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ENVIRONMENT

Subject:  
Remedial Design Report  
Rensselaer Non-Owned Former MGP Site  
Site No. 4-42-057

Date:  
November 9, 2020

Dear Mr. Spellman:

Contact:  
Jason Golubski, PE

On behalf of National Grid, please find enclosed, the final Remedial Design Report (Remedial Design) for the National Grid Rensselaer Non-Owned Former Manufactured Gas Plant (MGP) Site (Site No. 4-42-057, former Site No. V00488).

Phone:  
315.671.9437

A Draft Final Remedial Design Report (Draft Final RD) was previously submitted to the New York State Department of Environmental Conservation (NYSDEC) on July 27, 2020 and NYSDEC comments were provided via a September 2, 2020 letter to National Grid. The Remedial Design has been modified to address each NYSDEC comment from the September 2, 2020 letter (as applicable).

Email:  
jason.golubski@arcadis.com

For ease of presentation, each NYSDEC comment is presented in below in bold, followed by National Grid's response.

Our ref:  
30004017

**Comment 1. Section 3.1. The 2015 Decision Document requires the removal of the northern gas holder structure and its contents. Thus, the phase "removal of the holder contents to the extent practicable" does not apply. To allow for the holder wall and foundation to remain in-place, as a modification of the Decision Document, the structure will need to be inspected for the presence of tar or oil. This will require the removal of the entirety of the holder contents.**

Section 3.1 was revised to indicate that the contents of the northern gas holder will be fully removed using mechanical methods (i.e., using an excavator). Removal of northern gas holder contents will not be completed via manual methods (i.e., using shovels and/or brooms).

**Comment 2. Section 6.5. The section states that if visually clean material is encountered below the tar well structure (at depths less than 16 feet) the**

**visually clean material will not be removed, and the excavation will be terminated. The inverse statement should also be indicated, the being, if visual tar or oil is observed, the excavation will continue, to remove that material.**

Section 6.5 was revised to indicate that if visual impacts are observed below the tar well structure, excavation will continue to remove visual impacts to a maximum depth of up to 16 feet below grade, which corresponds to the approximate depth to till and the maximum achievable depth of the slide rail excavation support system.

**Comment 3. Section 6.5.1. The report indicates the northern holder wall appears to be structurally competent (2.3.4) which suggests there is a degree of uncertainty as to whether the wall can function for excavation support and has contained impacted material within the former holder. Please specify the contingency action to be followed if the northern holder wall and/or foundation slab are later found to be in a poor, non-competent structural condition.**

As a conservative measure, the northern gas holder will be excavated (and backfilled) in three sections ("cells"), each no more than 12-feet wide to limit the length of holder wall exposed at any given time. Additionally, if the holder wall is observed to be in poor structural condition, portions of the excavation may be backfilled using controlled low-strength material (CLSM) (i.e., flowable fill) to provide added stability. Section 6.5.1 text, Design Drawing S-101, and appropriate specifications have been updated to include these requirements.

**Comment 4. Drawing C-501. Please extent the profile of the Asphalt Driveway Detail to show the underlying ISS Wall.**

Detail 3 on Design Drawing C-501 was revised to show the underlying ISS gravity wall.

**Comment 5. Specification 01045. Please update the project sign.**

Attachment A of Specification Section 01 58 13 – Temporary Project Signage was updated to include project specific information.

Additionally, please note other minor modifications to the Remedial Design include revisions to the text, specifications, and supporting plans to indicate that, in lieu of the Engineer, the Contractor will be responsible for 1) performing analytical testing of imported fill materials and 2) conducting community air monitoring.

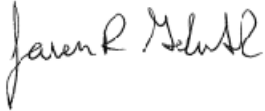
As the final stamped/signed Remedial Design has been submitted to NYSDEC, National Grid respectfully requests that NYSDEC issue a final approval for the Remedial Design. Additionally, National Grid has initiated contractor procurement and anticipates contract award by May 2021.

John Spellman  
NYSDEC  
November 9, 2020

Please contact Steve Beam at 315.428.2690 or [steve.beam@nationalgrid.com](mailto:steve.beam@nationalgrid.com) with any additional questions or concerns.

Sincerely,

Arcadis of New York, Inc.

A handwritten signature in black ink, appearing to read "Jason Golubski".

Jason Golubski, PE  
Principal Environmental Engineer

Copies:

Steve Beam, National Grid  
Terry Young, PE, Arcadis





# FINAL REMEDIAL DESIGN REPORT

Rensselaer Non-Owned Former  
Manufactured Gas Plant Site  
Rensselaer, New York  
Site No. 4-42-057

November 2020

A large, solid orange geometric shape in the bottom right corner of the page. It consists of a large right-angled triangle with a diagonal line running from the bottom-left corner to the top-right corner, creating two smaller triangles within the main shape. A thin white horizontal line crosses the page just above the orange shape.

## FINAL REMEDIAL DESIGN REPORT

### Certification

I, Terry W. Young, certify that I am currently a New York State registered Professional Engineer and that this Remedial Design Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.



A handwritten signature in black ink, appearing to read "Terry W. Young", is written over a horizontal line.

November 9, 2020

Terry W. Young, P.E.

Date

## FINAL REMEDIAL DESIGN REPORT

### Rensselaer Non-Owned Former MGP Site

Prepared for:

National Grid

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Our Ref.:

30004017

Date:

November 2020

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## APPENDICES

- A Design Drawings
- B Technical Specifications
- C Community Air Monitoring Plan
- D Community and Environmental Response Plan
- E Storm Water Pollution Prevention Plan

## ATTACHMENTS

- 1 March 23, 2018 PDI Summary Report Letter
- 2 Treatability Study Report

## ACRONYMS AND ABBREVIATIONS

BTEX	benzene, toluene, ethylbenzene, and xylene
CAMP	Community Air Monitoring Plan
CERP	Community Environmental Response Plan
CFR	Code of Federal Regulations
CLSM	controlled low-strength material
cm/sec	centimeters per second
CP	Commissioner's Policy
CPP	Citizen's Participation Plan
CSM	conceptual site model
cy	cubic yards
DER	Division of Environmental Remediation
DNAPL	dense non-aqueous phase liquid
EAGLC	East Albany Gas Light Company
FER	Final Engineering Report
HASP	Health and Safety Plan
ISS	in-situ soil solidification
LTTD	low-temperature thermal desorption
mg/kg	milligrams per kilogram
MGP	manufactured gas plant
NAPL	non-aqueous phase liquid
NYCRR	New York Code of Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OCFS	Office of Children and Family Services
PAH	polycyclic aromatic hydrocarbon
PDI	pre-design investigation
POP	Project Operations Plan
PPE	Personal Protective Equipment

## FINAL REMEDIAL DESIGN REPORT

psf	pounds per square-foot
RAO	remedial action objective
RDWP	Remedial Design Work Plan
RI	remedial investigation
SCO	soil cleanup objective
SMP	Site Management Plan
SWPPP	Storm Water Pollution Prevention Plan
VCP	Voluntary Cleanup Program

## 1. INTRODUCTION

This Final Remedial Design Report (Final Remedial Design) has been prepared to support the implementation of the New York State Department of Environmental Conservation- (NYSDEC-) selected remedy for the National Grid Non-Owned Rensselaer former manufactured gas plant (MGP) site (the site) located in Rensselaer, New York (Site No. 4-42-057). The selected remedy to address environmental impacts identified at the site is presented in the NYSDEC-Voluntary Cleanup Program (VCP) Decision Document (NYSDEC 2015). As discussed in Section 6 of this Final Remedial Design, the remedial construction activities to be performed will generally consist of excavation of soils from the limits shown on the Design Drawings (Appendix A).

This Final Remedial Design has been prepared in accordance with the following documents:

- VCP Decision Document.
- NYSDEC Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10) (NYSDEC 2010b).
- NYSDEC-approved Remedial Design Work Plan (RDWP) (Arcadis 2016).

Activities identified in this Final Remedial Design will be performed under the approval and oversight of NYSDEC and the New York State Department of Health (NYSDOH).

### 1.1 Summary of Selected Remedy

As presented in the VCP Decision Document, the selected remedy for the Rensselaer former MGP site consists of the following components:

- Implementing a remedial design program to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program.
- Conducting a pre-design investigation (PDI) in the area immediately north of the northern gas holder and tar well to further evaluate the potential for non-aqueous phase liquid (NAPL) to migrate.
- Excavating and transporting for off-site treatment/disposal the structures and contents of the former MGP holders and the former tar well structure and contents, and impacted soils containing visible tar or oil in material with total polycyclic aromatic hydrocarbons (PAHs) greater than 500 milligram per kilogram (mg/kg). Removal areas will be backfilled with imported fill that meets the applicable requirements specified in Title 6 of the New York Code of Rules and Regulations (6 NYCRR) Part 375-6.7(d).
- Installing a site cover to allow for restricted residential use of the project area. The cover will consist either of asphalt pavement, structures such as buildings, pavement, sidewalks comprising the development of the project area or a soil cover in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs).
- Establishing an institutional control for the site in the form of an environmental easement that:
  - Requires National Grid to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3).



- Allows for the use/redevelopment of project area properties for restricted-residential, commercial, and industrial use as defined by 6 NYCRR Part 375-1.8(g); although land use is subject to local zoning laws.
- Restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County Department of Health.
- Requires compliance with a Site Management plan (SMP).
- Preparing and implementing an SMP that includes the following:
  - An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the project area and details the steps and media-specific requirements necessary to ensure the institutional and/or engineering controls remain in place and effective. Note that institutional controls shall also include an agreement with the off-site property owner(s) necessary to implement the remedy and future site management of the off-site properties.
  - A Monitoring Plan to assess the performance and effectiveness of the remedy.

On February 10, 2016, NYSDEC submitted a letter to National Grid, requesting that an environmental easement be established for the site. As documented in NYSDEC's March 24, 2016 email to National Grid and Arcadis, NYSDEC clarified that the environmental easement was to be established on the parcel that comprises the former MGP site only and that agreement(s) with the off-site property owner(s) would be required to implement the remedy and necessary future SMP. Therefore, for purpose of this Final Remedial Design, references to institutional controls consist of the environmental easement to be established on the former MGP site, as well as the agreement(s) between National Grid and the off-site property owner(s).

## 1.2 Purpose

The purpose of this Final Remedial Design is to present the remedial approach and provide the engineering design necessary to implement the remedial action.

## 1.3 Report Organization and Structure

This Final Remedial Design is supported by Design Drawings (included as Appendix A) and Technical Specifications (included as Appendix B). Additional supporting documents included with this Final Remedial Design consist of the following:

- A Community Air Monitoring Plan (CAMP) that describes the monitoring activities that will be conducted to detect potential airborne releases of constituents of concern during the implementation of remedial activities.
- A Community and Environmental Response Plan (CERP) that presents a summary of the site monitoring and work practices that will be completed to address potential short-term impacts to the surrounding community and/or environmental resources.
- A Storm Water Pollution Prevention Plan (SWPPP) that describes the erosion and sediment control measures, as well as general site practices, to be implemented during the remedial activities.

The Final Remedial Design text is organized as follows:

## FINAL REMEDIAL DESIGN REPORT

- Section 1, Introduction – presents the purpose of the Final Remedial Design and summarizes the report organization.
- Section 2, Background Information – presents a description of the site characterization.
- Section 3, Basis of Design – describes the basis of design for soil removal delineation and excavation support.
- Section 4, Organization Structure and Responsibilities – presents the responsibilities of National Grid, the Engineer, and the Contractor during the implementation of the selected remedy.
- Section 5, Pre-Remediation Activities – describes the activities to be completed prior to the implementation of the selected remedy.
- Section 6, Remediation Activities – summarizes the remedial tasks to be conducted as part of the selected remedy.
- Section 7, Post-Remediation Activities – describes the reporting, monitoring, and administrative activities to be completed following remedial construction.
- Section 8, Schedule – presents the anticipated schedule for completing the design and implementation of the selected remedy.
- Section 9, References – lists select sources consulted as references.

## 2. BACKGROUND INFORMATION

This section presents a summary of site background information, including a description of the site location and physical setting, as well as a brief site history.

### 2.1 Location and Physical Setting

The former MGP site is located on Washington Street in the City of Rensselaer, Rensselaer County, New York. The former MGP site is comprised by the former MGP area, including remnants of two gas holders, a tar well, and MGP facilities. The former MGP site is currently paved and used as a parking lot for the Capital View Office Park which houses the Albany Regional office for the New York State (NYS) Office of Children and Family Services (OCFS). Off-site areas surrounding the former MGP site include:

- Huyck Square to the north and Mill Creek/Huyck Pond, which is surrounded by undeveloped land.
- Academy Street to the west.
- Washington Street to the east and the Capital View Office park.
- A private business and NYS Route 151 to the south.

For the purpose of this Final Remedial Design, the former MGP site and off-site areas are collectively referred to herein as the “project area.” The project area and adjacent properties are located in an area zoned for downtown mixed-use (MU-2) and planned development district use, as shown on the City of Rensselaer Zoning Update 2012 map ([https://rensselaerny.gov/application/files/4715/6347/7616/FINAL\\_Zoning\\_Map\\_June\\_2012.pdf](https://rensselaerny.gov/application/files/4715/6347/7616/FINAL_Zoning_Map_June_2012.pdf)), accessed January 16, 2020).

### 2.2 Project Area History and Operation

The East Albany Gas Light Company (EAGLC) began gas manufacturing operations at the site circa 1876. In general, the former MGP initially consisted of a single gas holder and the former retort house and used the coal carbonization process which did not use a petroleum feedstock (no information was identified during previous investigations to indicate that the carbureted water gas process was used at the site). Between 1900 and 1909, the site changed ownership three times: Kinderhook Light and Power Company took ownership in 1900; Hudson Railway & Power Company in 1902; and Albany & Southern Railroad Company in 1909. Additionally, according to the 1909 Sanborn® fire insurance map, the MGP was expanded to include an additional gas holder, coal shed, tar well, and meter, purifier and condenser rooms.

Between 1918 and 1925, the manufactured gas production ceased, and the plant became part of the F.C. Huyck & Sons Felt Mill (located on the property east of the MGP). According to the 1925 Sanborn® fire insurance map, the coal shed was converted into a garage, a carpentry shop was built following demolition of the large gas holder, and the remaining MGP facilities were used as chemical laboratories. Additional Sanborn® fire insurance maps indicate that the remaining MGP structures were demolished between 1949 and 1967.

## 2.3 Project Area Characterization Summary

This section presents an overall characterization of the project area and a summary of the nature and extent of impacted media based on the results of historical site investigation activities and remedial measures, which include the following:

- Brown and Caldwell Associates (Brown and Caldwell) – Site Characterization (2005)
- Brown and Caldwell – Remedial Investigation (RI) (2008-2013)
- Arcadis – Monitoring well gauging (2014)
- Arcadis – PDI (2016-2019)

The project area characterization consists of a summary of the topography, geology, and hydrogeology, , as well as the conceptual site model (CSM) which summarizes the nature and extent of the environmental impacts.

### 2.3.1 Project Area Topography and Drainage

The topography of the former MGP site slopes gently downward from the south to the north. The former MGP site primarily consists of a paved parking lot with minimal vegetation in the southern portion of the project area and contains no distinctive surface water runoff pathways (e.g., drainage ditches or storm drains). The Hudson River is located approximately 800 feet west of the site and fluctuates approximately five to six feet due to high and low tides approximately every six to eight hours. A dam structure is present at Mill Creek/Huyck Pond (located to the north of the MGP site) and there is a general east to west flow in the pond, towards the Hudson River.

### 2.3.2 Geology

The overburden strata, in descending order from the ground surface, consists of the following:

- Fill – The fill unit is present at the ground surface with a thickness ranging from less than 1 foot to approximately 10 feet (in the southern portion of the project area). The fill unit is comprised if an anthropogenic heterogeneous mixture of reworked silt, clay, sand, gravel and cobbles, with varying amounts of ash, coal fragment, cinders, and bricks.
- Silt and Sand – The silt and sand unit is encountered below the fill unit throughout a vast majority if the project area, at depths of approximately 3 to 5 feet below grade, with a thickness ranging from approximately 5 to 25 feet. The silt and sand unit is comprised of grey to brown sand and silt with relatively thin zones of fine to medium gravel.
- Sand and Gravel – The sand and gravel unit is encountered below the silt and sand unit in the northern portion of the project area in the vicinity of the Mill Creek/Huyck pond. Where present, this unit is encountered at depths of approximately 15 to 33 feet below grade with a thickness ranging from 2 to 15 feet. The sand and gravel unit is poorly sorted with a small amount of silt.
- Glacial Till – The glacial till unit is located above the bedrock throughout the project area. This unit is encountered below the sand and gravel unit in the northern portion of the project area and below the silt and sand unit in the southern portion of the project area. The glacial till unit is encountered at depths of approximately 8 feet to more than 20 feet below grade with a thickness ranging from

approximately 4 to 18 feet. The glacial till unit is comprised of dense, poorly sorted silt, sand, and gravel.

- Bedrock – The bedrock unit is encountered below the glacial till unit at depths ranging from approximately 23 to 38 feet below grade.

### 2.3.3 Hydrogeology

The water table is generally encountered within the silt and sand unit. Groundwater in the project area generally flows north towards the Mill Creek/Huyck Pond, with an estimated horizontal hydraulic conductivity in the overburden ranging from  $1.1 \times 10^{-5}$  to  $1.7 \times 10^{-3}$  centimeters per second (cm/sec).

Water level data from monitoring locations indicate an upward vertical hydraulic gradient near the Mill Creek/Huyck Pond, causing groundwater to flow from the bedrock to the overburden units. However, this vertical gradient varies in both magnitude and direction in the overburden units, and no distinct continuous water bearing zones were identified in the shallow/uppermost bedrock. Additionally, tidal effects have been observed in deep overburden deposits and bedrock north of the Mill Creek/Huyck Pond.

Bedrock in the project area is shale with a very low porosity and permeability. Therefore, groundwater flow in bedrock is controlled by fractures. The upper or shallow bedrock ( $\pm 18$  to 30 feet below the top of bedrock surface) contains water-bearing fractures; however, these fractures do not appear to be laterally continuous across the project area.

### 2.3.4 Conceptual Site Model

The CSM for subsurface soil and groundwater within the project area has been developed based on the results of historical site investigation activities. The CSM presented herein relates current conditions to the former MGP operations, including updates based on the PDI.

As with other MGP sites where coal carbonization processes were used, the tar encountered is typically a dense non-aqueous phase liquid (DNAPL). In general, tar-saturated or -coated subsurface material (i.e., visually impacted material) has been observed at isolated, sporadic locations throughout the project area; however, the vast majority of tar-saturated or -coated materials containing total PAHs greater than 500 mg/kg have been observed within or proximate to remnants of former subsurface MGP structures, including:

- Tar well – The walls of the former tar well are constructed of ¼-inch steel plates. The wall of the tar well was encountered at depths ranging from approximately 4.8 feet to 5.5 below grade during the RI and PDI, respectively; the base of the tar well was not encountered at the terminal depth of 10 feet below grade for a test pit excavated during the RI. Viscous black tar was observed in the interior of the tar well; and weeping from a perforation in the steel wall during the RI. Additionally, pockets of viscous NAPL were observed on top of the uncovered tar well structure during the PDI. One of three subsurface samples collected from the tar well (collected from 4-5' below grade) contained total PAHs at a concentration greater than 500 mg/kg.
- Northern gas holder – The wall of the northern gas holder is constructed of red brick. The wall of this former gas holder was encountered at a depth of 2 feet below grade during the PDI. The holder contains fill material consisting of sand, gravel, brick fragments, slag, coke, and cinders. Tar-

saturated soil was encountered within the northern holder during the RI with a greater degree of tar saturation observed in the lower portion of the holder. Total PAHs were detected at a concentration greater than 500 mg/kg in the sample collected within this holder (collected 8-10 feet below grade). The holder wall appears to be structurally competent based on visual observations; the approximate depth to water measured within the northern gas holder was several feet above saturated conditions observed immediately outside of subsurface structure, indicating that water in the holder has little or no hydraulic connectivity with surrounding groundwater.

- Southern gas holder – The wall and bottom of the southern gas holder were not encountered during site investigations. Although a small section of former gas holder wall was encountered at approximately 1.3 feet below grade, the brick wall is not structurally competent and is not continuous based on visual observations from multiple test pits completed during the PDI. The southern gas holder area contains fill material consisting of sand, gravel, brick, concrete, cinder, and slag. Additionally, stone/concrete structures were encountered at test pits excavated within the limits of the southern gas holder during the PDI. Tar-saturated material was observed within the limits of the southern gas holder at varying depths. NAPL was also observed, in varying amounts from blebs to saturated soils, approximately 5 to 10 feet below grade on the northern portion of the limits of the southern gas holder. Water saturation was encountered at the same depth (i.e., approximately 7 feet below grade) both within and outside of the limits of the southern gas holder, indicating that water within the holder is in hydraulic connection with the surrounding groundwater. Two of the four subsurface soil samples collected from this holder (collected at 5-7 and 10-12 feet below grade) contained total PAHs at a concentration greater than 500 mg/kg. During drilling of a PDI soil boring, oil-like NAPL was observed from approximately 10 to 12 feet below grade in the area between the northern gas holder and the southern gas holder. Therefore, the limits of soil subject to remediation in the southern gas holder area were extended (compared to the limits presented in the VCP Decision Document) to include soil the area between the northern gas holder and the southern gas holder.
- Area immediately north of the northern gas holder and the tar well – Tar-saturated or -coated materials, as well as oil-like NAPL, were initially observed north of the northern gas holder and tar well at depths below 10 feet below grade during the RI. Additionally, total PAHs were detected at a concentration greater than 500 mg/kg in one soil sample collected from this area at a depth of 12-14 feet below grade. However, this area was further investigated during the PDI to determine the extent (if any) remedial action is required in this area. Although NAPL was sporadically observed during installation of the new monitoring wells during the PDI, no recoverable NAPL was observed in any of the wells during the year-long NAPL monitoring program conducted as part of the PDI, indicating that mobile NAPL is not present.

To address the cleanup criteria presented in the VCP Decision Document (i.e., visible tar or oil [tar coated or tar saturated]) in material with total PAHs at concentrations greater than 500 mg/kg, the tar well and holder areas will be addressed through excavation. Consistent with the VCP Decision Document, additional remedial activities are not warranted in the area immediately north of the northern gas holder and the tar well.

The water table is encountered in the lowermost portion of the fill and within the silt and sand unit. Groundwater flow beneath the project area is primarily within the silt and sand and deeper overburden units. Groundwater flow direction is generally towards Mill Creek/Huyck Pond.

## FINAL REMEDIAL DESIGN REPORT

The extent of groundwater affected by the MGP impacts has a strong correlation to the NAPL distribution at the project area. NAPL has been observed at times to have entered four of the overburden monitoring wells (MW-102-05, MW-106S-08, MW-106D-08, and MW-107-08). These observations are adjacent to areas where NAPL was identified in subsurface soil. As indicated above, the only indications of NAPL observed during the year-long NAPL monitoring program conducted as part of the PDI were the minor amounts of NAPL (i.e., from blebs on the probe/tape up to 0.1 feet of NAPL) observed in monitoring wells MW-102R-10, MW-106D-08, and MW-118. However, NAPL was not consistently observed and quantities were not recoverable, indicating that mobile NAPL is not present.

Constituent concentrations in overburden groundwater were measured at levels above the NYS Class GA groundwater quality standards or guidance values for one or more constituents in samples from five overburden wells, located downgradient and side-gradient of former MGP operations. The dissolved-phase groundwater impacts significantly decrease with distance from the tar-saturated or -coated materials. Accordingly, the extent of overburden groundwater exceeding groundwater quality standards is limited and generally bounded by Academy Street to the west, monitoring wells MW-114-12 and MW-115-12 to the north, Washington Street (east side) to the east, and on-site monitoring well MW-101-05 to the south.

Concentrations of benzene, toluene, ethylbenzene, and xylene (BTEX) and naphthalene in bedrock groundwater exceed the Class GA groundwater quality standards or guidance values at two locations (MW-102R-10 and MW-106R-10), both of which are north of the northern gas holder. No continuous water-bearing zones were identified in the bedrock and; therefore, it appears that: 1) the exceedances are related to NAPL present in local, discontinuous bedrock fractures; 2) these concentrations are isolated and not migrating from this area.

Based on groundwater quality sampling during the RI, there is no impact to surface water on Mill Creek/Huyck Pond as a result of discharge of groundwater to surface water. Additionally, the results of the sediment sampling and analyses indicate that there are no site-related impacts in the surficial sediments in Mill Creek/Huyck Pond.



### 3. BASIS OF DESIGN

This section describes the process and tools that were used to identify the scope and extent of the required remedial components. The primary remedial component of the site remedy consists of excavating and transporting for off-site treatment/disposal tar saturated (or tar coated) soil with total PAH concentrations greater than 500 mg/kg.

#### 3.1 Soil Excavation

The soil excavation limits presented in the VCP Decision Document have been modified based on the results of the PDI activities. Detailed findings of the PDI are presented in the PDI Summary Letter Report, included as Attachment 1.

Rationale for establishing the revised limits for each of the proposed removal areas is presented below:

- Tar Well – The limits of this removal area did not change significantly relative to the limits presented in the VCP Decision Document. The limits of this removal area are defined based on the following:
  - The northern limits have been defined by PDI soil borings free of visual impacts.
  - The southern limit has been defined by the tar well structure encountered during the excavation of a PDI test pit. Pockets of NAPL were observed on top of uncovered tar well wall; the outside the tar well structure (i.e., south of the tar well) was free of visual impacts.
  - The eastern limit has been defined by a RI test pit free of visual impacts.
- Northern Gas Holder – The limits of this removal area have not changed relative to the limits presented in the VCP Decision Document. The limits of removal of this area are defined by the holder wall. The holder structures (wall and foundation slab) appear to be structurally competent; therefore, the northern gas holder structures will remain in place and the holder wall will be used as excavation support during the removal of the holder contents (i.e., to the holder bottom located approximately 10 feet below grade) without disturbance to the holder wall. Contents of the northern gas holder will be fully removed using mechanical methods. Manual methods will not be used to remove northern gas holder contents.
- Southern Gas Holder – This removal area was revised relative to the limits presented in the VCP Decision Document. The limits of removal were initially defined in the VCP Decision Document by the assumed location of the holder wall. However, as indicated in Section 1, the holder wall and bottom were not encountered during the PDI; only a small section of former gas holder wall and stone/concrete structures were encountered at test pits excavated within the limits of the southern gas holder during the PDI. Oil-like NAPL was also observed in a PDI soil boring north of the southern gas holder (between the northern and southern gas holders). Therefore, the limits of this removal area are defined based on the following:
  - The northern limit is defined by PDI soil borings free of visual impacts.
  - The eastern and southern limits are defined by PDI test pits free of visual impacts.

Although NAPL was sporadically observed during installation of the new monitoring wells immediately south of Huyck Square (during the PDI), no recoverable NAPL was observed in any of the wells during the year-long NAPL monitoring program conducted during the PDI, indicating that mobile NAPL is not present. Therefore, additional remedial activities are not warranted in the area of Huyck Square as part of the remedial construction.



Following completion of soil removal activities, excavated areas will be backfilled with imported fill that meets the requirements set-forth in Section 5.4 of DER-10 to facilitate placement of the soil cover. Disturbed surfaces will be restored, in kind, with asphalt pavement, concrete, etc.

### 3.2 Excavation Support

Excavation support systems that will be used at the tar well, northern gas holder, and southern gas holder areas are outlined below.

#### 3.2.1 Tar Well

The Contractor shall utilize a pre-fabricated slide rail excavation support system to facilitate removal of the tar well structure and visually impacted soil observed in the immediate vicinity of the structure, to depths up to 16 feet below grade (i.e., the top of till).

#### 3.2.2 Northern Gas Holder

As described in Section 3, the holder structures (wall and foundation slab) appear to be structurally competent. The Contractor shall utilize the existing northern gas holder structure as excavation support to facilitate the removal of the contents of the northern gas holder. The Contractor shall inspect the gas holder during excavation to verify that the holder structures are structurally competent.

#### 3.2.3 Southern Gas Holder

The Contractor shall utilize an in-situ soil solidification (ISS) gravity wall as excavation support to facilitate the removal of soil in the vicinity of the former southern gas holder, including any remaining structures. Excavation depths in the vicinity of the southern gas holder will range from approximately 10 to 14 feet below existing grade (i.e. to the top of till). Excavation support via a gravity wall was selected based on the following:

- The shallow depth to till prevents use of cantilevered steel sheet pile. Without significant embedment, internal excavation support would be required to brace the sheet pile, which would hinder excavation of impacted materials and former MGP structures.
- Benching/sloping of surrounding soils would require the excavation (and handling and backfilling) of additional material (i.e., beyond that requiring removal per the VCP). The relatively small size of the project area provides limited room for material staging. Additionally, the limits of benching/sloping would encroach on the nearby roadways, utilities, and structures.

As presented in a July 29, 2019 letter to NYSDEC, additional PDI activities were proposed to address additional remedial design data needs identified to support the design of an ISS gravity wall. On August 10, 2019, two additional soil borings were drilled in the location of the proposed gravity wall to facilitate the collection of samples of representative media to be used for bench-scale testing. Additional PDI activities were conducted in general accordance with the NYSDEC-approved RDWP. Detailed findings of the additional PDI and treatability study are presented in the 2019 Treatability Study Report (Arcadis 2020), included as Attachment 2. The mix design for the ISS gravity walls been developed based on the following criteria:

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- 28-day unconfined compressive strength (UCS) greater than 50 pounds-per-square-inch (psi)
- 28-day hydraulic conductivity less than  $1 \times 10^{-6}$  centimeters per second (cm/sec)

By achieving the above-listed criteria, the specific gravity wall thickness has been design based on a maximum construction surcharge of 250 pounds per square-foot (psf). ISS gravity wall installation is further discussed in Section 6.

The ISS gravity wall will be keyed into the underlying till a minimum of 6 inches to effectively isolate the excavation area from surrounding groundwater. As such, a temporary water treatment system is not required. The excavation area will be dewatered, water will be temporary stored in on-site tanks, and subsequently transported off-site for treatment/disposal by the Contractor.

## 4. ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES

National Grid, the NYSDEC, and NYSDOH will participate jointly in the implementation of the remedial activities described herein. National Grid has the ultimate responsibility for implementing the remedial activities. NYSDEC and NYSDOH personnel are anticipated to be on-site periodically to observe work activities. National Grid will be responsible for all on-site construction operations during the project, except for the operations indicated herein. The construction activities will be observed by National Grid's designated appointee (i.e., the Engineer) for general compliance with the Final Remedial Design. Communication with regulatory agencies and with members of the surrounding community will be managed by National Grid.

Key Project personnel are identified below.

**Table 4.1 Key Project Personnel**

Name/Affiliation	Address	Contact Information
<b>National Grid</b>		
Steve Beam Project Manager	300 Erie Blvd. West Syracuse, NY 13202	T: 315.428.5690 <a href="mailto:Steve.Beam@nationalgrid.com">Steve.Beam@nationalgrid.com</a>
<b>NYSDEC</b>		
John Spellman, P.E.	625 Broadway 11 <sup>th</sup> Floor Albany, NY 12233-7014	T: 518.402.9662 <a href="mailto:John.Spellman@dec.ny.gov">John.Spellman@dec.ny.gov</a>
<b>NYSDOH</b>		
Renata Ockerby	547 River Street Room 300 Troy, NY 12180	518.402.7880 <a href="mailto:reo02@health.state.ny.us">reo02@health.state.ny.us</a>
<b>Engineer: Arcadis</b>		
Terry Young, P.E. Engineer of Record	110 West Fayette Street Suite 300 Syracuse, NY 13202	T: 315.671.9478 <a href="mailto:Terry.Young2@arcadis.com">Terry.Young2@arcadis.com</a>
Jason Golubski, P.E. Project Manager	110 West Fayette Street Suite 300 Syracuse, NY 13202	T: 315.671.9437 <a href="mailto:jason.golubski@arcadis.com">jason.golubski@arcadis.com</a>
<b>Contractor</b>		
<b>To be determined</b>		

Minimum responsibilities of National Grid, the Engineer, and the Contractor for work to be conducted prior to, during, and following implementation of the remedial activities at the project area are presented in the following subsections.

### 4.1 National Grid Responsibilities

National Grid will be responsible for the following:

- Contract with the selected Contractor.
- Coordinate with the Contractor and Engineer (as necessary) to implement the required work activities in conformance with the Final Remedial Design.

- Secure access agreements and coordinating with property owners with respect to the implementation of the remedial activities.
- Assist NYSDEC in preparing and sending a Notice and Fact Sheet consistent with NYSDEC's Citizen Participation Handbook for Remedial Programs (DER-23) (NYSDEC 2010a).
- Issue contract addenda (if any) and modifications (if any) based on input from the Engineer.
- Act as the "Generator" for material resulting from the remedial activities for off-site treatment and/or disposal of the waste.
- Coordinate with the NYSDEC and NYSDOH regarding environmental-related work activities.
- Attend periodic site meetings.
- Evaluate the remedial activities to confirm that construction meets or exceeds the requirements presented in the Final Remedial Design.

### 4.2 Engineer Responsibilities

The Engineer will provide the following services prior to the implementation of the remedial activities:

- Prepare Contractor bid documents and evaluate bid documents submitted by prospective Contractors.
- Conduct pre-construction condition documentation of select structures.
- Decommission select existing monitoring wells (as discussed in Section 5).

The Engineer will provide the following services during implementation of the remedial activities:

- Review Contractor submittals and provide comments, if any, to the Contractor.
- Coordinate pre-construction project meeting, project construction/coordination meetings (as required), and a project close-out meeting for the remedial activities.
- Provide experienced and qualified project management/oversight personnel, including the Engineer's Resident Project Representative, to observe and monitor remedial activities.
- Resolve design-related technical questions or problems that may arise when the Final Remedial Design is implemented.
- Maintain records of the work efforts associated with implementation of the remedial activities, including daily field reports and digital photographs of the work in progress and to document observations, problems, and deficiencies.
- Maintain records of labor, materials, and equipment utilized for the remedial activities and any unusual circumstances, if any are encountered.
- Document that the remedial activities are conducted in general conformance with the Final Remedial Design and notify National Grid of any deviations.
- Review and sign (as an authorized agent for National Grid) waste manifests/bills of lading for shipments of waste materials generated by the remedial activities.
- Maintain an on-site project log containing manifests/bills of lading for wastes generated by the remedial activities.
- Monitor the Contractor's survey control for evaluating payment quantities, as applicable.
- Assist National Grid in the review of Contractor invoices/requests for payment.

- Issue formal design modifications (if necessary). Note that design modifications shall be signed and sealed by the NYS Licensed Professional Engineer.

The Engineer will provide the following services following the implementation of the remedial activities (as discussed in Section 7):

- Conduct post-construction condition documentation of select structures.
- Prepare (and certify) a Final Engineering Report (FER) to document completion of the remedial activities.
- Prepare an SMP to detail the post-remedial construction activities to be conducted at the project area.

### 4.3 Contractor Responsibilities

In general, the Contractor is responsible for providing the supervision, labor, equipment, and materials necessary to implement the activities described in the Final Remedial Design. Contractor responsibilities are detailed throughout the Design Drawings (Appendix A) and the Technical Specifications (included in Appendix B). The Contractor's responsibilities also include:

- Verify all existing site conditions including understanding the site data summarized in the supporting information presented as attachments to the remedial design.
- Thoroughly reviewing and understanding the Contract Documents which include the Final Remedial Design, the Design Drawings, Technical Specifications, and supporting documents and supplemental information provided herein. Nothing presented in one of the above documents or drawings should relieve the Contractor's obligation to satisfy the components specified in the other documents/drawings. The Contractor shall present in writing to National Grid and the Engineer any noted discrepancies in the information contained in the above-listed documents/drawings.
- Obtaining local construction related permits.
- Coordinate with all equipment and material suppliers to document compliance with the Final Remedial Design.
- Conduct community air monitoring in accordance with the CAMP (Appendix C) and Specification Section 01 35 49 – Community Air Monitoring Plan (Appendix B).
- Facilitate and coordinate quality assurance testing of off-site fill material samples in accordance with Specification Section 31 05 16 – Aggregates for Earthwork (Appendix B).
- Notify the Engineer and National Grid immediately upon discovery of a conflict between the Contract Documents and actual site conditions.
- Coordinate with waste disposal facilities to identify waste characterization requirements and conducting solid and liquid waste characterization sampling as required by the disposal facilities.
- Coordinate with waste disposal facilities to establish waste profiles for each waste stream.
- Contract with waste haulers and waste disposal vendors.
- Perform erosion and sediment control inspections and provide the Engineer with weekly inspection reports.
- Implementing the activities described in the Final Remedial Design in a safe manner and in accordance with applicable federal, state and local laws, rules and regulations.
- Coordinating with National Grid and the Engineer, as necessary, to complete required work activities.

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- Provide bills of lading/manifests for the off-site shipment of waste materials from the site. These shipping documents may be provided to the Engineer to sign as an agent for National Grid, under separate agreement with National Grid.
- Prepare and submit to the Engineer all shop drawings and other required submittals and project record documents specified in the Final Design Report.

## 5. PRE-REMEDIAL CONSTRUCTION ACTIVITIES

The following pre-remediation activities will be completed by National Grid, the Engineer, and/or the National Grid-selected Contractor prior to the initiation of remedial construction.

- Assisting NYSDEC in preparation of a citizen participation notice and fact sheet.
- Obtaining regulatory permits, access agreements, and other approvals.
- Decommissioning select groundwater monitoring wells.
- Preparing pre-mobilization submittals.
- Conducting a pre-construction conference.
- Conducting a pre-construction condition documentation inspection.

The overall purpose of the pre-remediation activities is to coordinate with the local community, officials, and other stake holders to facilitate the initiation of the remediation construction activities. Additional information regarding these pre-remediation activities is provided in the following subsections.

### 5.1 Citizen Participation

A Citizen Participation Plan (CPP) describing the citizen participation activities that have been and will be completed will be prepared as a stand-alone document and submitted to NYSDEC under separate cover. Consistent with DER-23, a Notice and Fact Sheet will be sent to the site contact list by NYSDEC before field work begins. National Grid will work with the NYSDEC (as appropriate) to develop the Notice that will be sent to all parties on the site contact list (i.e., residents and business owners within a specified radius of the project area, as well as additional community and political personnel) and to the document repository. The notice will include a Fact Sheet that describes the upcoming remediation work. NYSDEC is responsible for distributing the Notice and Fact Sheet.

### 5.2 Permitting

Based on the remedial activities to be conducted at the project area and information currently available, the following permit(s), authorization(s) and/or notification(s) have been identified, at a minimum, as being potentially applicable with respect to approval of remedial activities:

- Access Agreements – National Grid will extend/update the existing access agreement with Capital View Office Park and coordinate with the OCFS prior to conducting the remedial construction activities.
- Fire Hydrant Usage Permit – A permit from the City of Rensselaer will be required for the use of water from a fire hydrant located near the project area. The Contractor will be required to obtain and maintain this permit, including fees and deposit.
- Huyck Square, Academy Street, and Sidewalk Closure Permits – Huyck Square and select sidewalks adjacent to the remedial construction work limits will be closed for the duration of the remedial construction activities. Details regarding the street and sidewalk closures will be presented in the CERP (Appendix D). The Contractor will be required to obtain the necessary street and sidewalk closure permits from the City of Rensselaer and implement the closure activities.

The Contractor shall be responsible for obtaining any other pertinent and applicable local, state, or federal permits associated with the implementation of the supplemental remedial activities outlined herein.

### 5.3 Monitoring Well Decommissioning

Although considered part of the remedial design, the Contractor is not responsible for decommissioning existing monitoring wells. The Engineer will decommission select monitoring wells prior to the commencement of the remedial construction activities. Prior to site work, the Engineer will provide a well decommissioning work plan letter to NYSDEC describing the proposed monitoring well decommissioning methods.

Existing monitoring wells MW-101-05, MW-113R-10, and MW-102R-10 will be abandoned to facilitate remedial construction activities. Decommissioning activities will be completed in accordance with NYSDEC's guidance CP-43 Groundwater Monitoring Well Decommissioning Policy (NYSDEC 2009). Consistent with NYSDEC's policy, monitoring wells MW-101-05, MW-113R-10, and MW-102R-10 will be decommissioned via pulling the upper five feet of well casing and grouting the wells in place (to ground surface) with a non-shrink grout. NYSDEC Well Decommissioning Records will be completed for the decommissioned monitoring wells and submitted to the NYSDEC as part of the FER.

### 5.4 Contractor Pre-Mobilization Submittals

Following contract award, the selected Contractor will be required to prepare pre-mobilization submittals for review by National Grid and the Engineer. The Contractor will not be allowed to mobilize prior to review and approval of all required pre-mobilization submittals. These submittals will include, but not necessarily be limited to, the following:

- **Project Operations Plan** – The Project Operations Plan (POP) is required to present the Contractor's detailed approach for implementing the pertinent work activities (incorporating, as necessary, specifications, site maps, details, flow diagrams, charts, site geologic/geotechnical information, and schedules).
- **Health and Safety Plan (HASP)** – The Contractor will be required to prepare and submit a site-specific HASP (for use by the on-site personnel during the remedial activities) to provide a mechanism for establishing safe working conditions. The HASP will be prepared in accordance with all applicable rules and regulations, including 29 Code of Federal Regulations (CFR) 1910 and 29 CFR 1926, and shall be prepared by a Certified Industrial Hygienist. The Contractor is required to take all necessary precautions for the health and safety of all on-site personnel in compliance with all applicable provisions of federal, state, and local health/safety laws and the provisions associated with the HASP. The Contractor will assume sole responsibility for the accuracy and content of its HASP.
- **Preliminary Progress Schedule** – The Contractor will prepare a preliminary schedule that identifies major work items and work sequences.
- **Storm Water Permit Certification Statement** – The Contractor will sign-off on the Storm Water Permit Certification Statements included as an attachment to Specification Section 01 41 26 – SWPPP and Permit (Appendix B).



Additional requirements regarding the content of these Contractor pre-mobilization submittals and the overall submittal process are presented in the following Specification Sections (Appendix B):

- 01 15 00 – Contractor's Project Operations Plan
- 01 32 16 – Construction Progress Schedule
- 01 33 00 – Submittal Procedures
- 01 35 29 – Contractor's Health and Safety Plan

### 5.5 Pre-Construction Conference

A pre-construction conference will be held to designate responsible personnel, establish working relationships, discuss preliminary schedules submitted by the Contractor, and review administrative and procedural requirements for the remedial construction activities. The Engineer will be responsible for coordinating the conference. Prior to the conference, the Contractor shall provide the required submittals as presented in Specification Section 01 31 19.13 – Pre-Construction Conference (Appendix B).

### 5.6 Pre-Construction Structural Documentation Inspection

Prior to the Contractor's mobilization, the Engineer will conduct a pre-construction visual review to document the condition of a near-by existing structure. The pre-construction documentation will serve as the baseline for the post-construction documentation review. The pre-construction condition documentation will be conducted under the supervision of a Professional Engineer licensed in the State of New York and will include, but not be limited to, visual inspection and photo documentation of the existing conditions of the surface structure (i.e., garage) located at 332 Broadway. The inspection will document the general condition of the existing building interior/exterior, as well as exterior features on the subject property including, but not limited to: retaining walls; roads; utilities; poles; posts; signs; markers; curbs; sidewalks; and other facilities visible at or above the ground surface.

A pre-construction structural condition documentation summary letter will be submitted to National Grid prior to mobilization by the Contractor. The letter will include written text, detailed photographs, and any relevant measurements or descriptions to document pre-construction conditions of the surface structure at 332 Broadway.

## 6. REMEDIAL CONSTRUCTION ACTIVITIES

This section presents a task-by-task summary of the remedial activities to be completed as part of this project.

In addition to the text provided in the following subsections, the Design Drawings (Appendix A), and the Technical Specifications (Appendix B), remediation activities will be conducted in accordance with the CAMP (Appendix C), CERP (Appendix D), and SWPPP (Appendix E).

Additionally, the Contractor shall complete each remediation task in accordance with the Contractor's HASP. The Contractor shall be responsible for conducting worker health and safety and work space monitoring in accordance with the Specification Section 01 35 29 – Contractor's HASP (Appendix B), and community air monitoring for the duration of the project in accordance with the CAMP.

Remediation activities shall be conducted following the general sequence described below:

- Mobilization and site preparation
- Installation of ISS gravity wall
- Excavation and backfilling of northern gas holder area
- Excavation of southern gas holder area
- ISS gravity wall removal and backfilling of southern gas holder area
- Installation of excavation support system, excavation, and backfilling of tar well area
- Construction of the site cover
- Site restoration
- Demobilization

A description of each remediation task, including references to supporting information to be included elsewhere in the Contract Documents, is presented in the following subsections.

### 6.1 Mobilization

Mobilization will be initiated by the Contractor after notification from National Grid to proceed. In general, mobilization activities include establishing personnel, equipment, and materials at the project area necessary to support the remedial construction activities. Mobilization activities to be conducted by the Contractor include, but are not limited to, the following:

- Mobilizing necessary labor, equipment, materials, tools, and supervision to commence work on the project.
- Coordinating with Dig Safely New York, as well as a private utility locator, prior to construction activities to mark all on-site underground utilities.
- Mobilizing and establishing two field office trailers; one to be utilized by the Contractor and one by the Engineer and NYSDEC during implementation of the remedial activities. The trailers (and supporting telephone and internet services) shall conform to the requirements presented in Specification Section 01 52 13 – Field Offices and Sheds (in Appendix B).
- Providing and maintaining first-aid facilities and portable sanitary services for use by on-site personnel engaged in the remedial activities. First-aid and portable sanitary services shall conform to

the requirements presented in Specification Sections 01 52 16 – First-Aid Facilities and 01 52 19 – Sanitary Facilities (Appendix B).

- Coordinating with National Grid Customer Service to obtain electrical service. The Contractor shall be responsible for coordinating for electrical service and all necessary utilities for use during the remedial construction, in accordance with Specification Section 01 51 00 – Temporary Utilities (Appendix B).
- Preparing and providing submittals (in addition to the pre-mobilization submittals) to the Engineer and/or National Grid as required by the Contract Documents (e.g., Design Drawings, Technical Specifications, etc.). Select submittals may be provided NYSDEC for review and comment.
- Obtaining any additional permits not identified in Section 4.2. The Contractor will be responsible for obtaining local permits (e.g., city building and/or construction permits) necessary to facilitate the remedial activities during each phase.

## 6.2 Site Preparation

Site preparation activities will generally consist of the following:

- Verifying site conditions and identifying, marking, and verifying the location(s) of all aboveground and underground utilities, equipment, and structures, as necessary in accordance with Specification Section 01 71 33 – Protection of Work and Property (Appendix B), to implement the remedial activities. Current site conditions (i.e., a site plan and approximate locations of known existing utilities) are shown on Design Drawing G-101 (Appendix A). Historical site features are shown on Design Drawing G-102 (Appendix A).
- Maintaining appropriate clearances from utilities (e.g., active overhead electric lines, underground conduit/piping, etc.). If the Contractor damages existing utilities, equipment, or structures, the Contractor will be responsible for notifying the utility company/ municipality and fully repairing all damages at no additional cost to National Grid. Repairs (if necessary) will be completed in accordance with all requirements of the utility company/municipality.
- Installing temporary erosion and sedimentation controls in accordance with Design Drawings G-104 and G-501 (Appendix A) and the following Specification Sections (Appendix B):
  - 01 57 05 – Temporary Controls
  - 01 41 26 – SWPPP and Permit
- Erecting project signs in accordance with Specification Section 01 58 13 – Temporary Project Signage (Appendix B).
- Establishing survey control for soil excavation areas and work limits. Requirements for establishing survey control are presented in the following Specification Sections (Appendix B):
  - 01 71 26 – Construction Surveying and Layout
- Installing work zone air monitoring equipment (to be relocated, as appropriate, based on wind direction) as required by the Contractor's HASP.
- Constructing an equipment decontamination area. Materials used in the construction of the decontamination area shall be in accordance with Design Drawing G-502 (Appendix A) and the following Specification Sections (Appendix B):
  - 31 05 16 – Aggregates for Earthwork
  - 31 05 19.13 – Geotextiles for Earthwork
  - 31 05 19.16 – Geomembranes for Earthwork

- Establishing sidewalk and Huyck Square/Academy Street closures. Requirements for the closures are detailed in the CERP (Appendix D) and Specification Section 01 55 26 – Maintenance and Protection of Traffic (Appendix B). Huyck Square is anticipated to be closed for the duration of the construction activities. Closure at Academy Street shall consist of a partial temporary (i.e., one lane) closure during excavation activities that extend into the Academy Street right-of-way (Academy Street shall be re-opened following the completion of excavation work in this area).

Refer to Design Drawing G-104 (Appendix A) for additional information regarding site preparation.

## **6.3 Project Support**

This section presents project support activities to be completed by the Contractor. The Contractor will conduct project support activities (as necessary) in accordance with the Technical Specifications and plans as presented in the following subsections.

### **6.3.1 Project Meetings and Inspections**

Project meetings to be attended by the Contractor are described below. Additional details for the meetings are presented in Specification Sections 01 31 19.13 – Pre-Construction Conference and 01 31 19.23 – Progress Meetings (Appendix B). Anticipated on-site project meetings will consist of:

- Pre-Construction Conference (as discussed in Section 5)
- Daily Site Safety (Tailgate Safety) Meetings
- Weekly Construction Progress Meetings
- Pre-Final Inspection (Punch List)
- Final Inspection and Close-out Meeting

### **6.3.2 Survey**

The Contractor shall retain a NYS licensed surveyor to conduct survey control during completion of the remedial actions, as required by the Contract Documents. The survey information (including final as-built information) will be used to document that the remedial activities have been completed consistent with the project design requirements.

The Contractor shall supply the survey information (including an as-built survey, sealed and signed by the Contractor's NYS licensed surveyor) to the Engineer for inclusion in the FER to be prepared by the Engineer upon completion of the remedial activities (see Section 7). Survey work associated with the remedial activities will be performed in accordance with Specification Sections (Appendix B):

- 01 71 33 – Construction Surveying and Layout
- 01 78 39 – Project Record Documents

Contractor surveys are anticipated to include, but is not limited to the following:

- Pre-construction survey to document pre-remediation site conditions
- Horizontal and vertical extent of soil removal
- Top of site cover

The Contractor shall provide a final as-built survey within 21 days of final site demobilization and prior to final payment by National Grid.

### **6.3.3 Site Security, Control, and Access**

The Contractor will be responsible for maintaining site security, controls, and access in connection with each work task. Access to the project area shall be restricted by installing perimeter fencing and gates (as shown on Design Drawing G-104 [Appendix A]). Security around the work limits shall be maintained during both work and non-work hours. The level of security shall be dependent on the activities being performed and location of activities. Security measures to be implemented include: (1) temporary fencing and/or barriers; (2) warning tape and signs; (3) maintenance of sign-in/sign-out sheets; and (4) implementation of safe work practices. Temporary fence shall also be installed and relocated, as needed, during the remedial activities to limit access to the work limits. Site security, control, and access requirements are presented in Specification Section 01 57 33 – Site Security (Appendix B). Methods used by the Contractor shall be specified in the Contractor's Project Operations Plan.

## **6.4 Temporary Controls and Monitoring**

The Engineer and Contractor will share responsibilities for monitoring for impacts to workers and the surrounding community throughout the remedial construction.

The Contractor will also be responsible for implementing corrective actions, in consultation with the Engineer and National Grid in the event of an exceedance. Monitoring requirements, action levels and corrective actions are detailed in attached technical specifications, as presented in the following subsections.

### **6.4.1 Vapor, Odor, and Dust Monitoring and Mitigation**

The Contractor will be responsible for conducting community air monitoring (and associated reporting) for vapor and dust and dust in accordance with the CAMP (Appendix C) and Specification Section 01 35 49 – Community Air Monitoring Plan (Appendix B). The Contractor will implement corrective actions (in the event of an exceedance) in accordance with the CAMP, the CERP (Appendix D), and Specification Section 01 57 05 – Temporary Controls (Appendix B).

In the event of an exceedance of an air monitoring action level for either vapors or dust, the Contractor and/or the Engineer will notify National Grid as soon as the exceedance is identified. The Engineer will send a follow-up e-mail to NYSDEC, NYSDOH, National Grid, and the Contractor within 24 hours of an exceedance that summarizes the data, the cause of the exceedance, and corrective measures implemented (or to be implemented) in response to the exceedance. Work will not continue until exceedances are addressed in consultation with National Grid and the Contractor. Real time exceedances will be addressed immediately in consultation with the Contractor.

The Contractor will be responsible for conducting work space air monitoring in accordance with the Contractor's HASP, as well as implementing health and safety measures necessary to be protective to site workers.

### 6.4.2 Vibration Monitoring

The Contractor will be responsible for installing vibration (seismographs) and conducting vibration monitoring throughout the remedial construction. Monitoring will be conducted at the locations shown on Design Drawing S-101 (Appendix A). Details for vibration monitoring instrumentation, installation, and monitoring (including notification and action levels) are presented in Specification Section 31 09 13 – Geotechnical Instrumentation and Monitoring (Appendix B).

## 6.5 Soil Removal

The Contractor will conduct excavation activities to remove tar saturated (or tar coated) soil with total PAHs concentrations greater than 500 mg/kg. The anticipated horizontal and vertical extent of the soil excavation activities is shown on Design Drawings C-101 and S-301 (Appendix A). Soil excavation activities will be conducted in accordance with the following Specification Sections (Appendix B):

- 02 61 05 – Removal and Disposal of Contaminated Materials
- 31 23 00 – Excavation and Fill
- 31 50 00 – Excavation Support and Protection

Approximately 1,800 cubic yards (cy, neat volume, in-situ) of soil will be excavated during remedial construction activities. The Contractor shall saw-cut and remove existing asphalt pavement to facilitate soil removal to the limits shown on the Design Drawings (Appendix A). Soil excavation will be conducted as follows:

- Tar well – The Contractor shall remove the tar well (i.e., the structure and contents) to an estimated depth of 16 feet below grade (i.e., the approximate depth to till in this portion of the project area), as shown on Design Drawing S-301 (Appendix A). Note that if visually clean material is encountered below the tar well structure (i.e., at depths less than 16 feet below grade), the visually clean material will not be removed, and the excavation will be terminated. If visual impacts are observed below the tar well structure, excavation will continue to remove visual impacts to a maximum excavation depth of 16 feet below grade, which corresponds to the approximate depth to till and the maximum achievable depth of the slide rail excavation support system.
- Northern gas holder – The Contractor shall remove the contents of the northern gas holder to the base of the holder (identified at a depth of approximately 10 feet below grade), as shown on Design Drawing S-301 (Appendix A). As described in Section 3, the Contractor will utilize the existing northern gas holder structure to facilitate removal of the northern gas holder contents.
- Southern gas holder and surrounding soils – The Contractor shall remove soil in the vicinity of the former southern gas holder including any remaining structures to the top of till (i.e., to an estimated depth of 13 feet below grade), as shown on Design Drawing S-301. As discussed in Sections 2 and 3, the holder wall and bottom were not encountered during the PDI.

If encountered during excavation activities, former processing piping will be drained and abandoned in place by the Contractor, as shown on Design Drawing G-502 (Appendix A).

### 6.5.1 Excavation Support Systems

The Contractor will be responsible for providing, installing, monitoring, and maintaining excavation support systems to facilitate the excavation of materials from the removal areas shown on Design Drawing C-101 (Appendix A). Excavation support systems that will be used at the tar well, northern gas holder, and southern gas holder areas are outlined below.

- **Tar Well** – The Contractor will utilize a pre-fabricated slide rail excavation support system to facilitate removal of the tar well (i.e., the structure and contents). The Contractor will install the pre-fabricated slide rail to the limits shown on Design Drawing S-101 (Appendix A). The slide rail system will be installed in accordance with Specification Sections 01 71 33 – Protection of Work and Property and 31 50 00 – Excavation Support and Protection (Appendix B).
- **Northern Gas Holder** – Based on visual observations during the PDI, the holder wall appears to be structurally competent. The wall of this former gas holder was encountered at a depth of 2 feet below grade during the PDI. The Contractor will utilize the existing northern gas holder structure to facilitate removal of the northern gas holder contents. The Contractor will inspect the gas holder during excavation to verify that the holder structure (i.e., walls and foundation slab) are in good, sound structural condition and that no visible changes in structure condition are observed during implementation of the remedy. Additionally, the Contractor will install optical survey monitoring points on the holder wall and conduct periodic monitoring in accordance with Specification Section 31 09 13 – Geotechnical Instrumentation and Monitoring (Appendix B). The northern gas holder will be excavated in three “cells” (i.e., Cells A, B, and C), each a maximum 12-feet wide, to limit the length of holder wall exposed at any given time. The Contractor shall mechanically remove obvious visible tar-like material from the holder structure, to the satisfaction of National Grid, the Engineer, and/or NYSDEC, prior to backfilling. If the holder wall is observed to be in poor structural condition, portions of the northern gas holder excavation may be backfilled with controlled low-strength material (CLSM) (i.e., flowable fill) to stabilize the adjoining holder wall.
- **Southern Gas Holder** – The Contractor will install an ISS gravity wall to facilitate removal of soil in the vicinity of the former southern gas holder and any remaining structures to the top of till. The gravity wall will be keyed into till and constructed to the limits shown on Design Drawing S-101 (Appendix A) in accordance with Specification Section 31 50 00 – Excavation Support and Protection (Appendix B). In addition to providing excavation support, the gravity wall will serve as a hydraulic barrier that will reduce groundwater infiltration into the excavation area. The gravity wall will be constructed with Portland cement mixed with existing site soil using an excavator bucket. The resulting solidified mass has the strength of dense clay (e.g., 50 to 100 pounds per square inch [psi]), with a thickness (12 to 17 ft) and weight of the wall serving as the earth retention/excavation support system.

### 6.5.2 Material Loading

Excavated material is anticipated to include asphalt, concrete, gravel, subbase material, surface soil, non-impacted subsurface soil, and impacted surface soil. Soil, debris, water, NAPL, and miscellaneous wastes generated during the remedial activities will be handled in accordance with all applicable federal, state, and local regulations and the following Specification Sections (Appendix B):

- 01 35 43.13 – Environmental Procedures for Hazardous Materials
- 01 74 19 – Construction Waste Management and Disposal



- 02 61 05 – Removal and Disposal of Contaminated Material

Pre-excavation in-situ soil waste characterization sampling was performed as part of the PDI to support profiling for off-site treatment/disposal and facilitate direct-loading of the excavated materials during the remedial construction. The Contractor will be responsible for conducting additional waste characterization sampling, as required by the Contractor-selected and National Grid-approved waste disposal/treatment facility. Excavated material that contains visual MGP-related impacts and/or is characteristically hazardous for benzene is anticipated to be sent for off-site treatment via low-temperature desorption (LTDD). In general, excavated materials that do not contain visual impacts are anticipated to be sent for off-site disposal as non-hazardous solid waste.

Removed soils will be visually characterized on-site to determine final off-site treatment/disposal requirements. Excavated material that requires dewatering to remove free liquids or further characterization will be stockpiled in a lined material staging area or within the actual excavation prior to off-site transportation and disposal.

### 6.5.3 Transportation, Disposal, and/or Treatment

Transportation will be arranged by the Contractor. The Contractor will be responsible for placarding of waste containers/trucks, and for transportation to the designated facility by a licensed hauler in accordance with applicable local, state, and federal regulations. Each waste transporter shall have a valid waste transporter permit (6 NYCRR Part 364). Wastes shall be transported under a hazardous waste manifest, a conditionally-exempt MGP remediation manifest, or non-hazardous waste manifest, or bill-of-lading, as appropriate. The Contractor will be responsible for preparing waste profiles for review and signature by National Grid or Engineer (as an agent for National Grid, under separate agreement with National Grid). The Contractor will be responsible for obtaining blank manifests/bills of lading from the designated disposal/treatment facility, completing the manifests/bills of lading, and providing them to the National Grid/Engineer to sign. The manifests/bills-of-lading shall list National Grid as the waste generator, and copies of completed manifests/bills-of-lading shall be maintained on-site by the Engineer in the project office trailer. Completed copies of the manifests (facility confirmation of receipt and disposal) as well as weight tickets shall be provided to National Grid by the Contractor as part of the project close out submittals. The Contractor is required to maintain a running summary of off-site waste shipments for each waste stream including sequential load number, manifest number, date of shipment, facility ticket number, and facility weight. This information shall be required for each weekly construction meeting.

Potential facilities for off-site disposal of conditionally exempt hazardous and non-hazardous material generated during the remedial activities include Clean Earth's (formerly ESMI's) Fort Edward facility located in Fort Edward, New York and City of Albany Landfill located in Albany, New York, respectively. The Contractor shall be responsible for costs associated with transportation and disposal of both hazardous and non-hazardous material.

Traffic routes to be utilized by the Contractor and waste transporters (as well as the importation of construction materials) are shown on Design Drawing G-103 (Appendix A) and in the CERP (Appendix D).



## 6.6 Water Management/Treatment

Water generated during the remedial construction activities may include:

- Groundwater and perched water from the excavations.
- Precipitation and surface-water runoff that enter the excavations.
- Water generated by decontamination of equipment, trucks, and personnel.

The Contractor will be responsible for collecting and containerizing all water generated as a result of remedial activities. Water shall be conveyed to on-site holding tanks (i.e., frac tanks). Active dewatering of soils before or during excavation shall be conducted in accordance with Specification Section 01 51 41 – Temporary Pumping (Appendix B). Water generated by decontamination of equipment, trucks, and personnel shall be collected via a liquid collection sump, as shown on Design Drawing G-502 (Appendix A) and conveyed to on-site holding tanks. The Contractor will be responsible for collecting and analyzing waste characterization water samples. Following receipt of analytical results, water will be transported off-site for treatment/disposal in accordance with Specification Section 02 61 15 – Removal and Disposal of Contaminated Materials (Appendix B).

## 6.7 Non-Aqueous Phase Liquid Management

The Contractor will be responsible for collecting and containerizing any NAPL generated as a result of remedial activities. The Contractor will be responsible for collecting and analysing waste characterization NAPL samples required by the treatment/disposal facility. Following receipt of analytical results, NAPL will be transported off-site for treatment/disposal in accordance with Specification Section 02 61 05 – Removal and Disposal of Contaminated Materials (Appendix B).

## 6.8 Backfill

Following the completion of the soil excavation activities, each excavation area shall be backfilled as soon as possible to facilitate area stability, reduce the potential for groundwater ponding/accumulation, and increase overall site safety. The Contractor is responsible for collecting and analysing imported fill samples (with the exception of emerging contaminant sampling and analysis, to be completed by the Engineer) in accordance with Specification Sections 31 05 05 – Aggregates for Earthwork (Appendix B). The Contractor shall backfill excavation areas with imported general fill to within approximately 12 inches of the surrounding grade to facilitate placement of the site cover. Backfilling activities shall be conducted in accordance with Specification Sections 31 05 05 – Aggregates for Earthwork and 31 23 00 – Excavation and Fill (Appendix B).

As the southern gas holder area is backfilled, portions of the gravity wall will be removed to minimize the potential for post-construction changes to site hydrogeologic conditions (e.g., groundwater mounding or surface water accumulation within the area encompassed by the wall. Gravity wall removal areas and associated removal depths are shown on Design Drawing S-102 (Appendix A). Excavated portions of the gravity wall will be handled/managed consistent with excavated soil, as described in Section 6.5.

## 6.9 Site Restoration

The Contractor shall conduct site restoration activities prior to demobilizing equipment, labor, and materials from the project area. The Contractor shall restore disturbed areas to match previously existing lines and grades. The Contractor shall restore all surface features disturbed, damaged, or destroyed during remedial activities including, but not limited to, guard rail, poles, light posts, sidewalks, roadways, concrete sidewalks, granite curbs, and vegetated surfaces to pre-construction conditions.

The existing asphalt pavement and structures (such as buildings, sidewalks, etc.) that comprise the site will serve as a cover. The Contractor shall remove any remaining asphalt pavement for off-site disposal and replace the existing asphalt pavement and concrete sidewalk, as shown on Design Drawing C-102 (Appendix A). Requirements for the site cover materials will be presented in the following Specification Sections (Appendix B):

- 30 00 05 – Concrete
- 31 05 05 – Aggregates for Earthwork
- 31 05 19.13 – Geotextiles for Earthwork
- 32 23 00 – Flexible Paving

Repairs to sidewalks, roadways, and curbs that are damaged by the Contractor during remedial construction shall be approved by the City of Rensselaer, prior to conducting surface restorations. The Contractor shall be responsible for gaining City of Rensselaer approval of any repairs to damaged surfaces and meeting all local, state, and federal laws.

## 6.10 Project Close-Out and Demobilization

This section presents project close-out activities to be completed by the Contractor. The Contractor will conduct the project close-out activities (as necessary), in accordance with the following Specification Sections (Appendix B):

- 01 74 05 – Cleaning
- 01 77 19 – Closeout Procedures

### 6.10.1 Decontamination

The Contractor shall decontaminate (as necessary) all personnel and equipment that comes into contact with excavated materials. The Contractor shall conduct decontamination of personnel and equipment within the constructed decontamination area. The Contractor will construct the decontamination area in accordance with Design Drawing G-502. All construction vehicles leaving the project area shall be decontaminated by the Contractor (as necessary) to prevent the tracking of soil off-site (including vehicles transporting clean fill to the project area).

At a minimum, the Contractor shall decontaminate the Contractor's project equipment (including, but not limited to, excavation equipment, trucks, pumps, and hand tools) that comes into contact with excavated materials prior to demobilizing and prior to handling clean material in accordance with Specification Section 02 51 00 – Decontamination (Appendix B). The Contractor shall perform decontamination activities until no visible soil, debris, or stains are present on the equipment surfaces (to the satisfaction of

National Grid and/or the Engineer). Equipment, such as pumps, shall be flushed using clean water and appropriate cleaning agents (as necessary) to the satisfaction of National Grid and/or the Engineer.

Unless otherwise directed by the Engineer, any equipment to be taken off-site by the Contractor shall be cleaned within the constructed decontamination area and subject to a final visual review by National Grid, the Engineer, and or NYSDEC. Precautions shall be taken to limit contact between the equipment, personnel performing the cleaning activities and any cleaning liquids that may accumulate in the decontamination area. The extent and method of cleaning shall be inspected by National Grid and/or the Engineer for any visible soils, staining, or other debris prior to demobilization. Any observed soils, staining, or other debris shall be promptly removed by the Contractor to the satisfaction of National Grid and/or the Engineer.

The Contractor shall manage the solid and liquid waste streams generated by the decontamination activities for off-site disposal and on-site treatment, respectively. Treatment/disposal of collected wash water, solids, and other materials shall be in accordance with Section 6.5 and Specification Sections 01 74 19 – Construction Waste Management and Disposal, 02 61 05 – Removal and Disposal of Contaminated Material (Appendix B).

### **6.10.2 Post-Construction Structural Documentation Inspection**

The post-construction structural documentation inspection will be conducted by the Engineer. The post-construction condition documentation will be conducted consistent with the pre-construction condition documentation and include, but not be limited to, visual inspection and photographic documentation of the garage structure located at 332 Broadway. A post-construction condition documentation summary letter will be submitted to National Grid within two weeks following the inspection.

Note that any damage to existing structures (caused by negligent activities by the Contractor), shall be repaired by the Contractor, at no additional cost to National Grid.

### **6.10.3 Demobilization**

Following completion of all remedial actions, the Contractor shall conduct the following demobilization activities:

- Completion of “punch list” items, to be identified by the Engineer
- Dismantle the work area(s) and decontamination area.
- Remove specified erosion and sediment control measures when remedial activities are completed.
- Transport residual wastes (e.g., disposable equipment; personal protective equipment [PPE]; cleaning residuals; sacrificial soil and liners from the material staging, and equipment decontamination areas) remaining at the completion of the remedial activities for off-site disposal in accordance with applicable rules and regulations.
- Remove/dispose of project-related material, equipment, and support structures from the project area, as appropriate.
- Prepare and provide required final field records and submittals to the Engineer.

## 7. POST-REMEDIAL CONSTRUCTION ACTIVITIES

Activities to be conducted following the completion of remedial construction activities include the following:

- Preparation of a FER – The Engineer will prepare and submit a FER to the NYSDEC that conforms to the requirements of with DER-10.
- Establishment of institutional controls – As required by the VCP Decision Document, institutional controls in the form of an environmental easement will be established for the site. Institutional controls will also include an agreement with the off-site property owner(s) to implement the NYSDEC-approved SMP.
- Preparation of a SMP – The Engineer will prepare an SMP, consistent with the requirements of DER-10, that will detail the post-remedial action activities to be conducted at the project area.
- Completing post-remedial action groundwater monitoring – Periodic monitoring will be conducted to evaluate/monitor post-construction groundwater conditions and absence/presence of NAPL.

## 8. SCHEDULE

This section presents the project schedule for NYSDEC review of the Contract Documents.

**Table 8.1 Project Schedule**

Schedule Component	Date
Submit Final Remedial Design Report to NYSDEC	October 2020
Receive Approval Letter from NYSDEC	October 2020
Bid Document Preparation and Contractor Procurement	September 2020 – March 2021
Remedial Construction	Q2/Q3 2021

This project schedule for preparing remedial design documents is dependent on several factors, including time required to gain property access and receipt of NYSDEC comments/approvals on project submittals.

## REFERENCES

- Arcadis, 2016. Remedial Design Work Plan, Rensselaer Non-Owned Former Manufactured Gas Plant Site, Rensselaer, New York, Prepared for National Grid, Syracuse, New York, July 2016.
- Arcadis, 2018. Pre-Design Investigation Summary Report letter, Rensselaer Non-Owned Former Manufactured Gas Plant Site, Rensselaer, New York, Prepared for National Grid, Syracuse, New York, March 2018.
- Arcadis, 2020. Treatability Study Report, Rensselaer Non-Owned Former Manufactured Gas Plant site, Rensselaer, New York, Prepared for National Grid, Syracuse, New York, January 2020.
- NYSDEC, 2009. CP-43 Groundwater Monitoring Well Decommissioning Policy, November 2009.
- NYSDEC, 2010a. DER-23. Citizen Participation Handbook for Remedial Programs, January 2010.
- NYSDEC, 2010b. DER-10, Technical Guidance for Site Investigation and Remediation, May 2010.
- NYSDEC, 2010c. CP-51 Soil Cleanup Guidance. October 21, 2010.
- NYSDEC, 2015. Decision Document, NM – Rensselaer MGP Voluntary Cleanup Program, Rensselaer, Rensselaer County, Site No. V00488, September 2015.

# APPENDIX A

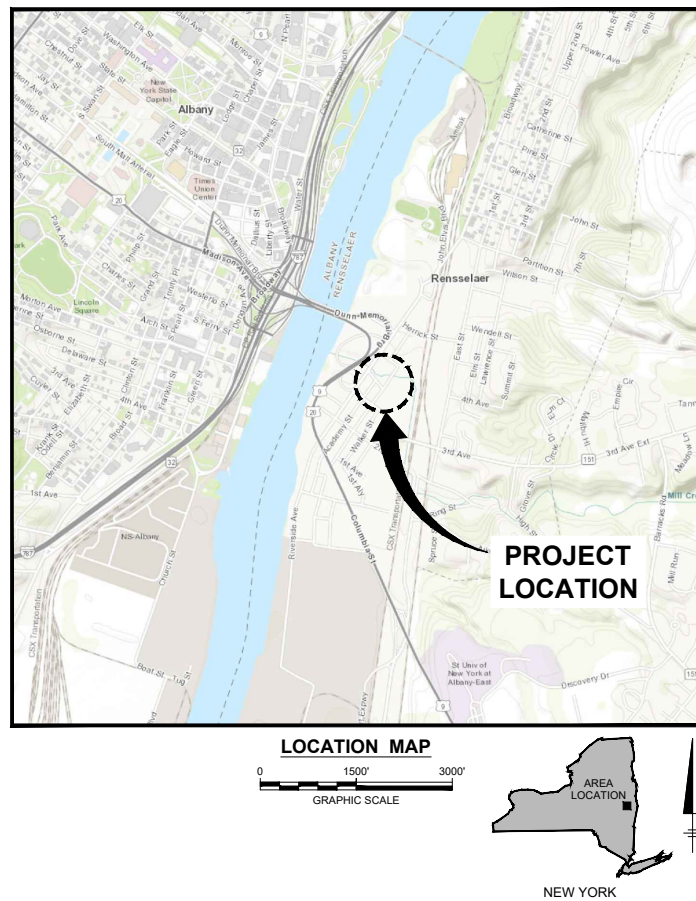
## Design Drawings



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## DESIGN DRAWINGS

# RENSSELAER NON-OWNED FORMER MANUFACTURED GAS PLANT SITE FINAL REMEDIAL DESIGN



nationalgrid  
RENSSELAER, NEW YORK

DATE ISSUED  
NOVEMBER 2020



ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS  
PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE  
NEW YORK STATE EDUCATION LAW

### INDEX TO DRAWINGS

G-001	COVER SHEET, LOCATION MAP, AND INDEX TO DRAWINGS
G-002	GENERAL NOTES, LEGEND, AND ABBREVIATIONS
G-101	EXISTING SITE PLAN WITH UTILITIES
G-102	HISTORICAL SITE PLAN
G-103	SITE UTILIZATION PLAN
G-104	SITE PREPARATION PLAN
G-501	EROSION AND SEDIMENT CONTROL DETAILS
G-502	MISCELLANEOUS DETAILS
G-503	MISCELLANEOUS DETAILS
C-101	SOIL REMEDIATION PLAN
C-102	SITE RESTORATION PLAN
C-501	RESTORATION DETAILS
S-101	EXCAVATION SUPPORT PLAN
S-102	GRAVITY WALL REMOVAL PLAN
S-301	EXCAVATION CROSS SECTIONS



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GENERAL NOTES:

- THE TECHNICAL WORK AND CONTRACTOR REQUIREMENTS ARE DESCRIBED IN SEVERAL DOCUMENTS THAT COLLECTIVELY REPRESENT THE REMEDIAL DESIGN. THESE DOCUMENTS INCLUDE THE REMEDIAL DESIGN NARRATIVE, DESIGN DRAWINGS, TECHNICAL SPECIFICATIONS, APPENDICES, AND ATTACHMENTS. THESE DOCUMENTS SHOULD BE THOROUGHLY REVIEWED BY THE CONTRACTOR. ANY DIFFERENCES IDENTIFIED BY THE CONTRACTOR BETWEEN THE INFORMATION PRESENTED IN THE ABOVE-LISTED DOCUMENTS WILL BE SUBMITTED TO THE ENGINEER (IN WRITING) FOR REVIEW AND RESOLUTION.
- ACTUAL SITE FEATURES AT THE TIME OF CONSTRUCTION MAY VARY FROM THOSE SHOWN ON THE DESIGN DRAWINGS. PROMPTLY NOTIFY THE OWNER AND ENGINEER (IN WRITING) OF ANY SUCH DIFFERENCES THAT MAY AFFECT THE PERFORMANCE OF WORK.
- INFORMATION RELATED TO SUBSURFACE CONDITIONS IS APPROXIMATE, SHOULD NOT BE RELIED UPON AS A COMPLETE DEPICTION OF SITE CONDITIONS, AND ARE SUBJECT TO FIELD VERIFICATION BY THE CONTRACTOR.
- OBTAIN ALL FEDERAL-, STATE-, COUNTY-, AND/OR CITY-SPECIFIC PERMITS THAT MAY BE REQUIRED TO PERFORM THE WORK, INCLUDING NYSDOT WORK PERMITS.
- FOLLOW THE REMEDIAL CONSTRUCTION SEQUENCE PRESENTED IN THE REMEDIAL DESIGN. THE CONTRACTOR MAY PROPOSE AN ALTERNATE CONSTRUCTION SEQUENCE. ALTERNATE CONSTRUCTION SEQUENCES MUST BE APPROVED BY THE OWNER AND THE ENGINEER PRIOR TO IMPLEMENTATION.

UTILITY NOTES:

- THE LOCATIONS, ALIGNMENTS, AND CONSTRUCTION OF UTILITIES SHOWN ON THE DESIGN DRAWINGS ARE APPROXIMATE AND BASED ON INFORMATION READILY AVAILABLE TO THE OWNER/ENGINEER. VERIFY THE PRESENCE AND LOCATION OF ALL OVERHEAD/UNDERGROUND SITE FEATURES AND UTILITIES RELEVANT TO AND POTENTIALLY TO BE ENCOUNTERED DURING THE WORK. ADDITIONAL SITE FEATURES AND UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE DESIGN DRAWINGS.
- COORDINATE WITH DIG SAFELY NEW YORK TO IDENTIFY AND LOCATE UNDERGROUND UTILITIES. THE DIG SAFELY NEW YORK PHONE NUMBER IS 811; THE WEBSITE IS WWW.DIGSAFELYNEWYORK.COM.
- CONTRACT WITH AN APPROPRIATE PRIVATE UTILITY LOCATOR TO LOCATE AND IDENTIFY UNDERGROUND UTILITIES WITHIN THE WORK LIMITS.
- EXCEPT WHERE NOTED OR AS OTHERWISE INDICATED IN THE REMEDIAL DESIGN, MAINTAIN AND PROTECT ALL OVERHEAD/UNDERGROUND SITE FEATURES AND UTILITIES THAT MAY BE AFFECTED BY THE WORK. ALL UTILITIES, UNLESS STATED OTHERWISE, SHALL REMAIN IN OPERATION FOR THE DURATION OF THE WORK.
- COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR THE TEMPORARY BRACING, REMOVAL, RELOCATION, AND/OR REPLACEMENT OF ANY UTILITIES, UTILITY POLES, OR GUY WIRES THAT FALL WITHIN THE PROJECT WORK LIMITS, OR THAT MAY INTERFERE WITH THE WORK.

SAFETY NOTES:

- PROVIDE EVIDENCE OF ALL ON-SITE PERSONNEL COMPLETING OSHA 40-HOUR TRAINING AND 8-HOUR REFRESHER TRAINING PRIOR TO INITIATING REMEDIAL CONSTRUCTION ACTIVITIES.
- IMPLEMENT, MAINTAIN, AND SUPERVISE ALL SAFETY MEASURES AND PROGRAMS IN CONNECTION WITH THE PROJECT. TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF, AND PROVIDE THE NECESSARY PRECAUTIONS TO PROTECT SITE WORKERS, CONSTRUCTION OVERSIGHT PERSONNEL, AND SITE VISITORS.
- COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF PUBLIC BODIES HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY OR TO PROTECT THEM FROM DAMAGE, INJURY, OR LOSS, INCLUDING, WITHOUT LIMITATION, THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (PL 91-596) AND UNDER SECTION 107 OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (PL 91-54) AND AMENDMENTS THERETO. COMPLY WITH THE REQUIREMENTS SET FORTH UNDER 29 CFR 1910 AND 29 CFR 1926. ERECT AND MAINTAIN, AS REQUIRED BY THE CONDITIONS AND THE PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR THE SAFETY AND PROTECTION OF PERSONS AND PROPERTY AND COMPLY WITH ALL APPLICABLE RECOMMENDATIONS OF THE MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION OF THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.
- FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, AND PROVIDE ALL EXCAVATION SHORING/BRACING, SCAFFOLDING, SHIELDING, DUST/VAPOR/ODOR PROTECTION, MECHANICAL/ELECTRICAL PROTECTION, SPECIAL GROUNDING, SAFETY RAILINGS, BARRIERS, OR OTHER SAFETY FEATURES REQUIRED. AS NEEDED, PROVIDE AND MAINTAIN SUFFICIENT LIGHT DURING NIGHT HOURS TO SECURE SUCH PROTECTION. PROVIDE AND MAINTAIN SECURITY ON SITE DURING NON-WORKING HOURS FROM THE DATE OF INITIAL MOBILIZATION UNTIL THE DATE OF FINAL DEMOBILIZATION, OR AS OTHERWISE DIRECTED BY THE OWNER/ENGINEER.
- THE MATERIALS SUBJECT TO HANDLING AS PART OF THE PROJECT MAY CONTAIN HAZARDOUS CONSTITUENTS OR CHEMICALS AND SHOULD BE HANDLED IN ACCORDANCE WITH APPLICABLE REGULATIONS. DEVELOP AND IMPLEMENT APPROPRIATE HEALTH AND SAFETY MEASURES FOR ITS EMPLOYEES, SUBCONTRACTORS, AND SITE VISITORS; AND FOR THE PROTECTION OF THE ENVIRONMENT AND SURROUNDING COMMUNITY. DEVELOP THE CONTRACTOR'S HASP IN ACCORDANCE WITH APPLICABLE OSHA, FEDERAL, STATE, AND LOCAL REGULATIONS.
- SEVERAL CONTRACTOR ACTIVITIES WILL BE PERFORMED WITHIN, ADJACENT TO, OR IN THE VICINITY OF THE EXCAVATION/BACKFILL AREAS. THE CONTRACTOR'S HASP WILL RECOGNIZE THE TYPES OF ACTIVITIES TO BE PERFORMED, THE UNIQUE HAZARDS SPECIFIC TO THESE ACTIVITIES, AND SPECIAL PRECAUTIONS AND CONTROLS THAT ARE TO BE IMPLEMENTED. OF ADDITIONAL NOTE AND EMPHASIS ARE THOSE ACTIVITIES THAT POTENTIALLY INVOLVE WORK WITHIN THE EXCAVATION AREAS ONCE EXCAVATION/BACKFILL ACTIVITIES ARE INITIATED, AND THAT POTENTIALLY REQUIRE WORKER ACCESS INTO THE EXCAVATED AREAS. CLEARLY IDENTIFY AND EVALUATE THE SPECIFIC TYPES OF ACTIVITIES THAT COULD INVOLVE WORKER ENTRY INTO THE EXCAVATION AREAS, SPECIFIC INGRESS/EGRESS ROUTES AND PROVISIONS, PERSONNEL AND WORK AREA MONITORING, PERSONAL PROTECTIVE EQUIPMENT, COMMUNICATIONS, ETC. MINIMIZE WORKER ENTRY INTO THE EXCAVATED AREAS.
- SEVERAL CONTRACTOR ACTIVITIES WILL BE PERFORMED ADJACENT TO, OR IN THE VICINITY OF, UTILITY POLES, OVERHEAD ELECTRICAL LINES, AND TRANSFORMERS. THE CONTRACTOR'S HASP WILL RECOGNIZE THESE HAZARDS AND INCORPORATE SPECIAL PRECAUTIONS AND CONTROLS SPECIFIC TO WORKING NEAR SUCH HAZARDS.
- PROVIDE A LIST OF ALL CHEMICAL PRODUCTS AND A SAFETY DATA SHEET (SDS) FORM FOR ALL CHEMICAL PRODUCTS TO BE USED ON-SITE. THE LIST MUST BE APPROVED BY THE OWNER PRIOR TO BEING BROUGHT ON-SITE.
- THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR ALL SAFETY PROGRAMS FOR THEIR EMPLOYEES, SUBCONTRACTORS, AND ANY OTHER PERSONS WHO MAY BE AFFECTED THEREBY. PREPARE A SITE-SPECIFIC HASP THAT WILL BE REVIEWED BY THE ENGINEER AND THE OWNER PRIOR TO THE START OF ANY WORK.

SITE MANAGEMENT/PROJECT PERFORMANCE NOTES:

- WORK ACTIVITIES ARE PERMITTED ON NON-HOLIDAY WEEKDAYS (MONDAY THROUGH FRIDAY) BETWEEN THE HOURS OF 7:00 AM AND 5:30 PM. NO WORK WILL BE PERFORMED OUTSIDE OF THESE HOURS WITHOUT PRIOR APPROVAL FROM THE OWNER/ENGINEER. NO HEAVY EQUIPMENT OPERATION WILL BE PERMITTED PRIOR TO 8:00 AM.
- PERFORM ALL WORK IN A NEAT AND ORDERLY MANNER, IN CONFORMANCE WITH BEST MODERN TRADE PRACTICE, AND BY COMPETENT, EXPERIENCED PERSONNEL. MATERIALS AND INSTALLATION WILL BE IN ACCORDANCE WITH ALL CODES, REGULATIONS, AND REQUIREMENTS OF ALL APPLICABLE CITY, STATE, FEDERAL, AND OTHER PUBLIC OR PRIVATE AUTHORITIES. THE CONTRACTOR WILL AT ALL TIMES KEEP THE CONSTRUCTION AREAS FREE FROM ACCUMULATIONS OF WASTE MATERIALS OR RUBBISH; AND PRIOR TO COMPLETION OF THE WORK, REMOVE ANY RUBBISH FROM THE PREMISES AND ALL TOOLS, EQUIPMENT, AND MATERIALS.
- INSTALL SITE SECURITY MEASURES AND EROSION AND SEDIMENTATION CONTROL MEASURES PRIOR TO DISTURBING SITE SOILS.
- PROVIDE TEMPORARY FIRST AID AND SANITARY FACILITIES. SANITARY FACILITIES WILL INCLUDE SUITABLY-ENCLOSED CHEMICAL OR SELF-CONTAINED TOILETS AND TEMPORARY WASHING FACILITIES. INSTALL AND MAINTAIN TEMPORARY FACILITIES IN ACCORDANCE WITH THE SPECIFICATIONS.
- DECONTAMINATE ALL EQUIPMENT OPERATED WITHIN THE PROJECT WORK LIMITS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS PRIOR TO ARRIVING ON-SITE AND PRIOR TO LEAVING THE SITE. PROJECT EQUIPMENT THAT COMES IN CONTACT WITH EXCAVATED MATERIALS WILL BE APPROPRIATELY DECONTAMINATED PRIOR TO HANDLING IMPORTED BACKFILL MATERIAL TO THE SATISFACTION OF THE ENGINEER. PREVENT TRACKING OF ALL SOIL MATERIALS ONTO OFF-SITE AREAS AND THROUGHOUT ON-SITE AREAS. ANY SOIL MATERIALS TRACKED, SPILLED, OR DROPPED WILL BE IMMEDIATELY CLEANED UP BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- COMPLY WITH ALL NOISE ORDINANCES. MAKE EVERY EFFORT TO MINIMIZE NOISE CAUSED BY CONSTRUCTION OPERATIONS. EQUIPMENT WILL BE EQUIPPED WITH SILENCERS OR MUFFLERS DESIGNED TO OPERATE WITH THE LEAST POSSIBLE NOISE IN COMPLIANCE WITH LAWS AND REGULATIONS.
- ESTABLISH, MAINTAIN, AND PROTECT THE PROJECT WORK LIMITS (INCLUDING EXCLUSION, CONTAMINATION REDUCTION, AND SUPPORT ZONES) AS DEFINED IN THE CONTRACTOR'S HASP. PERFORM ALL WORK WITHIN THE PROJECT WORK LIMITS. NO WORK WILL BE PERFORMED BEYOND THE PROJECT WORK LIMITS WITHOUT PRIOR APPROVAL FROM THE OWNER/ENGINEER.
- NO EXCAVATED MATERIALS OR SUPPLIES OF ANY KIND WILL BE STORED ON PRIVATE OR PUBLIC PREMISES WITHOUT PRIOR APPROVAL FROM THE OWNER/ENGINEER.
- PROVIDE TEMPORARY TRAFFIC CONTROL MEASURES (E.G., FLAG MEN, SIGNS, CONES, ETC.) AND COORDINATE THE HAULING OF MATERIALS ON PUBLIC ROADWAYS.
- PERFORM WORK ZONE AIR MONITORING IN ACCORDANCE WITH THE CONTRACTOR'S HASP AND THE REMEDIAL DESIGN.
- COMMUNITY AIR MONITORING FOR VOLATILE ORGANIC COMPOUNDS AND PARTICULATES WILL BE PERFORMED BY THE CONTRACTOR ON A CONTINUOUS BASIS DURING ALL INTRUSIVE AND/OR POTENTIAL DUST GENERATING ACTIVITIES (E.G., INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES, INSTALLATION OF EXCAVATION SUPPORT SYSTEMS, EXCAVATION/MATERIAL HANDLING ACTIVITIES, ETC.). ENSURE THAT COMMUNITY AIR MONITORING IS BEING PERFORMED PRIOR TO INITIATING INTRUSIVE AND/OR POTENTIAL DUST GENERATING ACTIVITIES EACH DAY.
- CONTROL ODORS, DUST, AND VAPORS GENERATED DURING THE CONSTRUCTION ACTIVITIES TO MEET THE COMMUNITY AIR MONITORING ACTION LEVELS SPECIFIED IN THE CAMP. CONTROL ODORS TO THE SATISFACTION OF THE OWNER/ENGINEER AND NYSDEC. IMPLEMENT DUST AND VAPOR CONTROLS, AS SPECIFIED IN THE CAMP. THE CONTRACTOR WILL BE RESPONSIBLE FOR COSTS ASSOCIATED WITH PROJECT DELAYS RESULTING FROM UNCONTROLLED ODOR/DUST EMISSIONS.
- IF THE CONTRACTOR DAMAGES EXISTING UTILITY EQUIPMENT OR STRUCTURES, THE CONTRACTOR WILL BE RESPONSIBLE FOR NOTIFYING THE UTILITY COMPANY OR MUNICIPALITY AND FULLY REPAIRING DAMAGES IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY/MUNICIPALITY, AT NO ADDITIONAL COST TO THE OWNER.
- RESTORE ALL AREAS IMPACTED BY OR OTHERWISE DISTURBED DURING THE PROJECT TO PRE-CONSTRUCTION CONDITION AND/OR AS INDICATED IN THE REMEDIAL DESIGN BY THE CONTRACTOR IN A TIMELY MANNER AND PRIOR TO DEMOBILIZATION.

WASTE MANAGEMENT NOTES:

- REMOVE ABOVEGROUND AND UNDERGROUND NON-EARTHEN MATERIALS (E.G., BRUSH, LOGS, BRICK, CONCRETE, PIPING, ETC.) AS REQUIRED TO PERFORM THE WORK. SUCH MATERIALS SHALL BE DOWNSIZED (AS REQUIRED BY THE WASTE TRANSPORTATION AND DISPOSAL VENDORS), AND TRANSPORTED OFF-SITE TO AN APPROPRIATE, OWNER-SELECTED OR OWNER-APPROVED DISPOSAL FACILITY.
- EXISTING SITE FEATURES NOT SPECIFICALLY IDENTIFIED ON THE DESIGN DRAWINGS MAY REQUIRE REMOVAL TO FACILITATE CONSTRUCTION. THE REMOVAL OF SUCH FEATURES WILL NOT BE PERFORMED WITHOUT PRIOR APPROVAL FROM THE OWNER/ENGINEER.
- THE CONTRACTOR WILL BE RESPONSIBLE FOR THE LOADING OF ALL WASTE MATERIALS GENERATED DURING THE PROJECT.
- VISUALLY IMPACTED MATERIAL DESTINED FOR LTLD TREATMENT OR DISPOSAL WILL BE DIRECT-LOADED FOR OFF-SITE TRANSPORTATION OR STOCKPILED WITHIN THE LIMITS OF THE REMOVAL AREAS UNTIL LOADED FOR OFF-SITE TRANSPORTATION. VISUALLY IMPACTED MATERIAL WILL BE COVERED WITH A MINIMUM 10-MIL THICK PLASTIC LINER OR LONG-DURATION ODOR CONTROLLING FOAM WHEN NOT BEING ACTIVELY MANAGED. NON-VISUALLY IMPACTED MATERIAL DESTINED FOR OFF-SITE DISPOSAL WILL BE DIRECT LOADED FOR OFF-SITE TRANSPORTATION OR STOCKPILED WITHIN THE REMOVAL AREAS, SEPARATE FROM VISUALLY IMPACTED MATERIAL, UNTIL LOADED FOR OFF-SITE TRANSPORTATION. TEMPORARY STOCKPILES OF NON-VISUALLY IMPACTED MATERIAL WILL BE COVERED WITH A MINIMUM 10-MIL THICK PLASTIC LINER WHEN NOT ACTIVELY BEING MANAGED. PLASTIC LINERS WILL BE PROPERLY ANCHORED TO PREVENT UPLIFT DUE TO WIND CONDITIONS AND WILL BE INSTALLED TO MINIMIZE PONDING OF PRECIPITATION.
- ALL WATER GENERATED DURING THE PROJECT (E.G., FROM EXCAVATION/MATERIAL DEWATERING, DECONTAMINATION OF EQUIPMENT, ETC) WILL BE COLLECTED, CONTAINERIZED, AND TRANSPORTED FOR OFF-SITE DISPOSAL.

REFERENCE AND SURVEY-RELATED NOTES:

- BASE MAP PREPARED FROM PDI SURVEY COMPLETED IN MARCH 2017 AND SUPPLEMENTAL SURVEY IN MARCH 2017 BY PAUL JAMES OLSZEWSKI, P.L.S., PLLC LAND SURVEYING.
- HORIZONTAL COORDINATES ARE IN US FEET AND ARE REFERENCED TO THE NEW YORK STATE PLANE COORDINATE SYSTEM, EAST ZONE, TRANSVERSE MERCATOR PROJECTION, NORTH AMERICAN DATUM OF 1983 (NAD83).
- ELEVATIONS ARE IN US FEET AND ARE REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1988 (NAVD88).
- ESTABLISH AND MAINTAIN CONSTRUCTION SURVEY CONTROL AND VERIFY GRADES DURING THE PERFORMANCE OF WORK USING A NEW YORK STATE-LICENSED LAND SURVEYOR.
- ALL LOCATIONS ARE APPROXIMATE.

GENERAL CONSTRUCTION SEQUENCE:

- MOBILIZATION AND SITE PREPARATION.
- INSTALLATION OF ISS GRAVITY WALL.
- EXCAVATION AND BACKFILLING OF NORTHERN GAS HOLDER AREA.
- EXCAVATION OF SOUTHERN GAS HOLDER AREA.
- ISS GRAVITY WALL REMOVAL AND BACKFILLING OF SOUTHERN GAS HOLDER AREA.
- INSTALLATION OF EXCAVATION SUPPORT SYSTEM, EXCAVATION, AND BACKFILLING OF TAR WELL AREA.
- CONSTRUCTION OF THE SITE COVER.
- SITE RESTORATION.
- DEMOBILIZATION.

ABBREVIATIONS:

AMSL	ABOVE MEAN SEA LEVEL
BTEX	BENZENE, TOLUENE, ETHYLBENZENE, XYLENE
CAMP	COMMUNITY AIR MONITORING PLAN
CERP	COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN
CFR	CODE OF FEDERAL REGULATIONS
CL	CENTERLINE
CQAP	CONSTRUCTION QUALITY ASSURANCE PLAN
CY	CUBIC YARDS
EA	EACH
EL	ELEVATION
HASP	HEALTH AND SAFETY PLAN
HDPE	HIGH-DENSITY POLYETHYLENE
HMA	HOT MIX ASPHALT
ISS	IN-SITU SOIL SOLIDIFICATION
LTLD	LOW TEMPERATURE THERMAL DESORPTION
M&P	MATERIALS AND PERFORMANCE
MAX.	MAXIMUM
MGP	MANUFACTURED GAS PLANT
MIL	0.0001 INCHES
MIN.	MINIMUM
NYCCR	OFFICIAL COMPILATION OF CODES, RULES, AND REGULATIONS OF THE STATE OF NEW YORK
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NYSDOT	NEW YORK STATE DEPARTMENT OF TRANSPORTATION
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PAH	POLYCYCLIC AROMATIC HYDROCARBONS
PDI	PRE-DESIGN INVESTIGATION
PPM	PARTS PER MILLION
PVC	POLYVINYL CHLORIDE
RI	REMEDIAL INVESTIGATION
SQ.	SQUARE
TYP.	TYPICAL

LEGEND:

	PROJECT WORK LIMITS
	PROPERTY LINE
	ELEVATION CONTOUR
	EDGE OF PAVEMENT
	CONCRETE WALK
	W-BEAM GUIDE RAIL
	OVERHEAD ELECTRIC
	SEWER LINE
	UNKNOWN LINE
	UNDERGROUND WATERLINE
	SEWER MANHOLE
	CATCH BASIN
	UTILITY POLE
	LIGHT POLE
	HYDRANT
	SIGN
	SOIL BORING
	EXISTING MONITORING WELL (SHALLOW)
	EXISTING MONITORING WELL (DEEP)
	EXISTING MONITORING WELL (BEDROCK)
	DECOMMISSIONED MONITORING WELL

NOT TO SCALE

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Professional Engineer's Name  
**TERRY W. YOUNG**

Professional Engineer's No.  
074847-1

State  
NY

Date Signed  
11/3/2020

Project Mgr.  
JRG

Designed by  
TLH

Drawn by  
BKD

Checked by  
DJR

**ARCADIS**

Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

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NATIONAL GRID • RENSSELAER, NEW YORK

RENSSELAER NON-OWNED FORMER MGP SITE

FINAL REMEDIAL DESIGN

ARCADIS Project No.  
30004017

Date  
NOVEMBER 2020

ARCADIS  
ONE LINCOLN CENTER  
110 W FAYETTE STREET  
SYRACUSE, NY 13202  
TELEPHONE: 315-448-9120

**G-002**



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Design-X-Base

15'015'30'

1"=15'

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Professional Engineer's Name <b>TERRY W. YOUNG</b>		
Professional Engineer's No. 074847-1		
State NY	Date Signed 11/3/2020	Project Mgr. JRG
Designed by TLH	Drawn by BKD	Checked by DJR





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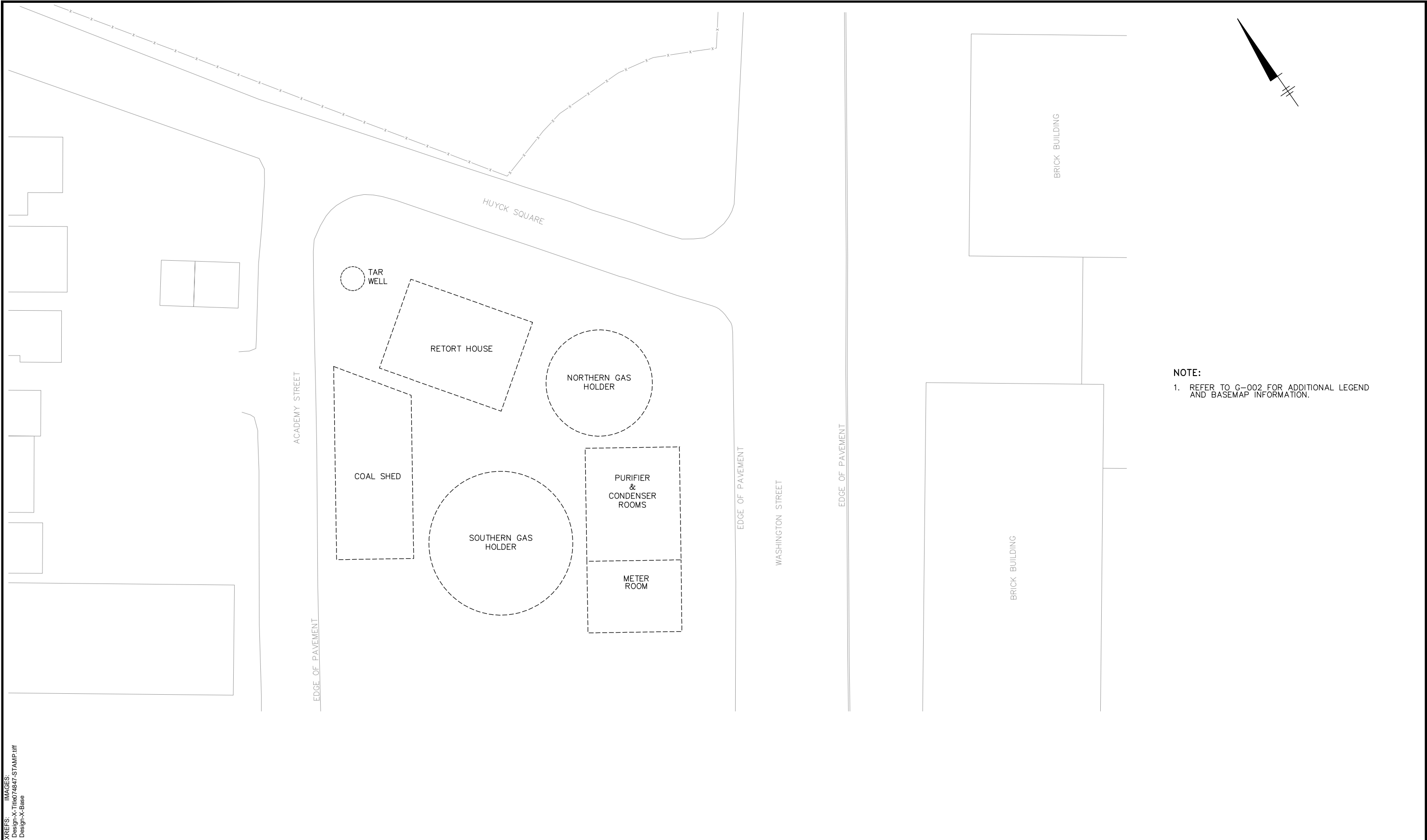
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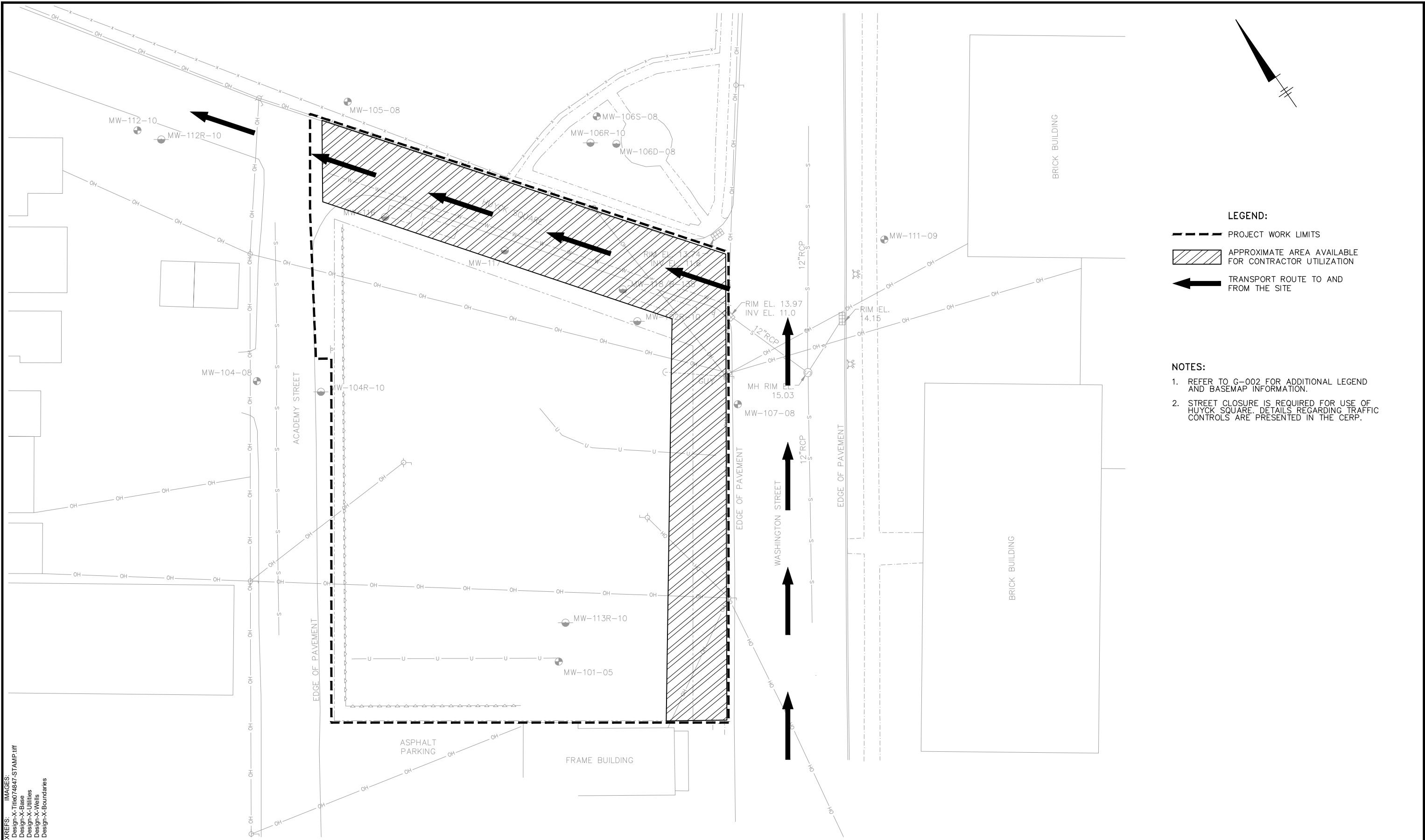
**HISTORICAL SITE PLAN**

ARCADIS Project No. 30004017
Date NOVEMBER 2020
ARCADIS ONE LINCOLN CENTER 110 W FAYETTE STREET SYRACUSE, NY 13202 TELEPHONE: 315-446-9120

**G-102**



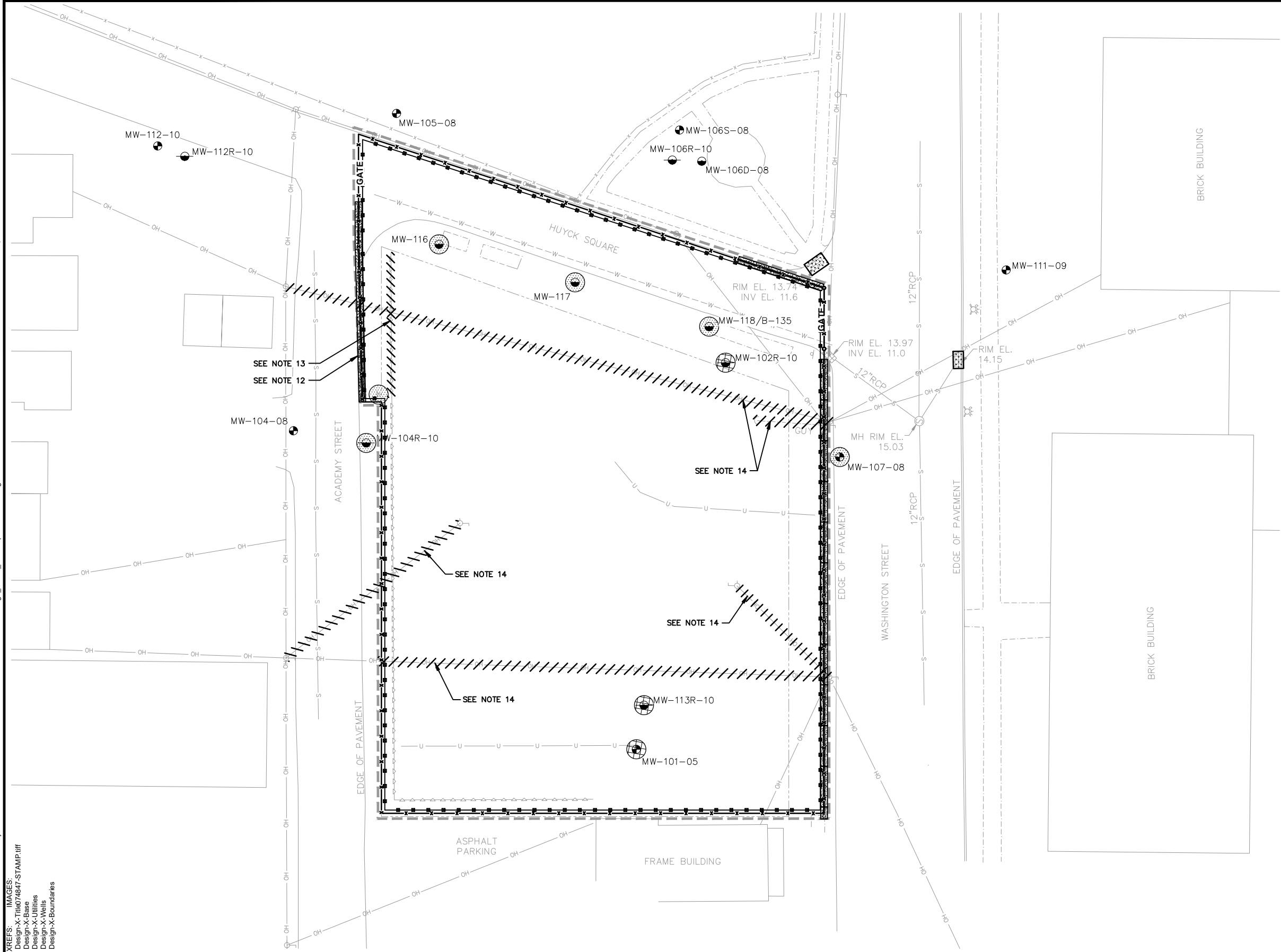
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Design-X-Base  
Design-X-Utilities  
Design-X-Well  
Design-X-Boundaries

	Professional Engineer's Name <b>TERRY W. YOUNG</b>				NATIONAL GRID • RENSSELAER, NEW YORK RENSSELAER NON-OWNED FORMER MGP SITE FINAL REMEDIAL DESIGN	ARCADIS Project No. 30004017	<b>G-103</b>
	Professional Engineer's No. 074847-1					Date NOVEMBER 2020	
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		Designed by TLH	Drawn by BKD	Checked by DJR			

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15' 0 15' 30'

1"=15'

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Professional Engineer's Name  
**TERRY W. YOUNG**  
Professional Engineer's No.  
074847-1  
State  
NY  
Date Signed  
11/3/2020  
Project Mgr.  
JRG  
Designed by  
TLH  
Drawn by  
BKD  
Checked by  
DJR

STATE OF NEW YORK  
TERRY W. YOUNG  
074847-1  
REGISTERED PROFESSIONAL ENGINEER

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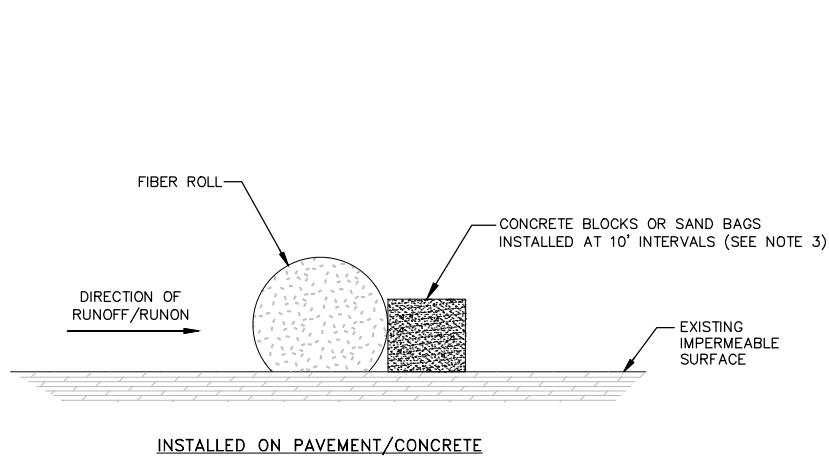
**SITE PREPARATION PLAN**

ARCADIS Project No.  
30004017  
Date  
NOVEMBER 2020  
ARCADIS  
ONE LINCOLN CENTER  
110 W FAYETTE STREET  
SYRACUSE, NY 13202  
TELEPHONE: 315-448-9120

**G-104**

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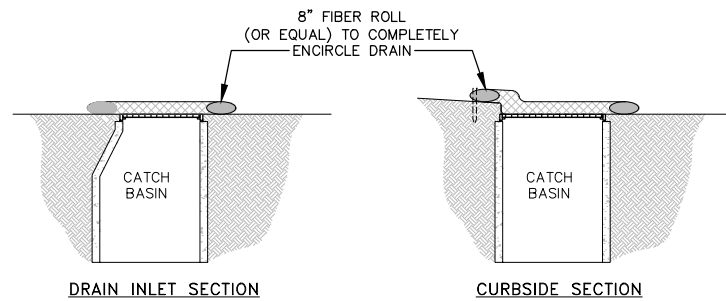
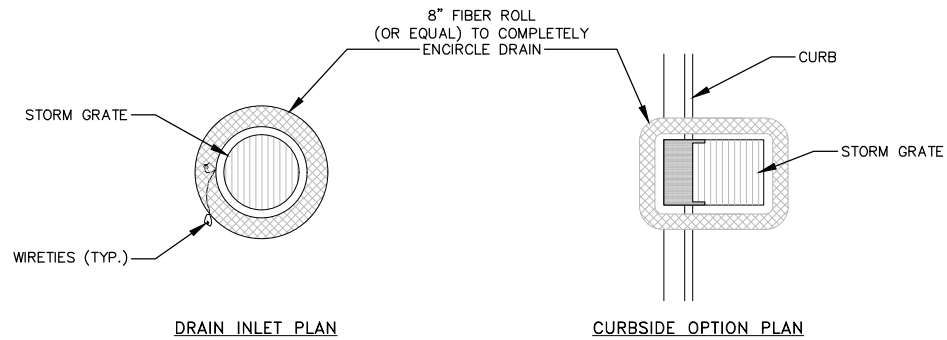
NOTES:

- OVERLAP FIBER ROLL A MINIMUM OF 18-INCHES TO FORM A CONTINUOUS BARRIER.
- SECURE FIBER ROLL WITH CONCRETE BLOCKS OR SAND BAGS BEHIND THE FIBER ROLL TO STABILIZE DURING RAINFALL/RUNOFF/RUNON EVENTS.
- IF SLOPE IS GREATER THAN 2:1 INSTALL SECOND FIBER ROLL BARRIER AT TOP OF SLOPE.
- FIBER ROLL SHALL MEET MINIMUM STANDARDS OF FILTREXX® SEDIMENT/PERIMETER CONTROL OR EQUIVALENT.

FIBER ROLL

NOT TO SCALE

1



NOTES:

- INLET FILTER BAGS MAY BE USED FOR INLET PROTECTION, AS NECESSARY.
- INLET FILTER BAGS WILL MEET MINIMUM STANDARDS OF FLEXSTORM CATCH-IT LITE INLET FILTER OR EQUIVALENT.
- SECURE FIBER ROLL WITH CONCRETE BLOCKS OR SAND BAGS TO STABILIZE DURING RAINFALL/RUNOFF/RUNON EVENTS.

FIBER ROLL INLET PROTECTION

NOT TO SCALE

2

NOT TO SCALE

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Professional Engineer's Name <b>TERRY W. YOUNG</b>			
Professional Engineer's No. 074847-1			
State NY	Date Signed 11/3/2020	Project Mgr. JRG	
Designed by TLH	Drawn by BKD	Checked by DJR	



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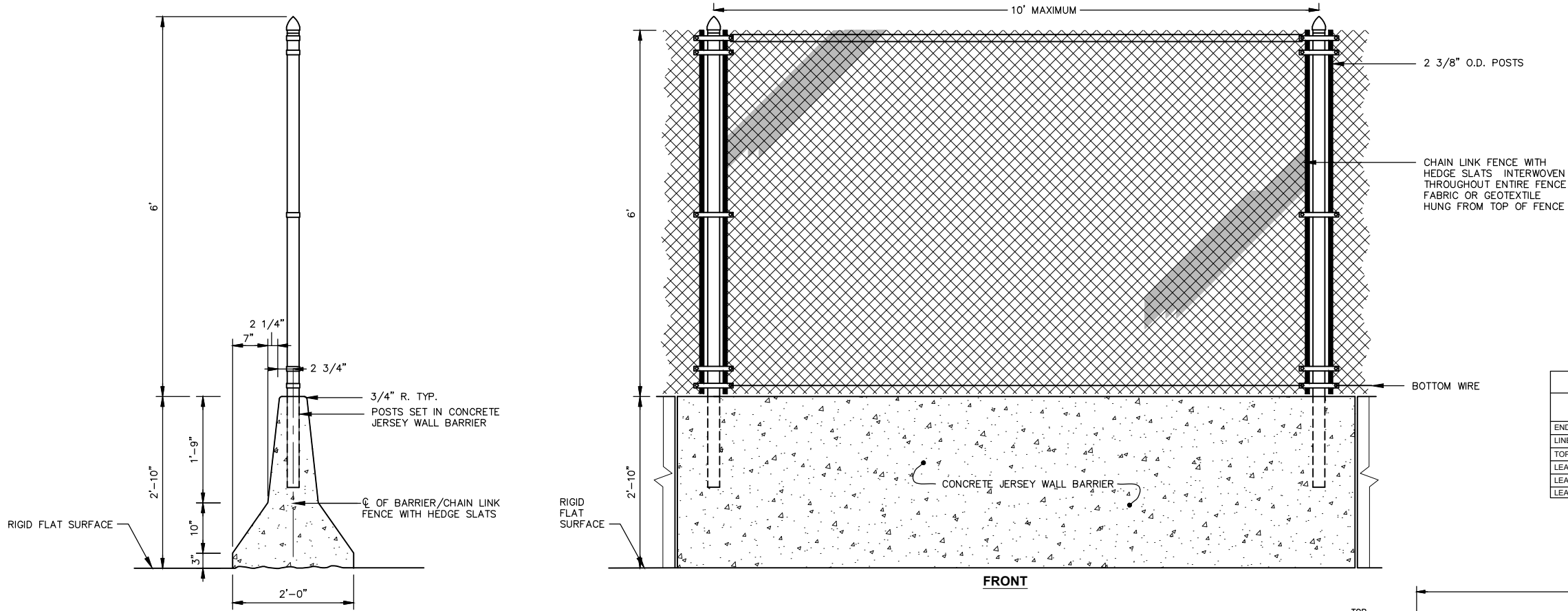
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CONTROL DETAILS

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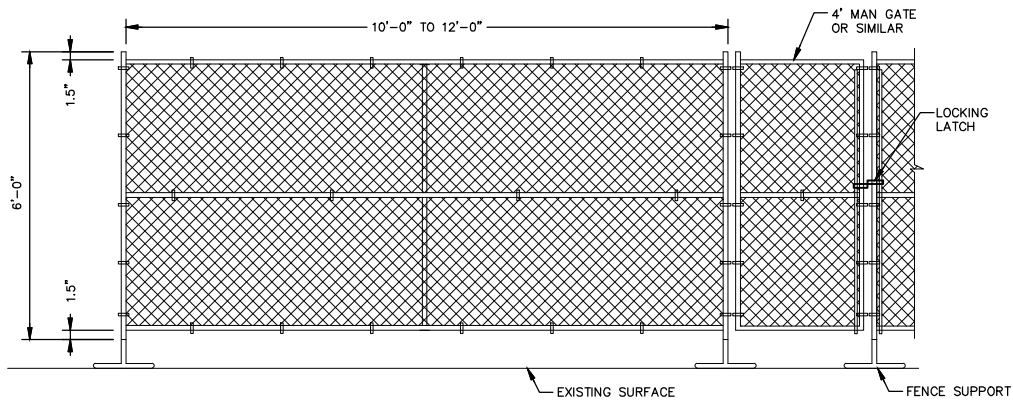
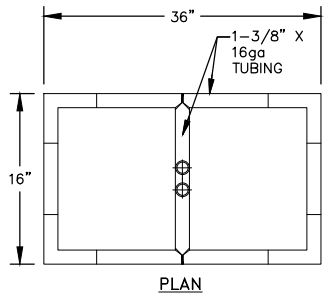
G-501



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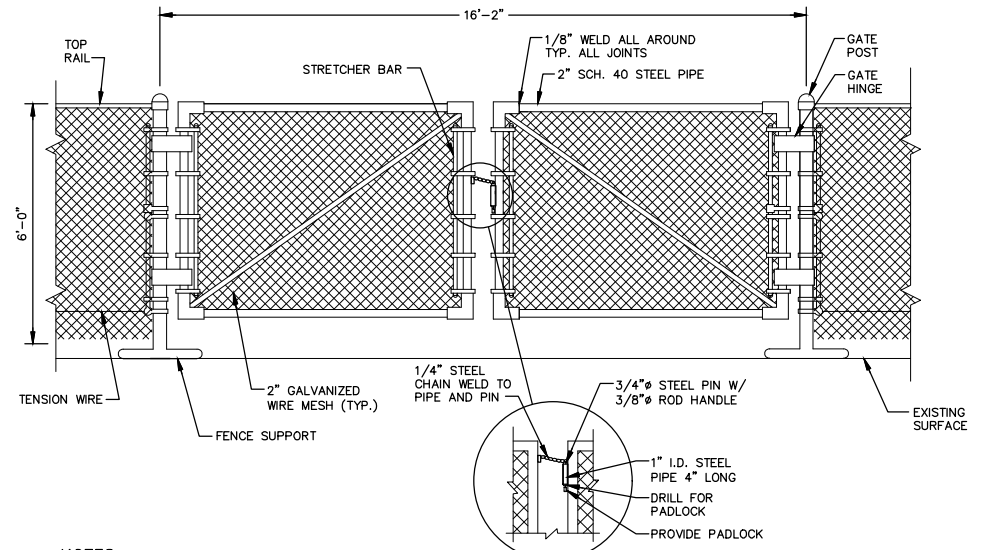


**CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE A  
WITH CHAIN LINK FENCE WOVEN WITH HEDGE SLATS** ①  
NOT TO SCALE



- NOTES:**
1. INSTALL MAN GATES, AS NECESSARY, TO PROVIDE ACCESS AND EGRESS TO SUBCONTRACTORS, SUPPLIERS, AND SITE WORKERS.
  2. INSTALL A WOVEN GEOTEXTILE VISUAL BARRIER MEETING THE SPECIFICATIONS OF FENCE SCREEN 130 SERIES PRIVACY AIR OR EQUIVALENT.
  3. WIRE TIES OR CLIPS WILL BE A MINIMUM OF 6 GAUGE. HOG RINGS MAY BE USED TO TIE FABRIC TO FENCE SUPPORTS.
  4. UNLESS STATED OTHERWISE, DIMENSIONS AND WEIGHTS SHALL BE AS LISTED IN TABLE G-503-A.
  5. SECURITY FENCE SUPPORTS SHALL BE WEIGHED DOWN WITH SAND BAGS AS NECESSARY.
  6. ALTERNATE SECURITY FENCE SUPPORTS MAY BE USED WITH OWNER/ENGINEER APPROVAL.

**TEMPORARY CONSTRUCTION FENCE** ②  
NOT TO SCALE



- NOTES:**
1. INSTALL VEHICLE GATES IN ACCORDANCE WITH THE REMEDIAL DESIGN.
  2. CHAIN LINK FABRIC SHALL BE ONE PIECE OF 9-GAUGE STEEL WIRE FABRIC, WIDTH AS SHOWN ON THE DETAIL, 3- BY 5-INCH CHAIN-LINK WIRE WITH A WOVEN GEOTEXTILE VISUAL BARRIER MEETING THE SPECIFICATIONS OF FENCE SCREEN 130 SERIES PRIVACY AIR OR EQUIVALENT.
  3. TENSION WIRE WILL BE 7-GAUGE GALVANIZED COIL SPRING STEEL.
  4. WIRE TIES OR CLIPS WILL BE A MINIMUM OF 6 GAUGE. HOG RINGS MAY BE USED TO TIE FABRIC TO TENSION WIRE.
  5. STRETCHER BARS WILL BE A MINIMUM OF 1/2- BY 3/4-INCH STEEL AND ATTACHED TO POSTS WITH HEAVY STEEL BANDS.
  6. UNLESS STATED OTHERWISE, DIMENSIONS AND WEIGHTS SHALL BE AS LISTED IN TABLE G-503-A.

**TYPICAL SECURITY FENCE AND VEHICLE ACCESS GATE DETAIL** ③  
NOT TO SCALE

SCALE(S) AS INDICATED			Professional Engineer's Name <b>TERRY W. YOUNG</b>			 Design & Consultancy for natural and built assets	NATIONAL GRID • RENSSELAER, NEW YORK RENSSELAER NON-OWNED FORMER MGP SITE FINAL REMEDIAL DESIGN	ARCADIS Project No. 30004017	Date NOVEMBER 2020	<b>G-503</b>
	Professional Engineer's No. 074847-1		State NY							
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**MISCELLANEOUS DETAILS**













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**LEGEND:**

SOIL TO BE REMOVED

EXISTING GRADE

SILTY SAND

TILL

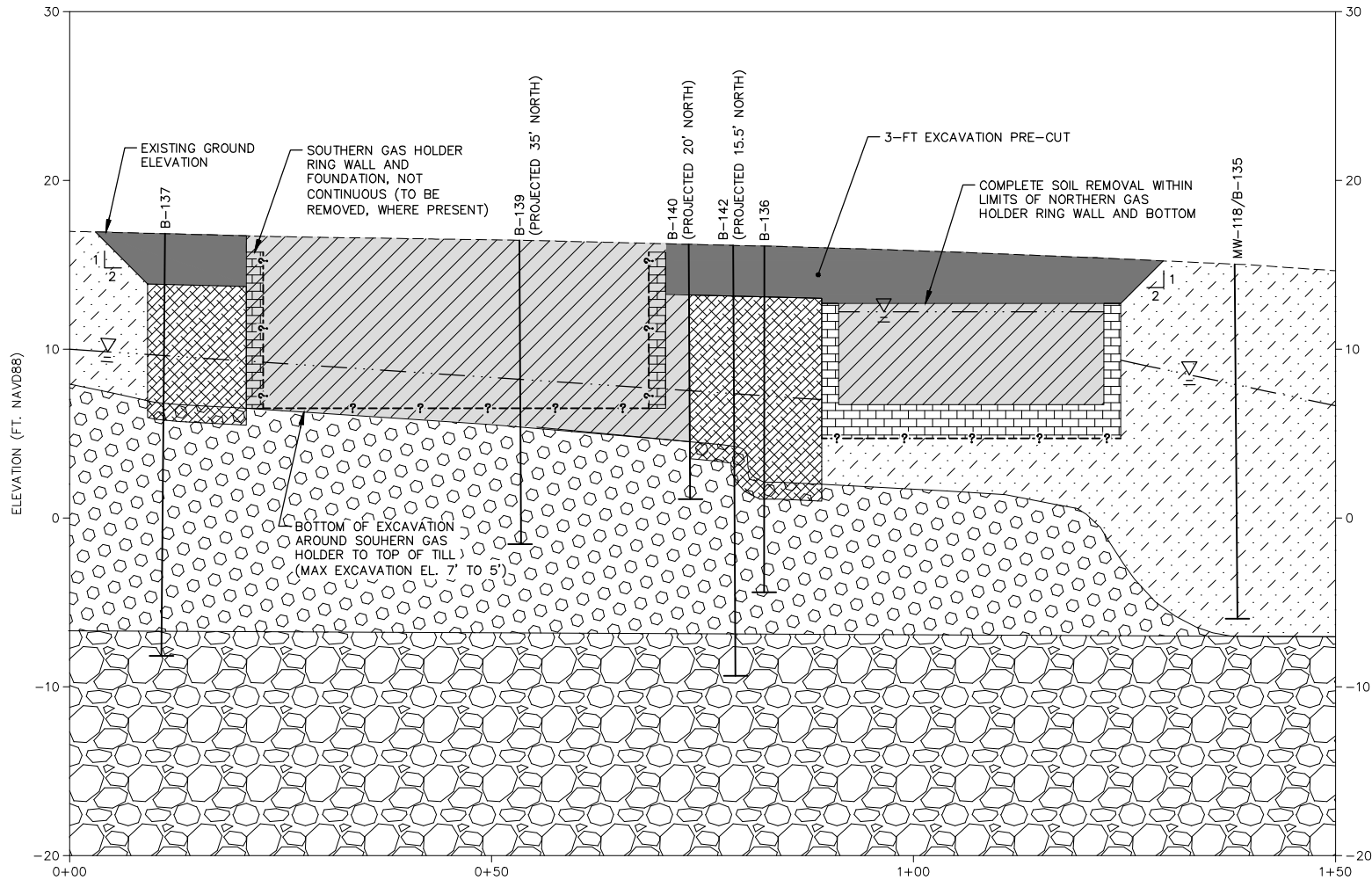
SHALE

GROUND WATER TABLE

ISS GRAVITY WALL

3-FT EXCAVATION PRE-CUT  
(SHOWN FOR CONCEPTUAL PURPOSES ONLY)

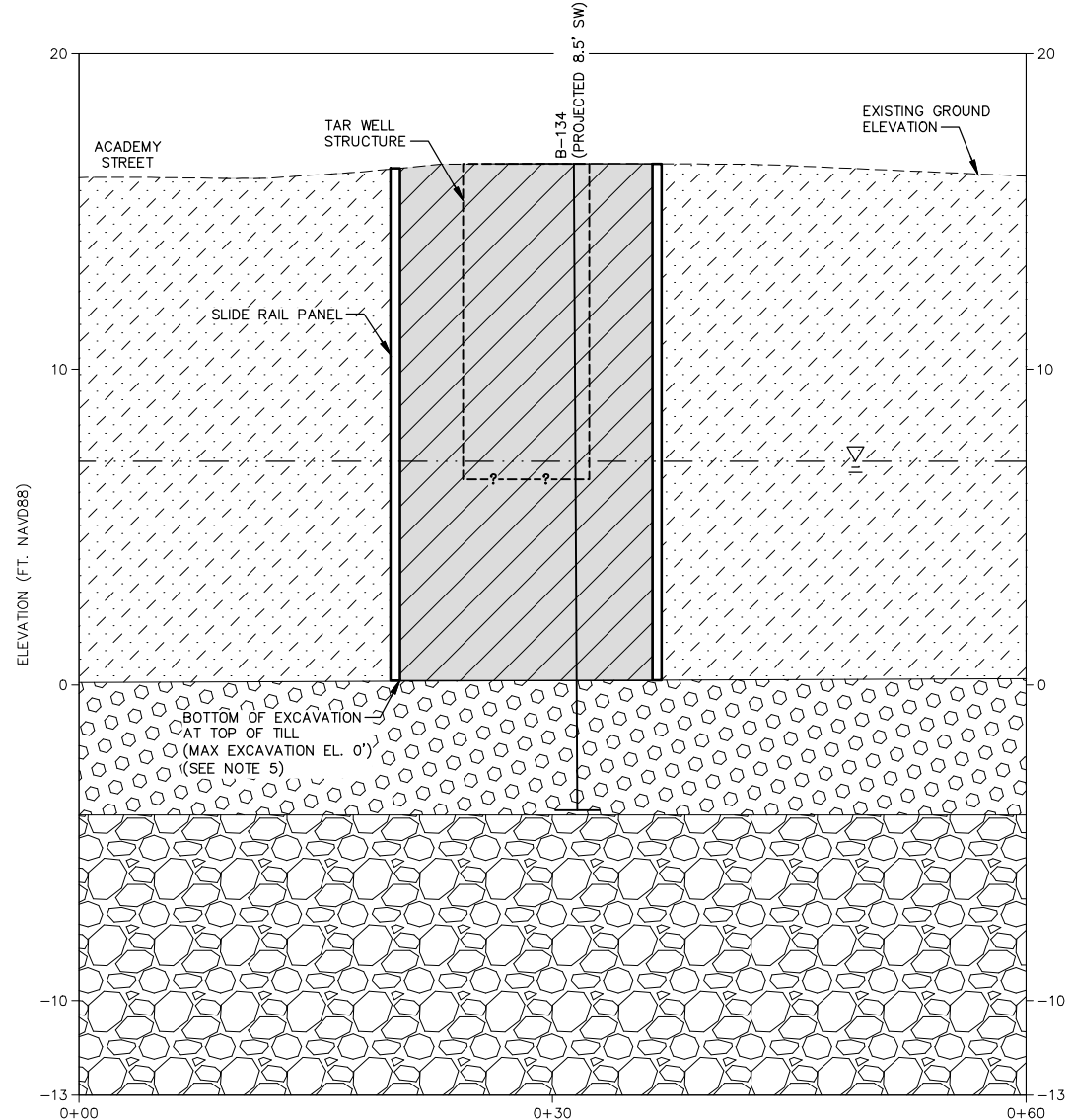
- NOTES:**
1. SOIL LAYERS AND GROUNDWATER ELEVATION WERE IDENTIFIED USING SOIL BORINGS INSTALLED PREVIOUSLY DURING THE PDI INVESTIGATION AND SUPPLEMENTAL INVESTIGATIONS. SOIL LAYERS AND GEOLOGICAL CONTACT LOCATIONS ARE APPROXIMATE AND INFERRED BETWEEN BORING LOCATIONS. ACTUAL SUBSURFACE CONDITIONS ENCOUNTERED DURING REMEDIAL CONSTRUCTION ACTIVITIES MAY BE DIFFERENT FROM THESE SHOWN.
  2. HORIZONTAL SCALE ON SECTIONS REPRESENT STATIONING IN FEET.
  3. LOCATION, DEPTH, AND THICKNESS OF EXISTING GAS HOLDER WALLS AND TAR WELL ARE APPROXIMATE BASED ON TEST PITS PERFORMED DURING THE PDI INVESTIGATION AND HISTORICAL DRAWINGS PROVIDED BY NATIONAL GRID.
  4. INFORMATION RELATED TO SUBSURFACE FEATURES SHOULD BE CONSIDERED APPROXIMATE AND SHOULD NOT BE RELIED UPON AS A COMPLETE DEPICTION OF SITE CONDITIONS. SITE FEATURES SHALL BE VERIFIED BY THE REMEDIATION CONTRACTOR PRIOR TO THE START OF THE WORK.
  5. TAR WELL EXCAVATION TO BE TERMINATED IF VISUALLY CLEAN MATERIAL IS ENCOUNTERED BELOW THE TAR WELL STRUCTURE.
  6. PRE-EXCAVATION TO BE PERFORMED THROUGHOUT ENTIRE NORTHERN HOLDER AND SOUTHERN HOLDER EXCAVATION AREAS TO LOCATE THE TOP OF THE EXISTING NORTHERN HOLDER WALLS AND ALLOW FOR SWELL OF ISS INSTALLATION. BENCH AND SLOPE AS NECESSARY AND IN ACCORDANCE WITH ALL APPLICABLE OSHA REQUIREMENTS DURING GRAVITY WALL CONSTRUCTION AND DURING ACTIVE EXCAVATION AND MATERIAL HANDLING WITHIN AND ADJACENT TO THE EXCAVATION AREA. GRAVITY WALL ISS TO BE INSTALLED TO TOP OF TILL.



**SECTION A-A' 1**

HORIZONTAL SCALE: 1"=10'

VERTICAL SCALE: 1"=5'



**SECTION B-B' 2**

HORIZONTAL SCALE: 1"=6'

VERTICAL SCALE: 1"=6'

SCALE(S) AS INDICATED										Professional Engineer's Name <b>TERRY W. YOUNG</b>		  <div>Design &amp; Consultancy for natural and built assets</div> <div>ARCADIS OF NEW YORK, INC.</div> <div>NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW</div>	NATIONAL GRID • RENSSELAER, NEW YORK RENSSELAER NON-OWNED FORMER MGP SITE FINAL REMEDIAL DESIGN		ARCADIS Project No. 30004017		<b>S-301</b>								
										Professional Engineer's No. 074847-1			Date NOVEMBER 2020												
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:		USE TO VERIFY FIGURE REPRODUCTION SCALE		No.		Date		Revisions		By			Ckd		NY			Date Signed 11/3/2020		Project Mgr. JRG					
															Designed by TLH			Drawn by BKD		Checked by DJR					
																						THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.		ARCADIS ONE LINCOLN CENTER 110 W FAYETTE STREET SYRACUSE, NY 13202 TELEPHONE: 315-446-9120	

# APPENDIX B

Technical Specifications



## SECTION 00 01 10

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SUMMARY OF WORK

PART 1 – GENERAL

1.01 LOCATION AND DESCRIPTION OF WORK

- A. The Work is located at the site of a former manufactured gas plant (MGP) on Washington Street in the City of Rensselaer, Rensselaer County, New York.
- B. The Work to be performed under this Contract includes, but is not limited to, the following:
  - 1. Pre-remediation activities.
  - 2. Mobilization and site preparation.
  - 3. Soil excavation.
  - 4. Site cover installation.
  - 5. Waste and water handling and management.
  - 6. Site restoration and demobilization.
- C. Contracting Method: Work shall be performed under one prime contract.
- D. Contaminants: Work related to MGP Waste and other site-related Contaminants, is included.

1.02 CONTRACTOR'S USE OF SITE

- A. Use of Premises:
  - 1. Confine construction operations to the work areas shown or indicated on the Design Drawings. Do not disturb portions of the site beyond areas of the Work.
  - 2. Confine storage of materials and equipment, and locations of temporary facilities to the areas shown or indicated on the Design Drawings.
  - 3. Authorities having jurisdiction at the site and others performing work for Owner shall, for all purposes that may be required by their contracts, have access to the site and the premises used by the Contractor, and the Contractor shall provide safe and proper access.
- B. Promptly repair damage to premises caused by construction operations. Upon completion of the Work, restore premises to specified condition. If condition is not specified, restore to pre-construction condition.
- C. Work hours are anticipated to be between 7 a.m. and 5:30 p.m. Monday through Friday. No work shall be performed outside of these hours without prior approval from the Owner/ Engineer. No heavy equipment operation shall be permitted prior to 8:00 a.m.

1.03 EASEMENTS AND RIGHTS-OF-WAY

- A. Confine construction to the limits shown on the Design Drawings. Use care in placing construction tools, equipment, excavated materials, and materials and equipment to be incorporated into the Work to avoid damaging property and interfering with traffic. Do not enter private property without permission from the owner of the property.

#### 1.04 NOTICES TO OWNERS AND AUTHORITIES OF PROPERTIES ADJACENT TO THE WORK

- A. Notify Owner when execution of the Work may affect adjacent properties or use of adjacent properties. Owner will notify adjacent property owners; do not contact adjacent property owners directly unless authorized by Owner to do so.
- B. When it is necessary to temporarily obstruct access to property, or when utility service connection will be interrupted, provide notices sufficiently in advance to enable affected persons to provide for their needs. Conform notices to Laws and Regulations and, whether delivered orally or in writing, include appropriate information concerning the interruption and instructions on how to limit inconvenience caused thereby.
- C. Notify utility owners and other concerned entities at least two working days, but not more than 10 working days, prior to cutting or closing streets or other traffic areas or excavating near Underground Facilities or exposed utilities.

#### PART 2 – PRODUCTS (NOT USED)

#### PART 3 – EXECUTION (NOT USED)

END OF SECTION

## SECTION 01 15 00

### CONTRACTOR'S PROJECT OPERATIONS PLAN

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. Contractor shall prepare and submit to the Engineer a Project Operations Plan (POP) in accordance with this Section.
  - 2. POP shall clearly describe Contractor's proposed means, methods, and sequence of construction operations, and shall demonstrate compliance with the Contract Documents.

##### 1.02 SUBMITTALS

- A. Informational Submittals:
  - 1. Contractor's POP: Submit in accordance with Part 1.03 of this Section.

##### 1.03 POP SUBMITTAL

- A. Contractor's POP shall address and include the following:
  - 1. Contractor's Organizational Structure: Specific chain of command and overall responsibilities of Contractor personnel. Include the following:
    - a. Name and general functions and responsibilities of the following:
      - 1) Project manager.
      - 2) Site superintendent.
      - 3) Field engineer.
      - 4) Foreman.
      - 5) Equipment operators and laborers.
      - 6) Others as appropriate.
    - b. Designation of Contractor personnel that will reside at the site for the duration of the Project.
  - 2. Work Schedule: Proposed workdays and work hours. Include copy of Contractor's initial Progress Schedule, prepared in accordance with Section 01 32 16 - Construction Progress Schedule.
  - 3. List of major construction equipment.
  - 4. List of major Subcontractors and Suppliers. Include name, role, and contact information for the following:
    - a. Safety representative.
    - b. Surveyor.
    - c. Suppliers and sources of off-site fill, aggregates, and asphalt.
    - d. Treatment, disposal, and recycling facilities.
    - e. Others as appropriate.
  - 5. Site Utilization Plan: Site plan showing the proposed location and layout of the following:
    - a. Temporary facilities (e.g., field offices, parking/storage, mix plant, exclusion zones, frac tanks, etc.).
    - b. Parking areas.
    - c. Equipment storage and fueling area(s).
    - d. Temporary decontamination area(s). Clearly identify location and size of each.
    - e. Temporary containment area(s). Clearly identify location and size of each.

6. Comprehensive Work Plan: Written description of the general sequence and scope of the following:
    - a. Mobilization and site preparation.
    - b. Site access controls and security, including traffic control.
    - c. Utility clearance, mark-out, and verification.
    - d. Erosion and sediment control.
    - e. Odor, vapor, and dust monitoring and control.
    - f. Excavation, including excavation support, and material handling and staging approach.
    - g. Dewatering.
    - h. Backfilling and grading.
    - i. Site cover installation.
    - j. Site restoration.
    - k. Construction waste management.
    - l. Demobilization.
- B. Submit POP to Engineer the sooner of: seven days prior to pre-construction conference, or 30 days prior to Contractor's scheduled mobilization to the site.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

## SECTION 01 26 00

### CONTRACT MODIFICATION PROCEDURES

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. This Section expands upon the provisions of the General Conditions and includes administrative and procedural requirements for the following:
    - a. Requests for interpretation.
    - b. Clarification notices.
    - c. Minor changes in the Work and Field Orders.
    - d. Work Change Directives.
    - e. Proposal requests.
    - f. Change Order requests.
    - g. Change Orders.
- B. Submit Contract modification documents to Engineer.
- C. Retain at Contractor's office and at the site, a complete copy of each Contract modification document and related documents and Engineer's response.

##### 1.02 REQUESTS FOR INTERPRETATION

- A. General:
  - 1. Submit requests for interpretation to obtain clarification or interpretation of the Contract Documents. Report conflicts, errors, ambiguities, and discrepancies in the Contract Documents using requests for interpretation.
  - 2. Do not submit request for interpretation when other form of communication is appropriate, such as submittals, requests for substitutions or "or equals", notices, ordinary correspondence, or other form of communication. Improperly prepared or inappropriate requests for interpretation will be returned without response or action.
  - 3. Submit written requests for interpretation to Engineer. Contractor and Owner may submit requests for interpretation.
- B. Procedure:
  - 1. Submit one original and one copy of each request for interpretation. Submit each request for interpretation with separate letter of transmittal.
  - 2. Engineer will provide timely review of requests for interpretation. Allow sufficient time for review and response.
  - 3. Engineer will maintain a log of all requests for interpretation. A copy of the log will be provided upon request.
  - 4. Engineer will provide written response to each request for interpretation. One copy of Engineer's response will be distributed to:
    - a. Contractor.
    - b. Owner.
    - c. Engineer.
  - 5. If Engineer requests additional information to make an interpretation, provide information requested within ten days, unless Engineer allows additional time, via correspondence referring to request for interpretation number.

6. If Contractor or Owner believes that a change in the Contract Price or Contract Times or other change to the Contract is required, notify Engineer in writing before proceeding with the Work associated with the request for interpretation.
- C. Submit each request for interpretation on the request for interpretation form included with this Section, or other form acceptable to Engineer.
  1. Number each request for interpretation using a two-digit sequential number. First request for interpretation will be "01".
  2. In space provided on form, describe the interpretation requested. Provide additional sheets as necessary. Include text and sketches as required in sufficient detail for Engineer's response.
  3. When applicable, request for interpretation shall include Contractor's recommended resolution.

### 1.03 CLARIFICATION NOTICES

- A. General:
  1. Clarification notices provide clarification or interpretation of conflicts, errors, ambiguities, and discrepancies in the Contract Documents that are identified by the Engineer.
  2. Clarification notices do not change the Contract Price or Contract Times, and do not alter the Contract Documents.
  3. Clarification notices, when required, will be initiated and issued by the Engineer as correspondence with additional information as required.
- B. Procedure:
  1. One copy of each written clarification notice will be distributed to:
    - a. Contractor.
    - b. Owner.
    - c. Engineer.
    - d. NYSDEC.
  2. If Contractor or Owner believes that a change in the Contract Price or the Contract Times or other change to the Contract is required, notify Engineer in writing before proceeding with the Work associated with clarification notice.
  3. If clarification notice is unclear, submit request for interpretation.

### 1.04 MINOR CHANGES IN THE WORK AND FIELD ORDERS

- A. General:
  1. Field Orders authorize minor variations in the Work, but do not change the Contract Price or Contract Times.
  2. Field Orders, when required, will be initiated and issued by Engineer on the Field Order form included with this Section, or other form acceptable to Engineer.
  3. Engineer will maintain a log of all Field Orders issued.
- B. Procedure:
  1. One copy of each Field Order will be distributed to:
    - a. Contractor.
    - b. Owner.
    - c. Engineer.
    - d. NYSDEC.
  2. If Contractor or Owner believes that a change in the Contract Price or the Contract Times or other change to the Contract is required, immediately notify Engineer in writing before proceeding with the Work associated with the Field Order.
  3. If Field Order is unclear, submit request for interpretation.

## 1.05 WORK CHANGE DIRECTIVES

### A. General:

1. Work Change Directives, when required, order additions, deletions, or revisions to the Work.
2. Work Change Directives do not change the Contract Price or Contract Times, but is evidence that the parties to the Contract expect that the change ordered or documented by the Work Change Directive will be included in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.
3. Work Change Directives, when required, will be initiated and issued by the Engineer on the Work Change Directive form included with this Section, or other form acceptable to the Owner and Remediation Engineer.

### B. Procedure:

1. Four originals of Work Change Directive signed by the Owner and Engineer will be furnished to the Contractor, who shall promptly sign each original Work Change Directive and, within five days of receipt, return all originals to the Engineer.
2. Signed Work Change Directives will be distributed as follows:
  - a. Contractor: One original.
  - b. Owner: Two originals.
  - c. Engineer: One original.
3. When required by the Engineer, document the Work performed under each separate Work Change Directive. For each day, document the following in a format acceptable to Engineer:
  - a. Number and type of workers employed and hours worked.
  - b. Equipment used, including manufacturer, model, and year of equipment, and number of hours for each.
  - c. Materials used.
  - d. Receipts for and descriptions of materials and equipment incorporated into the Work.
  - e. Invoices and labor and equipment breakdowns for Subcontractors and Suppliers.
  - f. Other information required by Owner or Engineer.
4. Submit documentation to Engineer as a Change Order request.

## 1.06 PROPOSAL REQUESTS

### A. General:

1. Proposal requests are for requesting the effect on the Contract Price and the Contract Times and other information relative to contemplated changes in the Work.
2. Proposal requests do not authorize changes or variations in the Work, and do not change the Contract Price or Contract Times, or terms of the Contract.
3. Proposal requests may be initiated by Engineer or Owner.
4. Proposal requests will be issued on the proposal request form included with this Section, or other form acceptable to Owner and Engineer.

### B. Procedure:

1. One copy of each signed proposal request will be furnished to Contractor, with one copy each distributed to:
  - a. Owner.
  - b. Engineer.
2. Submit request for interpretation to clarify conflicts, errors, ambiguities, and discrepancies in proposal request.



3. Upon receipt of proposal request, Contractor shall prepare and submit a Change Order request, in accordance with this Section, for the proposed Work described in the proposal request.

#### 1.07 CHANGE ORDER REQUESTS

A. General:

1. Submit written Change Order request to Engineer in response to each proposal request, and when Contractor believes a change in the Contract Price or Contract Times, or other change to the terms of the Contract is required.

B. Procedure:

1. Submit to Engineer one original and one copy of each Change Order request with accompanying documentation. Submit each Change Order request with separate letter of transmittal.
2. Engineer will review Change Order request and either request additional information from Contractor or provide to Owner a recommendation regarding approval of the Change Order request.
3. When Engineer requests additional information to render a decision, submit required information within five days of receipt of Engineer's request, unless Engineer allows more time. Submit the required information via correspondence that identifies the Change Order request number.
4. Upon completing review, one copy of Engineer's written response, if any, will be distributed to:
  - a. Contractor.
  - b. Owner.
  - c. Engineer.
5. If Change Order request is recommended for approval by Engineer and approved by Owner, a Change Order will be issued.

C. Each Change Order request shall be submitted on the Change Order request form included with this Section, or other form acceptable to Owner and Engineer.

1. Number each Change Order request using a two-digit sequential number. First Change Order request will be "01".
2. In space provided on the form:
  - a. Describe the scope of each proposed change. Include text and sketches on additional sheets as required to provide detail sufficient for Engineer's review and response. If the proposed change is submitted in response to a proposal request, write in as scope, "In accordance with Proposal Request No." followed by the proposal request number. Provide written clarifications, if any, to scope of change.
  - b. Provide justification for each proposed change. If the proposed change is submitted in response to a proposal request, write in as justification, "In accordance with Proposal Request No." followed by the proposal request number.
  - c. List the total change in the Contract Price and Contract Times for each proposed change.
3. Unless otherwise directed by Engineer, attach to the Change Order request detailed breakdowns of pricing (Cost of the Work and Contractor's fee), including:
  - a. List of Work tasks to accomplish the change.
  - b. For each task, labor cost breakdown including labor classification, total hours per labor classification, and hourly cost rate for each labor classification.
  - c. Construction equipment and machinery to be used, including manufacturer, model, and year of manufacture, and number of hours for each.
  - d. Detailed breakdown of materials and equipment to be incorporated into the Work, including quantities, unit costs, and total cost, with Supplier's written quotations.

- e. Breakdowns of the Cost of the Work and fee for Subcontractors, including labor, construction equipment and machinery, and materials and equipment incorporated into the Work, other costs, and Subcontractor fees.
- f. Breakdown of other costs eligible, in accordance with the General Conditions.
- g. Other information required by Engineer.
- h. Contractor's fees applied to eligible Contractor costs and eligible Subcontractor costs.

## 1.08 CHANGE ORDERS

### A. General:

- 1. Change Orders will be recommended by Engineer, and signed by Owner and Contractor, to authorize additions, deletions, or revisions to the Work, or changes to the Contract Price or Contract Times.
- 2. Change Orders will be issued on the Change Order form included with this Section or other form acceptable to Owner and Engineer.

### B. Procedure:

- 1. Four originals of each Change Order will be furnished to Contractor, who shall promptly sign each original Change Order and, within five days of receipt, return all originals to Engineer.
- 2. Engineer will sign each original Change Order and forward them to Owner.
- 3. After approval and signature by Owner, signed Change Orders will be distributed as follows:
  - a. Contractor: One original.
  - b. Owner: Two originals.
  - c. Engineer: One original.

## PART 2 – PRODUCTS (NOT USED)

## PART 3 – EXECUTION

### 3.01 ATTACHMENTS

- A. The attachments listed below, which follow after the “End of Section” designation, are part of this Section:
  - 1. Attachment A: Request for interpretation form (one page).
  - 2. Attachment B: Field Order form (one page).
  - 3. Attachment C: Work Change Directive form (one page).
  - 4. Attachment D: Proposal request form (one page).
  - 5. Attachment E: Change Order request form (one page).
  - 6. Attachment F: Change Order form (two pages).

END OF SECTION

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REQUEST FOR INTERPRETATION NO. \_\_\_\_\_

Reference(s): \_\_\_\_\_  
 Specification Section(s) \_\_\_\_\_ Drawing(s) / Note(s) / Detail(s) \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Arcadis of New York, Inc.

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NATIONAL GRID  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

FIELD ORDER NO. \_\_\_\_\_

Contractor: \_\_\_\_\_ Purchase Order No.: \_\_\_\_\_

Date Issued: \_\_\_\_\_ Effective Date: \_\_\_\_\_

Subject: \_\_\_\_\_

Reference(s): \_\_\_\_\_  
Specification Section(s) Drawing(s) / Note(s) / Detail(s)

---

Attention:

Contractor is hereby directed to promptly execute this Field Order for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, please notify Engineer immediately and before proceeding with this Work.

Description:

Attachments:

---

Issued by Engineer:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Receipt Acknowledged by Contractor:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

END OF FIELD ORDER

NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

FIELD ORDER FORM  
01 26 00B – 1  
REVISION NO. 00  
DATE ISSUED: NOVEMBER 2020

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NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

FIELD ORDER FORM  
01 26 00B – 2  
REVISION NO. 00  
DATE ISSUED: NOVEMBER 2020

NATIONAL GRID  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

WORK CHANGE DIRECTIVE NO. \_\_\_\_\_

Contractor: \_\_\_\_\_ Purchase Order No.: \_\_\_\_\_

Date Issued: \_\_\_\_\_ Effective Date: \_\_\_\_\_

Contractor is directed to proceed promptly with the following change(s):

Item No.	Description

Scope of Work:

Attachments:

Purpose for Work Change Directive:

Authorization for the Work described herein to proceed on the basis of Cost of the Work due to:

- ☐ Non-agreement on pricing of proposed change.
- ☐ Necessity to expedite Work described herein prior to agreeing to changes in Contract Price and Contract Times.

Estimated Change in Contract Price and Contract Times:

Contract Price:

\$ \_\_\_\_\_ ☐ Increase ☐ Decrease ☐ No Change

Contract Times:

\_\_\_\_\_ Days ☐ Increase ☐ Decrease ☐ No Change



Recommended for Approval by Engineer:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Authorized by Owner:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Receipt Acknowledged by Contractor:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

END OF WORK CHANGE DIRECTIVE

NATIONAL GRID  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

PROPOSAL REQUEST NO. \_\_\_\_\_

Contractor: \_\_\_\_\_ Purchase Order No.: \_\_\_\_\_

Date: \_\_\_\_\_

Subject: \_\_\_\_\_

---

Please submit a complete Change Order request for the proposed modifications described below. If the associated Change Order request is approved, a Change Order will be issued to authorize adjustment to the scope of the Work. This proposal request is not a Change Order, Work Change Directive, or an authorization to proceed with the proposed Work described below.

Scope of Proposed Work:

---

Requested by Engineer:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

END OF PROPOSAL REQUEST

NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

PROPOSAL REQUEST FORM  
01 26 00D – 1  
REVISION NO. 00  
DATE ISSUED: NOVEMBER 2020

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Changes in Contract Price and Contract Times:

*For Contract Price, when requested by Engineer, attach detailed cost breakdowns for Contractor and Subcontractors, Supplier quotations, and other information required. For the Contract Times, state increase, decrease, or no change to Contract Times for Substantial Completion, readiness for final payment, and Milestones, if any. If increase or decrease, state specific number of days for changes to the Contract Times.*

The following changes are proposed to the Contract Price and Contract Times:

Description	Contract Price (dollars)	Contract Times (days)	
		Substantial	Final
1.	\$		
2.	\$		
<b>Total This Change Order Proposal:</b>	<b>\$</b>		

Changes to Milestones (if any): \_\_\_\_\_

The adjustment proposed is the entire adjustment to the Contract to which Contractor believes it is entitled as a result of the proposed change.

---

Requested by Contractor:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

END OF CHANGE ORDER REQUEST

NATIONAL GRID  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

CHANGE ORDER NO. \_\_\_\_\_

Contractor: \_\_\_\_\_ Purchase Order No.: \_\_\_\_\_

Date Issued: \_\_\_\_\_ Effective Date: \_\_\_\_\_

---

The Contract Documents are modified as follows upon execution of this Change Order:

Description:

Attachments:

---

Change in Contract Price:

- A. Original Contract Price: \$ \_\_\_\_\_
- B. ☐ Increase ☐ Decrease ☐ No Change  
from previously approved Change Order Nos. \_\_\_\_ to \_\_\_\_: \$ \_\_\_\_\_
- C. Contract Price prior to this Change Order (Lines A+B): \$ \_\_\_\_\_
- D. ☐ Increase ☐ Decrease ☐ No Change  
of this Change Order: \$ \_\_\_\_\_
- E. Contract Price incorporating this Change Order (Lines C+D): \$ \_\_\_\_\_

NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

CHANGE ORDER FORM  
01 26 00F – 1  
REVISION NO. 00  
DATE ISSUED: NOVEMBER 2020

Change in Contract Times:

A. Original Contract Times ☐ Working days ☐ Calendar days:

Substantial Completion (days or date): \_\_\_\_\_

Ready for Final Payment (days or date): \_\_\_\_\_

B. ☐ Increase ☐ Decrease ☐ No Change  
from previously approved Change Order Nos. \_\_\_\_ to \_\_\_\_:

Substantial Completion (days or date): \_\_\_\_\_

Ready for Final Payment (days or date): \_\_\_\_\_

C. Contract Times prior to this Change Order (Lines A+B):

Substantial Completion (days or date): \_\_\_\_\_

Ready for Final Payment (days or date): \_\_\_\_\_

D. ☐ Increase ☐ Decrease ☐ No Change  
of this Change Order:

Substantial Completion (days or date): \_\_\_\_\_

Ready for Final Payment (days or date): \_\_\_\_\_

E. Contract Times incorporating this Change Order (Lines C+D):

Substantial Completion (days or date): \_\_\_\_\_

Ready for Final Payment (days or date): \_\_\_\_\_

---

Recommended for Approval by Engineer:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Accepted by Owner:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Accepted by Contractor:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

END OF CHANGE ORDER

NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

CHANGE ORDER FORM  
01 26 00F – 2  
REVISION NO. 00  
DATE ISSUED: NOVEMBER 2020

SECTION 01 31 13  
PROJECT COORDINATION

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope:
1. This Section includes general requirements for coordinating construction operations on the Project.

1.02 COORDINATION

- A. Coordinate the Work, including testing agencies, whether hired by Contractor, Owner, or others, Subcontractors, Suppliers, and others with whom coordination is necessary, in accordance with this Section, to complete the Work in accordance with the Contract Documents.
- B. Cooperate with and coordinate the Work with other contractors, utility service companies, Owner's employees working at the site, and other entities working at the site, in accordance with Section 01 11 00 - Summary of Work.
- C. Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- D. Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's Progress Schedule.
  2. Installation and removal of temporary utilities, facilities, and controls.
  3. Delivery and processing of submittals.
  4. Progress meetings.
  5. Startup and adjustment of systems.
  6. Project closeout activities.
- E. Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.



- F. Maintain sufficient competent personnel, drafting and CADD equipment (as necessary), and supplies at the site for preparing layout drawings, coordination drawings, and record documents. With the Contract Documents and Shop Drawings, use such coordination drawings as tools for coordinating the Work of various trades. Where such coordination drawings are to be prepared by Subcontractors, ensure that each Subcontractor maintains required personnel and facilities at the site.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

## SECTION 01 31 19.13

### PRE-CONSTRUCTION CONFERENCE

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. A pre-construction conference will be held for the Project. Contractor shall attend the conference and be prepared to discuss all items on the agenda.
  - 2. Engineer will distribute an agenda, preside at conference, and prepare and distribute minutes to all conference participants and others as requested.
- B. Purpose of conference is to designate responsible personnel, establish working relationships, discuss preliminary schedules submitted by Contractor, and review administrative and procedural requirements for the Project. Matters requiring coordination will be discussed and procedures for handling such matters will be established.
- C. Date, Time, and Location: Conference will be held within 20 days after the Contract Times start to run and before Work starts at the site. Owner will establish the date, time, and location of conference and will notify the interested and involved parties.
- D. Prior to the conference, the Contractor shall submit the following preliminary schedules:
  - 1. Preliminary Progress Schedule.
  - 2. Preliminary Schedule of Submittals.
- E. Contractor shall provide information required and contribute appropriate items for discussion. Contractor shall bring to the conference the following, with sufficient number of copies for each attendee:
  - 1. Preliminary Progress Schedule.
  - 2. Preliminary Schedule of Submittals.
  - 3. List of emergency contact information for Contractor's project manager, site superintendent, safety representative, and foreman.

##### 1.02 ATTENDANCE

- A. Representatives present for each entity shall be qualified and authorized to act on that entity's behalf.
- B. Attendance:
  - 1. Contractor:
    - a. Project manager.
    - b. Site superintendent.
    - c. Safety representative.
  - 2. Owner.
  - 3. Engineer.
  - 4. New York State Department of Environmental Conservation and New York State Department of Health, if available.
  - 5. Others as requested by Owner, Contractor, or Engineer.

## 1.03 PRELIMINARY AGENDA

### A. Safety Moment

### B. Procedural and Administrative:

1. Personnel and Teams:
  - a. Designation of roles and responsible personnel.
  - b. Limitations of authority of personnel, including personnel who will sign Contract modifications and make binding decisions.
  - c. List of proposed Subcontractors and Suppliers.
  - d. Authorities having jurisdiction.
2. Procedures for communication and correspondence.
3. Copies of Contract Documents and availability.
4. The Work and Scheduling:
  - a. Scope of Work.
  - b. Contract Times, including Milestones (if any).
  - c. Phasing and sequencing.
  - d. Preliminary Progress Schedule.
  - e. Critical path activities.
  - f. Working hours.
5. Safety:
  - a. Responsibility for safety.
  - b. Designation of Contractor's safety representative.
  - c. Emergency procedures and accident reporting.
  - d. Emergency contact information.
  - e. Impact of Project on public safety.
6. Permits.
7. Coordination:
  - a. Project coordination.
  - b. Progress meetings.
8. Products and Submittals:
  - a. Preliminary Schedule of Submittals.
  - b. Shop Drawings, Samples, and other submittals.
  - c. Product options, "or equals", and substitutions.
9. Contract Modification Procedures:
  - a. Requests for interpretation.
  - b. Clarification notices.
  - c. Field Orders.
  - d. Proposal requests.
  - e. Change Order proposals.
  - f. Work Change Directives.
  - g. Change Orders.
10. Payment:
  - a. Progress payment procedures.
  - b. Taxes.
  - c. Retainage.
11. Testing and inspections.
12. Record documents.
13. Preliminary Discussion of Contract Closeout:
  - a. Procedures for Substantial Completion.
  - b. Contract closeout requirements.
  - c. Correction period.
  - d. Duration of bonds and insurance.

- C. Site Mobilization:
  - 1. Field offices and staging areas.
  - 2. Temporary facilities and utilities.
  - 3. Access to site and parking.
  - 4. Maintenance and protection of traffic.
  - 5. Use of premises.
  - 6. Protection of existing property.
  - 7. Security.
  - 8. Temporary Controls:
    - a. Erosion and sediment control.
    - b. Storm water control.
    - c. Odor, vapor, and dust control.
    - d. Noise control.
    - e. Pollution control.
  - 9. Temporary fencing.
  - 10. Storage of materials and equipment.
  - 11. Reference points and benchmarks; surveys and layouts.
  - 12. Site maintenance and housekeeping during the Project, including cleaning and removal of trash and debris.
  - 13. Restoration.
- D. General discussion and questions.
- E. Next meeting.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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## SECTION 01 32 16

### PROGRESS SCHEDULE

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Prepare, submit, maintain, and update Progress Schedules in accordance with this Section, unless otherwise accepted by the Owner.
2. The Owner's acceptance of the Progress Schedule, and comments or opinions concerning the activities in the Progress Schedule shall not control the Contractor's independent judgment relative to the means, methods, techniques, sequences, and procedures of construction. The Contractor is solely responsible for complying with the Contract Times.
3. If the Progress Schedule reflects completion date(s) different than the Contract Times, the Contract Times are not thereby voided, nullified, or affected. The Contract Times govern. Where the Progress Schedule reflects completion date(s) that are earlier than the Contract Times, Owner may accept such Progress Schedule with Contractor to specifically understand that no Claim for additional Contract Times or additions to the Contract Price shall be brought against Owner resulting from Contractor's failure to complete the work by the earlier date(s) indicated on the accepted Progress Schedule.

###### B. Factors Affecting the Progress Schedule

1. In preparing the Progress Schedule, take into consideration submittal requirements and submittal review times, time for fabricating and delivering materials and equipment, work by subcontractors, availability and abilities of workers, availability of construction equipment, weather conditions, restrictions in operations at the site and coordination with the Owner's operations, if any, and other factors that have the potential to affect completion of the work within the Contract Times.
2. Comply with sequencing requirements, if any, indicated in the Contract Documents.

##### 1.02 SUBMITTALS

###### A. Informational Submittals

1. Preliminary Progress Schedule: Submit preliminary Progress Schedule in accordance with this Section.
2. Initial Progress Schedule: After making revisions in accordance with Owner's/Engineer's comments on the preliminary Progress Schedule, submit initial Progress Schedule in accordance this Section.
3. Progress Schedule Updates:
  - a. Submit updated Progress Schedule at each progress meeting. Bring to meeting the minimum number of copies specified in Section 01 31 19.23 - Progress Meetings.
  - b. Submit each updated Progress Schedule with letter of transmittal complying with requirements of Section 01 33 00 - Submittal Procedures and specifically indicating the following:
    - 1) Listing of activities and dates that have changed since the previous Progress Schedule submittal.
    - 2) Discussion of problems causing delays, anticipated duration of delays, and proposed countermeasures.
    - 3) Completed activities, if any, and the anticipated and actual durations of each.

- b. If the Progress Schedule remains unchanged from one progress meeting to the next, submit a written statement to that effect.
- 4. Look-Ahead Schedules: Submit two-week look-ahead schedule at each progress meeting.
- 5. Recovery Schedules: Submit in accordance with this Section.

### 1.03 PROGRESS SCHEDULES

#### A. Format

- 1. Type: Gantt chart prepared using Microsoft Project 2007 or later edition, Primavera P6, or similar scheduling software.
- 2. Sheet Size: 22 inches by 34 inches, unless otherwise accepted by Owner.
- 3. Time Scale: Indicate first date of each work week.
- 4. Organization:
  - a. Group deliveries of materials and equipment into a separate sub-schedule that is part of the Progress Schedule.
  - b. Group construction into a separate sub-schedule (that is part of the Progress Schedule) by activity.
  - c. Group Work by Subcontractors into a separate sub-schedule (that is part of the Progress Schedule) by activity.
  - d. Group critical activities that dictate the rate of progress (the "critical path") into a separate sub-schedule that is part of the Progress Schedule. Clearly indicate the critical path on the Progress Schedule.
  - e. Organize each sub-schedule by Specification Section or payment item number.
- 5. Activity Designations: Indicate title and related Specification Section or payment item number.

#### B. Content

- 1. At a minimum, the following major work items should be included, with appropriate subtasks included as necessary, in the general sequence listed below:
  - a. Mobilization.
  - b. Site Preparation.
  - c. Excavation Support Installation.
  - d. Soil Excavation and Backfilling.
  - e. Site Cover Installation.
  - f. Site Restoration.
  - g. Demobilization.
- 2. Progress Schedules shall also indicate the following:
  - a. Dates for shop-testing.
  - b. Delivery dates for materials and equipment to be incorporated into the Work.
  - c. Dates for beginning and completing each phase of the Work by activity and by trade.
  - d. Dates for start-up, check-out, and field-testing.
  - e. Dates corresponding to the Contract Times, and planned completion date associated with each Milestone (if any), Substantial Completion, and readiness for final payment.

- C. Progress Schedule Updates: Update Progress Schedule on a bi-weekly basis (i.e., every two weeks) and to reflect changes to the Contract Times, if any.

### 1.04 RECOVERY SCHEDULES

#### A. General

- 1. When updated Progress Schedule indicates that the ability to comply with the Contract Times falls two or more weeks behind schedule, and there is no excusable delay, Change Order, or Work Change Directive to support an extension of the Contract Times,

Contractor shall prepare and submit a Progress Schedule demonstrating Contractor's plan to accelerate the work to achieve compliance with the Contract Times ("recovery schedule") for Owner's acceptance.

2. Submit recovery schedule within three days after submittal of updated Progress Schedule where need for recovery schedule is indicated.

B. Implementation of Recovery Schedule

1. At no additional cost to Owner, do one or more of the following: furnish additional labor, provide additional construction equipment, provide suitable materials, employ additional work shifts, expedite procurement of materials and equipment to be incorporated into the Work, and other measures necessary to complete the Work within the Contract Times.
2. Upon acceptance of recovery schedule by Owner, incorporate recovery schedule into the next Progress Schedule update.

- C. Lack of Action: Contractor's refusal, failure, or neglect to take appropriate recovery action, or to submit a recovery schedule, shall constitute reasonable evidence that Contractor is not prosecuting the work or separable part thereof with the diligence that will ensure completion within the Contract Times.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION



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## SECTION 01 31 19.23

### PROGRESS MEETINGS

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. Progress meetings will be held on a regular basis throughout the Project. Contractor shall attend each progress meeting and be prepared to discuss in detail all items on the agenda.
  - 2. Engineer will preside at progress meetings and will prepare and distribute minutes of progress meetings to all meeting participants and others as requested.
- B. Date and Time:
  - 1. Regular Meetings: Every week on a day and time agreeable to Owner, Engineer, and Contractor.
  - 2. Other Meetings: As required.
- C. Location: Contractor's field office at the site or other location mutually agreed upon by Owner, Engineer, and Contractor.
- D. Handouts: Contractor shall bring to each progress meeting a minimum of 10 copies of each of the following:
  - 1. List of Work accomplished since the previous progress meeting.
  - 2. Up-to-date Progress Schedule.
  - 3. Up-to-date Schedule of Submittals.
  - 4. Detailed "look-ahead" schedule of Work planned for the next two weeks, with specific starting and ending dates for each activity, including shutdowns, deliveries of important materials and equipment, Milestones (if any), and important activities affecting Owner, the Project, and the site.

##### 1.02 ATTENDANCE

- A. Representatives present for each entity shall be qualified and authorized to act on that entity's behalf.
- B. Attendance:
  - 1. Contractor:
    - a. Project manager.
    - b. Site superintendent.
    - c. Safety representative.
    - d. Representatives of other Subcontractors and Suppliers when needed for the discussion of a particular agenda item.
  - 2. Owner.
  - 3. Engineer.
    - a. Project Manager
    - b. Project Engineer
    - c. Engineer's Resident Project Representative
    - d. Air Monitoring Technician
  - 4. NYSDEC and NYSDOH, if available.

5. Others as appropriate.

1.03 PRELIMINARY AGENDA

- A. Review, comment, and amendment (if required) of minutes of previous progress meeting.
- B. Safety and safe work practices.
- C. Results of community air monitoring performed since previous progress meeting.
- D. Review of progress since previous progress meeting.
- E. Planned progress through next progress meeting.
- F. Review of Progress Schedule:
  - 1. Contract Times, including Milestones (if any).
  - 2. Critical path.
  - 3. Schedules for fabrication and delivery of materials and equipment.
  - 4. Issues potentially affecting the Contract Times, including Milestones (if any).
  - 5. Corrective measures, if required, to achieve Contract Times, including Milestones (if any).
- G. Submittals:
  - 1. Status of critical submittals.
  - 2. Review of Schedule of Submittals and Engineer's submittal log.
- H. Field observations, problems, and conflicts.
- I. Quality standards, testing, and inspections.
- J. Coordination between parties.
- K. Site management issues, including access, security, temporary controls, maintenance and protection of traffic, and housekeeping.
- L. Permits.
- M. Punch list status, as applicable.
- N. Other business.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

## SECTION 01 32 26

### CONSTRUCTION PROGRESS REPORTING

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. Prepare and submit construction progress reports in accordance with this Section.
  - 2. Construction progress reports include:
    - a. Daily construction reports.
    - b. Field condition reports.

##### 1.02 SUBMITTALS

- A. Informational Submittals:
  - 1. Daily Construction Reports: Submit in accordance with Part 1.03 of this Section.
  - 2. Field Condition Reports: Submit in accordance with Part 1.04 of this Section.

##### 1.03 DAILY CONSTRUCTION REPORTS

- A. Prepare daily construction reports throughout the Project. Include in each report, at a minimum, the following:
  - 1. Contractor's name.
  - 2. Owner's name.
  - 3. Project name.
  - 4. Site name and location.
  - 5. Date and day of the week.
  - 6. High and low temperatures and general weather conditions.
  - 7. Number of Contractor employees at the site.
  - 8. Number of employees at the site for each Subcontractor.
  - 9. Breakdown of employees by trades.
  - 10. Major construction equipment used.
  - 11. Material and equipment deliveries.
  - 12. Waste shipments.
  - 13. Meter readings and similar recordings.
  - 14. Work performed, including field quality control measures and testing.
  - 15. Location of areas in which construction was performed.
  - 16. Major equipment and materials installed as part of the Work.
  - 17. Services connected and disconnected.
  - 18. Equipment or system tests and startups.
  - 19. Stoppages, delays, shortages, and losses.
  - 20. Accidents. Comply with accident reporting requirements of Section 01 35 29 - Contractor's Health and Safety Plan.
  - 21. Emergency procedures.
  - 22. Meetings and significant decisions.
  - 23. Orders and requests of authorities having jurisdiction.
  - 24. Change Orders received and implemented.
  - 25. Work Change Directives received and implemented.
  - 26. Field Orders received and implemented.
  - 27. Other instructions received from Owner or Engineer.

- B. Submit daily construction reports to Engineer by 9:00 a.m. the next working day after the day covered in the associated report. Daily report shall be signed by responsible member of Contractor's staff, such as Contractor's project manager or superintendent, or foreman designated by Contractor as having authority to sign daily reports.

#### 1.04 FIELD CONDITION REPORTS

- A. Immediately upon discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- B. Submit field condition reports to Engineer with request for interpretation, prepared in accordance with Section 01 26 00 - Contract Modification Procedures.

#### PART 2 – PRODUCTS (NOT USED)

#### PART 3 – EXECUTION (NOT USED)

END OF SECTION

## SECTION 01 33 00

### SUBMITTAL PROCEDURES

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. This Section specifies the general methods and requirements of submissions applicable to Contractor submittals, including plans, shop drawings, product data, samples, mock-ups, and schedules. Detailed and specific submittal requirements are provided elsewhere in the Specifications and are summarized in the submittal log form included with this Section.
2. Provide submittals well in advance (as indicated in this Section) of the need for the material, equipment, or procedure (as applicable) in the Work and with ample time required for delivery of material or equipment and to implement procedures following Engineer's review or acceptance of the associated submittal. Work covered by a submittal will not be included in progress payments until review or acceptance of related submittals has been obtained in accordance with the Contract Documents.
3. Contractor is responsible for dimensions to be confirmed and corrected at the site, for information pertaining solely to the fabrication processes and to techniques of construction, and for coordinating the work of all trades. Contractor's signature of submittal's stamp and letter of transmittal shall be Contractor's representation that Contractor has met its obligations under the Contract Documents relative to that submittal.

###### B. Samples:

1. Conform submittal of Samples to the Specification Section in which the Sample is specified.
2. Furnish at the same time Samples and submittals that are related to the same unit of Work or Specification Section. Engineer will not review submittals without associated Samples, and will not review Samples without associated submittals.
3. Samples shall clearly illustrate functional characteristics of product, all related parts and attachments, and full range of color, texture, pattern, and material.

###### C. Each submittal shall be prepared and transmitted to the Engineer a minimum of 10 working days in advance of the Contractor's intended performance of the related Work or other applicable activities, or within the time specified in the individual Work of other related Sections, so that Work will not be delayed by processing times (including rejections and resubmittals, if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. The Owner/Engineer will not be liable for any expense and/or delay resulting from the Contractor's failure to provide submittals in a timely manner.

###### D. The Engineer shall forward select submittals to New York State Department of Environmental Conservation (NYSDEC) for review, as requested by NYSDEC.

##### 1.02 TYPES OF SUBMITTALS

###### A. Submittals are classified as Action Submittals, Informational Submittals, Closeout Submittals, and Maintenance Material Submittals. The type of each required submittal is designated in

the respective Specification Sections. When type of submittal is not specified in the associated Specification Section, submittal will be classified as follows:

1. Action Submittals include:
    - a. Shop Drawings.
    - b. Product data.
    - c. Delegated design submittals, which include documents prepared, sealed, and signed by a design professional retained by Contractor, Subcontractor, or Supplier for materials and equipment to be incorporated into the completed Work. Delegated design submittals do not include submittals related to temporary construction unless specified otherwise in the related Specification Section. Delegated design submittals include design drawings, design data including calculations, specifications, certifications, and other submittals prepared by such design professional.
    - d. Samples.
    - e. Testing plans, procedures, and testing limitations.
  2. Informational Submittals include:
    - a. Certificates.
    - b. Design data not sealed and signed by a design professional retained by Contractor, Subcontractor, or Supplier.
    - c. Pre-construction test and evaluation reports, such as reports on pilot testing, subsurface investigations and similar reports.
    - d. Supplier instructions, including installation data, and instructions for handling, starting-up, and troubleshooting.
    - e. Source quality control submittals (other than testing plans, procedures, and testing limitations), including results of shop testing.
    - f. Field quality control submittals (other than testing plans, procedures, and testing limitations), including results of operating and acceptability tests at the site.
    - g. Supplier reports.
    - h. Sustainable design submittals (other than sustainable design closeout documentation).
    - i. Special procedure submittals, including health and safety plans and other procedural submittals.
    - j. Qualifications statements.
  3. Closeout Submittals include:
    - a. Maintenance contracts.
    - b. Operations and maintenance data.
    - c. Bonds, such as maintenance bonds and bonds for a specific product or system.
    - d. Warranty documentation.
    - e. Record documentation.
    - f. Sustainable design closeout documentation.
    - g. Software.
  4. Maintenance Material Submittals include:
    - a. Spare parts.
    - b. Extra stock materials.
    - c. Tools.
  5. When type of submittal is not specified and is not included in the list above, Engineer will determine the type of submittal.
- B. Not Included in this Section: Administrative and procedural requirements for the following are covered elsewhere in the Contract Documents:
1. Requests for interpretations of the Contract Documents.
  2. Field Orders, Work Change Directives, and Change Orders.
  3. Applications for Payment.
  4. Progress Schedules.

5. Progress reports.
6. Photographic documentation.
7. Reports and documentation required in accordance with applicable permits.
8. Site survey data.

### 1.03 SUBMITTALS REQUIRED IN THIS SECTION

#### A. Informational Submittals:

##### 1. Schedule of Submittals:

- a. Timing:
  - 1) Provide submittal within time frames specified in the Contract Documents.
  - 2) Provide updated Schedule of Submittals with each submittal of the updated Progress Schedule.
- b. Content: Requirements for content of preliminary Schedule of Submittals and subsequent submittals of the Schedule of Submittals are identical. Identify on Schedule of Submittals all submittals required in the Contract Documents. Updates of Schedule of Submittals shall show scheduled dates and actual dates for completed tasks. Indicate submittals that are on the Project's critical path. Indicate the following for each submittal:
  - 1) Date by which submittal will be provided to Engineer.
  - 2) Whether submittal will be for a substitution or "equal".
  - 3) Date by which Engineer's response is required. At least 10 working days shall be allowed from Engineer's receipt of each submittal. Allow increased time, upwards of 20 working days, for large or complex submittals.
  - 4) For submittals for materials or equipment, date by which material or equipment must be at the site to avoid delaying the Work and to avoid delaying the work of other contractors.
- c. Prepare Schedule of Submittals using same software, and in same format, specified for Progress Schedules.
- d. Coordinate Schedule of Submittals with the Progress Schedule.
- e. Schedule of Submittals that is not compatible with the Progress Schedule, or that does not indicate submittals on the Project's critical path, or that places extraordinary demands on Engineer for time and resources, is unacceptable. Do not include submittals not required by the Contract Documents.
- f. In preparing Schedule of Submittals:
  - 1) Considering the nature and complexity of each submittal, allow sufficient time for review and revision.
  - 2) Reasonable time shall be allowed for Engineer's review and processing of submittals, for submittals to be revised and resubmitted, and for returning submittals to Contractor.
  - 3) Identify and accordingly schedule submittals that are expected to have long anticipated review times and submittals that may be subject to review by NYSDEC, or other authorities having jurisdiction.

### 1.04 PROCEDURE FOR SUBMITTALS

- A. Submittal Identification System: Use the following submittal identification system, consisting of submittal number and review cycle number.
  1. Submittal number shall be separate and unique number correlating to each individual submittal required. Contractor shall assign submittal number as follows:
    - a. First part of submittal number shall be the applicable Specification Section number, followed by a hyphen.



- b. Second part of submittal number shall be a three-digit number (sequentially numbered from 001 through 999) assigned to each separate and unique submittal provided under the associated Specification Section.
    - c. Typical submittal number for the third submittal provided for Section 31 23 00 - Excavation and Fill would be "31 23 00-003".
  - 2. Review cycle number shall be a letter designation indicating the initial submittal or re-submittal associated with each submittal number:
    - a. "A" = Initial (first) submittal.
    - b. "B" = Second submittal (i.e., first re-submittal).
    - c. "C" = Third submittal (i.e., second re-submittal).
  - 3. Typical submittal identification for the second submission (first re-submission) of the third submittal provided for Section 31 23 00 - Excavation and Fill would be "31 23 00-003-B".
- B. Letter of Transmittal for Submittals:
  - 1. Provide separate letter of transmittal with each submittal. Each submittal shall be for one Specification Section.
  - 2. Each letter of transmittal shall contain the following:
    - a. Contractor's name.
    - b. Owner's name.
    - c. Project name.
    - d. Contract or Purchase Order number.
    - e. Transmittal number.
    - f. Submittal number and review cycle.
    - g. Submittal date and dates of any previous submissions.
    - h. Reference to appropriate Specification Section number, page, and paragraph(s).
    - i. Reference to appropriate Drawing sheet(s) and detail(s).
    - j. Clear space at least three inches by three inches in size for affixing Engineer's review stamp.
    - k. Clear space suitably sized for affixing Contractor's stamp.
  - 3. For submittals with proposed deviations from requirements of the Contract Documents, letter of transmittal shall specifically describe each proposed variation.
- C. Contractor's Review and Stamp:
  - 1. Contractor's Review: Before transmitting submittals to Engineer, review submittals to:
    - a. Ensure proper coordination of the Work.
    - b. Determine that each submittal is in accordance with Contractor's desires.
    - c. Verify that submittal contains sufficient information for Engineer to determine compliance with the Contract Documents.
  - 2. Incomplete or inadequate submittals will be returned without review.
  - 3. Contractor's Stamp and Signature:
    - a. Each submittal provided shall bear Contractor's stamp of approval and signature, as evidence that submittal has been reviewed by Contractor and verified as complete and in accordance with the Contract Documents.
    - b. Submittals without Contractor's stamp and signature will be returned without review.
    - c. Contractor's stamp shall contain the following certification statement:
 

"By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data, and I have checked and coordinated each item with other applicable Shop Drawings and all Project requirements."

- D. Submittal Marking and Organization:
1. Mark each page of submittal, and each individual component submitted, with submittal number and applicable Specification paragraph.
  2. Arrange submittal information in same order as requirements are written in the associated Specification Section.
  3. Each Shop Drawing sheet shall have title block with complete identifying information satisfactory to Engineer.
  4. Package together submittals for the same Specification Section. Do not provide required information piecemeal.
- E. Format of Submittal and Recipients:
1. Action Submittals and Informational Submittals: Provide Action Submittals and Informational Submittals as electronic files in PDF format, except that submittals of Samples shall be as specified in Part 1.04.E.2 of this Section.
  2. Samples:
    - a. Securely label or tag Samples with submittal identification number. Label or tag shall include clear space at least three inches by three inches in size for affixing Engineer's review stamp. Label or tag shall not cover, conceal, or alter appearance or features of Sample. Label or tag shall not be separated from the Sample.
    - b. Submit number of Samples required in Specifications. If number of Samples is not specified in the associated Specification Section, provide at least three identical Samples of each item required for Engineer's review. Samples will not be returned to Contractor. If Contractor requires Sample(s) for Contractor's use, notify Engineer in writing and provide additional Sample(s). Contractor is responsible for furnishing, shipping, and transporting additional Samples.
    - c. Deliver one Sample to Engineer's field office at the site. Deliver balance of Samples to Engineer's office, unless otherwise directed by Engineer.
  3. Closeout Submittals:
    - a. Provide the following Closeout Submittals as electronic files in PDF format:
      - 1) Maintenance contracts.
      - 2) Operations and maintenance data.
      - 3) Bonds for specific products or systems.
      - 4) Warranty documentation.
      - 5) Sustainable design closeout documentation.
    - b. Record Documentation: Submit in accordance with Section 01 78 39 - Project Record Documents.
    - c. Software: Submit number of copies required in Specification Section where the software is specified. If number of copies is not specified, provide two copies on compact disc in addition to software loaded on to Owner's computer(s) or microprocessor(s).
  4. Maintenance Material Submittals: For spare parts, extra stock materials, and tools, submit quantity of items specified in associated Specification Section.
- F. Distribution:
1. Engineer will distribute each reviewed submittal requiring Engineer's written response as electronic file in PDF format.
  2. Contractor shall distribute hardcopy reproductions of reviewed submittals, where required, to the job site file and elsewhere, as directed by Engineer. Number of hardcopies shall be as directed by Engineer, but will not exceed six.
- G. Resubmittals: Resubmittal requirements are provided in Part 1.05 of this Section.

- H. Engineer's Submittal Log:
1. Engineer will maintain a log of required submittals using the form included with this Section. Updated submittal log will be provided to Contractor upon request.
  2. Review submittal log and status of each submittal with Engineer on a weekly or more frequent basis.
  3. Coordinate updates to Schedule of Submittals with Engineer's updates to submittal log.

## 1.05 ENGINEER'S REVIEW

- A. Timing: Engineer's review will conform to timing accepted by Engineer in the accepted Schedule of Submittals.
- B. Submittals not required in the Contract Documents will not be reviewed by Engineer and will not be recorded in Engineer's submittal log. Hardcopies, if any, of such submittals will be returned to Contractor.
- C. Results of Engineer's Review:
1. Action Submittals: Each submittal will be given one of the following dispositions:
    - a. Reviewed: Upon return of submittal marked "Reviewed", order, ship, or fabricate materials and equipment included in the submittal (pending Engineer's review or acceptance, as applicable, of source quality control submittals) or otherwise proceed with the Work in accordance with the submittal and the Contract Documents.
    - b. Reviewed and Noted: Upon return of submittal marked "Reviewed and Noted", order, ship, or fabricate materials and equipment included in the submittal (pending Engineer's review or acceptance, as applicable, of source quality control submittals) or otherwise proceed with the Work in accordance with the submittal and the Contract Documents, provided it is in accordance with corrections indicated.
    - c. Revise and Resubmit: Upon return of submittal marked "Revise and Resubmit", make the corrections indicated and re-submit to Engineer for review.
    - d. Rejected: This disposition indicates material or equipment that cannot be reviewed. Upon return of submittal marked "Rejected", repeat initial submittal procedure utilizing reviewable material or equipment.
  2. Informational Submittals:
    - a. Each submittal will be given one of the following dispositions:
      - 1) Accepted: Information included in submittal conforms to the applicable requirements of the Contract Documents, and is acceptable. No further action by Contractor is required relative to this submittal, and the Work covered by the submittal may proceed, and products with submittals with this disposition may be shipped or operated, as applicable.
      - 2) Not Accepted: Submittal does not conform to applicable requirements of the Contract Documents and is not acceptable. Revise submittal and re-submit to indicate acceptability and conformance with the Contract Documents.
    - b. The following types of Informational Submittals, when acceptable to Engineer, will not receive a written response from Engineer. Disposition as "Accepted" will be recorded in Engineer's submittal log. When submittals of the following are not acceptable, Engineer will provide written response to Contractor:
      - 1) Safety data sheets.
      - 2) Manifests and other shipping documents.
      - 3) Delivery tickets.
      - 4) Compaction testing reports.
      - 5) Concrete testing reports.
      - 6) Manufacturer's instructions.

3. Closeout Submittals: Dispositions and meanings are the same as specified for Informational Submittals. When acceptable, Closeout Submittals will not receive a written response from Engineer. Disposition as "Accepted" will be recorded in Engineer's submittal log. When Closeout Submittal is not acceptable, Engineer will provide written response to Contractor.
4. Maintenance Material Submittals: Dispositions and meanings are the same as specified for Informational Submittals. When acceptable, Maintenance Material Submittals will not receive a written response from Engineer. Disposition as "Accepted" will be recorded in Engineer's submittal log. When Maintenance Material Submittal is not acceptable, Engineer will provide written response to Contractor, and Contractor is responsible for costs associated with transporting and handling of maintenance materials until compliance with the Contract Documents is achieved.

## PART 2 – PRODUCTS (NOT USED)

## PART 3 – EXECUTION

### 3.01 ATTACHMENTS

- A. The form listed below, which follows after the "End of Section" designation, is part of this Specification Section:
  1. Attachment A: Engineer's submittal log form (2 pages).

END OF SECTION

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NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

SUBMITTAL PROCEDURES  
01 33 00 – 8  
REVISION NO. 00  
DATE ISSUED: NOVEMBER 2020

Table 1  
Specification Section 01 33 00A - Submittal Log  
National Grid Non-Owned Rensselaer Former MGP Site  
Rensselaer, NY

Specification / Document Reference	Submittal Description	Schedule of Submittal	Submittal Type	Submittal Number	Date Received
Section 01 15 00 Contractor's Project Operations Plan	Contractor's Organizational Structure	Submit the sooner of seven days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the Site	Informational		
	Work Schedule				
	List of Major Construction Equipment				
	List of major Subcontractors and Suppliers				
	Site Utilization Plan				
	Comprehensive Work Plan				
Section 01 31 19.13 Pre-Construction Conference	Preliminary Progress Schedule	Submit prior to Pre-Construction Conference	Informational		
	Preliminary Schedule of Submittals				
	Contractors Emergency Contact Information				
Section 01 31 19.23 Progress Meetings	Up-to-date handouts covering work completed, progress schedule, schedule of submittals, and future schedule for each weekly meeting	Submit prior to each weekly meeting	Informational		
	Status of critical submittals	Submit prior to close of each weekly meeting			
	Review of Schedule of Submittals and Engineer's submittal log				
Section 01 32 16 Construction Progress Schedule	Preliminary Progress Schedule	Submit prior to Pre-Construction Conference	Informational		
	Initial Progress Schedule	Submit after addressing comments from Owner/Engineer on Preliminary Progress Schedule			
	Progress Schedule Updates	Submit at each progress meeting			
	Look-Ahead Schedule	Submit at each progress meeting			
	Recovery Schedules	Submit as necessary			
Section 01 32 26 Construction Progress Reporting	Daily Construction Reports	Submit to Engineer by 9:00 AM the next working day after the day covered in the associated report	Informational		
	Field Condition Reports	Submit with request for interpretation, as necessary			
Section 01 35 29 Contractor's Health and Safety Plan	Contractor's HASP	Submit the sooner of seven days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the site	Informational		
	Qualification Statements (for HASP preparer and Safety representative)				
	Accident Reports				
	Daily Health and Safety Field Reports				
	Training Certificates				
Section 01 35 43.13 Environmental Procedures for Hazardous Materials	Hazardous Materials Communication Plan	Submit within 3 days of Contractor's receipt of request	Informational		
	Emergency Spill Response Plan	Submit at least 3 days prior to bringing Hazardous Material to the Site			
	Hazardous Materials Proposed for Use at the Site	Submit Information not less than 3 days after Contractor's Receipt of Analytical Results			
	Hazardous Materials Generated at the Site	Submit at least 3 days prior to bringing Hazardous Material to the Site			
	Permits (for storing, handling, using, transporting, and disposing of Hazardous Materials)	Submit within 3 days of Contractor's receipt of request			
	Other Documents required for the Hazardous Materials Management Plan				
Section 01 35 49 Community Air Monitoring Plan	Weekly Air Monitoring Reports	Submit prior to 12:00 PM the Monday after the week covered in the associated report	Informational		
	Exceedance Reports	Submit within 24 hours after exceedance			
Section 01 41 26 Storm Water Pollution Prevention Plan and Permit	Storm Water Permit Certification Statement	Submit at least 2 weeks prior to performing any work at the Site	Informational		
	Qualifications Statements				
	Storm Water Inspection Reports	Submit within 3 days after each inspection			
Section 01 51 41 Temporary Pumping	Temporary Pumping System Plan	Provide to Engineer at least 15 days prior to delivery to Site	Informational		
Section 01 52 13 Field Offices and Sheds	Field Office Submittal (site plan, field office dimensions, layout, internet service information, office equipment)	Submit to Engineer for approval prior to staging on Site	Action		
Section 01 55 26 Maintenance and Protection of Traffic	Traffic Maintenance and Protection Plan	Submit the sooner of seven days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the Site	Informational		
Section 01 57 05 Temporary Controls	Product Data for fiber roll	Submit at least 2 weeks prior to installation at the Site	Action		
Section 01 57 33 Site Security	Product Data for vapor mitigation agents				
	Shop Drawings	Submit the sooner of seven days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the Site	Informational		
	Product Data for temporary fencing, temporary gates, and privacy screens				
	Daily Security Logs	Submit with Daily Construction Reports	Action		

Table 1  
Specification Section 01 33 00A - Submittal Log  
National Grid Non-Owned Rensselaer Former MGP Site  
Rensselaer, NY

Specification / Document Reference	Submittal Description	Schedule of Submittal	Submittal Type	Submittal Number	Date Received
Section 01 58 13 Temporary Project Signage	Shop Drawings - layout, text, font, character size, colors, graphics or logos (if any), materials of construction, and dimensions of each temporary sign, and the proposed locations and orientations at the Site	Submit at least 2 weeks prior to installation at the Site	Action		
Section 01 71 23 Field Engineering	Qualification Statements - Contractor Field Engineer	Submit the sooner of seven days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the Site	Informational		
	Certificates - Accuracy of Field Engineering	Submit upon request by Engineer			
Section 01 71 26 Construction Surveying and Layout	Survey Plan	Submit the sooner of seven days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the Site	Informational		
	Survey Field Books				
	Qualification Statements - Surveyor	Submit the sooner of seven days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the Site	Informational		
	Certificates - Accuracy of Surveying	Submit upon request by Engineer			
	Pre-Construction Survey Results	Submit prior to commencement of intrusive activities			
	Interim Survey Results	Submit upon request by Engineer			
	Post-Removal Survey Results	Submit prior to commencement of backfill activities			
	Post-Restoration Survey Results	Submit prior to demobilization and not more than 2 weeks after completion of the survey			
Section 01 74 19 Construction Waste Management and Disposal	Waste Management Plan	Submit within 14 days before the date the Contract Times commence running, and before removing any waste	Informational		
	Waste Profiles	Submit counter-signed waste profile and proof of acceptance of waste for each landfill and incinerator facility			
	Disposal Records	Submit counter-signed manifests with each concurrent Application for Payment			
Section 01 77 19 Closeout Procedures	Work Completion Documentation - Actual excavated volumes	Submit prior to submitting an application for Final Certification Inspection	Informational		
	Work Completion Documentation - Actual backfill volumes				
	Work Completion Documentation - Construction Drawings				
	Work Completion Documentation - Certified survey data				
	Work Completion Documentation - Executed warranties				
	Work Completion Documentation - Certified weigh slips from disposal facilities				
	Work Completion Documentation - Maintenance Agreements				
	Work Completion Documentation - Inspection certificates				
	Truck volume counts and measurement summary				
Section 01 78 39 Project Record Documents	Record Documents	Submit to Engineer prior to readiness for final payment	Closeout		
Section 01 71 26 Construction Surveying and Layout	Qualification Statement (for Professional Engineer performing surveys)	Submit at least 14 days before performing each survey	Informational		
	Notification of Intended Survey Start				
	Pre-Construction Survey				
	Post-Removal Survey	Submit within 14 days after each survey			
	Post-Restoration Survey				
	Final Site Plan				
Section 02 41 00 Demolition	Demolition and Removal Plan	Submit at least 21 days prior to starting demolition Work	Informational		
	Qualification Statements				
	Notification of Intended Demolition Start	Submit at least 48 hours prior to commencing demolition or removal			
Section 02 51 00 Decontamination	SDSs for all cleaning/decontamination solutions	Submit as part of Contractor's Health and Safety Plan	Informational		
Section 02 61 05 Removal and Disposal of Contaminated Material	Product Data for soil during agent	Submit as part of Contractor's POP or Separately	Action		
	Waste Profiles and Manifests	Submit at least 10 days prior to material transport	Informational		
	Waste Transporter Permits	Submit at least 10 days prior to material transport			
	Waste Profiles for all materials transported off-site	Submit weekly			
	Chain of Custody records	Submit monthly			
	Disposal records				

Specification / Document Reference	Submittal Description	Schedule of Submittal	Submittal Type	Submittal Number	Date Received
Section 03 00 05 Concrete	Concrete Materials/Mix designs	Submit to Engineer at least 2 weeks prior to placement of concrete	Action		
	Laboratory Trial Batch Reports				
	Product Data	Submit to Engineer within 24 hours of completion of test	Informational		
	Qualification Statements				
	Field Quality Control Submittals				
	Weigh-tickets/Delivery Tickets				
Section 31 05 16 Aggregates for Earthwork	Borrow Source Characterization Report	Submit to Engineer at least 2 weeks prior to placement	Action		
	50-pound sample from each of the borrow pits	Submit to Engineer at least 4 weeks prior to placement of materials			
	Geotechnical and Chemical testing results, as necessary	Submit to Engineer at least 2 weeks prior to placement			
	NYSDEC's Request to Import/reuse Fill or Soil Form	Submit to Engineer at least 2 weeks prior to placement			
	Delivery Tickets	Submit weekly	Informational		
	Product Data - lot and roll identification	Submit to Engineer prior to shipment of any geotextile material	Action		
Section 31 05 19.13 Geotextiles for Earthwork	Geotextile quality assurance tests from the manufacturer		Informational		
Section 31 09 13 Geotechnical Instrumentation and Monitoring	Product data for geotechnical instrumentation and accessories	Submit to Engineer at least 2 weeks prior to start of geotechnical monitoring	Action		
	Qualification Statements - Independent Geotechnical Monitoring Specialist				
	Displacement Monitoring and Installation Plan				
	Displacement Monitoring Reports	Submit to Engineer by the end of the next day after monitoring	Informational		
	Qualification Statements - Instrumentation Personnel	Submit to Engineer at least 2 weeks prior to start of geotechnical monitoring			
	Final Geotechnical Monitoring Report	Submit to Engineer within 20 days of completion of excavation, demolition, backfilling, or any shoring installation	Closeout		
Section 31 05 19.16 Geomembranes for Earthwork	Manufacturer's certification	Submit to Engineer at least 2 weeks prior to mobilizing material to Site	Informational		
	Manufacturer's standard warranty for the geomembrane				
	Results of QC tests conducted by the manufacturer				
	Contractor's written certification that material is not damaged		Action		
	HDPE lot and roll number of field-delivered material				
	QC testing results				
Section 31 23 00 Excavation and Fill	Excavation and Backfilling Plan	Submit at least 2 weeks prior to starting excavation operations	Action		
	Qualification Statements - Nuclear Density Testing firm				
	Soil Solidification Gravity Wall Installation and Removal Plan				
	Slide Rail Installation and Removal Plan	Submit to Engineer within 24 hours of completion of test	Informational		
	Field Quality Control Submittals				
	Field test results				
	Excavation Dewatering Log	Submit daily with Daily Construction Reports			



Specification / Document Reference	Submittal Description	Schedule of Submittal	Submittal Type	Submittal Number	Date Received
Section 31 50 00 Excavation Support and Protection	Soil Solidification Gravity Wall Installation and Removal Plan	Submit the sooner of seven days prior to pre-construction conference or 30 days prior to Contractor's scheduled mobilization to the Site	Action		
	Slide Rail Installation and Removal Plan				
	Qualifications Statements				
	Off-site Water Source Information				
	Weekly Soil Solidification Report				
	Daily Soil Solidification Report	Submit Daily	Informational		
	Daily Slide Rail Solidification Report				
	Field Quality Control Submittals				
	Gravity Wall Mixture Preparation Calculations				
Section 32 12 00 Flexible Paving	Shop drawings	Submit to Engineer at least 2 weeks prior to installation	Action		
	Qualification Statement- Asphalt Concrete Production Facility				
	Qualification Statement- Contractor's Testing Laboratory				
	Quality Assurance Test Data Submittals	Submit to Engineer within 24 hours of completion of test	Informational		
	Delivery Tickets				
	Field Quality Control Submittals				

## SECTION 01 35 29

### CONTRACTOR'S HEALTH AND SAFETY PLAN

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Prepare and maintain a written, site-specific Health and Safety Plan (HASP), and conduct all construction activities in a safe manner that avoids:
  - a. Injuries to employees, Subcontractors, and other persons with an interest at or near the site.
  - b. Employee exposures to health hazards above occupational limits established respectively by the Occupational Safety and Health Administration (OSHA), American Conference of Governmental Industrial Hygienists (ACGIH), and Nuclear Regulatory Commission (NRC), as applicable.
  - c. Exposure of the public and Owner's employees to air contaminants above levels established for public exposure by USEPA, NRC, NYSDEC, NYSDOH, and other authorities having jurisdiction at the site.
  - d. Significant increases in concentrations of contaminants in soil, water, or sediment near the site.
  - e. Violations of the Occupational Safety and Health Act, or other Laws or Regulations.

##### 1.02 QUALITY ASSURANCE

###### A. Qualifications:

1. HASP Preparer:
  - a. Engage a certified industrial hygienist, accredited by the American Board of Industrial Hygiene, or safety professional certified by the Board of Certified Safety Professionals, to prepare or supervise preparation of Contractor's HASP.
2. Safety Representative:
  - a. Retain the services of an independent, safety industry professional to manage, oversee, and enforce Contractor's health and safety program at the site, and ensure compliance with Contractor's HASP and applicable Laws and Regulations during the Project. Contractor's safety representative shall have a minimum of five years direct construction safety experience and appropriate training to supervise Hazardous Waste operations and emergency response (HAZWOPER) activities.
  - b. The Safety Representative shall possess at least one of the following certifications: Certified Safety Professional, Certified Industrial Hygienist or Construction Health and Safety Technician.
  - c. Contractor's safety representative shall be present at the site at all times when Work is being performed, and shall be dedicated solely to the supervision of Contractor's health and safety program.
  - d. Responsibilities include, but are not necessarily limited to, the following:
    - 1) Supervising the implementation of Contractor's HASP.
    - 2) Providing health and safety orientation training to Contractor's employees, Subcontractors, and site visitors.
    - 3) Attending pre-construction conference, progress meetings, and other Project meetings, as required.
    - 4) Preparing and maintaining health and safety records and statistics.
    - 5) Leading and documenting daily job safety briefings.

- 6) Preparing and submitting accident reports in accordance with Part 1.05 of this Section.
- 7) Leading accident investigations on Contractor's behalf.
- 8) Preparing and submitting daily health and safety field reports in accordance with Part 1.06 of this Section.

**B. Regulatory Requirements:**

1. Laws and Regulations applying to the Work under this Section include, but are not limited to, the following:
  - a. 29 CFR 1904, Recording and Reporting Occupational Injuries and Illnesses.
  - b. 29 CFR 1910, Occupational Safety and Health Standards.
  - c. 29 CFR 1926, Safety and Health Regulations for Construction.
  - d. 40 CFR 261.3, 264, and 265, Resource Conservation and Recovery Act (RCRA).
  - e. 49 CFR 171.8, Transportation, Definitions and Abbreviations.
  - f. 6 NYCRR 371, Identification and Listing of Hazardous Wastes.
  - g. 6 NYCRR 375, Environmental Remediation Programs.
  - h. 12 NYCRR 23, Protection in Construction, Demolition, and Excavation Operations.
  - i. 12 NYCRR 56, Asbestos.
  - j. 12 NYCRR 57, High Voltage Proximity.
  - k. 12 NYCRR 59, Workplace Safety and Loss Prevention Program.
  - l. 12 NYCRR 61, Occupational Licensing and Certification.
  - m. 16 NYCRR 753, Protection of Underground Facilities.
  - n. 17 NYCRR 32, Oil Spill Prevention and Control – Actions to be Taken in Case of Discharge.

### 1.03 SUBMITTALS

**A. Informational Submittals:**

1. Contractor's HASP: Submit in accordance with Part 1.04 of this Section.
2. Qualifications Statements:
  - a. HASP Preparer: Submit name and qualifications of certified industrial hygienist or safety professional, including summary of experience and copy of valid certifications.
  - b. Safety Representative: Submit name and qualifications of safety representative, including summary of experience, training received, and copy of valid certifications applicable to the Project.
3. Reports:
  - a. Accident Reports: Submit in accordance with Part 1.05 of this Section.
  - b. Daily Health and Safety Field Reports: Submit in accordance with Part 1.06 of this Section.
4. Submit in accordance with Part 1.07 of this Section, the following valid training certificates:
  - a. Initial 40-hour HAZWOPER training.
  - b. Initial 24-hour HAZWOPER training.
  - c. Eight-hour HAZWOPER supervisor training.
  - d. Annual eight-hour HAZWOPER refresher training.

### 1.04 HASP SUBMITTAL

**A. General:**

1. Each employer working at the site shall develop and implement a written HASP for its employees involved in Hazardous Waste operations. HASP shall include procedures that will be used to ensure the safe handling of Hazardous Waste during excavating, loading, and transporting activities.

2. Comply with 29 CFR 1904, 29 CFR 1910, 29 CFR 1926, 12 NYCRR 23, 12 NYCRR 56, 12 NYCRR 57, 12 NYCRR 59, 12 NYCRR 61, 17 NYCRR 32, and other Laws and Regulations.
  3. Include in HASP requirements for complying with Owner's health and safety requirements and site-specific hazard/emergency response plans, if any.
  4. HASP shall be kept at the site, shall address safety and health hazards of each phase of operations at the site, and shall include requirements and procedures for employee protection.
- B. HASP Contents: HASP shall address and include the following:
1. Organizational Structure:
    - a. Specific chain of command and overall responsibilities of supervisors and employees. Include the following:
      - 1) Designation of general supervisor who has responsibility and authority to direct all Hazardous Waste operations.
      - 2) Name of site safety representative who has responsibility and authority to implement and modify the HASP and verify compliance.
      - 3) Other personnel required for Hazardous Waste operations at the site and emergency response, and general functions and responsibilities of each.
      - 4) Lines of authority, responsibility, and communication.
    - b. Review and update organizational structure as necessary to reflect current status of site operations and personnel.
  2. Site description, background, and scope of Work.
  3. Safety and health risk or hazard analysis, and planned hazard controls, for each task and operation required to complete the Project.
  4. Site control measures, including:
    - a. Preventing trespassing.
    - b. Preventing unqualified or unprotected workers from entering restricted areas.
    - c. Preventing the "tracking" of contaminants out of the site.
    - d. Maintaining a log of employees at the Site and visitors to the site.
    - e. Delineating exclusion, contamination reduction, and support zones.
    - f. Locating personnel and equipment decontamination zones.
    - g. Communicating routes of escape and gathering points.
  5. Training Program:
    - a. Initial training requirements for site workers and supervisors.
    - b. Exceptions to initial training requirements.
    - c. Site briefings for visitors and workers.
    - d. Refresher training requirements.
    - e. Certification of training for all Contractor and Subcontractor employees assigned to the Project.
  6. Medical Surveillance Program:
    - a. Provisions of the site medical surveillance program.
    - b. Communication protocols between the site, physicians, and workers.
    - c. Medical recordkeeping procedures.
    - d. Certification of medical clearance for all Contractor and Subcontractor employees assigned to the Project.
  7. Personal Protective Equipment (PPE):
    - a. PPE selection criteria.
    - b. Site- and task-specific PPE ensembles.
    - c. Training in the use of PPE.
    - d. Respiratory protection.
    - e. Hearing conservation.
    - f. PPE maintenance and storage.

8. Exposure Monitoring Program:
    - a. Monitoring procedures to detect the presence of hazardous substances.
    - b. Monitoring procedures to determine worker exposures to hazardous substances and physical hazards.
    - c. Action levels and required responses for known and expected hazardous substances and physical hazards.
    - d. Calibration and maintenance procedures for monitoring equipment.
  9. Heat stress prevention program.
  10. Spill containment program. Comply with Section 01 35 43.13 – Environmental Procedures for Hazardous Materials.
  11. Decontamination Program:
    - a. Location and type of temporary decontamination facilities.
    - b. General and specific decontamination procedures for personnel and PPE.
    - c. General and specific decontamination procedures for equipment and vehicles.
    - d. Disposal of residual waste from decontamination.
    - e. Decontamination equipment and materials.
    - f. Monitoring procedures used to evaluate the effectiveness of decontamination.
  12. Emergency Response Plan:
    - a. Potential emergencies that may occur at the site.
    - b. Pre-emergency planning.
    - c. On-site emergency response equipment, materials, and PPE.
    - d. Emergency Maps: Evacuation routes, gathering points, and route to nearest hospital.
    - e. Emergency roles and responsibilities.
    - f. Emergency alerting and evacuation procedures for site personnel.
    - g. Procedures for notifying, and list of emergency contact information for:
      - 1) Emergency responders, including fire officials, ambulance service, poison control, police, and local hospitals.
      - 2) Authorities having jurisdiction.
      - 3) Owner and Engineer.
      - 4) Contractor's project manager, site superintendent, safety representative, and foreman.
      - 5) Other entities, as required.
    - h. Emergency response procedures.
    - i. Emergency decontamination, medical treatment, and first-aid.
    - j. Emergency response training.
  13. Other standard operating procedures applicable to the Work.
- C. Submittal Procedure:
1. Submit HASP to Engineer the sooner of: seven days prior to pre-construction conference, or 30 days prior to Contractor's scheduled mobilization to the site.
  2. Engineer's review and acceptance of HASP will be only to determine if the topics covered in HASP comply with the Contract Documents. Engineer's review and acceptance will not extend to safety measures, means, methods, techniques, procedures of construction, or whether representations made in the HASP comply with Laws and Regulations, or standards of good practice.
  3. Do not perform Work at the site until written HASP has been accepted by Engineer.
  4. Notwithstanding other provisions of the Contract Documents, changes in the Contract Price or Contract Times will not be authorized due to delay by Contractor in developing, submitting, or revising the HASP.

## 1.05 ACCIDENT REPORTING AND INVESTIGATION

- A. Immediately notify Owner and Engineer of all accidents that:
  - 1. Result in bodily injury, illness, or property damage.
  - 2. Affect the environment.
  - 3. Involve the public.
- B. Submit accident report to Owner and Engineer within 24 hours after accident occurs. Include in each report the following:
  - 1. Date, time, and location of accident.
  - 2. Names of all site personnel involved in or affected by accident.
  - 3. Description of accident and activities being performed when accident occurred.
  - 4. Medical treatment administered, if any.
  - 5. Nature and seriousness of injury or damage.
- C. Comply with 29 CFR 1904.29, including using OSHA 300, 300-A, and 301 forms (or equivalent) to document all accidents that result in bodily injury.
- D. Based upon results of accident investigation, modify HASP as required by changing tasks or procedures to prevent reoccurrence of accident.
- E. Post current copy of Contractor's OSHA 300-A report at conspicuous place at the site from February 1 through April 30 of each year.

## 1.06 DAILY HEALTH AND SAFETY FIELD REPORTS

- A. Prepare daily health and safety field reports throughout the Project. Include in each report, at a minimum, the following:
  - 1. Contractor's name.
  - 2. Owner's name.
  - 3. Project name.
  - 4. Site name and location.
  - 5. Date and day of the week.
  - 6. Weather conditions.
  - 7. Delays encountered in construction.
  - 8. Acknowledgment of deficiencies noted along with corrective actions taken on current and previous deficiencies.
  - 9. Daily health and safety exposure monitoring results, documentation of instrument calibration, new hazards encountered, and PPE utilized.
  - 10. Problems, real or anticipated, encountered during the Work that should be brought to the attention of Owner, Construction Manager, and Engineer.
  - 11. Deviations from planned Work described in previously submitted daily health and safety field report(s).
- B. Submit daily health and safety field reports to Engineer by 9:00 a.m. the next working day after the day covered in the associated report. Daily reports shall be signed by the Contractor's safety representative.

## 1.07 RECORDS

- A. Retain at the site complete and accurate health and safety records for all Contractor and Subcontractor employees assigned to the Project. Records shall include, at a minimum, the following:

1. Valid Training Certificates:
    - a. Initial 40-hour HAZWOPER training.
    - b. Initial 24-hour HAZWOPER training.
    - c. Eight-hour HAZWOPER supervisor training.
    - d. Annual eight-hour HAZWOPER refresher training.
    - e. 10-hour construction safety training.
    - f. First-aid/cardiopulmonary resuscitation training.
    - g. Other training required by Contractor's HASP.
  2. Valid medical clearance certificates.
  3. Valid respirator fit test certificates.
  4. Accident reports, prepared in accordance with Part 1.05 of this Section.
  5. Daily health and safety field reports, prepared in accordance with Part 1.06 of this Section.
  6. Other records required by Laws and Regulations.
- B. Keep records up-to-date throughout the Project.
- C. Contractor's safety representative shall meet at least monthly with Owner and Engineer to review Contractor's health and safety records and verify compliance with this Section.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

## SECTION 01 35 43.13

### ENVIRONMENTAL PROCEDURES FOR HAZARDOUS MATERIALS

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Develop, implement, and maintain a Hazardous Materials management program (HMMP) throughout the Project, in accordance with Laws and Regulations.
  - a. Hazardous Materials Brought to site by Contractor: Transport, handle, store, label, use, and dispose of in accordance with this Section, and Laws and Regulations.
  - b. Hazardous Material Generated by Contractor:
    - 1) Hazardous Material shall be properly handled, stored, labeled, transported, and disposed of by Contractor in accordance with Laws and Regulations, and this Section.
    - 2) If Contractor will generate or has generated Hazardous Material at the site, obtain Owner's USEPA identification number listing Owner's name and address of the site as generator of the Hazardous Material.
    - 3) Contractor shall be responsible for identifying, characterizing, profiling, transporting, and disposing of Hazardous Material generated by Contractor.
  - c. Fines or civil penalties levied against Owner for violations committed at the Site by Contractor, and costs to Owner (if any) associated with cleanup of Hazardous Materials shall be paid by Contractor.

###### B. Enforcement of Laws and Regulations:

1. Interests of Owner are that accidental spills and emissions, site contamination, and injury of personnel at the site are avoided.
2. When Owner is aware of suspected violations, Owner will notify Contractor, and authorities having jurisdiction if Owner reasonably concludes that doing so is required by Laws or Regulations.

##### 1.02 DEFINITIONS

###### A. The following terms are defined for this Section and supplement the terms defined in the General Conditions:

1. Hazardous Material: Material, whether solid, semi-solid, liquid, or gas, that, if not stored or used properly, may cause harm or injury to persons through inhalation, ingestion, absorption or injection, or that may negatively impact the environment through use or discharge of the material on the ground, in water (including groundwater), or to the air. Hazardous Material includes, but is not limited to, chemicals, Asbestos, Hazardous Waste, PCBs, Petroleum, Radioactive Material, and which is or becomes listed, regulated, or addressed pursuant to the following:
  - a. Comprehensive Environmental Response, Compensation, and Liability Act, 42 United States Code (USC) §§9601 et seq. ("CERCLA").
  - b. Hazardous Materials Transportation Act, 49 USC §§1801 et seq.
  - c. Resource Conservation and Recovery Act, 42 USC §§6901 et seq. ("RCRA").
  - d. Toxic Substances Control Act, 15 USC §§2601 et seq.
  - e. Clean Water Act, 33 USC §§1251 et seq.
  - f. Clean Air Act, 42 USC §§7401 et seq.



- g. Any other Law or Regulation regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

### 1.03 QUALITY ASSURANCE

#### A. Regulatory Requirements:

1. Laws and Regulations applying to the Work under this Section include, but are not limited to, the following:
  - a. 29 CFR 1910, Occupational Safety and Health Standards.
  - b. 29 CFR 1926, Safety and Health Regulations for Construction.
  - c. 40 CFR 261.3, 264, and 265, Resource Conservation and Recovery Act (RCRA).
  - d. 49 CFR 171.8, Transportation, Definitions and Abbreviations.
  - e. 6 NYCRR 364, Waste Transporter Permits.
  - f. 6 NYCRR 371, Identification and Listing of Hazardous Wastes.
  - g. 6 NYCRR 372, Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities.
  - h. 6 NYCRR 375, Environmental Remediation Programs.
  - i. 17 NYCRR 32, Oil Spill Prevention and Control – Actions to be Taken in Case of Discharge.

### 1.04 SUBMITTALS

#### A. Informational Submittals:

1. Hazardous Materials (including Chemicals) Proposed for Use at the site: Submit current (dated within the past two years) safety data sheets (SDSs) in accordance with 29 CFR 1910.1200 (OSHA Hazard Communication Standard), manufacturer, Supplier (if different than manufacturer), container size(s) and number of containers proposed to be at the site, minimum and maximum volume of material intended to be stored at the site, and description of process or procedures in which Hazardous Material will be used. Furnish information in sufficient time to obtain Owner's acceptance no later than at least three days before bringing Hazardous Material to the site.
2. Hazardous Material Generated at the site: Submit for each Hazardous Material generated at the site identification number, analysis results, and number and size of storage containers at the site. Furnish information not less than three days after Remediation Contractor's receipt of analytical results.
3. Permits: Submit copies of permits for storing, handling, using, transporting, and disposing of Hazardous Materials, obtained from authorities having jurisdiction.
4. Other Documents required for the HMMP: Submit requested documents within three days of Contractor's receipt of request. HMMP documents may include communication plan, emergency/spill response plan, and other documents.
5. Communication Plan in accordance with Paragraph 1.05.B.
6. Emergency/Spill Response Plan in accordance with Paragraph 1.05.C.

### 1.05 HAZARDOUS MATERIALS MANAGEMENT

- A. Obtain Owner's acceptance before bringing each Hazardous Material to the site.
- B. Communication Plan: Contractor shall develop a Hazardous Materials communication plan. At a minimum, maintain at the site two notebooks containing the following:
  1. Inventory of Hazardous Materials, including all chemicals.

2. Current (dated within the past two years) SDSs for all materials being used to accomplish the Work, whether or not defined as Hazardous Material in this Section. Keep one notebook in Contractor's field office at the site; keep second notebook at location acceptable to Owner and Engineer. Keep notebooks up-to-date as materials are brought to and removed from the site.
- C. Emergency/Spill Response Plan: Develop, implement, and maintain an emergency/spill response plan, for each Hazardous Material or each class/group of Hazardous Materials as applicable. Response plan shall include, at a minimum, the following:
1. Description of equipment and materials available at the site to contain a spill of, or respond to an emergency related to, the material.
  2. Procedures for notifying, and list of emergency contact information for:
    - a. Authorities having jurisdiction.
    - b. Emergency responders.
    - c. Contractor's project manager, site superintendent, safety representative, and foreman.
    - d. Owner and Engineer.
    - e. Other entities as required.
  3. Response coordination procedures between Contractor, Owner, and others as appropriate.
  4. site plan showing proposed location of Hazardous Materials storage area, location of spill containment/response equipment and materials, and location of storm water drainage inlets and drainage routes.
  5. Description of Hazardous Material handling and spill response training provided to Remediation Contractor's and Subcontractors' employees, in accordance with 29 CFR 1926.21(b) and other Laws and Regulations.
- D. Storage of Hazardous Materials and Non-Hazardous Materials:
1. Hazardous Materials containers shall bear applicable hazard diamond(s).
  2. Container Labeling:
    - a. Properly label each container of consumable materials, whether or not classified as Hazardous Materials under this Section.
    - b. Stencil Contractor's name and, as applicable, Subcontractor's name, on each vessel containing Hazardous Material and, for non-Hazardous Materials, on each container over five-gallon capacity. Containers shall bear securely-attached label clearly identifying contents. Label containers that are filled from larger containers.
    - c. If Owner becomes aware of unlabeled containers at the site, Owner will notify Contractor. Properly label container(s) within one hour of receipt of notification or remove container from the site.
  3. To greatest extent possible, store Hazardous Materials off-site until required for use in the Work.
- E. Hazardous Materials Storage Area:
1. Maintain designated storage area for Hazardous Materials that includes secondary containment. Storage area shall include barriers to prevent vehicles from colliding with storage containers, and shall include protection from environmental factors such as weather.
  2. Provide signage in accordance with Laws and Regulations, clearly identifying the Hazardous Materials storage area.
- F. Contractor's safety representative shall meet at least monthly with Owner and Engineer to review Contractor's HMMP documents and procedures, and inspect storage areas and the site in general, to verify compliance with this Section.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

## SECTION 01 35 49

### COMMUNITY AIR MONITORING PLAN

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Provide all labor, materials, equipment, services, and incidentals as specified and required to comply with the Community Air Monitoring Plan (CAMP), respectively. The CAMP is part of the Contract Documents.
2. Perform community air monitoring on a continuous basis during all ground-intrusive Work or dust-generating Work. Community air monitoring includes:
  - a. Real-time air monitoring for total volatile organic compounds (TVOCs) and particulate matter less than 10 micrometers in diameter (PM<sub>10</sub>).
  - b. Periodic monitoring for manufactured gas plant (MGP)-related odors.

###### B. Coordination:

1. Coordinate requirements of this Section with requirements for odor, vapor, and dust control in the Contract Documents.

###### C. Related Sections:

1. Section 01 57 05 - Temporary Controls.
2. Community Air Monitoring Plan.

##### 1.02 TERMINOLOGY

###### A. The following words or terms are not defined but, when used in this Section, have the following meaning:

1. “Dust-generating Work” means any Work with the potential to generate dust. Examples of dust-generating Work include, but are not limited to, the following:
  - a. Handling excavated material and fill material.
  - b. Ground-intrusive Work.
2. “Ground-intrusive Work” means any Work performed below the existing level of the ground, or that involves the disturbance of existing earth, regardless of quantity. Examples of ground-intrusive Work include, but are not limited to, the following:
  - a. Demolitions and removals of below-grade construction and Underground Facilities.
  - b. Excavating, trenching, and test pitting.
  - c. Backfilling and grading.
3. “Perimeter of work area” means the limits of Work, or half the distance to the nearest potential receptor or occupied residential/commercial structure, whichever is less, but in no case less than 20 feet.
4. “Work area” means any area where ground-intrusive Work or dust-generating Work is being performed.

### 1.03 QUALITY ASSURANCE

#### A. Qualifications:

##### 1. Air Monitoring Technician:

- a. Contractor's air monitoring technician shall have a minimum of three years direct construction safety or environmental monitoring experience, and appropriate health and safety training in accordance with Laws and Regulations.
- b. Contractor's air monitoring technician shall be present at the site at all times when Work is being performed, and shall be dedicated solely to the implementation of the CAMP.
- c. Responsibilities include, but are not necessarily limited to, the following:
  - 1) Installing the meteorological monitoring system.
  - 2) Selecting upwind and downwind monitoring locations and setting up air monitoring stations on a daily basis.
  - 3) Calibrating air monitoring equipment on a daily basis, or other frequency recommended by the manufacturer.
  - 4) Coordinating equipment maintenance and repairs.
  - 5) Monitoring meteorological conditions throughout the work day and relocating air monitoring stations as necessary and appropriate.
  - 6) Performing hourly or more frequent inspections of air monitoring stations to verify proper function.
  - 7) Performing hourly or more frequent perimeter checks of the work area to monitor for MGP-related odors.
  - 8) Removing air monitoring stations and downloading TVOC and PM<sub>10</sub> data from monitoring equipment at the end of each work day.
  - 9) Managing a database of TVOC, PM<sub>10</sub>, and meteorological data at the site.
  - 10) Attending progress meetings and other Project meetings, as required.
  - 11) Preparing and submitting weekly air monitoring reports in accordance with Part 1.05 of this Section.
  - 12) Preparing and submitting exceedance reports in accordance with Part 1.06 of this Section.
  - 13) Preparing and submitting daily odor monitoring logs in accordance with Part 1.07 of this Section.
  - 14) Notifying the Engineer immediately when alert or action levels are exceeded at downwind monitoring locations, and when MGP-related odors are noted at the perimeter of the work area.

#### B. Regulatory Requirements:

1. Comply with applicable provisions and recommendations of the NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10).

### 1.04 SUBMITTALS

#### A. Informational Submittals:

##### 1. Reports:

- a. Weekly Air Monitoring Reports: Submit in accordance with Part 1.05 of this Section.
  - b. Exceedance Reports: Submit in accordance with Part 1.06 of this Section.
2. Submit community air monitoring and weather data in accordance with Part 1.08 of this Section.

## 1.05 WEEKLY AIR MONITORING REPORTS

- A. Prepare weekly air monitoring reports throughout the Project. Include in each report, at a minimum, the following:
1. Contractor's name.
  2. Owner's name.
  3. Engineer's name.
  4. Project name.
  5. Site name and location.
  6. The following for each day that community air monitoring is performed:
    - a. Date and day of the week.
    - b. General location and brief description of work performed at the site.
    - c. Daily average concentration of TVOCs and PM<sub>10</sub> for each air monitoring station.
    - d. Daily maximum 15-minute time-weighted average (TWA) concentration of TVOCs and PM<sub>10</sub> for each air monitoring station.
    - e. Exceedances (if any) of the action levels specified in Paragraph 3.01.C of this Section. Provide the following:
      - 1) Time, location, and 15-minute TWA concentration (above background) of exceedance.
      - 2) Copy of exceedance report, prepared in accordance with Part 1.06 of this Section.
    - f. Site plan showing approximate locations of upwind and downwind air monitoring stations at the site and predominant wind direction for the day. Note if air monitoring stations were relocated during the day.
    - g. Copy of daily odor monitoring log, prepared in accordance with Part 1.07 of this Section.
- B. Submit weekly air monitoring reports to the Engineer by 12:00 p.m. the Monday after the week covered in the associated report. Engineer will distribute weekly air monitoring reports to:
1. Owner.
  2. NYSDEC.
  3. NYSDOH.
  4. Others as appropriate.

## 1.06 EXCEEDANCE REPORTS

- A. Prepare an exceedance report whenever the action levels specified in Paragraph 3.01.C of this Section are exceeded. Include in each report the following:
1. Contractor's name.
  2. Owner's name.
  3. Engineer's name.
  4. Project name.
  5. Site name and location.
  6. Date, day of the week, and time of exceedance.
  7. General location and brief description of work being performed at time of exceedance.
  8. Weather conditions at time of exceedance.
  9. For each air monitoring station, 15-minute TWA concentration of TVOCs and PM<sub>10</sub> at time of exceedance.
  10. Source or cause of exceedance.
  11. Corrective actions taken or to be taken in response to exceedance.
  12. Date and time verbal or written notification was provided to NYSDEC.

- B. Submit exceedance reports to the Engineer within 24 hours after exceedance. Engineer will distribute exceedance reports to:
  - 1. Owner.
  - 2. NYSDEC.
  - 3. NYSDOH.
  - 4. Others as appropriate.

#### 1.07 DAILY ODOR MONITORING LOG

- A. Prepare daily odor monitoring logs throughout the Project. Include in each daily log, at a minimum, the following:
  - 1. Contractor's name.
  - 2. Owner's name.
  - 3. Project name.
  - 4. Site name and location.
  - 5. Date and day of the week.
  - 6. Weather conditions.
  - 7. Time and outcome of each perimeter check.
    - a. Note the presence or absence of MGP-related odors at the perimeter of the work area.
    - b. Identify the general location(s) along the work area perimeter where MGP-related odors are noticed.
  - 8. Time and outcome of any odor complaints from the public.
- B. Submit daily odor monitoring logs in weekly air monitoring report submittal in accordance with Part 1.05 of this Section.

#### 1.08 DATA MANAGEMENT

- A. Maintain a database of TVOC, PM<sub>10</sub>, and meteorological data files at the site.
  - 1. Index TVOC and PM<sub>10</sub> data files by date, station number, station location (upwind or downwind), and data type (TVOC or PM<sub>10</sub>).
  - 2. Index meteorological data files by date.
- B. Back up data files to disc or portable hard drive on a weekly or more frequent basis.
- C. Submit TVOC, PM<sub>10</sub>, and meteorological data files on a monthly basis throughout the Project. Label each disc with the following information:
  - a. Dates covered.
  - b. Owner's name.
  - c. Project name.
  - d. Site name and location.

### PART 2 – PRODUCTS

#### 2.01 PERIMETER AIR MONITORING SYSTEM

- A. System Description:
  - 1. Provide complete, integrated perimeter air monitoring system consisting of the following:
    - a. Three portable air monitoring stations, each capable of measuring real-time ambient air concentrations of TVOCs and PM<sub>10</sub>, logging air monitoring data, and alerting site personnel if alert levels or action levels are exceeded.

- b. One portable meteorological monitoring system capable of measuring wind speed, wind direction, relative humidity, dry bulb temperature, and barometric pressure, and displaying and logging weather data.
- B. Air Monitoring Stations:
  - 1. Photoionization Detectors: Direct-reading, data-logging photoionization detector with 10.6 eV lamp. Provide one of the following for each air monitoring station:
    - a. MiniRAE 3000 by RAE Systems.
    - b. Or equal.
  - 2. Aerosol Photometers: Direct-reading, data-logging aerosol monitor. Provide one of the following for each air monitoring station:
    - a. DustTrak II Aerosol Monitor Model 8530 by TSI, Inc.
    - b. Or equal.
  - 3. Telemetry Package: Netronix Thiamis Telemetry Modem (or equivalent) and appurtenances.
  - 4. Spare Equipment: Provide and retain at the site the following:
    - a. Spare photoionization detectors and aerosol photometers to allow for uninterrupted monitoring in the event of equipment damage or malfunction.
    - b. Spare batteries for each photoionization detector and aerosol photometer to allow for continuous real-time monitoring and data-logging for a period of not less than 12 hours.
  - 5. Environmental Enclosures and Mounting Tripods: Provide portable, weather-tight enclosure and compatible mounting (survey) tripod for each air monitoring station. Environmental enclosures shall provide proper operating conditions for photoionization detectors and aerosol photometers.
  - 6. Alarms and Wireless Alert System: Provide for each air monitoring station audible and visible alarms and wireless alert system capable of alerting air monitoring technician in real-time (via handheld radio, cell phone, etc.) if alert or action levels are exceeded.
  - 7. Accessories: Provide equipment calibration kits, sampling inlets, data management software, and other accessories recommended by the equipment manufacturers for the intended application.
- C. Meteorological Monitoring System:
  - 1. Product and Manufacturer: Provide one of the following:
    - a. Wireless Vantage Pro2 by Davis Instruments.
    - b. Or equal.
  - 2. Accessories: Provide the following:
    - a. WeatherLink data logger and software suite by Davis Instruments.
    - b. Mounting Pole Kit by Davis Instruments.
    - c. Other accessories recommended by equipment manufacturer for the intended application.

## PART 3 – EXECUTION

### 3.01 REAL-TIME AIR MONITORING FOR TVOCS AND PM10

- A. Air Monitoring Stations:
  - 1. Installation:
    - a. Deploy air monitoring stations at the start of each work day before any ground-intrusive Work or dust-generating Work is initiated.
      - 1) Position one air monitoring station at the upwind perimeter of the work area and two air monitoring stations at the downwind perimeter of the work area.



- Determine and designate upwind and downwind air monitoring stations based on predominant wind direction, and nature and location of Work to be performed.
- 2) Set alarm levels on real-time TVOC and PM<sub>10</sub> monitoring equipment to respond to 15-minute TWA concentrations at or below the action levels specified in Paragraph 3.01.C of this Section.
  - 3) Ensure that community air monitoring is being performed before initiating ground-intrusive Work or dust-generating Work.
- b. Monitor wind direction throughout the day and adjust locations of air monitoring stations if wind direction shifts more than 60 degrees from original upwind direction. Document original upwind and downwind air monitoring stations, and any changes made to monitoring locations during the day.
2. Protection:
    - a. Protect air monitoring stations from damage due to construction operations, weather, and vandalism.
    - b. Immediately remove from service, and replace at Contractor's expense, damaged equipment.
  3. Removal:
    - a. Remove air monitoring stations at the end of each work day, and only after all ground-intrusive Work or dust-generating Work has been completed for the day.
    - b. Download TVOC and PM<sub>10</sub> data from air monitoring stations at the end of each day.
- B. Alert Levels and Response:
1. Alert Levels:
    - a. TVOCs: 15-minute TWA concentration at downwind air monitoring station of 2.5 parts per million (ppm) above background (upwind) 15-minute TWA concentration.
    - b. PM<sub>10</sub>: 15-minute TWA concentration at downwind air monitoring station of 100 micrograms per cubic meter (ug/m<sup>3</sup>) above background (upwind) 15-minute TWA concentration, or visible dust observed leaving the work area.
  2. Response: Implement the following if alert levels are exceeded:
    - a. Notify Engineer.
    - b. Contractor shall continue Work and employ additional odor, vapor, and dust controls to abate emissions in accordance with Section 01 57 05 - Temporary Controls.
    - c. Evaluate and, if necessary and appropriate, modify construction techniques.
- C. Action Levels and Response:
1. Action Levels:
    - a. TVOCs: 15-minute TWA concentration at downwind air monitoring station of 5 ppm above background (upwind) 15-minute TWA concentration.
    - b. PM<sub>10</sub>: 15-minute TWA concentration at downwind air monitoring station of 150 ug/m<sup>3</sup> above background (upwind) 15-minute TWA concentration.
  2. Response: Implement the following if action levels are exceeded:
    - a. Contractor shall stop all Work and immediately notify Owner and Engineer. Owner or Engineer will notify the NYSDEC project manager by telephone or e-mail within two hours after the exceedance.
    - b. Contractor shall continue monitoring and employ additional odor, vapor, and dust controls to abate emissions in accordance with Section 01 57 05 (Temporary Controls).
    - c. Identify the source or cause of the exceedance.
    - d. Contractor shall evaluate and, if necessary and appropriate, modify construction techniques.
    - e. Contractor shall prepare exceedance report in accordance with Part 1.06 of this Section.

- f. Work shall not resume until 15-minute TWA concentrations are below the action levels. If the 15-minute TWA concentration of TVOCs exceeds 25 ppm above the background (upwind) 15-minute TWA concentration, work shall not resume until authorized by Owner.

### 3.02 PERIODIC MONITORING FOR MGP-RELATED ODORS

#### A. Perimeter Checks:

1. During work hours, perform hourly or more frequent walks around the entire perimeter of the work area to monitor for MGP-related odors.
2. Document the time and outcome of each perimeter check in daily odor monitoring log in accordance with Part 1.07 of this Section.
3. Implement the following if MGP-related odors are noticed at the perimeter of the work area:
  - a. Notify Engineer.
  - b. Continue Work and employ additional odor, vapor, and dust controls to abate emissions in accordance with Section 01 57 05 - Temporary Controls.
  - c. Evaluate and, if necessary and appropriate, modify construction techniques.
  - d. Perform more frequent perimeter checks.
  - e. If MGP-related odors persist at the perimeter of the work area, stop work and notify the Owner and Engineer.
  - f. Identify the source or cause of MGP-related odors.
  - g. Evaluate and, if necessary and appropriate, further modify construction techniques and employ additional odor, vapor, and dust controls to abate emissions in accordance with Section 01 57 05 - Temporary Controls.
  - h. Work shall not resume until authorized by Owner.

#### B. Odor Complaints:

1. Immediately notify Owner and Engineer of any odor complaints from the public. Owner or Engineer will immediately direct such complaints to NYSDEC's on-site representative.
2. Implement the following in response to an odor complaint:
  - a. As appropriate, Engineer shall verify the legitimacy of the complaint based on the Work being performed at the site, the predominant wind direction, and other climatological factors.
  - b. Continue monitoring and employ additional odor, vapor, and dust controls to abate emissions in accordance with Section 01 57 05 - Temporary Controls.
  - c. Evaluate and, if necessary and appropriate, modify construction techniques.
3. Document the time and outcome of any odor complaints in daily odor monitoring log in accordance with Part 1.07 of this Section.

### 3.03 FIELD QUALITY CONTROL

- A. Calibrate air monitoring equipment on a daily basis, or other frequency recommended by the manufacturer, in accordance with manufacturer's calibration and quality assurance requirements. Document all instrument readings, field reference checks, and calibrations in a dedicated log.
- B. During the work day, perform hourly or more frequent field checks of monitoring equipment to verify proper function. Document the date, day, time, and outcome of each field check in a dedicated log.
- C. Immediately remove from service, and replace at Contractor's expense, damaged or malfunctioning equipment.

- D. Preventative maintenance and repair of monitoring equipment, if required, shall only be performed by qualified personnel, or authorized representatives of the manufacturer.
- E. Prepare and retain at the site electronic or written records of all equipment calibrations, field checks, maintenance, and repairs.

END OF SECTION

## SECTION 01 41 26

### STORM WATER POLLUTION PREVENTION PLAN AND GENERAL PERMIT

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Complying with the Project's Storm Water Pollution Prevention Plan (SWPPP) and the substantive requirements of the most current version of NYSDEC's SPDES General Permit for Storm Water Discharges from Construction Activity (hereinafter, the "SPDES General Permit"). Providing necessary materials and taking appropriate measures to comply with requirements of the SPDES General Permit and minimize pollutants in storm water run-off from the site.
- B. The following documents are part of the Work included under this Section:
  - 1. SWPPP: Prepared by Engineer, on behalf of Owner, and filed with NYSDEC. The SWPPP is included as Appendix E to the Remedial Design and is part of the Contract Documents.
  - 2. SWPPP Revisions: Prepared by Engineer, on behalf of Owner, in accordance with Part 1.04 of this Section. Copy of each SWPPP Revision will be furnished to Contractor. SWPPP Revisions, if any, will become part of the Contract Documents.
  - 3. Storm Water Permit Certification Statement: To be submitted by Contractor to Engineer on the form included with this Section. Do not perform Work at the site until the storm water permit certification statement has been submitted to Engineer.
  - 4. Storm Water Inspection Reports: Prepared by Contractor's qualified inspector and submitted to Engineer in accordance with Part 1.05 of this Section. A storm water inspection report shall be prepared for each site inspection and assessment required by the SPDES General Permit and this Section.
- C. Preventing discharge of sediment to and erosion from the site to surface waters, drainage routes, public streets and rights-of-way, and private property, including dewatering operations. Preventing trash and construction and demolition debris from leaving the site via storm water run-off. Providing berms, dikes, and other acceptable methods of directing storm water around work areas to drainage routes.
- D. Do not cause or contribute to a violation of water quality standards, Laws, or Regulations. Provide and implement measures to control pollutants in storm water run-off from the site to prevent:
  - 1. Turbidity increases that will cause a substantial visible contrast to natural conditions.
  - 2. Increase in suspended, colloidal, and settleable solids that would cause sediment deposition, or impair receiving water quality and use.
  - 3. Presence of residue from oil and floating substances, visible oil, and globules of grease.
- E. Contractor shall pay civil penalties and other costs incurred by Owner, including additional engineering, construction management, and inspection services, associated with non-complying with the SPDES General Permit and erosion and sediment controls associated with the Work.
- F. Contract Price includes all material, labor, and other permits and incidental costs related to:
  - 1. Installing and maintaining structural and non-structural items used in complying with the SWPPP and its revisions, if any.

2. Clean-up, disposal, and repairs following wet weather events or spills caused by Contractor.
  3. Implementing and maintaining “best management practices”, as defined in applicable permits and Laws or Regulations, to comply with requirements that govern storm water discharges at the site.
  4. Inspecting erosion, sediment, and storm water controls as specified.
- G. Coordinating requirements of this Section with requirements for earthwork, erosion control, and landscaping in the Contract Documents, applicable permit requirements, and Laws and Regulations.
- H. Implementing SWPPP controls and practices prior to starting other Work at the site.

## 1.02 QUALITY ASSURANCE

### A. Qualifications:

#### 1. Qualified Inspector:

- a. Contractor’s qualified inspector shall be knowledgeable in the principles and practices of erosion and sediment control and shall be responsible for performing site inspections and assessments, and preparing and certifying storm water inspection reports, in accordance with this Section.
- b. Contractor’s qualified inspector shall be one of the following:
  - 1) Professional engineer licensed and registered in the State of New York.
  - 2) Landscape architect licensed and registered in the State of New York.
  - 3) Certified Professional in Erosion and Sediment Control.
  - 4) NYSDEC-endorsed individual.
  - 5) An individual working under the direct supervision of, and employed by the same company as, a professional engineer or landscape architect licensed and registered in New York State, provided that said individual has received four hours of NYSDEC-endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC-endorsed entity. Following the initial training, the individual shall have completed four hours of training every three years.

### B. Regulatory Requirements:

1. Comply with Laws and Regulations related to environmental protection and restoration, including:
  - a. SPDES General Permit.
  - b. New York State Standards and Specifications for Erosion and Sediment Control.

## 1.03 SUBMITTALS

### A. Informational Submittals:

1. Storm Water Permit Certification Statement: Submit in accordance with Paragraph 1.01.B.3 of this Section.
2. Qualifications Statements: Submit name and qualifications of qualified inspector, including summary of experience, training received, and copy of valid certifications applicable to the Project.
3. Storm Water Inspection Reports: Submit in accordance with Part 1.05 of this Section.

#### 1.04 SWPPP REVISIONS

- A. Engineer will prepare a SWPPP Revision in accordance with the SPDES General Permit:
  - 1. When the provisions of the SWPPP prove to be ineffective in minimizing pollutants in storm water discharges from the site.
  - 2. When there is a significant change in design, construction, operation, or maintenance of the Project that has or could have an effect on the discharge of pollutants from the site.
  - 3. To address issues or deficiencies identified during an inspection by Contractor's qualified inspector, NYSDEC, or other regulatory authority having jurisdiction.

#### 1.05 STORM WATER INSPECTION REPORTS

- A. Prepare a storm water inspection report for each site inspection and assessment required by the SPDES General Permit and this Section. Each report shall be prepared using the form included with this Section.
- B. Include in each storm water inspection report, at a minimum, the following:
  - 1. Date and time of inspection.
  - 2. Name, title, and affiliation of Contractor's qualified inspector.
  - 3. Weather and soil conditions (e.g., dry, wet, saturated, etc.) at the time of the inspection.
  - 4. Description of and site plan showing areas that are disturbed at the time of the inspection and any areas that have been stabilized (either temporary or final) since the previous inspection.
  - 5. Repairs, maintenance, or corrective actions implemented since the previous inspection. Include digital photographs, with date stamp, that clearly show the areas or items installed, repaired, or replaced.
  - 6. Condition of storm water run-off at all points of discharge from the site.
  - 7. Identification of any erosion, sediment, and storm water controls that require repair or maintenance.
  - 8. Identification of any erosion, sediment, and storm water controls that were not installed properly or are not functioning as designed.
  - 9. Repairs, maintenance, or corrective actions required to correct any deficiencies observed during the inspection. Include digital photographs, with date stamp, that clearly show the deficient areas or items.
- C. Submit storm water inspection reports to Engineer within three days after each inspection. Inspection reports shall be signed by Contractor's qualified inspector.
- D. Retain copies of storm water inspection reports at the site. Keep with the SWPPP and any SWPPP revisions.

### PART 2 – PRODUCTS (NOT USED)

### PART 3 – EXECUTION

#### 3.01 INSPECTIONS AND REPAIRS

- A. Perform site inspections and assessments as required by the SPDES General Permit and this Section to ensure the continued effectiveness and integrity of all SWPPP controls and practices, including erosion and sediment controls. Inspections and assessments shall be done by Contractor's qualified inspector, together the Engineer.

- B. Inspections:
1. Site inspections shall be performed:
    - a. After installation of SWPPP controls, including erosion and sediment controls, and temporary field offices and other temporary facilities, prior to starting other Work at the site.
    - b. Every seven days during the Work, and within 24 hours after wet weather events, until all disturbed areas have achieved final stabilization in accordance with the SPDES General Permit and the SWPPP. For temporary Work stoppages and seasonal shut-downs greater than two weeks in duration, inspection frequency may be reduced to once every 30 days if temporary stabilization measures have been applied to all disturbed surfaces, and if approved by Engineer and NYSDEC.
  2. During each inspection, verify sediment control practices and record approximate degree of sediment accumulation as percentage of acceptable sediment storage volume. Inspect erosion and sediment control practices and record repairs and maintenance performed, if any. Observe and record deficiencies relative to implementation of the SWPPP.
  3. Prepare storm water inspection report for each inspection in accordance with Part 1.05 of this Section.
- C. Notify Engineer within one day after each inspection of any observed deficiencies, and any repairs, maintenance, or corrective actions required to correct such deficiencies.
- D. Complete repairs or maintenance to SWPPP controls in accordance with applicable requirements and to satisfaction of Engineer within two days after each inspection. If site conditions prevent repairs or maintenance from being completed, document such conditions in the subsequent storm water inspection report and complete repairs or maintenance as soon as site conditions permit.
- E. Cooperate with representatives of authorities having jurisdiction during periodic visits to site, and promptly provide information requested by authorities having jurisdiction.

### 3.02 ATTACHMENTS

- A. The attachments listed below, which follow the "End of Section" designation, are part of this Section:
1. Attachment A: SPDES General Permit (46 pages).
  2. Attachment B: Storm water permit certification statement form (two pages).
  3. Attachment C: Storm water inspection report form (four pages).

END OF SECTION

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Department of  
Environmental  
Conservation

NEW YORK STATE  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT  
FOR STORMWATER DISCHARGES

From

**CONSTRUCTION ACTIVITY**

Permit No. GP- 0-20-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70  
of the Environmental Conservation Law

Effective Date: January 29, 2020

Expiration Date: January 28, 2025

John J. Ferguson

Chief Permit Administrator

A handwritten signature in black ink, appearing to be "John J. Ferguson", written over a horizontal line. The signature is stylized and cursive.

Authorized Signature

1-23-20

Date

Address: NYS DEC  
Division of Environmental Permits  
625 Broadway, 4th Floor  
Albany, N.Y. 12233-1750

## PREFACE

Pursuant to Section 402 of the Clean Water Act (“CWA”), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System (“NPDES”)* permit or by a state permit program. New York administers the approved State Pollutant Discharge Elimination System (SPDES) program with permits issued in accordance with the New York State Environmental Conservation Law (ECL) Article 17, Titles 7, 8 and Article 70.

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of “*construction activity*”, as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a *point source* and therefore, pursuant to ECL section 17-0505 and 17-0701, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. The *owner or operator* cannot wait until there is an actual *discharge* from the *construction site* to obtain permit coverage.

**\*Note: The italicized words/phrases within this permit are defined in Appendix A.**

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM  
CONSTRUCTION ACTIVITIES**

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## Part 1. PERMIT COVERAGE AND LIMITATIONS

### A. Permit Application

This permit authorizes stormwater *discharges to surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;
2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants to surface waters of the State*.
3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

### B. Effluent Limitations Applicable to Discharges from Construction Activities

*Discharges* authorized by this permit must achieve, at a minimum, the effluent limitations in Part I.B.1. (a) – (f) of this permit. These limitations represent the degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement and maintain control measures to *minimize the discharge of pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part I.B.1.(a) – (f) of this permit and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in the *Stormwater Pollution Prevention Plan* (“SWPPP”) the reason(s) for the

deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

- a. **Erosion and Sediment Controls.** Design, install and maintain effective erosion and sediment controls to *minimize* the *discharge of pollutants* and prevent a violation of the *water quality standards*. At a minimum, such controls must be designed, installed and maintained to:
- (i) *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharges*;
  - (ii) Control stormwater *discharges*, including both peak flowrates and total stormwater volume, to *minimize* channel and *streambank* erosion and scour in the immediate vicinity of the *discharge* points;
  - (iii) *Minimize* the amount of soil exposed during *construction activity*;
  - (iv) *Minimize* the disturbance of *steep slopes*;
  - (v) *Minimize* sediment *discharges* from the site;
  - (vi) Provide and maintain *natural buffers* around surface waters, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce *pollutant discharges*, unless *infeasible*;
  - (vii) *Minimize* soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted;
  - (viii) Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover; and
  - (ix) *Minimize* dust. On areas of exposed soil, *minimize* dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants that could be discharged from the site.
- b. **Soil Stabilization.** In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the current soil disturbance activity ceased. For construction sites that *directly discharge* to one of the 303(d) segments

listed in Appendix E or is located in one of the watersheds listed in Appendix C, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. See Appendix A for definition of *Temporarily Ceased*.

- c. **Dewatering.** *Discharges* from *dewatering* activities, including *discharges* from *dewatering* of trenches and excavations, must be managed by appropriate control measures.
- d. **Pollution Prevention Measures.** Design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be designed, installed, implemented and maintained to:
  - (i) *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. This applies to washing operations that use clean water only. Soaps, detergents and solvents cannot be used;
  - (ii) *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, hazardous and toxic waste, and other materials present on the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use) ; and
  - (iii) Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.
- e. **Prohibited Discharges.** The following *discharges* are prohibited:
  - (i) Wastewater from washout of concrete;
  - (ii) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

- (iii) Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance;
  - (iv) Soaps or solvents used in vehicle and equipment washing; and
  - (v) Toxic or hazardous substances from a spill or other release.
- f. Surface Outlets. When discharging from basins and impoundments, the outlets shall be designed, constructed and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion at or below the outlet does not occur.

### **C. Post-construction Stormwater Management Practice Requirements**

1. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must select, design, install, and maintain the practices to meet the *performance criteria* in the New York State Stormwater Management Design Manual (“Design Manual”), dated January 2015, using sound engineering judgment. Where post-construction stormwater management practices (“SMPs”) are not designed in conformance with the *performance criteria* in the Design Manual, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.
2. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must design the practices to meet the applicable *sizing criteria* in Part I.C.2.a., b., c. or d. of this permit.

#### **a. Sizing Criteria for New Development**

- (i) Runoff Reduction Volume (“RRv”): Reduce the total Water Quality Volume (“WQv”) by application of RR techniques and standard SMPs with RRv capacity. The total WQv shall be calculated in accordance with the criteria in Section 4.2 of the Design Manual.
- (ii) Minimum RRv and Treatment of Remaining Total WQv: Construction activities that cannot meet the criteria in Part I.C.2.a.(i) of this permit due to site limitations shall direct runoff from all newly constructed impervious areas to a RR technique or standard SMP with RRv capacity unless infeasible. The specific site limitations that prevent the reduction of 100% of the WQv shall be documented in the SWPPP.



For each impervious area that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered infeasible.

**In no case shall the runoff reduction achieved from the newly constructed impervious areas be less than the Minimum RRv as calculated using the criteria in Section 4.3 of the Design Manual.** The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

- (iii) Channel Protection Volume (“Cpv”): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
  - (1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
  - (2) The site discharges directly to tidal waters, or fifth order or larger streams.
- (iv) *Overbank* Flood Control Criteria (“Qp”): Requires storage to attenuate the post-development 10-year, 24-hour peak discharge rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
  - (1) the site discharges directly to tidal waters or fifth order or larger streams, or
  - (2) A downstream analysis reveals that *overbank* control is not required.
- (v) Extreme Flood Control Criteria (“Qf”): Requires storage to attenuate the post-development 100-year, 24-hour peak discharge rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
  - (1) the site discharges directly to tidal waters or fifth order or larger streams, or
  - (2) A downstream analysis reveals that *overbank* control is not required.

**b. Sizing Criteria for New Development in Enhanced Phosphorus Removal Watershed**

- (i) Runoff Reduction Volume (RRv): Reduce the total Water Quality Volume (WQv) by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24 hour design storm over the post-developed watershed and shall be

calculated in accordance with the criteria in Section 10.3 of the Design Manual.

- (ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.b.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible*.

**In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 10.3 of the Design Manual.** The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

- (iii) Channel Protection Volume (Cpv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
  - (1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
  - (2) The site *discharges* directly to tidal waters, or fifth order or larger streams.
- (iv) Overbank Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
  - (1) the site *discharges* directly to tidal waters or fifth order or larger streams, or
  - (2) A downstream analysis reveals that *overbank* control is not required.
- (v) Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
  - (1) the site *discharges* directly to tidal waters or fifth order or larger streams, or
  - (2) A downstream analysis reveals that *overbank* control is not required.

### c. Sizing Criteria for Redevelopment Activity

- (i) Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* shall be addressed by one of the following options. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C of this permit) shall calculate the WQv in accordance with Section 10.3 of the Design Manual. All other *redevelopment activities* shall calculate the WQv in accordance with Section 4.2 of the Design Manual.
  - (1) Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the Design Manual must be applied to all newly created pervious areas, or
  - (2) Capture and treat a minimum of 25% of the WQv from the disturbed, *impervious area* by the application of standard SMPs; or reduce 25% of the WQv from the disturbed, *impervious area* by the application of RR techniques or standard SMPs with RRv capacity., or
  - (3) Capture and treat a minimum of 75% of the WQv from the disturbed, *impervious area* as well as any additional runoff from tributary areas by application of the alternative practices discussed in Sections 9.3 and 9.4 of the Design Manual., or
  - (4) Application of a combination of 1, 2 and 3 above that provide a weighted average of at least two of the above methods. Application of this method shall be in accordance with the criteria in Section 9.2.1(B) (IV) of the Design Manual.

If there is an existing post-construction stormwater management practice located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 – 4 above.

- (ii) Channel Protection Volume (Cpv): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.
- (iii) Overbank Flood Control Criteria (Qp): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.
- (iv) Extreme Flood Control Criteria (Qf): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site

**d. Sizing Criteria for Combination of Redevelopment Activity and New Development**

Construction projects that include both New Development and Redevelopment Activity shall provide post-construction stormwater management controls that meet the sizing criteria calculated as an aggregate of the Sizing Criteria in Part I.C.2.a. or b. of this permit for the New Development portion of the project and Part I.C.2.c of this permit for Redevelopment Activity portion of the project.

**D. Maintaining Water Quality**

The Department expects that compliance with the conditions of this permit will control *discharges* necessary to meet applicable *water quality standards*. It shall be a violation of the *ECL* for any discharge to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;
2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and
3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

If there is evidence indicating that the stormwater *discharges* authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standards*; the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this general permit and document in accordance with Part IV.C.4. of this general permit. To address the *water quality standard* violation the *owner or operator* may need to provide additional information, include and implement appropriate controls in the SWPPP to correct the problem, or obtain an individual SPDES permit.

If there is evidence indicating that despite compliance with the terms and conditions of this general permit it is demonstrated that the stormwater *discharges* authorized by this permit are causing or contributing to a violation of *water quality standards*, or if the Department determines that a modification of the permit is necessary to prevent a violation of *water quality standards*, the authorized *discharges* will no longer be eligible for coverage under this permit. The Department may require the *owner or operator* to obtain an individual SPDES permit to continue discharging.

## **E. Eligibility Under This General Permit**

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph F. of this Part.
2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater *discharges*; including stormwater runoff, snowmelt runoff, and surface runoff and drainage, from *construction activities*.
3. Notwithstanding paragraphs E.1 and E.2 above, the following non-stormwater discharges are authorized by this permit: those listed in 6 NYCRR 750-1.2(a)(29)(vi), with the following exception: “Discharges from firefighting activities are authorized only when the firefighting activities are emergencies/unplanned”; waters to which other components have not been added that are used to control dust in accordance with the SWPPP; and uncontaminated *discharges* from *construction site* de-watering operations. All non-stormwater discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with *water quality standards* in Part I.D of this permit.
4. The *owner or operator* must maintain permit eligibility to *discharge* under this permit. Any *discharges* that are not compliant with the eligibility conditions of this permit are not authorized by the permit and the *owner or operator* must either apply for a separate permit to cover those ineligible *discharges* or take steps necessary to make the *discharge* eligible for coverage.

## **F. Activities Which Are Ineligible for Coverage Under This General Permit**

All of the following are **not** authorized by this permit:

1. *Discharges* after *construction activities* have been completed and the site has undergone *final stabilization*;
2. *Discharges* that are mixed with sources of non-stormwater other than those expressly authorized under subsection E.3. of this Part and identified in the SWPPP required by this permit;
3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII.K. of this permit;
4. *Construction activities* or *discharges* from *construction activities* that may adversely affect an *endangered or threatened species* unless the *owner or*

*operator* has obtained a permit issued pursuant to 6 NYCRR Part 182 for the project or the Department has issued a letter of non-jurisdiction for the project. All documentation necessary to demonstrate eligibility shall be maintained on site in accordance with Part II.D.2 of this permit;

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;
6. *Construction activities* for residential, commercial and institutional projects:
  - a. Where the *discharges* from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and
  - b. Which are undertaken on land with no existing *impervious cover*; and
  - c. Which disturb one (1) or more acres of land designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.
7. *Construction activities* for linear transportation projects and linear utility projects:
  - a. Where the *discharges* from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and
  - b. Which are undertaken on land with no existing *impervious cover*; and
  - c. Which disturb two (2) or more acres of land designated on the current USDA Soil Survey as Soil Slope Phase "D" (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

8. *Construction activities* that have the potential to affect an *historic property*, unless there is documentation that such impacts have been resolved. The following documentation necessary to demonstrate eligibility with this requirement shall be maintained on site in accordance with Part II.D.2 of this permit and made available to the Department in accordance with Part VII.F of this permit:
- a. Documentation that the *construction activity* is not within an archeologically sensitive area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the *construction site* within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the *construction site* within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant.
    - 1-5 acres of disturbance - 20 feet
    - 5-20 acres of disturbance - 50 feet
    - 20+ acres of disturbance - 100 feet, or
  - b. DEC consultation form sent to OPRHP, and copied to the NYS DEC Agency Historic Preservation Officer (APO), and
    - (i) the State Environmental Quality Review (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or
    - (ii) documentation from OPRHP that the *construction activity* will result in No Impact; or
    - (iii) documentation from OPRHP providing a determination of No Adverse Impact; or
    - (iv) a Letter of Resolution signed by the owner/operator, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA); or
  - c. Documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:

- (i) No Affect
- (ii) No Adverse Affect
- (iii) Executed Memorandum of Agreement, or

d. Documentation that:

- (i) SHPA Section 14.09 has been completed by NYS DEC or another state agency.

9. *Discharges from construction activities* that are subject to an existing SPDES individual or general permit where a SPDES permit for *construction activity* has been terminated or denied; or where the *owner or operator* has failed to renew an expired individual permit.

## Part II. PERMIT COVERAGE

### A. How to Obtain Coverage

1. An *owner or operator* of a *construction activity* that is not subject to the requirements of a regulated, traditional land use control MS4 must first prepare a SWPPP in accordance with all applicable requirements of this permit and then submit a completed Notice of Intent (NOI) to the Department to be authorized to discharge under this permit.
2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then have the SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed in accordance with Part VII.H., and then submit that form along with a completed NOI to the Department.
3. The requirement for an *owner or operator* to have its SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.F. (Change of Owner or Operator) or where the *owner or operator* of the *construction activity* is the *regulated, traditional land use control MS4*. This exemption does not apply to *construction activities* subject to the New York City Administrative Code.



## **B. Notice of Intent (NOI) Submittal**

1. Prior to December 21, 2020, an owner or operator shall use either the electronic (eNOI) or paper version of the NOI that the Department prepared. Both versions of the NOI are located on the Department's website (<http://www.dec.ny.gov/>). The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the following address:

**NOTICE OF INTENT  
NYS DEC, Bureau of Water Permits  
625 Broadway, 4<sup>th</sup> Floor  
Albany, New York 12233-3505**

2. Beginning December 21, 2020 and in accordance with EPA's 2015 NPDES Electronic Reporting Rule (40 CFR Part 127), the *owner or operator* must submit the NOI electronically using the *Department's* online NOI.
3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.
4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

## **C. Permit Authorization**

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.
2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied all of the following criteria:
  - a. project review pursuant to the State Environmental Quality Review Act ("SEQRA") have been satisfied, when SEQRA is applicable. See the Department's website (<http://www.dec.ny.gov/>) for more information,
  - b. where required, all necessary Department permits subject to the *Uniform Procedures Act* ("UPA") (see 6 NYCRR Part 621), or the equivalent from another New York State agency, have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators of construction activities* that are required to obtain UPA permits

must submit a preliminary SWPPP to the appropriate DEC Permit Administrator at the Regional Office listed in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

- c. the final SWPPP has been prepared, and
  - d. a complete NOI has been submitted to the Department in accordance with the requirements of this permit.
3. An *owner or operator* that has satisfied the requirements of Part II.C.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:
- a. For *construction activities* that are not subject to the requirements of a *regulated, traditional land use control MS4*:
    - (i) Five (5) business days from the date the Department receives a complete electronic version of the NOI (eNOI) for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.; or
    - (ii) Sixty (60) business days from the date the Department receives a complete NOI (electronic or paper version) for *construction activities* with a SWPPP that has not been prepared in conformance with the design criteria in technical standard referenced in Part III.B.1. or, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C., the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, or;
    - (iii) Ten (10) business days from the date the Department receives a complete paper version of the NOI for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.

- b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:
  - (i) Five (5) business days from the date the Department receives both a complete electronic version of the NOI (eNOI) and signed “MS4 SWPPP Acceptance” form, or
  - (ii) Ten (10) business days from the date the Department receives both a complete paper version of the NOI and signed “MS4 SWPPP Acceptance” form.
- 4. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department. The *owner or operator* shall not *commence construction activity* on the future or additional areas until their authorization to *discharge* under this permit goes into effect in accordance with Part II.C. of this permit.

#### **D. General Requirements For Owners or Operators With Permit Coverage**

- 1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination (“NOT”) has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4. of this permit.
- 2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-20-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form, inspection reports, responsible contractor’s or subcontractor’s certification statement (see Part III.A.6.), and all documentation necessary to demonstrate eligibility with this permit at the *construction site* until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department. The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.
- 3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land*

*use control MS4, the regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

- a. The *owner or operator* shall have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. of this permit every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.
  - b. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016.
  - c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.
  - d. The *owner or operator* shall install any additional site-specific practices needed to protect water quality.
  - e. The *owner or operator* shall include the requirements above in their SWPPP.
4. In accordance with statute, regulations, and the terms and conditions of this permit, the Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements or consistent with Part VII.K..
  5. Upon a finding of significant non-compliance with the practices described in the SWPPP or violation of this permit, the Department may order an immediate stop to all activity at the site until the non-compliance is remedied. The stop work order shall be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.
  6. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the

*regulated, traditional land use control MS4* in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *regulated, traditional land use control MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *regulated, traditional land use control MS4* prior to commencing construction of the post-construction stormwater management practice.

#### **E. Permit Coverage for Discharges Authorized Under GP-0-15-002**

1. Upon renewal of SPDES General Permit for Stormwater Discharges from *Construction Activity* (Permit No. GP-0-15-002), an *owner or operator* of a *construction activity* with coverage under GP-0-15-002, as of the effective date of GP- 0-20-001, shall be authorized to *discharge* in accordance with GP- 0-20-001, unless otherwise notified by the Department.

An *owner or operator* may continue to implement the technical/design components of the post-construction stormwater management controls provided that such design was done in conformance with the technical standards in place at the time of initial project authorization. However, they must comply with the other, non-design provisions of GP-0-20-001.

#### **F. Change of Owner or Operator**

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. For *construction activities* subject to the requirements of a *regulated, traditional land use control MS4*, the original *owner or operator* must also notify the MS4, in writing, of the change in ownership at least 30 calendar days prior to the change in ownership.
2. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.B.1. of this permit. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.
3. Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or*

*operator* was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

### Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

#### A. General SWPPP Requirements

1. A SWPPP shall be prepared and implemented by the *owner or operator* of each *construction activity* covered by this permit. The SWPPP must document the selection, design, installation, implementation and maintenance of the control measures and practices that will be used to meet the effluent limitations in Part I.B. of this permit and where applicable, the post-construction stormwater management practice requirements in Part I.C. of this permit. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*. A copy of the completed, final NOI shall be included in the SWPPP.
2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the *pollutants* in stormwater *discharges* and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.
3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.
4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP, including construction drawings:
  - a. whenever the current provisions prove to be ineffective in minimizing *pollutants* in stormwater *discharges* from the site;

- b. whenever there is a change in design, construction, or operation at the *construction site* that has or could have an effect on the *discharge* of *pollutants*;
  - c. to address issues or deficiencies identified during an inspection by the *qualified inspector*, the Department or other regulatory authority; and
  - d. to document the final construction conditions.
5. The Department may notify the *owner or operator* at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.D.4. of this permit.
6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP. The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor*. The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with

the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater *discharges* from *construction activities* and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the *construction site*. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

## **B. Required SWPPP Contents**

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Where erosion and sediment control practices are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must demonstrate *equivalence* to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:
  - a. Background information about the scope of the project, including the location, type and size of project



- b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours ; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater *discharge(s)*;
- c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);
- d. A construction phasing plan and sequence of operations describing the intended order of *construction activities*, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;
- e. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;
- f. A temporary and permanent soil stabilization plan that meets the requirements of this general permit and the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of *final stabilization*;
- g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;
- h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;
- i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6. of this permit, to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection

schedule shall be in accordance with the requirements in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016;

- j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the stormwater *discharges*;
  - k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the *construction site*; and
  - l. Identification of any elements of the design that are not in conformance with the design criteria in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.
2. Post-construction stormwater management practice component – The *owner or operator* of any construction project identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the applicable *sizing criteria* in Part I.C.2.a., c. or d. of this permit and the *performance criteria* in the technical standard, New York State Stormwater Management Design Manual dated January 2015

Where post-construction stormwater management practices are not designed in conformance with the *performance criteria* in the technical standard, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

The post-construction stormwater management practice component of the SWPPP shall include the following:

- a. Identification of all post-construction stormwater management practices to be constructed as part of the project. Include the dimensions, material specifications and installation details for each post-construction stormwater management practice;

- b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;
- c. A Stormwater Modeling and Analysis Report that includes:
  - (i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points;
  - (ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and post-construction stormwater management practices;
  - (iii) Results of stormwater modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre and post-development runoff rates and volumes for the different storm events;
  - (iv) Summary table, with supporting calculations, which demonstrates that each post-construction stormwater management practice has been designed in conformance with the *sizing criteria* included in the Design Manual;
  - (v) Identification of any *sizing criteria* that is not required based on the requirements included in Part I.C. of this permit; and
  - (vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the Design Manual. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the Design Manual;
- d. Soil testing results and locations (test pits, borings);
- e. Infiltration test results, when required; and
- f. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the applicable *sizing criteria* in Part I.C.2. b., c. or d. of this permit and the *performance criteria*, Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.f. above.

### **C. Required SWPPP Components by Project Type**

Unless otherwise notified by the Department, *owners or operators of construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1 of this permit. *Owners or operators of the construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3 of this permit.

## **Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS**

### **A. General Construction Site Inspection and Maintenance Requirements**

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures) and all post-construction stormwater management practices identified in the SWPPP are inspected and maintained in accordance with Part IV.B. and C. of this permit.
2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York or protect the public health and safety and/or the environment.

### **B. Contractor Maintenance Inspection Requirements**

1. The *owner or operator* of each *construction activity* identified in Tables 1 and 2 of Appendix B shall have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor shall

begin implementing corrective actions within one business day and shall complete the corrective actions in a reasonable time frame.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *trained contractor* can stop conducting the maintenance inspections. The *trained contractor* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. of this permit as soon as soil disturbance activities resume.
3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

### C. Qualified Inspector Inspection Requirements

The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. and IV.B. of this permit **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- licensed Professional Engineer,
  - Certified Professional in Erosion and Sediment Control (CPESC),
  - New York State Erosion and Sediment Control Certificate Program holder
  - Registered Landscape Architect, or
  - someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].
1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, with the exception of:
    - a. the construction of a single family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located

in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

- b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;
  - c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and
  - d. *construction activities* located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.
2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:
- a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.
  - b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.D.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.
  - c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4*, the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to reducing the frequency of inspections.

- d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4*, the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization*, and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the “*Final Stabilization*” and “*Post-Construction Stormwater Management Practice*” certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.B.1 of this permit.
  - e. For construction sites that directly *discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.
3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices and pollution prevention measures to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization*, all points of *discharge* to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the *construction site*, and all points of *discharge* from the *construction site*.
  4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

- a. Date and time of inspection;
- b. Name and title of person(s) performing inspection;
- c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;
- d. A description of the condition of the runoff at all points of *discharge* from the *construction site*. This shall include identification of any *discharges* of sediment from the *construction site*. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;
- e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the *construction site* which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;
- f. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance;
- g. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;
- h. Description and sketch of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection;
- i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;
- j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s);
- k. Identification and status of all corrective actions that were required by previous inspection; and



- I. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.
5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of this permit of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.
6. All inspection reports shall be signed by the *qualified inspector*. Pursuant to Part II.D.2. of this permit, the inspection reports shall be maintained on site with the SWPPP.

## **Part V. TERMINATION OF PERMIT COVERAGE**

### **A. Termination of Permit Coverage**

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.B.1 of this permit. The NOT form shall be one which is associated with this permit, signed in accordance with Part VII.H of this permit.
2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:
  - a. Total project completion - All *construction activity* identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

- b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;
  - c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.F. of this permit.
  - d. The *owner or operator* obtains coverage under an alternative SPDES general permit or an individual SPDES permit.
3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the “*Final Stabilization*” and “Post-Construction Stormwater Management Practice certification statements on the NOT, certify that all the requirements in Part V.A.2.a. or b. of this permit have been achieved.
4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *regulated, traditional land use control MS4* sign the “MS4 Acceptance” statement on the NOT in accordance with the requirements in Part VII.H. of this permit. The *regulated, traditional land use control MS4* official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The *regulated, traditional land use control MS4* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector’s* final site inspection certification(s) required in Part V.A.3. of this permit.
5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:
- a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

- b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),
- c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has a mechanism in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the *owner or operator's* deed of record,
- d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility; the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

## **Part VI. REPORTING AND RETENTION RECORDS**

### **A. Record Retention**

The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the Department receives a complete NOT submitted in accordance with Part V. of this general permit.

### **B. Addresses**

With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.B.1 of this permit), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate DOW Water (SPDES) Program contact at the Regional Office listed in Appendix F.

## **Part VII. STANDARD PERMIT CONDITIONS**

### **A. Duty to Comply**

The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water

Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE). *Construction activity* shall not resume until written permission to do so has been received from the RWE.

#### **B. Continuation of the Expired General Permit**

This permit expires five (5) years from the effective date. If a new general permit is not issued prior to the expiration of this general permit, an *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the terms and conditions of this general permit, if it is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, until a new general permit is issued.

#### **C. Enforcement**

Failure of the *owner or operator*, its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to \$37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

#### **D. Need to Halt or Reduce Activity Not a Defense**

It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

### **E. Duty to Mitigate**

The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

### **F. Duty to Provide Information**

The *owner or operator* shall furnish to the Department, within a reasonable specified time period of a written request, all documentation necessary to demonstrate eligibility and any information to determine compliance with this permit or to determine whether cause exists for modifying or revoking this permit, or suspending or denying coverage under this permit, in accordance with the terms and conditions of this permit. The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

### **G. Other Information**

When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any of the documents required by this permit, or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s) changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or *impervious area*), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department using the contact information in Part II.A. of this permit. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

### **H. Signatory Requirements**

1. All NOIs and NOTs shall be signed as follows:
  - a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

- (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or
    - (ii) the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
  - b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or
  - c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:
    - (i) the chief executive officer of the agency, or
    - (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).
2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. of this permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:
- a. The authorization is made in writing by a person described in Part VII.H.1. of this permit;
  - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field,

superintendent, position of *equivalent* responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position) and,

- c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.
3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.
4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4*, or by a duly authorized representative of that person.

It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

## **I. Property Rights**

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity*.

## **J. Severability**

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

## **K. Requirement to Obtain Coverage Under an Alternative Permit**

1. The Department may require any owner or operator authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any discharger authorized by a general permit to apply for an individual SPDES permit, it shall notify the discharger in writing that a permit application is required. This notice shall

include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the owner or operator to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from owner or operator receipt of the notification letter, whereby the authorization to discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Permit Administrator at the Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Department, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. When an individual SPDES permit is issued to a discharger authorized to *discharge* under a general SPDES permit for the same *discharge(s)*, the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

#### **L. Proper Operation and Maintenance**

The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

#### **M. Inspection and Entry**

The *owner or operator* shall allow an authorized representative of the Department, EPA, applicable county health department, or, in the case of a *construction site* which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the owner's or operator's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;
2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and



3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment), practices or operations regulated or required by this permit.
4. Sample or monitor at reasonable times, for purposes of assuring permit compliance or as otherwise authorized by the Act or ECL, any substances or parameters at any location.

## **N. Permit Actions**

This permit may, at any time, be modified, suspended, revoked, or renewed by the Department in accordance with 6 NYCRR Part 621. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

## **O. Definitions**

Definitions of key terms are included in Appendix A of this permit.

## **P. Re-Opener Clause**

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with construction activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.
2. Any Department initiated permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

## **Q. Penalties for Falsification of Forms and Reports**

In accordance with 6NYCRR Part 750-2.4 and 750-2.5, any person who knowingly makes any false material statement, representation, or certification in any application, record, report or other document filed or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished in accordance with ECL §71-1933 and or Articles 175 and 210 of the New York State Penal Law.

## **R. Other Permits**

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

## **APPENDIX A – Acronyms and Definitions**

### **Acronyms**

APO – Agency Preservation Officer  
BMP – Best Management Practice  
CPESC – Certified Professional in Erosion and Sediment Control  
Cpv – Channel Protection Volume  
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)  
DOW – Division of Water  
EAF – Environmental Assessment Form  
ECL - Environmental Conservation Law  
EPA – U. S. Environmental Protection Agency  
HSG – Hydrologic Soil Group  
MS4 – Municipal Separate Storm Sewer System  
NOI – Notice of Intent  
NOT – Notice of Termination  
NPDES – National Pollutant Discharge Elimination System  
OPRHP – Office of Parks, Recreation and Historic Places  
Qf – Extreme Flood  
Qp – Overbank Flood  
RRv – Runoff Reduction Volume  
RWE – Regional Water Engineer  
SEQR – State Environmental Quality Review  
SEQRA - State Environmental Quality Review Act  
SHPA – State Historic Preservation Act  
SPDES – State Pollutant Discharge Elimination System  
SWPPP – Stormwater Pollution Prevention Plan  
TMDL – Total Maximum Daily Load  
UPA – Uniform Procedures Act  
USDA – United States Department of Agriculture  
WQv – Water Quality Volume

## Definitions

All definitions in this section are solely for the purposes of this permit.

**Agricultural Building** – a structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products; excluding any structure designed, constructed or used, in whole or in part, for human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as a place used by the public.

**Agricultural Property** – means the land for construction of a barn, *agricultural building*, silo, stockyard, pen or other structural practices identified in Table II in the “Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State” prepared by the Department in cooperation with agencies of New York Nonpoint Source Coordinating Committee (dated June 2007).

**Alter Hydrology from Pre to Post-Development Conditions** - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

**Combined Sewer** - means a sewer that is designed to collect and convey both “sewage” and “stormwater”.

**Commence (Commencement of) Construction Activities** - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for “*Construction Activity(ies)*” also.

**Construction Activity(ies)** - means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

**Construction Site** – means the land area where *construction activity(ies)* will occur. See definition for “*Commence (Commencement of) Construction Activities*” and “*Larger Common Plan of Development or Sale*” also.

**Dewatering** – means the act of draining rainwater and/or groundwater from building foundations, vaults or excavations/trenches.

**Direct Discharge (to a specific surface waterbody)** - means that runoff flows from a *construction site* by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a *construction site* to a separate storm sewer system

and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

**Discharge(s)** - means any addition of any pollutant to waters of the State through an outlet or *point source*.

**Embankment** – means an earthen or rock slope that supports a road/highway.

**Endangered or Threatened Species** – see 6 NYCRR Part 182 of the Department’s rules and regulations for definition of terms and requirements.

**Environmental Conservation Law (ECL)** - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

**Equivalent (Equivalence)** – means that the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

**Final Stabilization** - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

**General SPDES permit** - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 and Section 70-0117 of the ECL authorizing a category of discharges.

**Groundwater(s)** - means waters in the saturated zone. The saturated zone is a subsurface zone in which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

**Historic Property** – means any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State or National Registers of Historic Places.

**Impervious Area (Cover)** - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

**Infeasible** – means not technologically possible, or not economically practicable and achievable in light of best industry practices.

**Larger Common Plan of Development or Sale** - means a contiguous area where multiple separate and distinct *construction activities* are occurring, or will occur, under one plan. The term “plan” in “larger common plan of development or sale” is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that *construction activities* may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same “common plan” is not concurrently being disturbed.

**Minimize** – means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

**Municipal Separate Storm Sewer (MS4)** - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

- (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State;
- (ii) Designed or used for collecting or conveying stormwater;
- (iii) Which is not a *combined sewer*; and
- (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

**National Pollutant Discharge Elimination System (NPDES)** - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

**Natural Buffer** – means an undisturbed area with natural cover running along a surface water (e.g. wetland, stream, river, lake, etc.).

**New Development** – means any land disturbance that does not meet the definition of Redevelopment Activity included in this appendix.

**New York State Erosion and Sediment Control Certificate Program** – a certificate program that establishes and maintains a process to identify and recognize individuals who are capable of developing, designing, inspecting and maintaining erosion and sediment control plans on projects that disturb soils in New York State. The certificate program is administered by the New York State Conservation District Employees Association.

**NOI Acknowledgment Letter** - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from *construction activity*.

**Nonpoint Source** - means any source of water pollution or pollutants which is not a discrete conveyance or *point source* permitted pursuant to Title 7 or 8 of Article 17 of the Environmental Conservation Law (see ECL Section 17-1403).

**Overbank** –means flow events that exceed the capacity of the stream channel and spill out into the adjacent floodplain.

**Owner or Operator** - means the person, persons or legal entity which owns or leases the property on which the *construction activity* is occurring; an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications; and/or an entity that has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

**Performance Criteria** – means the design criteria listed under the “Required Elements” sections in Chapters 5, 6 and 10 of the technical standard, New York State Stormwater Management Design Manual, dated January 2015. It does not include the Sizing Criteria (i.e. WQv, RRv, Cpv, Qp and Qf ) in Part I.C.2. of the permit.

**Point Source** - means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, or landfill leachate collection system from which *pollutants* are or may be discharged.

**Pollutant** - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq .

**Qualified Inspector** - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

**Qualified Professional** - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

**Redevelopment Activity(ies)** – means the disturbance and reconstruction of existing impervious area, including impervious areas that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

**Regulated, Traditional Land Use Control MS4** - means a city, town or village with land use control authority that is authorized to discharge under New York State DEC's



SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s) or the City of New York's Individual SPDES Permit for their Municipal Separate Storm Sewer Systems (NY-0287890).

**Routine Maintenance Activity** - means *construction activity* that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that stabilizes the transition between the road shoulder and the ditch or *embankment*,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or *embankment*,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

**Site limitations** – means site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical site limitations include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of site limitations shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

**Sizing Criteria** – means the criteria included in Part I.C.2 of the permit that are used to size post-construction stormwater management control practices. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), *Overbank Flood* (Qp), and *Extreme Flood* (Qf).

**State Pollutant Discharge Elimination System (SPDES)** - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

**Steep Slope** – means land area designated on the current United States Department of Agriculture (“USDA”) Soil Survey as Soil Slope Phase “D”, (provided the map unit name is inclusive of slopes greater than 25%) , or Soil Slope Phase E or F, (regardless of the map unit name), or a combination of the three designations.

**Streambank** – as used in this permit, means the terrain alongside the bed of a creek or stream. The bank consists of the sides of the channel, between which the flow is confined.

**Stormwater Pollution Prevention Plan (SWPPP)** – means a project specific report, including construction drawings, that among other things: describes the construction activity(ies), identifies the potential sources of pollution at the *construction site*; describes and shows the stormwater controls that will be used to control the pollutants (i.e. erosion and sediment controls; for many projects, includes post-construction stormwater management controls); and identifies procedures the *owner or operator* will implement to comply with the terms and conditions of the permit. See Part III of the permit for a complete description of the information that must be included in the SWPPP.

**Surface Waters of the State** - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

**Temporarily Ceased** – means that an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

**Temporary Stabilization** - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

**Total Maximum Daily Loads (TMDLs)** - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and *nonpoint sources*. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet *water quality standards*, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for *point source* discharges, load allocations (LAs) for *nonpoint sources*, and a margin of safety (MOS).

**Trained Contractor** - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed

training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* is responsible for the day to day implementation of the SWPPP.

**Uniform Procedures Act (UPA) Permit** - means a permit required under 6 NYCRR Part 621 of the Environmental Conservation Law (ECL), Article 70.

**Water Quality Standard** - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

## APPENDIX B – Required SWPPP Components by Project Type

**Table 1**  
**Construction Activities that Require the Preparation of a SWPPP That Only Includes Erosion and Sediment Controls**

<p><b>The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:</b></p> <ul style="list-style-type: none"><li>• Single family home <u>not</u> located in one of the watersheds listed in Appendix C or <u>not directly discharging</u> to one of the 303(d) segments listed in Appendix E</li><li>• Single family residential subdivisions with 25% or less impervious cover at total site build-out and <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E</li><li>• Construction of a barn or other <i>agricultural building</i>, silo, stock yard or pen.</li></ul>
<p><b>The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:</b></p> <p>All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.</p>
<p><b>The following construction activities that involve soil disturbances of one (1) or more acres of land:</b></p> <ul style="list-style-type: none"><li>• Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains</li><li>• Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects</li><li>• Pond construction</li><li>• Linear bike paths running through areas with vegetative cover, including bike paths surfaced with an impervious cover</li><li>• Cross-country ski trails and walking/hiking trails</li><li>• Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are not part of residential, commercial or institutional development;</li><li>• Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that include incidental shoulder or curb work along an existing highway to support construction of the sidewalk, bike path or walking path.</li><li>• Slope stabilization projects</li><li>• Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics</li></ul>

**Table 1 (Continued) CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP  
THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS**

**The following construction activities that involve soil disturbances of one (1) or more acres of land:**

- Spoil areas that will be covered with vegetation
- Vegetated open space projects (i.e. recreational parks, lawns, meadows, fields, downhill ski trails) excluding projects that *alter hydrology from pre to post development* conditions,
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions
- Demolition project where vegetation will be established, and no redevelopment is planned
- Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*
- Structural practices as identified in Table II in the “Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State”, excluding projects that involve soil disturbances of greater than five acres and construction activities that include the construction or reconstruction of impervious area
- Temporary access roads, median crossovers, detour roads, lanes, or other temporary impervious areas that will be restored to pre-construction conditions once the construction activity is complete

**Table 2**  
**CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES**  
**POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES**

**The following construction activities that involve soil disturbances of one (1) or more acres of land:**

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family home that disturbs five (5) or more acres of land
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes duplexes, townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Breweries, cideries, and wineries, including establishments constructed on agricultural land
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development conditions*
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other *agricultural building* (e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional development; includes hospitals, prisons, schools and colleges
- Industrial facilities; includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's, water treatment plants, and water storage tanks
- Office complexes
- Playgrounds that include the construction or reconstruction of impervious area
- Sports complexes
- Racetracks; includes racetracks with earthen (dirt) surface
- Road construction or reconstruction, including roads constructed as part of the construction activities listed in Table 1

Table 2 (Continued)

**CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES**

**The following construction activities that involve soil disturbances of one (1) or more acres of land:**

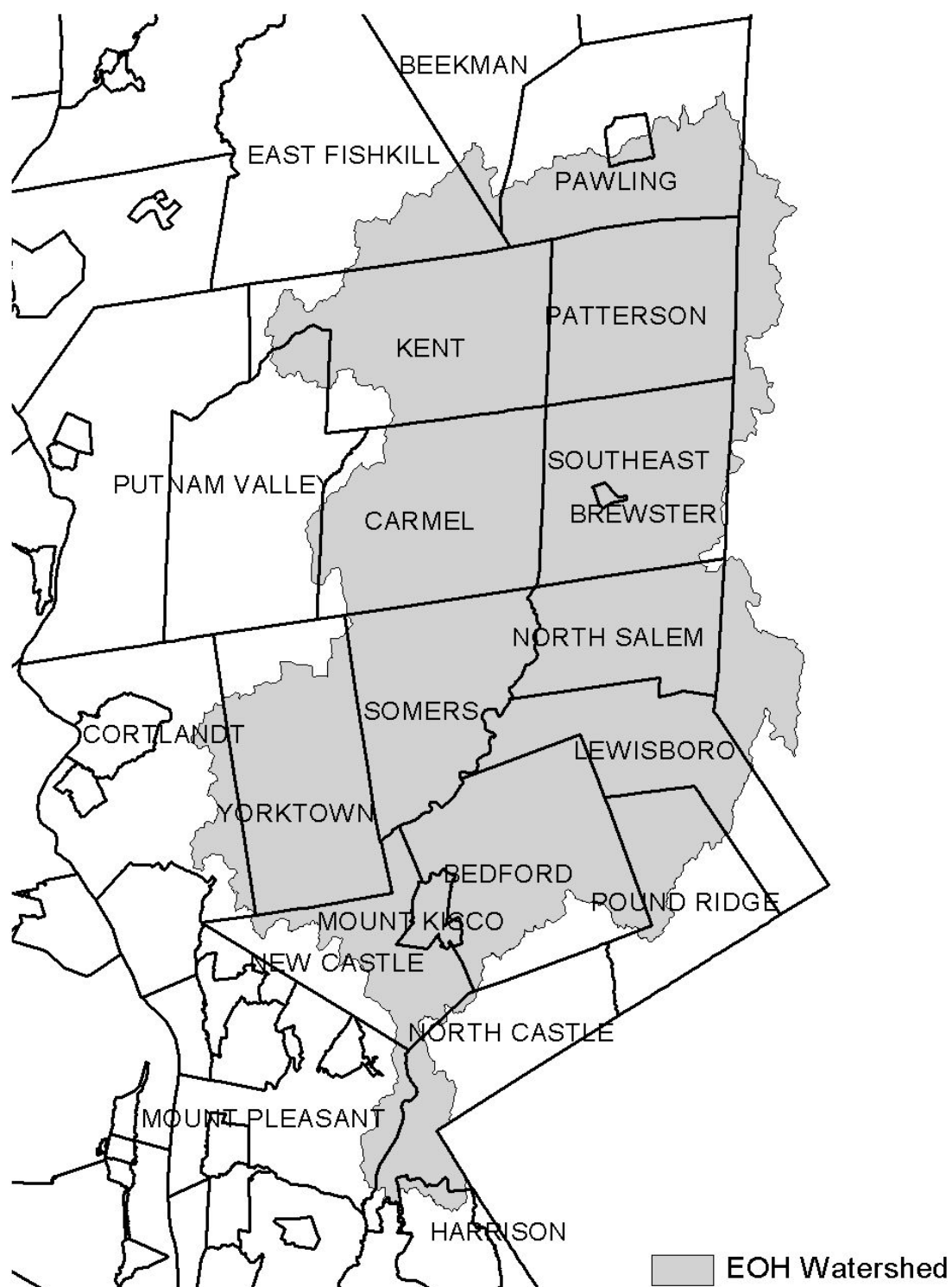
- Parking lot construction or reconstruction, including parking lots constructed as part of the construction activities listed in Table 1
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover*, and constructed as part of an over-head electric transmission line project, wind-power project, cell tower project, oil or gas well drilling project, sewer or water main project or other linear utility project
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a residential, commercial or institutional development
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a highway construction or reconstruction project
- All other construction activities that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

## APPENDIX C – Watersheds Requiring Enhanced Phosphorus Removal

**Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual (“Design Manual”).**

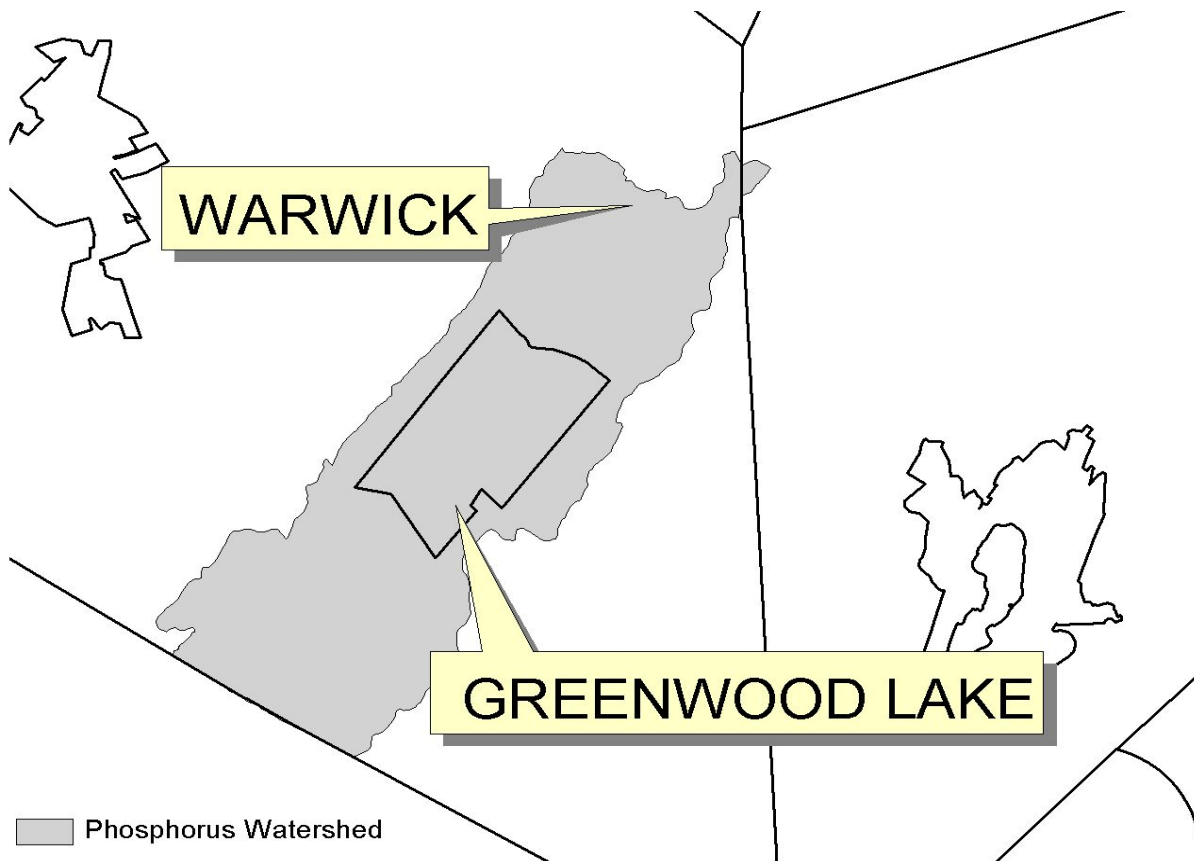
- Entire New York City Watershed located east of the Hudson River - Figure 1
- Onondaga Lake Watershed - Figure 2
- Greenwood Lake Watershed -Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5



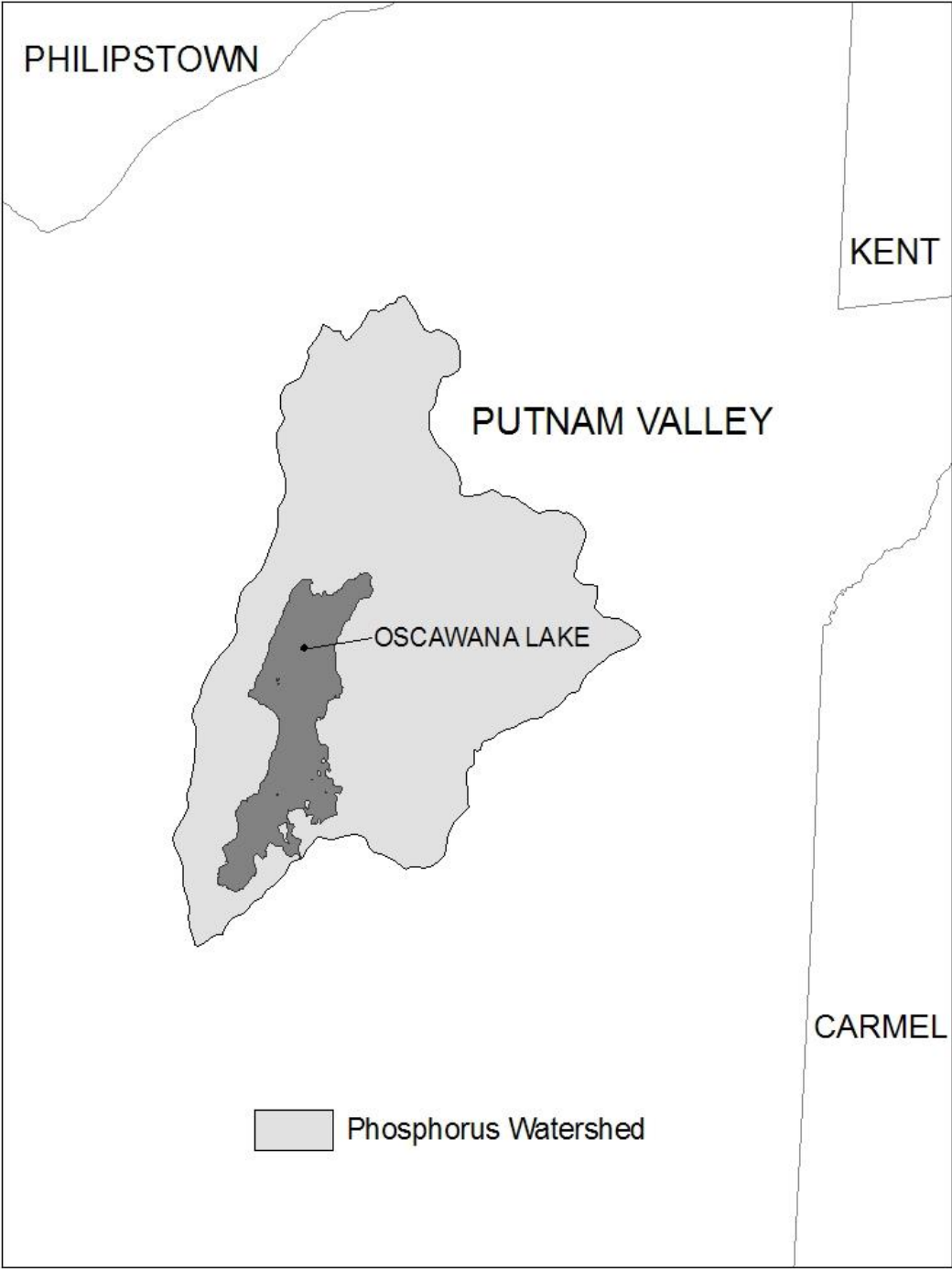
**Figure 1 - New York City Watershed East of the Hudson**

**Figure 2 - Onondaga Lake Watershed**

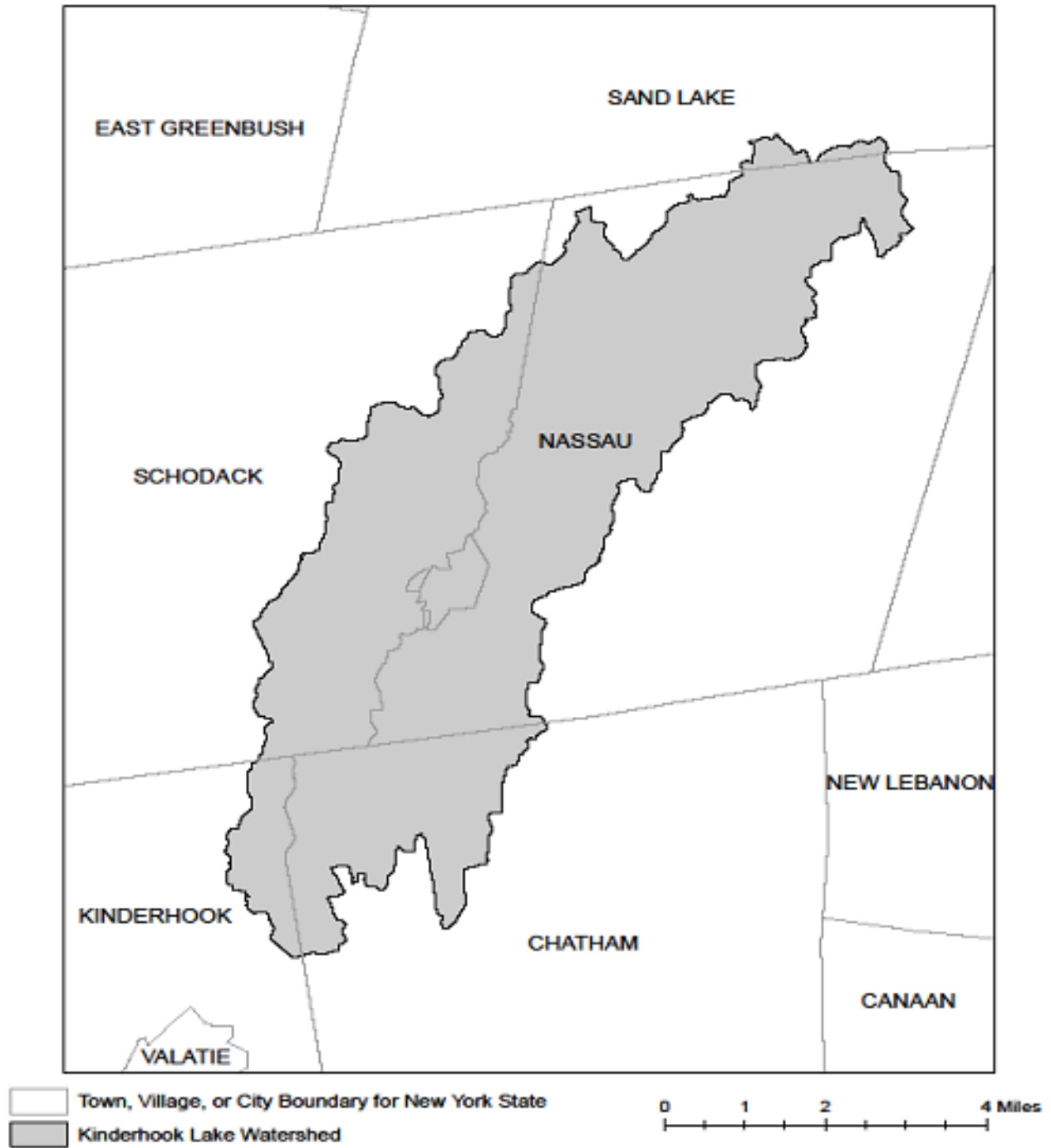
**Figure 3 - Greenwood Lake Watershed**



**Figure 4 - Oscawana Lake Watershed**



**Figure 5 - Kinderhook Lake Watershed**



## **APPENDIX D – Watersheds with Lower Disturbance Threshold**

**Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.**

Entire New York City Watershed that is located east of the Hudson River - See Figure 1 in Appendix C
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## APPENDIX E – 303(d) Segments Impaired by Construction Related Pollutant(s)

List of 303(d) segments impaired by pollutants related to *construction activity* (e.g. silt, sediment or nutrients). The list was developed using "The Final New York State 2016 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy" dated November 2016. *Owners or operators* of single family home and single family residential subdivisions with 25% or less total impervious cover at total site build-out that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015.

COUNTY	WATERBODY	POLLUTANT
Albany	Ann Lee (Shakers) Pond, Stump Pond	Nutrients
Albany	Basic Creek Reservoir	Nutrients
Allegany	Amity Lake, Saunders Pond	Nutrients
Bronx	Long Island Sound, Bronx	Nutrients
Bronx	Van Cortlandt Lake	Nutrients
Broome	Fly Pond, Deer Lake, Sky Lake	Nutrients
Broome	Minor Tribs to Lower Susquehanna (north)	Nutrients
Broome	Whitney Point Lake/Reservoir	Nutrients
Cattaraugus	Allegheny River/Reservoir	Nutrients
Cattaraugus	Beaver (Alma) Lake	Nutrients
Cattaraugus	Case Lake	Nutrients
Cattaraugus	Linlyco/Club Pond	Nutrients
Cayuga	Duck Lake	Nutrients
Cayuga	Little Sodus Bay	Nutrients
Chautauqua	Bear Lake	Nutrients
Chautauqua	Chadakoin River and tribs	Nutrients
Chautauqua	Chautauqua Lake, North	Nutrients
Chautauqua	Chautauqua Lake, South	Nutrients
Chautauqua	Findley Lake	Nutrients
Chautauqua	Hulburt/Clymer Pond	Nutrients
Clinton	Great Chazy River, Lower, Main Stem	Silt/Sediment
Clinton	Lake Champlain, Main Lake, Middle	Nutrients
Clinton	Lake Champlain, Main Lake, North	Nutrients
Columbia	Kinderhook Lake	Nutrients
Columbia	Robinson Pond	Nutrients
Cortland	Dean Pond	Nutrients

### 303(d) Segments Impaired by Construction Related Pollutant(s)

Dutchess	Fall Kill and tribs	Nutrients
Dutchess	Hillside Lake	Nutrients
Dutchess	Wappingers Lake	Nutrients
Dutchess	Wappingers Lake	Silt/Sediment
Erie	Beeman Creek and tribs	Nutrients
Erie	Ellicott Creek, Lower, and tribs	Silt/Sediment
Erie	Ellicott Creek, Lower, and tribs	Nutrients
Erie	Green Lake	Nutrients
Erie	Little Sister Creek, Lower, and tribs	Nutrients
Erie	Murder Creek, Lower, and tribs	Nutrients
Erie	Rush Creek and tribs	Nutrients
Erie	Scajaquada Creek, Lower, and tribs	Nutrients
Erie	Scajaquada Creek, Middle, and tribs	Nutrients
Erie	Scajaquada Creek, Upper, and tribs	Nutrients
Erie	South Branch Smoke Cr, Lower, and tribs	Silt/Sediment
Erie	South Branch Smoke Cr, Lower, and tribs	Nutrients
Essex	Lake Champlain, Main Lake, South	Nutrients
Essex	Lake Champlain, South Lake	Nutrients
Essex	Willsboro Bay	Nutrients
Genesee	Bigelow Creek and tribs	Nutrients
Genesee	Black Creek, Middle, and minor tribs	Nutrients
Genesee	Black Creek, Upper, and minor tribs	Nutrients
Genesee	Bowen Brook and tribs	Nutrients
Genesee	LeRoy Reservoir	Nutrients
Genesee	Oak Orchard Cr, Upper, and tribs	Nutrients
Genesee	Tonawanda Creek, Middle, Main Stem	Nutrients
Greene	Schoharie Reservoir	Silt/Sediment
Greene	Sleepy Hollow Lake	Silt/Sediment
Herkimer	Steele Creek tribs	Silt/Sediment
Herkimer	Steele Creek tribs	Nutrients
Jefferson	Moon Lake	Nutrients
Kings	Hendrix Creek	Nutrients
Kings	Prospect Park Lake	Nutrients
Lewis	Mill Creek/South Branch, and tribs	Nutrients
Livingston	Christie Creek and tribs	Nutrients
Livingston	Conesus Lake	Nutrients
Livingston	Mill Creek and minor tribs	Silt/Sediment
Monroe	Black Creek, Lower, and minor tribs	Nutrients
Monroe	Buck Pond	Nutrients
Monroe	Cranberry Pond	Nutrients



### 303(d) Segments Impaired by Construction Related Pollutant(s)

Monroe	Lake Ontario Shoreline, Western	Nutrients
Monroe	Long Pond	Nutrients
Monroe	Mill Creek and tribs	Nutrients
Monroe	Mill Creek/Blue Pond Outlet and tribs	Nutrients
Monroe	Minor Tribs to Irondequoit Bay	Nutrients
Monroe	Rochester Embayment - East	Nutrients
Monroe	Rochester Embayment - West	Nutrients
Monroe	Shipbuilders Creek and tribs	Nutrients
Monroe	Thomas Creek/White Brook and tribs	Nutrients
Nassau	Beaver Lake	Nutrients
Nassau	Camaans Pond	Nutrients
Nassau	East Meadow Brook, Upper, and tribs	Silt/Sediment
Nassau	East Rockaway Channel	Nutrients
Nassau	Grant Park Pond	Nutrients
Nassau	Hempstead Bay	Nutrients
Nassau	Hempstead Lake	Nutrients
Nassau	Hewlett Bay	Nutrients
Nassau	Hog Island Channel	Nutrients
Nassau	Long Island Sound, Nassau County Waters	Nutrients
Nassau	Massapequa Creek and tribs	Nutrients
Nassau	Milburn/Parsonage Creeks, Upp, and tribs	Nutrients
Nassau	Reynolds Channel, west	Nutrients
Nassau	Tidal Tribs to Hempstead Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Silt/Sediment
Nassau	Tribs to Smith/Halls Ponds	Nutrients
Nassau	Woodmere Channel	Nutrients
New York	Harlem Meer	Nutrients
New York	The Lake in Central Park	Nutrients
Niagara	Bergholtz Creek and tribs	Nutrients
Niagara	Hyde Park Lake	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Oneida	Ballou, Nail Creeks and tribs	Nutrients
Onondaga	Harbor Brook, Lower, and tribs	Nutrients
Onondaga	Ley Creek and tribs	Nutrients
Onondaga	Minor Tribs to Onondaga Lake	Nutrients
Onondaga	Ninemile Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Middle, and tribs	Nutrients

### 303(d) Segments Impaired by Construction Related Pollutant(s)

Onondaga	Onondaga Lake, northern end	Nutrients
Onondaga	Onondaga Lake, southern end	Nutrients
Ontario	Great Brook and minor tribs	Silt/Sediment
Ontario	Great Brook and minor tribs	Nutrients
Ontario	Hemlock Lake Outlet and minor tribs	Nutrients
Ontario	Honeoye Lake	Nutrients
Orange	Greenwood Lake	Nutrients
Orange	Monhagen Brook and tribs	Nutrients
Orange	Orange Lake	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Oswego	Lake Neatahwanta	Nutrients
Oswego	Pleasant Lake	Nutrients
Putnam	Bog Brook Reservoir	Nutrients
Putnam	Boyd Corners Reservoir	Nutrients
Putnam	Croton Falls Reservoir	Nutrients
Putnam	Diverting Reservoir	Nutrients
Putnam	East Branch Reservoir	Nutrients
Putnam	Lake Carmel	Nutrients
Putnam	Middle Branch Reservoir	Nutrients
Putnam	Oscawana Lake	Nutrients
Putnam	Palmer Lake	Nutrients
Putnam	West Branch Reservoir	Nutrients
Queens	Bergen Basin	Nutrients
Queens	Flushing Creek/Bay	Nutrients
Queens	Jamaica Bay, Eastern, and tribs (Queens)	Nutrients
Queens	Kissena Lake	Nutrients
Queens	Meadow Lake	Nutrients
Queens	Willow Lake	Nutrients
Rensselaer	Nassau Lake	Nutrients
Rensselaer	Snyders Lake	Nutrients
Richmond	Grasmere Lake/Bradys Pond	Nutrients
Rockland	Congers Lake, Swartout Lake	Nutrients
Rockland	Rockland Lake	Nutrients
Saratoga	Ballston Lake	Nutrients
Saratoga	Dwaas Kill and tribs	Silt/Sediment
Saratoga	Dwaas Kill and tribs	Nutrients
Saratoga	Lake Lonely	Nutrients
Saratoga	Round Lake	Nutrients
Saratoga	Tribs to Lake Lonely	Nutrients

### 303(d) Segments Impaired by Construction Related Pollutant(s)

Schenectady	Collins Lake	Nutrients
Schenectady	Duane Lake	Nutrients
Schenectady	Mariaville Lake	Nutrients
Schoharie	Engleville Pond	Nutrients
Schoharie	Summit Lake	Nutrients
Seneca	Reeder Creek and tribs	Nutrients
St.Lawrence	Black Lake Outlet/Black Lake	Nutrients
St.Lawrence	Fish Creek and minor tribs	Nutrients
Steuben	Smith Pond	Nutrients
Suffolk	Agawam Lake	Nutrients
Suffolk	Big/Little Fresh Ponds	Nutrients
Suffolk	Canaan Lake	Silt/Sediment
Suffolk	Canaan Lake	Nutrients
Suffolk	Flanders Bay, West/Lower Sawmill Creek	Nutrients
Suffolk	Fresh Pond	Nutrients
Suffolk	Great South Bay, East	Nutrients
Suffolk	Great South Bay, Middle	Nutrients
Suffolk	Great South Bay, West	Nutrients
Suffolk	Lake Ronkonkoma	Nutrients
Suffolk	Long Island Sound, Suffolk County, West	Nutrients
Suffolk	Mattituck (Marratooka) Pond	Nutrients
Suffolk	Meetinghouse/Terrys Creeks and tribs	Nutrients
Suffolk	Mill and Seven Ponds	Nutrients
Suffolk	Millers Pond	Nutrients
Suffolk	Moriches Bay, East	Nutrients
Suffolk	Moriches Bay, West	Nutrients
Suffolk	Peconic River, Lower, and tidal tribs	Nutrients
Suffolk	Quantuck Bay	Nutrients
Suffolk	Shinnecock Bay and Inlet	Nutrients
Suffolk	Tidal tribs to West Moriches Bay	Nutrients
Sullivan	Bodine, Montgomery Lakes	Nutrients
Sullivan	Davies Lake	Nutrients
Sullivan	Evens Lake	Nutrients
Sullivan	Pleasure Lake	Nutrients
Tompkins	Cayuga Lake, Southern End	Nutrients
Tompkins	Cayuga Lake, Southern End	Silt/Sediment
Tompkins	Owasco Inlet, Upper, and tribs	Nutrients
Ulster	Ashokan Reservoir	Silt/Sediment
Ulster	Esopus Creek, Upper, and minor tribs	Silt/Sediment
Warren	Hague Brook and tribs	Silt/Sediment

### 303(d) Segments Impaired by Construction Related Pollutant(s)

Warren	Huddle/Finkle Brooks and tribs	Silt/Sediment
Warren	Indian Brook and tribs	Silt/Sediment
Warren	Lake George	Silt/Sediment
Warren	Tribs to L.George, Village of L George	Silt/Sediment
Washington	Cossayuna Lake	Nutrients
Washington	Lake Champlain, South Bay	Nutrients
Washington	Tribs to L.George, East Shore	Silt/Sediment
Washington	Wood Cr/Champlain Canal and minor tribs	Nutrients
Wayne	Port Bay	Nutrients
Westchester	Amawalk Reservoir	Nutrients
Westchester	Blind Brook, Upper, and tribs	Silt/Sediment
Westchester	Cross River Reservoir	Nutrients
Westchester	Lake Katonah	Nutrients
Westchester	Lake Lincolndale	Nutrients
Westchester	Lake Meahagh	Nutrients
Westchester	Lake Mohegan	Nutrients
Westchester	Lake Shenorock	Nutrients
Westchester	Long Island Sound, Westchester (East)	Nutrients
Westchester	Mamaroneck River, Lower	Silt/Sediment
Westchester	Mamaroneck River, Upper, and minor tribs	Silt/Sediment
Westchester	Muscoot/Upper New Croton Reservoir	Nutrients
Westchester	New Croton Reservoir	Nutrients
Westchester	Peach Lake	Nutrients
Westchester	Reservoir No.1 (Lake Isle)	Nutrients
Westchester	Saw Mill River, Lower, and tribs	Nutrients
Westchester	Saw Mill River, Middle, and tribs	Nutrients
Westchester	Sheldrake River and tribs	Silt/Sediment
Westchester	Sheldrake River and tribs	Nutrients
Westchester	Silver Lake	Nutrients
Westchester	Teatown Lake	Nutrients
Westchester	Titicus Reservoir	Nutrients
Westchester	Truesdale Lake	Nutrients
Westchester	Wallace Pond	Nutrients
Wyoming	Java Lake	Nutrients
Wyoming	Silver Lake	Nutrients

## APPENDIX F – List of NYS DEC Regional Offices

<u>Region</u>	<u>COVERING THE FOLLOWING COUNTIES:</u>	<u>DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS</u>	<u>DIVISION OF WATER (DOW) WATER (SPDES) PROGRAM</u>
1	NASSAU AND SUFFOLK	50 CIRCLE ROAD STONY BROOK, NY 11790 TEL. (631) 444-0365	50 CIRCLE ROAD STONY BROOK, NY 11790-3409 TEL. (631) 444-0405
2	BRONX, KINGS, NEW YORK, QUEENS AND RICHMOND	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4997	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4933
3	DUTCHESS, ORANGE, PUTNAM, ROCKLAND, SULLIVAN, ULSTER AND WESTCHESTER	21 SOUTH PUTT CORNERS ROAD NEW PALTZ, NY 12561-1696 TEL. (845) 256-3059	100 HILLSIDE AVENUE, SUITE 1W WHITE PLAINS, NY 10603 TEL. (914) 428 - 2505
4	ALBANY, COLUMBIA, DELAWARE, GREENE, MONTGOMERY, OTSEGO, RENSSELAER, SCHENECTADY AND SCHOHARIE	1150 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2069	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2045
5	CLINTON, ESSEX, FRANKLIN, FULTON, HAMILTON, SARATOGA, WARREN AND WASHINGTON	1115 STATE ROUTE 86, Po Box 296 RAY BROOK, NY 12977-0296 TEL. (518) 897-1234	232 GOLF COURSE ROAD WARRENSBURG, NY 12885-1172 TEL. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROADAVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7070

NATIONAL GRID  
RENSSELAER NON-OWNED FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

STORM WATER PERMIT CERTIFICATION STATEMENT

Each Contractor and Subcontractor identified in the Storm Water Pollution Prevention Plan (SWPPP) shall certify that they understand the permit conditions and their responsibilities. Every Contractor and Subcontractor performing an activity that involves soil disturbance shall sign and submit this certification statement to Engineer prior to performing the Work. This certification statement shall be signed by an owner, principal, president, secretary, or treasurer of the firm.

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I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that Owner must comply with the terms and conditions of the most current version of NYSDEC's SPDES General Permit for Storm Water Discharges from Construction Activity (SPDES General Permit), and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect, or inaccurate information is a violation of the referenced permit and the laws of the State of New York, and could subject me to criminal, civil, and/or administrative proceedings.

Firm: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Name (Print): \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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NATIONAL GRID  
RENSSELAER NON-OWNED FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

STORM WATER INSPECTION REPORT

Date and Time of Inspection: \_\_\_\_\_

Qualified Inspector (Name, Title, and Affiliation): \_\_\_\_\_

Weather Conditions: \_\_\_\_\_

Soil Conditions: \_\_\_\_\_

Describe disturbed areas at time of inspection: \_\_\_\_\_

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Describe areas stabilized (temporary or final) since previous inspection: \_\_\_\_\_

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ATTACH SITE PLAN SHOWING APPROXIMATE LIMITS OF DISTURBED AND NEWLY-STABILIZED AREAS

Describe repairs, maintenance, or corrective actions implemented since previous inspection: \_\_\_\_\_

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ATTACH PHOTOGRAPHS OF AREAS OR ITEMS INSTALLED, REPAIRED, OR REPLACED



### **Maintaining Water Quality**

**Yes No NA**

- |                          |                          |                          |   |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is there an increase in turbidity causing a substantial visible contrast to natural conditions? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is there residue from oil and floating substances, visible oil film, or globules or grease?     |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | All disturbance is within the limits of the approved plans?                                     |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?             |

### **Housekeeping**

**Yes No NA**

#### **1. General Site Conditions:**

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is construction site litter and debris appropriately managed?  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is construction impacting the adjacent property?   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is dust adequately controlled?   |

#### **2. Temporary Stream Crossing:**

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Maximum diameter pipes necessary to span creek without dredging are installed?   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Installed non-woven geotextile fabric beneath approaches?  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is fill composed of aggregate (no earth or soil)?  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Rock on approaches is clean enough to remove mud from vehicles and prevent sediment from entering stream during high flow? |

### **Run-Off Control Practices**

**Yes No NA**

#### **1. Excavation Dewatering:**

- |                          |                          |                          |   |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Clean water from upstream pool is being pumped to the downstream pool?                  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sediment laden water from work area is being discharged to a silt-trapping device?      |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Constructed upstream berm with 1-foot minimum freeboard?                                |

#### **2. Level Spreader:**

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Installed per plan?  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Flow sheets out of level spreader without erosion on downstream edge?                        |

#### **3. Interceptor Dikes and Swales:**

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Installed per plan with minimum side slopes of 2H:1V or flatter?           |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Stabilized by geotextile fabric, seed, or mulch with no erosion occurring? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sediment-laden run-off directed to sediment trapping structure?            |

#### **4. Stone Check Dam:**

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is channel stable (flow is not eroding soil underneath or around the structure)?             |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Check dam is in good condition (rocks in place and no permanent pools behind the structure)? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Has accumulated sediment been removed?   |

#### **5. Rock Outlet Protection:**

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Installed per plan?                            |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Installed concurrently with pipe installation? |

### **Soil Stabilization**

**Yes No NA**

#### **1. Topsoil and Spoil Stockpiles:**

- |                          |                          |                          |   |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Stockpiles are stabilized with vegetation and/or mulch? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sediment control is installed at the toe of the slope?  |

#### **2. Revegetation:**

- |                          |                          |                          |   |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Temporary seed and mulch have been applied to idle areas?               |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Six inches minimum of topsoil has been applied under permanent seeding? |

### **Sediment Control Practices**

**Yes No NA**

**1. Stabilized Construction Entrance:**

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Stone is clean enough to effectively remove mud from vehicles?                     |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Installed per standards and specifications?  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Does all traffic use the stabilized entrance to enter and leave construction site? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is adequate drainage provided to prevent ponding at entrance?                      |

**2. Silt Fence:**

Sediment accumulation is \_\_\_\_% of design capacity.

- |                          |                          |                          |   |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Installed on contour, 10 feet from toe of slope (not across conveyance channels)? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Joints constructed by wrapping the two ends together for continuous support?      |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Fabric buried six inches minimum below grade?                                     |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Posts are stable, fabric is tight and without rips or frayed areas?               |

**3. Storm Drain Inlet Protection (Use for Stone and Block; Filter Fabric; Curb; or Excavated Practices)**

Sediment accumulation \_\_\_\_% of design capacity.

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Installed concrete blocks lengthwise so open ends face outward, not upward?  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Placed wire screen between No. 3 crushed stone and concrete blocks?  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Drainage area is one acre or less?   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Excavated area is 900 cubic feet?  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Excavated side slopes are 2H:1V?   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2"x4" frame is constructed and structurally sound?   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Three-foot maximum spacing between posts?  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Fabric is embedded one to 1.5 feet below ground and secured to frame/posts with staples at maximum eight-inch spacing? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Posts are stable, fabric is tight and without rips or frayed areas?  |

**4. Temporary Sediment Trap:**

Sediment accumulation is \_\_\_\_% of design capacity.

- |                          |                          |                          |   |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Outlet structure is constructed per the approved plan or drawing? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Geotextile fabric has been placed beneath rock fill?              |

**5. Temporary Sediment Basin:**

Sediment accumulation is \_\_\_\_% of design capacity.

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Basin and outlet structure constructed per the approved plan?                                  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Basin side slopes are stabilized with seed and mulch?  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Drainage structure flushed and basin surface restored upon removal of sediment basin facility? |

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Describe any repairs, maintenance, or corrective actions required to correct observed deficiencies: \_\_\_\_\_

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**ATTACH PHOTOGRAPHS OF DEFICIENT AREAS OR ITEMS OBSERVED DURING THE INSPECTION**

Qualified Inspector's Certification:

I certify under penalty of Law that this document and all attachments were prepared under my direction or supervision in accordance with a system to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein may be punishable by Law.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

SECTION 01 51 00  
TEMPORARY UTILITIES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope:
1. Provide all temporary utilities required for the Project.
    - a. Make all arrangements with utility service companies for temporary services and obtain required permits and approvals for temporary utilities.
    - b. Pay all utility service costs, including cost of electricity, water, fuel, and other utility services required for the Work.
    - c. Continuously maintain adequate utilities for all purposes during the Project, until removal of temporary utilities and temporary facilities. At a minimum, provide and maintain temporary utilities through Substantial Completion and removal of temporary field offices and sheds.
    - d. Maintain, including cleaning, temporary utilities and continuously provide consumables as required.
    - e. Temporary utilities shall be adequate for personnel using the site and requirements of the Project.
    - f. Provide temporary utilities in compliance with Laws and Regulations and, when applicable, requirements of utility owners.
- B. Provide the following temporary utilities:
1. Electricity.
  2. Lighting.
  3. Telephone and communications.
  4. Heating, ventilating, and temporary enclosures.
  5. Water.
  6. Fire protection.

1.02 REFERENCE STANDARDS

- A. The following standards are referenced in this Section:
1. NFPA 10, Standard for Portable Fire Extinguishers.
  2. NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.03 REQUIREMENTS FOR TEMPORARY UTILITIES

- A. Electrical:
1. Provide temporary electrical service required for the Work, including continuous power for temporary field offices and sheds. Provide temporary outlets with circuit breaker protection and ground fault protection.
- B. Lighting:
1. Minimum lighting shall be five foot-candles for open areas and 10 foot-candles for stairs and shops. Provide minimum of one, 300-watt lamp every 15 feet in indoor Work areas.

- C. Telephone and Communications:
  - 1. Provide temporary telephone and communications required for Contractor's operations at the site and for summoning emergency medical assistance.
- D. Heating, Ventilating, and Enclosures:
  - 1. Provide sufficient temporary heating, ventilating, and enclosures to ensure safe working conditions and prevent damage to existing facilities and the Work.
  - 2. Except where otherwise specified, temporary heating shall maintain temperature of the area served between 50 degrees F and maximum design temperature of building or facility and its contents.
  - 3. Required temperature range for storage areas and certain elements of the Work, including preparation of materials and surfaces, installation or application, and curing as applicable, shall be in accordance with the Contract Documents for the associated Work and the Supplier's recommended temperature range for storage, application, or installation, as appropriate.
  - 4. Provide temporary ventilation sufficient to prevent accumulation in construction areas and areas occupied by Owner of hazardous and nuisance levels or concentrations of dust and particulates, mist, fumes or vapors, odors, and gases associated with construction.
  - 5. Provide temporary enclosures and partitions required to maintain required temperature and humidity.
- E. Water:
  - 1. Provide temporary water facilities including piping, valves, meters if not provided by owner of existing waterline, backflow preventers, pressure regulators, and other appurtenances. Provide freeze-protection as required.
  - 2. Provide water for temporary sanitary facilities, field offices, site maintenance and cleaning and, when applicable, disinfecting and testing of systems.
  - 3. Continuously maintain adequate water flow and pressure for all purposes during the Project, until removal of temporary water system.
- F. Fire Protection:
  - 1. Provide temporary fire protection, including portable fire extinguishers rated not less than 2A or 5B in accordance with NFPA 10 for each temporary building and for every 3,000 square feet of floor area under construction.
  - 2. Comply with NFPA 241 and requirements of fire marshals and authorities having jurisdiction at the site.

## PART 2 – PRODUCTS

### 2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment for temporary systems may be new or used, but shall be adequate for purposes intended and shall not create unsafe conditions, and shall comply with Laws and Regulations.
- B. Provide required materials, equipment, and facilities, including piping, wiring, and controls.

## PART 3 – EXECUTION

### 3.01 INSTALLATION

- A. Install temporary utilities in neat, orderly, manner, and make structurally, mechanically, and electrically sound throughout.
- B. Location of Temporary Utilities:
  - 1. Locate temporary systems for proper function and service.
  - 2. Temporary systems shall not interfere with or provide hazards or nuisances to the Work under this and other contracts, movement of personnel, traffic areas, materials handling, hoisting systems, storage areas, finishes, and work of utility companies.
  - 3. Do not install temporary utilities on the ground, with the exception of temporary extension cords, hoses, and similar systems in place for short durations.
- C. Modify and extend temporary systems as required by progress of the Work.

### 3.02 USE

- A. Maintain temporary systems to provide safe, continuous service as required.
- B. Properly supervise operation of temporary systems:
  - 1. Enforce compliance with Laws and Regulations.
  - 2. Enforce safe practices.
  - 3. Prevent abuse of services.
  - 4. Prevent nuisances and hazards caused by temporary systems and their use.
  - 5. Prevent damage to finishes.
  - 6. Ensure that temporary systems and equipment do not interrupt continuous progress of construction.
- C. At end of each work day, check temporary systems and verify that sufficient consumables are available to maintain operation until work is resumed at the Site. Provide additional consumables if the supply on hand is insufficient.

### 3.03 REMOVAL

- A. Completely remove temporary utilities, facilities, equipment, and materials when no longer required. Repair damage caused by temporary systems and their removal, and restore the site to condition required by the Contract Documents. If restoration of damaged areas is not specified, restore to pre-construction condition.
- B. Where temporary utilities are disconnected from existing utility, provide suitable, water-tight or gas-tight (as applicable) cap or blind flange, as applicable, on service line, in accordance with requirements of utility owner.

END OF SECTION

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## SECTION 01 51 41

### TEMPORARY PUMPING

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Provide all labor, materials, tools, equipment, and incidentals shown, specified, and required for temporary pumping and handling of fluids during the Project.
2. Design and provide temporary pumping system; pumps; piping, supports, and valves; temporary instrumentation and control systems; fuel and electricity as required; personnel; and appurtenances. Comply with Laws and Regulations and requirements of authorities having jurisdiction. System shall be suitable for its service and operating environment.
3. Capacity – General:
  - a. Provide temporary pumping system of necessary capacity with not less than one of the largest pumps out of service.
  - b. Pay costs associated with repairing damage to property, including cleaning, caused by undersized or inadequate temporary pumping systems.
  - c. Engineer's acceptance of temporary pumping submittals does not relieve or mitigate Contractor from responsibility for the temporary pumping system in accordance with the Contract Documents.
4. Temporary Pumping Capacity for Dewatering Work Areas:
  - a. Dewatering pumps shall be sufficient in quantity and capacity to remove, temporarily store, and dispose all surface water and groundwater entering excavations, or other work areas.
  - b. Temporary pumping systems shall not result in: overflows to storm sewers or receiving waters; or adverse effects on utility owners, or owners of transportation systems (including streets and roads).
5. Location of temporary pumping systems shall not affect utility owners, public access to streets and drives, or access to private property, unless approved by authorities having jurisdiction.
6. Obtain Engineer's acceptance of each temporary pumping system submittal. Temporary pumping systems for which Engineer's acceptance is not obtained in advance will not be eligible for payment.

###### B. Coordination:

1. Coordinate the Work to be performed under other Sections that must be performed with or before the Work specified in this Section.

###### C. Related Sections:

1. Section 02 61 05 – Removal and Disposal of Contaminated Material.
2. Section 32 23 00 – Excavation and Fill.

##### 1.02 QUALITY ASSURANCE

###### A. Component Supply and Compatibility:

1. Obtain temporary pumping system from a single Supplier who shall be responsible for providing a complete system.



- B. Regulatory Requirements:
1. Secondary containment for fuel tanks, where applicable, shall be in accordance with Laws and Regulations.
  2. Leakage from temporary pumping system or improper discharge is not allowed.
  3. Quality of exhaust emissions from internal-combustion engines associated with temporary pumping systems shall comply with Laws and Regulations, including applicable air permits. Before furnishing temporary pumping system, verify compliance with air quality standards and provide temporary emissions controls to comply with such standards when required.

### 1.03 SUBMITTALS

- A. Timing: Furnish to Engineer submittals for temporary pumping system not less than 30 days prior to delivery of temporary pumping system to the site.
- B. Information Submittals: Submit the following:
1. Temporary Pumping System Plan, to include the following for each temporary pumping system:
    - a. Basis for capacity of the system proposed.
    - b. System curve of flow plotted against total dynamic head, and calculations that substantiate the proposed temporary pumping system, including comparison of net positive suction head required and net positive suction head available.
    - c. Manufacturer's data and specifications on each type and size of pump proposed and its capacity, including pump curves.
    - d. Manufacturer's data and specifications for engines and other equipment required for temporary pumping system, including expected exhaust emissions data.
    - e. Technical information and specifications on noise controls for noise-emitting equipment.
    - f. Technical data on temporary piping, pipe joints, valves, pipe supports, controls, flow meter, secondary containment for fuel tanks, emissions controls when required, and other information pertinent to the temporary pumping system.
    - g. Narrative describing proposed operation of temporary pumping system, including who will operate system, staffing, planned frequency of fueling, and contingency plan in event of pump failure.

## PART 2– PRODUCTS

### 2.01 TEMPORARY PUMPING SYSTEM

- A. General:
1. System components shall be suitable for continuous operation with the fluid pumped.
  2. Noise controls: Provide noise controls for temporary pumping system. Noise emitted from temporary pumping system shall comply with Laws and Regulations and shall not exceed 70 db at a distance of 30 feet from noise source.
  3. Fuel-consuming temporary pumping system components intended for use when Contractor is not present shall include fuel tanks sized for not less than 24 hours of uninterrupted operation at system's operating capacity, and means to automatically notify Remediation Contractor upon high and low suction water level and low fuel level.
  4. Use biodegradable fluids for equipment and environmentally-acceptable lubricants for oil-water interfaces, to the extent practicable.
- B. Temporary Pumps for Dewatering Work Area:

1. Sufficient in quantity and size to convey water to the on-site Frac Tanks as specified in Section 02 61 05 – Removal and Disposal of Contaminated Materials.
- C. Temporary Piping System:
  1. Durable hoses capable of conveying water to the on-site Frack Tanks, as specified in Section 02 61 05 – Removal and Disposal of Contaminated Materials.
  2. Hoses shall have watertight connections of the following types: quick-connects by Camlok or equal, and other watertight joints accepted by the Engineer.
  3. Discharge from temporary pumping system shall not adversely affect private property, and shall not result in flow backups, flooding, or damage.

## PART 3– EXECUTION

### 3.01 PREPARATION

- A. General:
  1. Verify that entire temporary pumping system is ready for operation before commencing temporary pumping. Verify that controls are properly connected and functional, where appropriate.

### 3.02 TEMPORARY PUMPING

- A. During operation of the Temporary Pumping System, temporary pumping system shall operate continuously as needed to dewater the work areas. In the event of equipment failure, immediately make repairs or replace equipment. Provide spare parts and redundant units as necessary for continuous operation.

### 3.03 REMOVAL

- A. Upon Conclusion of Temporary Pumping to Dewater Work Areas:
  1. Flush out temporary pumping system with clean water discharged to the on-site Frac Tanks.
  2. Remove temporary pumping system and appurtenances from the site.
  3. Repair damage caused by temporary systems and their removal and restore the site to condition required by the Contract Documents. If restoration of damaged areas is not specified, restore to pre-construction condition.

END OF SECTION

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## SECTION 01 52 13

### FIELD OFFICES AND SHEDS

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. Providing and maintaining field offices at the site for Owner, Engineer, NYSDEC, and Contractor.
  - 2. Provide required storage and work sheds.
  - 3. Field offices shall be complete, fully functional, and ready for occupancy within 14 days after Engineer's approval of the submittal required by this Section.
  - 4. Paying for required permits and utilities. Field offices and sheds shall comply with Laws and Regulations.
- B. Related Sections:
  - 1. Section 01 51 00 - Temporary Utilities.
  - 2. Section 01 52 16 - First-Aid Facilities.

##### 1.02 SUBMITTALS

- A. Action Submittals:
  - 1. Field Office Submittal: Submit, as a single submittal, the following:
    - a. Site plan indicating proposed location of field offices, parking for field offices, and facilities related to the field offices.
    - b. Information on proposed field office size, construction, exterior appearance, interior finishes, and field office security measures.
    - c. Proposed type of Internet service; name of proposed Internet service provider; and product data and technical information on equipment (if any) required for Internet service.
    - d. Listing of utility providers (if applicable).
    - e. Office Equipment: Product data and technical information for copier, fax (if any), telephones, and other office equipment.

#### PART 2 – PRODUCTS

##### 2.01 FIELD OFFICE (TWO TRAILERS)

- A. Provide two field office trailers (i.e., one for the Contractor and one for the Engineer and NYSDEC).
- B. The field office trailers shall:
  - 1. Consist of a weather-tight, insulated Mobile Office manufactured by ModSpace (or equivalent) and provide a minimum of 400 square feet of floor space (with a 10-foot minimum width) and shall be partitioned to provide three separate office spaces (one for which will serve as a shared common area). A minimum of two outside doors will be required. A sign reading "All Site Visitors Must Sign-In Here" shall be affixed to the trailer exterior of the Contractor's trailer.

2. Be equipped with windows with insect screen and operable sash. Provide each window with lock and exterior security bars approved by the Engineer.
  3. Be equipped with two doors for ingress and egress, each with landing, stairs, and railing conforming to building codes at the site.
    - a. Landing and stairs shall be metal, pressure-treated wood, fiberglass, or concrete, and have slip-resistant walking surfaces.
    - b. Railing shall be metal, wood, or fiberglass.
    - c. Doors shall be secure and lockable, and each furnished with suitable lockable security bar by MasterLock or equal.
    - d. Furnish to Engineer and NYSDEC two identical sets of keys suitable for operating all keyed locks, including ingress/egress door locks, security bards for doors, window locks, closets, and office furnishings.
- C. Provide and maintain, in accordance with all applicable codes and regulations, the fire protection system (e.g., fire extinguishers, sprinklers, etc.) and electric, heating, and cooling services for the office trailers.

## 2.02 FIELD OFFICE UTILITIES

- A. Comply with Section 01 51 00 - Temporary Utilities.
- B. Provide the following for each field office:
1. Electrical System and Lighting:
    - a. Electric service as required, including paying all costs.
    - b. Interior lighting of 50 foot-candles at desktop height.
    - c. Minimum of eight 120-volt, wall-mounted, duplex convenience electrical receptacles.
    - d. Exterior, wall-mounted, 250-watt lighting at each entrance.
  2. Heating, Ventilating, and Air Conditioning:
    - a. Automatic heating to maintain indoor temperature of at least 65 degrees F in cold weather.
    - b. Automatic cooling to maintain indoor temperature no warmer than 75 degrees F in warm weather.
    - c. Furnish all fuel and pay all utility costs.
  3. Telephone Service:
    - a. Private telephone service, including payment of installation, monthly, and service costs.
    - b. Provide four telephone lines, two for voice and two for fax service (four lines total), each with separate telephone number assigned by the telephone company.
  4. Pay for unlimited local and long-distance service for duration of the Project.
  5. Internet Service:
    - a. Obtain and pay for Internet service, with unlimited (untimed) Internet access, until removal of field office trailers.
    - b. Provide fiber-optic or cable connection with appropriate modem and appurtenances, and dual-band Wireless-N router.
    - c. Minimum Speed: Up to 15 megabits per second download, up to 1 megabit per second upload.
    - d. Set up system and appurtenances required and verify functionality in each field office space.
- C. Should actions of utility companies delay the complete set up of field offices, Contractor shall provide temporary electricity, heat, telephone, and internet service as required at no additional cost to Owner.

## 2.03 FIELD OFFICE FURNISHINGS AND EQUIPMENT

- A. Provide the following furnishings and equipment for each field office:
1. Desks: Four five-drawer desks, each five feet long by 2.5 feet wide with at least one file drawer per desk suitable for storing 8.5-inch by 11-inch documents.
  2. Desk Chairs: Four new or used (in good condition) five-point, high backed, cushioned swivel chairs.
  3. Other Chairs: Ten metal folding chairs without arm rests.
  4. Tables:
    - a. Two new or used (in good condition) portable folding tables, each eight feet long by 2.5 feet wide.
    - b. Two new or used (in good condition) portable folding tables, each six feet long by 2.5 feet wide.
  5. Plan rack(s) to hold a minimum of eight sets of the Drawings.
  6. Two four-drawer, legal size, fire-proof file cabinets with locks.
  7. Four polyethylene waste baskets, each with minimum capacity of seven gallons.
  8. Suitable doormat at each exterior ingress/egress door.
  9. One tack board, approximately three feet long by 2.5 feet wide, with thumbtacks.
  10. One white board for use with dry markers, approximately six feet long by four feet wide, with marker holding tray, installed by Contractor at location selected by Engineer in the field. Furnish supply of colored markers and eraser for the white board.
  11. Fire extinguisher with associated signage, and smoke detector, in accordance with Laws and Regulations. At a minimum, provide two wall-mounted fire extinguishers and one battery-operated, ceiling-mounted smoke detector. Comply with fire protection requirements of Section 01 51 00 (Temporary Utilities).
  12. One first-aid station. Comply with Section 01 52 16 (First Aid Facilities).
  13. Two electric clocks.
  14. One electric coffee maker with ten-cup capacity or larger.
  15. One microwave oven with minimum capacity of 0.9 cubic foot.
  16. Two refrigerators, each with minimum capacity of 2.5 cubic feet.
  17. Bottled water with electric cooler dispenser for five-gallon bottles, with cup dispenser.
  18. Multifunction Printer:
    - a. Two new or used (in good condition) machines with the following functions:
      - 1) Photocopying.
      - 2) Network printing.
      - 3) Scanning to produce PDF and JPG files.
      - 4) E-mail.
      - 5) Fax via telephone line.
    - b. Products and Manufacturers: Provide one of the following:
      - 1) Brother MFC-j430w printer.
      - 2) Xerox WorkCentre Pro 7345
      - 3) Canon imageRUNNER C3380
      - 4) Toshiba eSTUDIO3510C
      - 5) Approved equal.
    - c. Provide necessary cables and appurtenances to enable all functions specified in this Section, including scan-and-email and printing from field office computers.
  19. Telephone System:
    - a. Telephone System Features:
      - 1) Provide two cordless telephones, each with hands-free speaker, speed dialing with minimum of 16 programmable numbers, volume control, LCD display, and buttons for hold and mute.
      - 2) Set up and verify operation of each telephone set.
    - b. Provide two digital telephone answering machines.

- B. Provide two-way portable radios and charging units for Engineer, and key Contractor personnel (e.g., superintendent, foreman, etc.).

#### 2.04 STORAGE AND WORK SHEDS

- A. Provide storage and work sheds sized, furnished, and equipped to accommodate personnel, materials, and equipment involved in the Work, including temporary utility services and facilities required for environmental controls sufficient for personnel, materials, and equipment.

### PART 3 – EXECUTION

#### 3.01 INSTALLATION

- A. Install field offices and related facilities in accordance with Laws and Regulations.
- B. Install materials and equipment, including pre-fabricated structures, in accordance with manufacturer's instructions.

#### 3.02 CLEANING, MAINTENANCE, AND SUPPLIES

- A. Provide the following maintenance services:
  - 1. Immediately repair malfunctioning, damaged, leaking, or defective field offices, sheds, site improvements, systems, and equipment.
  - 2. Provide all supplies and pay for maintenance on copiers.
  - 3. Promptly provide snow removal for field offices, including parking areas, walkways, and stairs and landings.
  - 4. Provide continuous maintenance and janitorial service of field offices and sanitary facilities. Clean field offices at least once per week.
  - 5. Properly dispose of trash as needed, at least twice per week. Dispose of other waste, if any, as required, to avoid creation of nuisances.
- B. Provide the following consumables as needed:
  - 1. Light bulbs for interior and exterior lights.
  - 2. Toner or ink cartridges for multifunction printers, as required.
  - 3. Paper supplies for multifunction printers.
  - 4. Dry markers in six colors and white board eraser set.
  - 5. Bottled water suitable for water dispensers and disposable cups.
  - 6. Coffee supplies, including disposable cups, filters, coffee, sugar, creamer, and stir-sticks.
  - 7. Soap, paper towels, cleansers, sanitary supplies, and janitorial implements, including broom.
  - 8. Batteries for smoke detector and other battery-powered items furnished by Contractor.
  - 9. Replace fire extinguishers upon expiration.
  - 10. Replenish contents of first-aid kits as required.

#### 3.03 REMOVAL

- A. Do not remove field offices and sheds until after Substantial Completion. Restore areas upon removal and prior to final inspection.

- B. Remove field offices and sheds and restore areas upon removal and prior to final inspection.

END OF SECTION



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NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

FIELD OFFICES AND SHEDS  
01 52 13 – 6  
REVISION NO. 00  
DATE ISSUED: NOVEMBER 2020

## SECTION 01 52 16

### FIRST-AID FACILITIES

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. Provide first-aid facilities during the Project.
    - a. Pay all costs for first-aid facilities, including installation, maintenance, and removal.
    - b. Maintain, including cleaning, first-aid facilities. Keep first-aid facilities continuously supplied with consumables.
    - c. Facilities shall be adequate for personnel using the site and requirements of the Project.
    - d. Provide facilities in compliance with Laws and Regulations.

##### 1.02 REFERENCE STANDARDS

- A. The following standards are referenced in this Section:
  - 1. ANSI Z308.1, Minimum Requirements for Workplace First Aid Kits and Supplies.
  - 2. ANSI Z358.1, Emergency Eye Wash and Shower Equipment.

##### 1.03 REQUIREMENTS FOR FIRST-AID FACILITIES

- A. Provide temporary first-aid stations at or immediately adjacent to the site's major work areas, and inside the temporary field office. Locations of first-aid stations shall be determined by Contractor's safety representative. At a minimum, first-aid stations provided shall include:
  - 1. One first-aid kit complying with ANSI Z308.1.
  - 2. One eyewash station complying with ANSI Z358.1.
- B. Provide list of emergency telephone numbers at each hardwired telephone at the site. List shall be in accordance with the list of emergency contact information required in Section 01 35 29 - Contractor's Health and Safety Plan.
- C. When Work is in progress, provide at the site at least one person trained in first-aid and cardiopulmonary resuscitation (CPR). First-aid- and CPR-trained personnel shall possess valid certificate indicating that they have successfully completed a first-aid and CPR training course by the American Red Cross or similar entity.

#### PART 2 – PRODUCTS (NOT USED)

#### PART 3 – EXECUTION

##### 3.01 INSTALLATION

- A. Location of temporary first-aid facilities shall be as specified in Part 1.03 of this Section.

### 3.02 USE

- A. Properly supervise temporary first-aid facilities.
- B. Properly dispose of wastes.
- C. Check temporary first-aid stations not less than weekly and verify that sufficient consumables are available. Provide additional consumables if the supply on hand is insufficient.

### 3.03 REMOVAL

- A. Completely remove temporary first-aid facilities and materials when no longer required. Repair damage caused by temporary first-aid facilities and their removal, and restore the site to condition required by the Contract Documents. If restoration of damaged areas is not specified, restore to pre-construction condition.

END OF SECTION

## SECTION 01 52 19

### SANITARY FACILITIES

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. Providing all temporary facilities required for the Project.
    - a. Making all arrangements with temporary sanitary facility companies for sanitary services and obtain required permits and approvals for temporary sanitary services.
    - b. Paying all temporary sanitary facility service costs, including cost of electricity, water, fuel, and other utility services required for the Work.
    - c. Continuously maintaining, including cleaning, adequate temporary sanitary facilities for all purposes during the Project, until removal of temporary sanitary facilities. At minimum, provide and maintain temporary sanitary facilities through Substantial Completion and removal of temporary field offices and sheds. Provide consumables as required.
    - d. Provide sanitary facilities in compliance with Laws and Regulations.

##### 1.02 REQUIREMENTS FOR TEMPORARY SANITARY FACILITIES

- A. Provide and maintain a minimum of two suitably-enclosed chemical or self-contained toilets and suitable temporary washing facilities for employees and visitors to the site. Location of temporary toilets and temporary washing facilities shall be acceptable to Owner.
- B. Provide supply of potable drinking water and related facilities and consumables for all personnel using the site.

#### PART 2– PRODUCTS

##### 2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment for temporary sanitary facilities may be new or used but shall be adequate for purposes intended and shall not create unsafe conditions and shall comply with Laws and Regulations.
- B. Provide required materials, equipment, and facilities, including piping, wiring, and controls.

#### PART 3– EXECUTION

##### 3.01 INSTALLATION

- A. Install temporary sanitary facilities in neat, orderly, manner, and make structurally, mechanically, and electrically sound throughout.
- B. Location of Temporary Sanitary Facilities
  - 1. Locate temporary sanitary facilities for proper function and service.

2. Temporary sanitary facilities shall not interfere with or provide hazards or nuisances to:  
The Work under this contract, movement of personnel, traffic areas, materials handling, hoisting systems, storage areas, finishes, or work of utility companies.

C. Modify and extend temporary sanitary facilities as required by progress of the Work.

### 3.02 USE

A. Maintain sanitary facilities to provide safe, continuous service as required.

B. Properly supervise operation of sanitary facilities:

1. Enforce compliance with Laws and Regulations.
2. Enforce safe practices.
3. Prevent abuse of services.
4. Prevent nuisances and hazards caused by temporary sanitary facilities and their use.
5. Prevent damage to finishes.
6. Ensure that temporary sanitary facilities do not interrupt continuous progress of construction.

C. At the end of each work day, check sanitary facilities and verify that sufficient consumables are available to maintain operation until work is resumed at the site. Provide additional consumables if the supply on hand is insufficient.

### 3.03 REMOVAL

A. Completely remove temporary sanitary facilities and materials when no longer required. Repair damage caused by temporary sanitary facilities and their removal and restore the site to condition required by the Contract Documents; if restoration of damaged areas is not specified, restore to preconstruction condition.

END OF SECTION

## SECTION 01 55 26

### MAINTENANCE AND PROTECTION OF TRAFFIC

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Keep all roads, streets, and traffic ways open for passage of traffic and pedestrians during the Work, unless otherwise approved by the owner of the street, traffic way, or right-of-way, as applicable.
2. Construction traffic shall access the site only via entrances(s) indicated on the Design Drawings.
3. Maintenance and protection of traffic shall be in accordance with all Laws and Regulations, including the New York State Department of Transportation Manual of Uniform Traffic Control Devices.

###### B. Coordination:

1. Coordinate with the owner of the highway or street right-of-way, as applicable, for maintenance and protection of traffic requirements.
2. Give required advance notice to fire departments, police departments, and other emergency services as applicable of proposed construction operations.
3. Give reasonable notice to owners or tenants of private property who may be affected by construction operations.

###### C. Related Sections:

1. Section 01 71 33 - Protection of Work and Property.
2. Section 31 23 00 - Excavation and Fill.

##### 1.02 SUBMITTALS

###### A. Informational Submittals: Submit the following:

1. Traffic Maintenance and Protection Plan: Detailed plan, procedures, and sequencing for maintaining and protecting traffic in accordance with the Contract Documents and requirements of authorities having jurisdiction. Include in the submittal the following:
  - a. Traffic staging plan, and construction sequencing as applicable to maintain and protect traffic.
  - b. Product data, including manufacturer's catalog information and specifications, for temporary signage, temporary signals, temporary illumination devices, and other products to be utilized in maintaining and protecting traffic.
  - c. Indication of number and types of personnel dedicated to maintaining and protecting traffic during construction.
  - d. Location of traffic controls to be installed.

#### PART 2– PRODUCTS (NOT USED)

## PART 3– EXECUTION

### 3.01 GENERAL PROVISIONS

- A. When required to cross, obstruct, or temporarily close a street or traffic way, provide and maintain suitable bridges, detours, or other acceptable temporary expedient for the accommodation of traffic. Closings shall be for shortest duration practical, and passage shall be restored immediately after completion of the Work.
- B. Temporary Control Devices:
  - 1. Provide temporary signs, signals, barricades, flares, lights, and other equipment, services, and personnel required to regulate and protect traffic and warn of hazards.
  - 2. Such Work shall comply with requirements of authorities having jurisdiction at the site.
  - 3. Remove temporary equipment and facilities when no longer required, and restore grounds to pre-construction conditions.
- C. Keep accessible for use permanent facilities such as hydrants, valves, fire alarm boxes, postal boxes, delivery service boxes, and other facilities that may require access during construction.

### 3.02 TRAFFIC SIGNALS AND SIGNS

- A. Provide and operate temporary traffic controls and directional signals required to direct and maintain an orderly flow of traffic in areas under Contractor's control, and areas affected by construction operations.
- B. Provide temporary traffic controls and directions signals, mounted on temporary barriers or standard posts, at the following locations:
  - 1. Detours and areas of hazard.
  - 2. Traffic entrance to and exit from each construction area.

### 3.03 TRAFFIC CONTROL PERSONNEL

- A. General:
  - 1. When construction operations encroach on traffic lanes, furnish qualified and suitably equipped traffic control personnel as required for regulating traffic and in accordance with requirements of authorities having jurisdiction.
  - 2. Traffic control personnel shall use appropriate flags or mobile signs.
  - 3. Equip traffic control personnel with appropriate personal protection equipment and suitable attire.
  - 4. Attire and conduct of traffic control personnel shall be appropriate and shall not create nuisances or distraction for traffic.

### 3.04 FLARES AND LIGHTS

- A. During periods of low visibility, provide temporary flares and lights for the following:
  - 1. To clearly delineate traffic lanes, to guide traffic, and to warn of hazardous areas.
  - 2. For use by traffic control personnel directing traffic.
- B. Provide adequate illumination of traffic and parking areas.

### 3.05 PARKING CONTROLS

- A. Control Contractor-related vehicular parking at the site to preclude interfering with traffic and parking, access by emergency vehicles, and construction operations.

### 3.06 REMOVAL

- A. Maintain and protect traffic until Substantial Completion, and at all times thereafter when Contractor is working at the site. Provide maintenance and protection of traffic measures at the site until no longer required due to the progress of the Work. When no longer required, completely remove maintenance and protection of traffic measures and restore site to pre-construction conditions.

END OF SECTION



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SECTION 01 57 05  
TEMPORARY CONTROLS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope:
1. Providing and maintaining methods, equipment, materials, and temporary construction as required to control environmental conditions at the site and adjacent areas.
  2. Maintain temporary controls until no longer required.
  3. Temporary controls include, but are not limited to, the following:
    - a. Erosion and sediment controls.
    - b. Control of surface water, including storm water run-off.
    - c. Odor, vapor, and dust controls.
    - d. Pollution controls.
    - e. Noise controls.
- B. Related Sections:
1. Section 01 34 43.13 - Environmental Procedures for Hazardous Materials.
  2. Section 01 35 49 - Community Air Monitoring Plan.
  3. Section 01 41 26 - Storm Water Pollution Prevention Plan and Permit.
  4. Section 01 74 05 - Cleaning.
  5. Section 31 23 00 - Excavation and Fill.

1.02 REFERENCE STANDARDS

- A. The following standards are referenced in this Section:
1. AASHTO M 288, Standard Specification for Geotextile Specification for Highway Applications.

1.03 QUALITY ASSURANCE

- A. Regulatory Requirements:
1. Comply with applicable provisions and recommendations of the following:
    - a. NYSDEC New York State Standards and Specifications for Erosion and Sediment Control.
    - b. NYSDOT Standard Specifications and Standard Sheets.

1.04 SUBMITTALS

- A. Action Submittals:
1. Product Data: Submit manufacturer's product data, specifications, and installation instructions for the following:
    - a. Fiber roll.
    - b. Vapor mitigation agents and proposed application and storage equipment for each.

## PART 2 – PRODUCTS

### 2.01 EROSION AND SEDIMENT CONTROLS

- A. General:
  - 1. Materials used for erosion and sediment controls shall be in accordance with the applicable regulatory requirements indicated in Part 1.03 of this Section, unless otherwise shown or indicated in the Contract Documents.
- B. Fiber Roll:
  - 1. Fiber Roll shall be a minimum of 9 inches in diameter and follow selected manufacturer material recommendations.
  - 2. Fiber Roll Support:
    - a. Concrete blocks or sand bags shall be used to stabilize the Fiber Roll.

### 2.02 ODOR, VAPOR, AND DUST CONTROLS

- A. Vapor Mitigation Agents: Provide the following:
  - 1. BioSolve® Pinkwater®, by The BioSolve Company.
  - 2. AC-645 Long-Duration Foam, by Rusmar, Inc.
- B. Water: Clean, potable.
- C. Provide pressure washers, pneumatic foam unit, portable tanks, hoses, and other equipment required for the storage and application of vapor mitigation agents and water.

## PART 3 – EXECUTION

### 3.01 EROSION AND SEDIMENT CONTROL

- A. Installation and Maintenance – General:
  - 1. General:
    - a. Provide erosion and sediment controls as shown and indicated on the Design Drawings and elsewhere in the Contract Documents. Provide erosion and sediment controls as the Work progresses into previously undisturbed areas.
    - b. Installation of erosion and sediment controls shall be in accordance with the applicable regulatory requirements indicated in Part 1.03 of this Section, unless otherwise shown or indicated in the Contract Documents.
    - c. Use necessary methods to successfully control erosion and sedimentation, including ecology-oriented construction practices, vegetative measures, and mechanical controls. Use best management practices in accordance with Laws and Regulations, and regulatory requirements indicated in Part 1.03 of this Section, to control erosion and sedimentation during the Project.
    - d. Plan and execute construction, disturbances of soils and soil cover, and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation. Provide temporary measures for controlling erosion and sedimentation, as indicated in the Contract Documents and as required for the Project.
    - e. Where areas must be cleared for storage of materials or equipment, or for temporary facilities, provisions shall be made for regulating drainage and controlling erosion and sedimentation, subject to Engineer's approval.

- f. Provide erosion and sediment controls, including stabilization of soils, at the end of each work day.
2. Coordination:
  - a. Coordinate erosion and sediment controls with this Section's requirements on water control and with Section 01 41 26 - Storm Water Pollution Prevention Plan and Permit.
  - b. Coordinate temporary erosion and sediment controls with construction of permanent drainage facilities and other Work to the extent necessary for economical, effective, and continuous erosion and sediment control.
3. Before commencing activities that will disturb soil or soil cover at the site, provide all erosion and sediment control measures required by the Contract Documents for the areas where soil or soil cover will be disturbed.
4. In general, implement construction procedures associated with, or that may affect, erosion and sediment control to ensure minimum damage to the environment during construction. Contractor shall implement any and all additional measures required to comply with Laws and Regulations, and Section 01 41 26 - Storm Water Pollution Prevention Plan and Permit.
5. Earthwork and Temporary Controls:
  - a. Perform excavation, fill, and related operations in accordance with Section 31 23 00 - Excavation and Fill.
  - b. Control erosion to minimize transport of silt from the site into existing waterways and surface waters. Such measures shall include, but are not limited to, using berms, fiber roll, straw bale dikes, gravel or crushed stone, slope drains, and other methods. Apply such temporary measures to erodible materials exposed by activities associated with the Work.
  - c. Hold to a minimum the areas of bare soil exposed at one time.
  - d. Construct fills and waste areas by selectively placing fill and waste materials to eliminate surface silts and clays that will erode.
6. Inspection and Maintenance:
  - a. Periodically inspect areas of earthwork and areas where soil or soil cover are disturbed to detect evidence of the start of erosion and sedimentation; apply corrective measures as required to control erosion and sedimentation. Continue inspections and corrective measures until soils are permanently stabilized and permanent vegetation has been established.
  - b. Inspect and report not less often than the frequency specified in Section 01 41 26 - Storm Water Pollution Prevention Plan and Permit.
  - c. Repair or replace damaged erosion and sediment controls within one day of Contractor becoming aware of such damage.
  - d. Periodically remove silt and sediment that has accumulated in or behind sediment and erosion controls. Properly dispose of silt and sediment.
7. Duration of Erosion and Sediment Controls:
  - a. Maintain erosion and sediment controls in effective working condition until the associated drainage area has been permanently stabilized.
  - b. Maintain erosion and sediment controls until the site is restored and site improvements including landscaping, if any, are complete with underlying soils permanently stabilized.
8. Work Stoppage: If the Work is temporarily stopped or suspended for any reason, Contractor shall provide additional temporary controls necessary to prevent environmental damage to the site and adjacent areas while the Work is stopped or suspended.
9. Failure to Provide Adequate Controls: In the event Contractor repeatedly fails to satisfactorily control erosion and siltation, Owner reserves the right to employ outside assistance or to use Owner's own forces for erosion and sediment control. Cost of such

work, plus engineering and inspection costs, will be deducted from monies due to Contractor.

B. Protection of Storm Water Drainage Inlets and Catch Basins:

1. Protect each drainage inlet and catch basin that has the potential to receive storm water run-off from exposed soils.
2. Install inlet filter bags inside of drainage inlet or catch basin in accordance with manufacturer's instructions. Secure inlet filter bag with the structure's grate or by other acceptable means.
3. Inlet filter bags shall not pose any obstruction above the elevation of the drainage inlet or catch basin grate requiring barricades or flashers.
4. When removing silt and sediment from inlet filter bag, do not dump filter bag's contents into the drainage inlet or catch basin.
5. Remove silt and sediment from inlet filter bag, or replace inlet filter bag, when inlet filter bag is not more than half full.

### 3.02 SURFACE WATER CONTROL

A. General:

1. Provide methods to control surface water to prevent damage to the Work, the site, and adjoining properties.
2. Control fill, grading, and ditching to direct surface water away from disturbed areas, excavations, pits, tunnels, and other construction areas, and to direct drainage to proper run-off courses to prevent erosion, damage, or nuisance.

B. Equipment and Facilities for Surface Water Control:

1. Provide, operate, and maintain equipment and facilities of adequate size to control surface water.

C. Discharge and Disposal:

1. Dispose of surface water in a manner to prevent flooding, erosion, and other damage to any and all parts of the site and adjoining areas, and that complies with Laws and Regulations.

### 3.03 ODOR, VAPOR, AND DUST CONTROL

A. General:

1. Provide means, methods, and facilities required to control MGP-related odors, vapors, and dust generated during the Work.
2. Proactively employ odor, vapor, and dust controls during the Work, and evaluate and modify construction techniques and site management practices, as necessary and appropriate, to:
  - a. Mitigate MGP-related odor emissions to the extent practicable, and to the satisfaction of Owner, Engineer, and NYSDEC.
  - b. Prevent exceedances of the community air monitoring action levels specified in the Community Air Monitoring Plan.
3. If Contractor's means, methods, and facilities are unsuccessful in controlling MGP-related odors, vapors, and dust as specified in this Section, based on visual observations or the results of community air monitoring, Work shall be suspended until appropriate corrective actions are taken by Contractor to remedy the situation to Engineer's satisfaction. Owner will not be liable for any expense or delay resulting from Contractor's failure to control MGP-related odors, vapors, and dust in accordance with this Section.

- B. Vapor Mitigation Agents:
1. Mobilize vapor mitigation agents and means of storage and dispersion at the site before initiating any ground-intrusive Work or dust-generating Work.
  2. Application of vapor mitigation agents shall be as follows:
    - a. BioSolve Pinkwater:
      - 1) Prepare three-percent solution (or per manufacturer's recommendations) of BioSolve® Pinkwater® concentrate and water. Apply to exposed soils and excavation faces using backpack sprayers, power washers, or misters.
      - 2) Apply when actively excavating, when actively handling excavated materials, and as required by Owner or Engineer.
    - b. AC-645 Long-Duration Foam:
      - 1) Prepare 13-percent solution (or per manufacturer's recommendations) of AC-645 Long-Duration Foam concentrate and water. Apply to excavation faces and uncovered stockpiles of excavated materials using pneumatic foam unit. Completely and uniformly cover exposed soil surfaces with minimum three inches of foam.
      - 2) Apply before each work break, at the end of each work day, and as required by Owner or Engineer.
- C. Construction Techniques and Site Management Practices:
1. Excavate and backfill, and load, handle, and unload excavated materials and clean fill materials, in manner that minimizes the generation of airborne dust.
  2. Haul excavated materials and clean fill materials in properly covered vehicles.
  3. Restrict vehicle speeds on temporary access roads and active haul routes.
  4. Cover shallow excavations and stockpiles of clean fill materials with polyethylene liners before extended work breaks and at the end of each work day. Anchor liners to resist wind forces; slope to prevent accumulation of water.
  5. Hold to a minimum the areas of bare soil exposed at one time.
  6. Comply with progress cleaning requirements of Section 01 74 05 - Cleaning.

### 3.04 POLLUTION CONTROL

- A. General:
1. Provide means, methods, and facilities required to prevent contamination of soil, water, and atmosphere caused by discharge of noxious substances from construction operations.
  2. Equipment used during construction shall comply with Laws and Regulations.
  3. Comply with Section 01 35 43.13 - Environmental Procedures for Hazardous Materials.
- B. Spills and Contamination:
1. Provide equipment, materials, and personnel to perform emergency measures required to contain and clean up spills, and to remove soils and liquids contaminated by spills.
  2. Provide spill kits, including oil-absorbent pads, socks, and booms, at or immediately adjacent to the site's major work areas and equipment storage and fueling areas.
  3. Immediately notify Owner or Engineer of all spills, regardless of material, volume, or circumstances involved.
  4. Excavate contaminated material and properly dispose of off-site and replace with suitable compacted fill and topsoil.
- C. Protection of Surface Waters:
1. Implement special measures to prevent harmful substances from entering surface waters. Prevent disposal of wastes, effluents, chemicals, and other such substances in

or adjacent to surface waters and open drainage routes, in sanitary sewers, or in storm sewers.

D. Atmospheric Pollutants:

1. Provide systems for controlling atmospheric pollutants related to the Work.
2. Prevent toxic concentrations of chemicals and vapors.
3. Prevent harmful dispersal of pollutants into atmosphere.

E. Solid Waste:

1. Provide systems for controlling and managing solid waste related to the Work.
2. Prevent solid waste from becoming airborne, and from discharging to surface waters and drainage routes.
3. Properly handle and dispose of solid waste.

### 3.05 NOISE CONTROL

- A. Contractor's vehicles, equipment, and operations shall minimize noise emissions to the greatest degree practicable. Provide mufflers, silencers, and sound barriers when necessary, or as directed by Owner or Engineer.
- B. Noise levels shall comply with all applicable Laws and Regulations, including OSHA requirements and local ordinances.
- C. Noise emissions shall not interfere with the Work of Owner or others.

### 3.06 PROHIBITED CONSTRUCTION PROCEDURES

- A. Prohibited construction procedures include, but are not limited to, the following:
1. Dumping or disposing of spoil material, cleared vegetation, debris, or other waste material in any surface waters, drainage ways, or other unauthorized locations.
  2. Indiscriminate, arbitrary, or capricious operation of equipment in any surface waters, drainage ways, or other unauthorized locations.
  3. Pumping of silt-laden water from trenches or other excavations to any surface waters, drainage ways, sewers, or other unauthorized locations.
  4. Damaging vegetation beyond the extent necessary for construction.

### 3.07 REMOVAL OF TEMPORARY CONTROLS

- A. Remove temporary controls only when directed by Owner or Engineer.

END OF SECTION

## SECTION 01 57 33

### SITE SECURITY

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Safely guard all Work, the Project, products, materials, equipment, and property from loss, theft, damage, and vandalism until Substantial Completion, or as otherwise directed by the Owner. Safely guard property in the vicinity of the Work, the site, and other private property in the vicinity of the Project from injury and loss in connection with the performance of the Work.
2. Make no claim against the Owner for damage resulting from trespass.
3. Provide temporary fencing and temporary gates in accordance with the Contract Documents and this Section.

##### 1.02 SUBMITTALS

###### A. Action Submittals:

1. Shop Drawings: Submit drawings showing proposed locations and extent of temporary fencing and gates at the site.
2. Product Data: Submit manufacturer's data, specifications, and installation instructions for temporary fencing, temporary gates, and privacy screens.

###### B. Informational Submittals:

1. Daily Security Logs: Submit in accordance with Paragraph 1.03.A of this Section.

##### 1.03 SITE ACCESS AND SECURITY PROCEDURES

- ###### A.
- Maintain a daily security log of all site workers and visitors throughout the Project. Include the date, name, affiliation, purpose of visit, time in, and time out for each site worker and visitor. Submit copy of daily security log to with daily construction report in accordance with Section 01 32 26 - Construction Progress Reporting.

#### PART 2 – PRODUCTS

##### 2.01 TEMPORARY FENCING AND GATES

###### A. Temporary Fencing:

1. Provide portable chain-link fence panels with minimum height of six feet in the location shown on the Design Drawings. Fence fabric and framework shall be galvanized steel.

###### B. Temporary Jersey Wall Barriers with Chain-Link Fencing:

1. Provide portable chain-link fence panels with minimum height of six feet set in concrete jersey barriers in the location shown on the Design Drawings.
2. Fence fabric shall be galvanized steel.



C. Temporary Gates:

1. Provide chain-link swing gates with minimum height of six feet and minimum width of sixteen-feet-two-inches. Gate fabric and framework shall be galvanized steel.
2. Provide suitable locking mechanism for each temporary gate.

2.02 RELATED MATERIALS

A. Privacy Screens: Provide privacy screens for all temporary fencing and gates used for site.

1. Size: Match to height of fence fabric.
2. Color: Green or black.
3. Opacity: 85 percent, minimum.

PART 3 – EXECUTION

3.01 TEMPORARY FENCING AND GATES

A. Installation:

1. Install temporary fencing and gates used for site security in accordance with the Contract Documents and manufacturer's instructions.
2. Install privacy screens in accordance with manufacturer's instructions on all temporary fencing and gates used for site security.

B. Maintenance:

1. Maintain temporary fencing and gates throughout the Project. Repair damage to temporary fencing and gates and replace fencing and gates when required to maintain site security.
2. Adjust or relocate temporary fencing and gates at the site as needed to accommodate the Work and construction sequencing.
3. Maintain privacy screens throughout the Project. Promptly repair or replace damaged privacy screens.

C. Removal:

1. Remove temporary fencing and gates upon Substantial Completion, or when otherwise directed by the Owner or Engineer.
2. Repair damage caused by temporary fencing and gates and their removal and restore the site to condition required by the Contract Documents. If restoration of damaged areas is not specified, restore to pre-construction condition.

END OF SECTION

## SECTION 01 58 13

### TEMPORARY PROJECT SIGNAGE

#### PART 1 – GENERAL

##### 1.01 SUMMARY

###### A. Scope:

1. Furnish and install temporary signage as specified in this Section for Project identification and construction site information.
2. Temporary signs include:
  - a. Project identification signs.
  - b. Project hotline signs.
  - c. Danger signs.
  - d. Security signs.
3. Do not display any other temporary signs, other than those specified, without prior approval of Owner.
4. Maintain temporary signs until Substantial Completion, or as otherwise directed by Owner.

##### 1.02 SUBMITTALS

###### A. Action Submittals:

1. Shop Drawings: Submit Shop Drawings showing layout, text, font, character size, colors, graphics or logos (if any), materials of construction, and dimensions of each temporary sign, and the proposed locations and orientations of temporary signs at the site.

#### PART 2 – PRODUCTS

##### 2.01 MATERIALS AND CONSTRUCTION

###### A. Project Identification Signs:

1. Project identification signs, including layout, fonts, logos, and colors, shall be as specified in the NYSDEC guidance document included with this Section.
2. Location: Mounted on fencing at the site entrance.
3. Text Inserts: Text inserts shall be centered horizontally on sign board in the specified locations.
  - a. Program Name: "STATE SUPERFUND PROGRAM".
  - b. Site Name: "NON-OWNED RENSSELAER FORMER MGP SITE".
  - c. Site Number: "SITE NO. 4-42-057".
  - d. NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
  - e. Governor: "GOVERNOR ANDREW M. CUOMO". (*or current*)
  - f. Commissioner: "COMMISSIONER BASIL SEGGOS". (*or current*)
  - g. Municipal Executive: "MICHAEL STAMMEL, MAYOR". (*or current*)
  - h. Tag Line: "TRANSFORM THE PAST...BUILD FOR THE FUTURE"
4. Background Color: White.
5. Text Height: 1.5 inches, minimum.
6. Printing: Digital or screen printing with ultraviolet-resistant inks.
7. Sign Board:
  - a. Material: medium density plywood with resin coating on both sides or aluminum composite, minimum thickness of three millimeters.

- b. Minimum Dimensions: 96 inches wide by 48 inches high.
    8. Supports and Bracing: Provide supports and bracing as required to adequately support and brace signs for the duration of the Project.
    9. Obtain Engineer approval before releasing for manufacture.
  - B. Project Hotline Signs:
    1. Location: Mounted on fencing at site entrance next to Project identification sign.
    2. Text: Text shall be centered vertically and horizontally on sign board, and shall read as follows:

“SITE HOTLINE: *[Insert telephone number assigned to the Site Hotline]*”
    3. Background Color: White.
    4. Text Color: Black.
    5. Text Height: 1.5 inches, minimum.
    6. Printing: Digital or screen printing with ultraviolet-resistant inks.
    7. Sign Board:
      - a. Material: Aluminum composite, minimum thickness of three millimeters.
      - b. Minimum Dimensions: 96 inches wide by 48 inches high.
    8. Supports and Bracing: Provide supports and bracing as required to adequately support and brace signs for the duration of the Project.
    9. Obtain Engineer approval before releasing for manufacture.
  - C. Danger Signs:
    1. Location: Mounted on fencing at intervals of 100 linear and on either side of temporary site security gate (two signs per gate).
    2. Text: “DANGER” in upper panel and “CONSTRUCTION AREA AUTHORIZED PERSONNEL ONLY” in lower panel.
    3. Background Color: Red upper panel, black outline along border, and white lower panel.
    4. Text Color: White in upper panel and black in lower panel.
    5. Printing: Digital or screen printing with ultraviolet-resistant inks.
    6. Sign Board:
      - a. Material: Treated polyethylene, thickness of 0.055 inch.
      - b. Minimum Dimensions: 14 inches wide by 10 inches high.
    7. Supports and Bracing: Provide supports and bracing as required to adequately support and brace signs for the duration of the Project.
  - D. Security Signs:
    1. Location: Mounted on fencing on each side of temporary site security gate entrance (two signs per site entrance) and at entrances of each field office trailer (one sign per trailer entrance).
    2. Text: “SECURITY NOTICE” in upper panel and “ALL VISITORS MUST SIGN-IN AT THE FIELD OFFICE” in lower panel.
    3. Background Color: Yellow upper panel, black outline along border, and white lower panel.
    4. Text Color: Black for upper and lower panels.
    5. Printing: Digital or screen printing with ultraviolet-resistant inks.
    6. Sign Board:
      - a. Material: Treated polyethylene, thickness of 0.055 inch.
      - b. Minimum Dimensions: 20 inches wide by 14 inches high.
    7. Supports and Bracing: Provide supports and bracing as required to adequately support and brace signs for the duration of the Project.

## PART 3 – EXECUTION

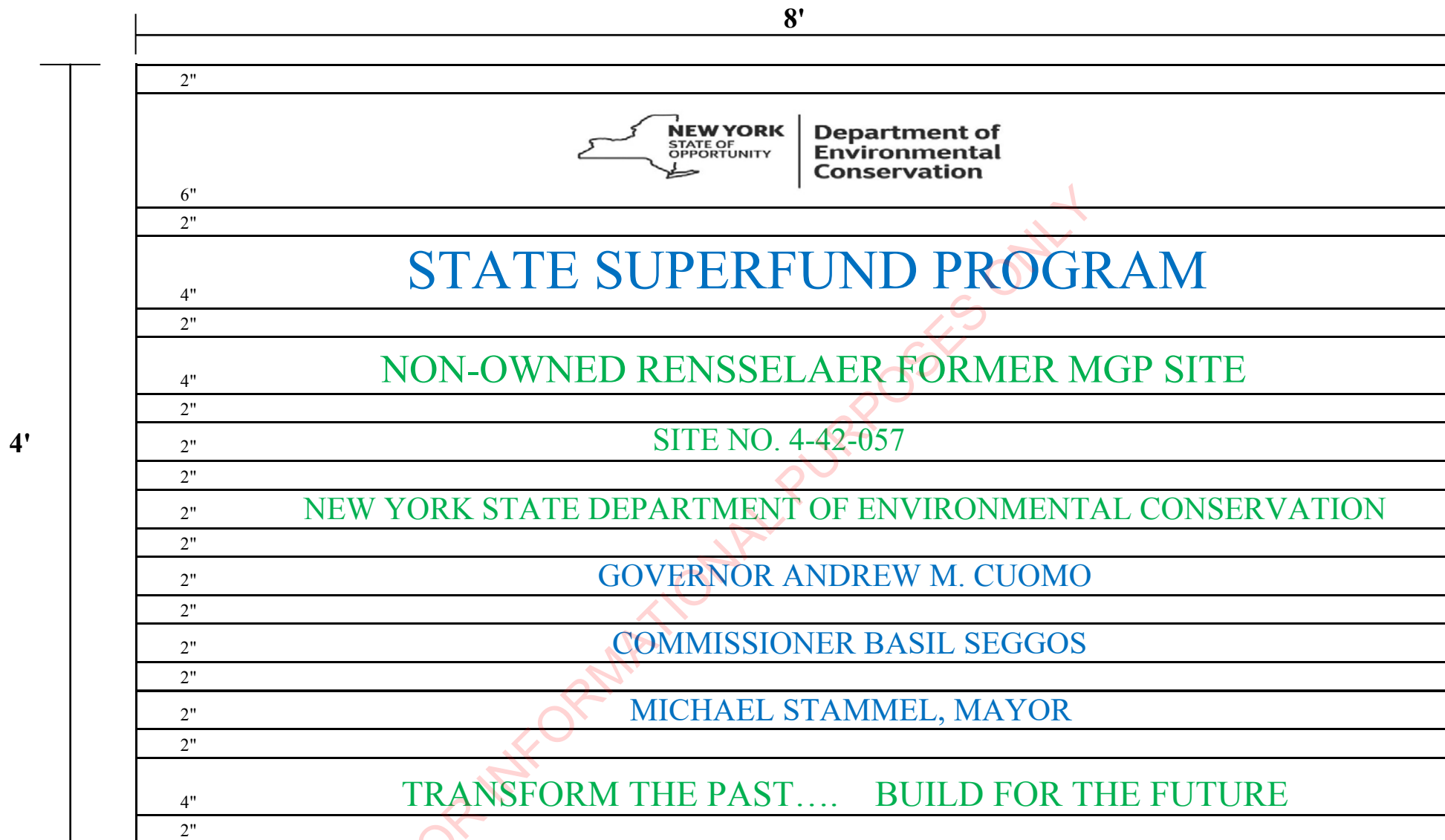
### 3.01 INSTALLATION, MAINTENANCE, AND REMOVAL

- A. Hotline:
  - 1. Procure an answering service to manage calls to the Site Hotline.
  - 2. Establish a phone tree for immediate notification to project team of receipt of call(s) to the site hotline. Phone tree is expected to include:
    - a. New York State Department of Environmental Conservation's (NYSDEC's) Project Manager.
    - b. Engineer.
    - c. Owner.
- B. Installation:
  - 1. Install temporary signs within 14 days of Engineer's approval of the submittal required by this Section.
  - 2. Obtain Owner and Engineer approval of installation locations before installing temporary signs.
- C. Maintenance:
  - 1. Maintain temporary signage so that signs are clean, legible, and upright. Cut grass, weeds, and other plants so that temporary signs are not covered or obscured.
  - 2. Repair or replace damaged temporary signs. Relocate signs as required by progress of the Project.
- D. Remove temporary signs upon Substantial Completion, or as otherwise directed by the Engineer.

### 3.02 ATTACHMENTS

- A. The attachment listed below, which follows after the "End of Section" designation, is part of this Specification Section:
  - 1. Attachment A: Signs for Remedial Programs (two pages).

END OF SECTION



**FIGURE 01045-1**  
**PROJECT SIGN**

SECTION 01 62 00  
PRODUCT OPTIONS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope:
  - 1. This Section includes:
    - a. Contractor's options for selecting products.
    - b. Requirements for consideration of "or-equal" products.

1.02 TERMINOLOGY

- A. The following words or terms are not defined but, when used in this Section, have the following meaning:
  - 1. "Products" includes materials, equipment, machinery, components, fixtures, systems, and other goods incorporated in the Work. Products do not include machinery and equipment used for preparing, fabricating, conveying, erecting, or installing the Work. Products include Owner-furnished goods incorporated in the Work where use of such goods is specifically required in the Contract Documents.

1.03 PRODUCT OPTIONS

- A. For products specified only by reference standard or description, without reference to Supplier, provide products meeting that standard, by a Supplier or from a source that complies with the Contract Documents.
- B. For products specified by naming one or more products or Suppliers, provide the named products that comply with the Contract Documents, unless an "or-equal" or substitute product is approved by Engineer.
- C. For products specified by naming one or more products or Suppliers and the term, "or equal", when Contractor proposes a product or Supplier as an "or equal", submit to Engineer a request for approval of an "or-equal" product or Supplier.
- D. For products specified by naming only one product or manufacturer and followed by words indicating that no substitution is allowed, there is no option and no substitution will be allowed.

1.04 "OR-EQUAL" PRODUCTS

- A. For proposed products not named in the Contract Documents and considered as an "or equal", Contractor shall request in writing Engineer's approval of the "or equal". Request for approval of an "or-equal" product shall accompany the Shop Drawing or product data submittal for the proposed product and shall include:
  - 1. Contractor's request that the proposed product be considered as an "or equal", accompanied by Contractor's certifications.

2. Documentation adequate to show that proposed product:
  - a. Does not require extensive revisions to the Contract Documents.
  - b. Is consistent with the Contract Documents.
  - c. Will produce results and performance required in the Contract Documents.
  - d. Is compatible with other portions of the Work.
3. Detailed comparison of significant qualities of proposed product with the products and manufacturers named in the Contract Documents. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements shown or indicated.
4. Evidence that proposed product manufacturer will furnish warranty equal to or better than specified, if any.
5. List of similar installations for completed projects with project names and addresses, and names and address of design professionals and owners, if requested.
6. Samples, if requested.
7. Other information requested by Engineer.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

## SECTION 01 65 00

### PRODUCT DELIVERY REQUIREMENTS

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. This Section includes general requirements for preparing for shipping, delivering, and handling materials and equipment.
  - 2. Contractor shall make all arrangements for transporting, delivering, and handling of materials and equipment required for prosecution and completion of the Work.
  - 3. When required, move stored materials and equipment without additional compensation and without changes to the Contract Times.

##### 1.02 SUBMITTALS

- A. Refer to individual Specification Sections for submittal requirements relative to delivering and handling materials and equipment.

##### 1.03 PREPARING FOR SHIPMENT

- A. When practical, factory-assemble materials and equipment. Match mark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with strippable, protective coating.
- B. Package materials and equipment to facilitate handling, and protect materials and equipment from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate the associated purchase order number, bill of lading number, contents by name, Owner's contract name and number, Remediation Contractor name, equipment number, and approximate weight. Include complete packing lists and bills of materials with each shipment.
- C. Protect materials and equipment from exposure to the elements and keep thoroughly dry and dust-free at all times. Protect painted surfaces against impact, abrasion, discoloration, and other damage. Lubricate bearings and other items requiring lubrication in accordance with manufacturer's instructions.
- D. Keep Engineer informed of delivery of all materials and equipment to be incorporated in the Work.
- E. Do not ship materials and equipment until:
  - 1. Related Shop Drawings, Samples, and other submittals have been reviewed or accepted (as applicable) by Engineer, including, but not necessarily limited to, all Action Submittals associated with the materials and equipment being delivered.
  - 2. Manufacturer's instructions for handling, storing, and installing the associated materials and equipment have been submitted to and accepted by Remediation Engineer in accordance with the Specifications.
  - 3. Results of source quality control testing (factory testing), when required by the Contract Documents for the associated materials or equipment, have been reviewed and accepted by Engineer.

NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

PRODUCT DELIVERY REQUIREMENTS  
01 65 00 – 1  
REVISION NO. 00  
DATE ISSUED: NOVEMBER 2020



4. Facilities required for handling materials and equipment in accordance with manufacturer's instructions are in place and available.
5. Required storage facilities have been provided.

#### 1.04 DELIVERY

##### A. Scheduling and Timing of Deliveries:

1. Arrange deliveries of materials and equipment in accordance with the accepted Progress Schedule and in ample time to facilitate inspection prior to installation.
2. Schedule deliveries to minimize space required for and duration of storage of materials and equipment at the site or delivery location, as applicable.
3. Coordinate deliveries to avoid conflicting with the Work and conditions at the site, and to accommodate the following:
  - a. Work of other contractors and Owner.
  - b. Storage space limitations.
  - c. Availability of equipment and personnel for handling materials and equipment.
  - d. Owner's use of premises.
4. Deliver materials and equipment to the site during regular working hours.
5. Deliver materials and equipment to avoid delaying the Work and the Project, including work of other contractors, as applicable. Deliver anchor system materials, including anchor bolts to be embedded in concrete or masonry, in ample time to avoid delaying the Work.

##### B. Deliveries:

1. Shipments shall be delivered with Contractor's name, Subcontractor's name (if applicable), site name, Project name, and contract designation clearly marked.
2. Site may be listed as the "ship to" or "delivery" address; but Owner shall not be listed as recipient of shipment unless otherwise directed in writing by Engineer.
3. Provide Contractor's telephone number to shipper; do not provide Owner's telephone number.
4. Arrange for deliveries while Contractor's personnel are at the site. Contractor shall receive and coordinate shipments upon delivery. Shipments delivered to the site when Contractor is not present will be refused by Owner, and Contractor shall be responsible for the associated delays and additional costs, if incurred.
5. Comply with Section 01 35 43.13 - Environmental Procedures for Hazardous Materials.

##### C. Containers and Marking:

1. Have materials and equipment delivered in manufacturer's original, unopened, labeled containers.
2. Clearly mark partial deliveries of component parts of materials and equipment to identify materials and equipment, to allow easy accumulation of parts, and to facilitate assembly.

##### D. Inspection of Deliveries:

1. Immediately upon delivery, inspect shipment to verify that:
  - a. Materials and equipment comply with the Contract Documents and reviewed or accepted (as applicable) submittals.
  - b. Quantities are correct.
  - c. Materials and equipment are undamaged.
  - d. Containers and packages are intact and labels are legible.
  - e. Materials and equipment are properly protected.
2. Promptly remove damaged materials and equipment from the site and expedite delivery of new, undamaged materials and equipment, and remedy incomplete or lost materials and equipment to furnish materials and equipment in accordance with the Contract Documents, to avoid delaying progress of the Work.

3. Advise Engineer in writing when damaged, incomplete, or defective materials and equipment are delivered, and advise Engineer of the associated impact on the Progress Schedule.

#### 1.05 HANDLING OF MATERIALS AND EQUIPMENT

- A. Provide equipment and personnel necessary to handle materials and equipment, including those furnished by Owner, by methods that prevent soiling or damaging materials, equipment, and packaging.
- B. Provide additional protection during handling as necessary to prevent scraping, marring, and otherwise damaging materials, equipment, and surrounding surfaces.
- C. Handle materials and equipment by methods that prevent bending and overstressing.
- D. Lift heavy components only at designated lifting points.
- E. Handle materials and equipment in safe manner and as recommended by the manufacturer to prevent damage. Do not drop, roll, or skid materials and equipment off delivery vehicles or at other times during handling. Hand-carry or use suitable handling equipment.

#### PART 2 – PRODUCTS (NOT USED)

#### PART 3 – EXECUTION (NOT USED)

END OF SECTION

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## SECTION 01 66 00

### PRODUCT STORAGE AND HANDLING REQUIREMENTS

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. This Section includes general requirements for storing and protecting materials and equipment.

##### 1.02 STORAGE

- A. Store and protect materials and equipment in accordance with manufacturer's recommendations and the Contract Documents.
- B. Contractor shall make all arrangements and provisions necessary for, and pay all costs for, storing materials and equipment. Excavated materials, construction equipment, and materials and equipment to be incorporated into the Work shall be placed to avoid injuring the Work and existing facilities and property. Arrange storage in manner to allow easy access for inspection.
- C. Areas available at the site for storing materials and equipment are shown or indicated in the Contract Documents, or as approved by Owner or Engineer.
- D. Store materials and equipment to become Owner's property to facilitate their inspection and ensure preservation of quality and fitness of the Work, including proper protection against damage by freezing, moisture, and high temperatures with ambient temperatures as high as 90 degrees F. Store in indoor, climate-controlled storage areas all materials and equipment subject to damage by moisture, humidity, heat, cold, and other elements, unless otherwise acceptable to Owner.
- E. Contractor shall be fully responsible for loss or damage (including theft) to stored materials and equipment.
- F. Do not open manufacturer's containers until time of installation, unless recommended by the manufacturer or otherwise specified in the Contract Documents.
- G. Do not use lawns or other private property for storage without written permission of the owner or other person in possession or control of such premises.

##### 1.03 PROTECTION

- A. Equipment to be incorporated into the Work shall be boxed, crated, or otherwise completely enclosed and protected during shipping, handling, and storage, in accordance with Section 01 65 00 - Product Delivery Requirements.
- B. Store all materials and equipment off the ground (or floor) on raised supports such as skids or pallets.

- C. Protect painted surfaces against impact, abrasion, discoloration, and other damage. Painted equipment surfaces that are damaged or marred shall be repainted in their entirety in accordance with equipment manufacturer and paint manufacturer requirements, to the satisfaction of Engineer.
- D. Protect electrical equipment, controls, and instrumentation against moisture, water damage, heat, cold, and dust. Space heaters provided in equipment shall be connected and operating at all times until equipment is placed in operation and permanently connected.

#### 1.04 UNCOVERED STORAGE

- A. The following types of materials may be stored outdoors without cover on supports so there is no contact with the ground:
  - 1. Reinforcing steel.
  - 2. Pre-cast concrete materials.
  - 3. Structural steel.
  - 4. Metal stairs.
  - 5. Handrails and railings.
  - 6. Grating.
  - 7. Checker plate.
  - 8. Metal access hatches.
  - 9. Castings.
  - 10. Fiberglass products.
  - 11. Rigid electrical conduit.
  - 12. Piping, except polyvinyl chloride (PVC) or chlorinated PVC (CPVC) pipe.

#### 1.05 COVERED STORAGE

- A. The following materials and equipment may be stored outdoors on supports and completely covered with covering impervious to water:
  - 1. Grout and mortar materials.
  - 2. Masonry units.
  - 3. Rough lumber.
  - 4. Soil materials and granular materials such as aggregate.
  - 5. PVC and CPVC pipe.
  - 6. Filter media.
- B. Tie down covers with rope or anchor with sandbags, and slope covering to prevent accumulation of water.
- C. Store loose soil materials and granular materials, with covering impervious to water, in well-drained area or on solid surfaces to prevent mixing with foreign matter. Place, grade, and shape stockpiles for proper drainage.

#### 1.06 FULLY-PROTECTED STORAGE

- A. Store all material and equipment not named in Articles 1.04 and 1.05 of this Section on supports in buildings or trailers that have concrete or wooden flooring, roof, and fully-closed walls on all sides. Covering with visquine plastic sheeting or similar material in space without floor, roof, and walls is not acceptable. Comply with the following:
  - 1. Provide heated storage for materials and equipment that could be damaged by low temperatures or freezing.

2. Provide air-conditioned storage for materials and equipment that could be damaged by high temperatures.
3. Protect mechanical and electrical equipment from being contaminated by dust, dirt, and moisture.
4. Maintain humidity at levels recommended by manufacturers for electrical and electronic equipment.

#### 1.07 HAZARDOUS PRODUCTS

- A. Prevent contamination of personnel, storage area, and the site. Comply with Laws and Regulations, manufacturer's instructions, and Section 01 35 43.13 - Environmental Procedures for Hazardous Materials.

#### 1.08 MAINTENANCE OF STORAGE

- A. On a scheduled basis, periodically inspect stored materials and equipment to ensure that:
  1. Condition and status of storage facilities is adequate to provide required storage conditions.
  2. Required environmental conditions are maintained on a continuing basis.
  3. Materials and equipment exposed to elements are not adversely affected.

#### 1.09 RECORDS

- A. Keep up-to-date account of materials and equipment in storage to facilitate preparation of Applications for Payment, if the Contract Documents provide for payment for materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing.

### PART 2 – PRODUCTS (NOT USED)

### PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 71 23  
FIELD ENGINEERING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope:
1. Provide field engineering services and professional services of the types indicated for the Project, including furnishing civil, structural, and other engineering services specified or required to execute Contractor's construction methods.

1.02 QUALITY ASSURANCE

- A. Qualifications:
1. Contractor Field Engineer:
    - a. Employ and retain at the site a field engineer with experience and capability of performing all field engineering tasks required of Contractor.
    - b. Responsibilities include, but are not necessarily limited to, the following:
      - 1) Checking all formwork, reinforcing, inserts, structural steel, bolts, sleeves, piping, other materials, and equipment for compliance with the Contract Documents.
      - 2) Maintaining field office files, drawings, and record documents, and coordinating field engineering services with Subcontractors and Suppliers as appropriate. Preparing layout and coordination drawings for construction operations.
      - 3) Checking and coordinating the Work for conflicts and interferences, and immediately advising the Engineer of all discrepancies of which Contractor is aware.
      - 4) Cooperating as required with the Engineer in observing the Work and performing field inspections.
      - 5) Reviewing and coordinating the Work with Shop Drawings and Contractor's other submittals.

1.03 SUBMITTALS

- A. Informational Submittals:
1. Qualifications Statements:
    - a. Contractor Field Engineer: Submit name and address of field engineer. When requested by Engineer, submit qualifications.
  2. Certificates:
    - a. Field Engineering: When requested by Engineer, submit documentation verifying accuracy of field engineering.

PART 2– PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION



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NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

FIELD ENGINEERING  
01 71 23 – 2  
REVISION NO.00  
DATE ISSUED: NOVEMBER 2020

## SECTION 01 71 26

### CONSTRUCTION SURVEYING AND LAYOUT

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Furnishing surveying services specified or required for construction and documentation purposes to execute Contractor's construction methods, including all supervision, labor, tools, materials, equipment, services and appurtenances necessary for, or incidental to, completing all work necessary for performing the surveying activities described herein and preparing required as-built survey drawings of pre-construction, interim, post-removal, and post-restoration grades.
2. Developing and making all detail surveys and measurements required for construction, including slope stakes, batter boards, and all other working lines, elevations, and cut sheets.
3. Providing materials required for benchmarks, control points, batter boards, grade stakes, and other items.
4. Safeguard all survey points and bench marks.
5. Keeping a transit, theodolite, or total station (theodolite with electronic distance measurement device), leveling instrument, and related implements such as survey rods and other measurement devices, at the site at all times, and having a skilled instrument person available when necessary for laying out the Work.
6. Being solely responsible for all locations, dimensions, and levels. No data other than Change Order, Work Change Directive, or Field Order shall justify departure from dimensions and levels required by the Contract Documents.
7. Rectifying all Work improperly installed because of not maintaining, not protecting, or removing without authorization established reference points, stakes, marks, and monuments.
8. Providing such facilities and assistance necessary for the Engineer to check lines and grade points placed by Contractor. Do not perform excavation or backfilling Work until all cross-sectioning necessary for determining payment quantities for Unit Price Work have been completed and accepted by Engineer.

##### 1.02 QUALITY ASSURANCE

###### A. Qualifications:

1. Surveyor:
  - a. Employ or retain the services of a surveyor with experience and capability of performing surveying and layout tasks required in the Contract Documents and as required for the Work. Surveyor shall be a professional land surveyor licensed and registered in the State of New York.
  - b. Responsibilities include, but are not necessarily limited to, the following:
    - 1) Providing required surveying equipment, including transit or theodolite, level, stakes, and surveying accessories.

- 2) Establishing required lines and grades for performing all excavating, filling, compacting, and grading, and for constructing all facilities, structures, pipelines, and site improvements.
  - 3) Preparing and maintaining professional-quality, accurate, well organized, legible notes of all measurements and calculations made while surveying and laying out the Work.
  - 4) Performing such surveys and computations necessary to determine quantities of Work performed, placed, or installed.
  - 5) Performing such surveys necessary to record actual construction, including demolition, excavation, backfilling, and restoration operations.
  - 6) Prior to backfilling operations, surveying, locating, and recording on a copy of the Contract Documents accurate representation of buried Work and Underground Facilities encountered.
  - 7) Preparing certified survey drawings in accordance with Section 01 78 39 - Project Record Documents.
  - 8) Complying with requirements of the Contract Documents relative to surveying and related Work.
- B. When applicable, regularly resurvey benchmarks for comparison with original elevations and positions. Where the Contractor uses a laser for control, periodically check the grade and alignment during each day's operation. The Contractor shall promptly notify the Engineer if changes in elevations or positions occur to be reviewed for consistency with Design Drawings.

### 1.03 SUBMITTALS

- A. Informational Submittals:
1. Survey Plan: Submit surveying plan for conducting all survey Work not less than 10 days prior to starting survey Work.
  2. Survey Field Books:
    - a. Submit example of proposed survey field books to be maintained by Contractor's surveyor. Example shall have sufficient information and detail, including example calculations and notes, to demonstrate that field books will be organized and maintained in a professional manner, complying with the Contract Documents.
    - b. Submit original field books within two days after completing survey Work.
  3. Qualifications Statements:
    - a. Surveyor: Submit name and address of firm, and resumes of each professional land surveyor and crew chief conducting the survey Work. Submit at least 10 days prior to beginning survey Work. During the Project, submit resume for each new registered land surveyor and crew chief employed or retained by Contractor at least 10 days prior to starting on the survey Work.
  4. Certificates:
    - a. Surveying: When requested by Engineer, submit certificate signed by professional surveyor certifying that elevations and locations of the Work comply with the Contract Documents. Explain all deviations, if any.

5. Survey Results:

- a. Provide electronic copy of results in PDF and AutoCAD release 2016, or newer, .dwg file with 3D points (in x, y, z [easting, northing, elevation] format), point labels (including point descriptions and elevations, at a minimum), topographic break lines, and triangulated irregular network (TIN) (i.e., 3D faces representing ground surface), or other format acceptable to Engineer. Each data file must include a descriptive header including, but not limited to: software and equipment information, project name and client, horizontal and vertical datum, units, survey type, alignment, and stations surveyed. Provide results of surveys required in Part 3.02, including:
  - 1) Pre-Construction.
  - 2) Interim.
  - 3) Post-Removal.
  - 4) Post-Restoration.
- b. Drawings shall include elevation contours at 1-foot resolution.
- c. Drawings showing survey data shall be shown on a scale not to exceed 1 inch equals 20 feet.

## 1.04 RECORDS

- A. Maintain at the site a complete and accurate log of control and survey Work as it progresses.
  1. Survey data shall be in accordance with recognized professional surveying standards, Laws and Regulations, and prevailing standards of practice in the locality where the site is located. Original field notes, computations, and other surveying data shall be recorded by Contractor's surveyor in Contractor-furnished hard-bound field books, and shall be signed and sealed by Contractor's surveyor. Completeness and accuracy of survey Work, and completeness and accuracy of survey records, including field books, shall be responsibility of Contractor. Failure to organize and maintain survey records in an appropriate manner that allows reasonable and independent verification of calculations, and to allow identification of elevations, dimensions, and grades of the Work, shall be cause for rejecting the survey records, including field books.
  2. The accuracy of the Contractor's survey and other furnishing of data to the Engineer do not constitute a transfer of responsibility for verifying accuracy.
  3. Illegible notes or data, and erasures on any page of field books, are unacceptable. Do not submit copied notes or data. Corrections by ruling or lining out errors will be unacceptable unless initialed by the surveyor. Violation of these requirements may require re-surveying the data questioned by Engineer.

## PART 2 - PRODUCTS

### 2.01 QUALITY OF MATERIALS AND EQUIPMENT

- A. Survey instruments will be calibrated as specified by the manufacturer.

## PART 3 - EXECUTION

### 3.01 SURVEYING

- A. Verification of Conditions: Verify Site conditions before starting Work. Promptly notify Engineer of any discrepancies with the potential to affect the Work.

- B Exercise care during the execution of the work activities specified herein to minimize any disturbance to existing property and to the landscape and waters in the areas surrounding the work areas. Survey crews shall not traverse into controlled areas or private property without first obtaining approval by the Owner or Engineer.
- C Contingency survey of the removal areas will be performed at the sole expense of the Contractor if post-removal and/or post-restoration surveys indicates that final removal elevation/extent and/or backfill elevation/extent, as specified within the Contract Documents, has not been met.
- D. Reference Points:
1. The Owner's established reference points damaged or destroyed by Contractor will be re-established by the Owner at Contractor's expense.
  2. From Owner-established reference points, establish lines, grades, and elevations necessary to control the Work. Obtain measurements required for executing the Work to tolerances specified in the Contract Documents.
  3. Establish, place, and replace as required, such additional stakes, markers, and other reference points necessary for control, intermediate checks, and guidance of construction operations.
- E. Coordinate System and Reference Datums: For all surveys, use and report data in using the following:
1. Horizontal datum: North American Datum of 1983, New York State Plane Coordinate System, New York East Zone, U.S. Survey Feet.
  2. Vertical Datum: National America Vertical Datum of 1988, U.S. Survey Feet.
- F. Surveys to Determine Quantities for Payment:
1. For each Application for Payment, perform such surveys and computations necessary to determine quantities of Work performed, placed, or installed. Perform surveys necessary for Engineer to determine final quantities of Work performed or in place. Surveys for payment shall be based on topographic survey performed by a licensed surveyor in accordance with this Section.
  2. Notify Engineer at least 24 hours before performing survey services for determining quantities. Unless waived in writing by Engineer, perform quantity surveys in presence of Engineer.
- G. Surveys to Record Actual Construction: Perform such surveys necessary to record actual construction including, but not limited to, the following:
1. Horizontal and vertical limits of excavation.
  2. Horizontal and vertical location of existing Underground Facilities and surface structures demolished, realigned, or abandoned in-place.
  3. Horizontal and vertical limits of fill for each material classification.
  4. Subgrade and final grade topography.
  5. Horizontal and vertical location of buildings, foundations, and walls.
  6. Horizontal location of exposed piping and utilities, poles, exposed wires, posts, signs, markers, curbs, fencing, gates, guard rails, guard cables, and other facilities visible at or above ground surface.
  7. Horizontal limits of lawns, pavements, roads, walks, drives, and other surface improvements.

- H. Construction Surveying: Comply with the following:
1. Topography: Collect elevation data on maximum 20-foot grid and at significant grade breaks (elevation changes of 1 foot or more).
  2. Alignment Staking: Provide alignment stakes at 50-foot intervals on tangent, and at 25-foot intervals on curves.
  3. Slope Staking: Provide slope staking at 50-foot intervals on tangent, and at 25-foot intervals on curves. Re-stake at every 10-foot difference in elevation.
  4. Structures: Stake out structures, including elevations, and check prior to and during construction.
  5. Pipelines: Stake out pipelines including elevations, and check prior to and during construction.
  6. Road: Stake out roadway elevations at 50-foot intervals on tangent, and at 25-foot intervals on curves.
  7. Cross-Sections: Provide original, intermediate, and final staking as required for site work, and other locations as necessary for quantity surveys.
  8. Easement Staking: Provide easement staking at 50-foot intervals on tangent, and at 25-foot intervals on curves. Also provide wooden laths with flagging at 100-foot maximum intervals.
  9. Record Staking: Provide permanent stake at each blind flange and each utility cap provided for future connections. Stakes for record staking shall be material acceptable to Engineer.
- I. Accuracy:
1. Establish Contractor's temporary survey reference points for Contractor's use to at least second-order accuracy (i.e., 1:10,000). Construction staking used as a guide for the Work shall be set at least third-order accuracy (i.e., 1:5000). Basis on which such orders are established shall provide the absolute margin for error specified below.
  2. Horizontal accuracy of easement staking shall be plus or minus 0.1 foot, unless otherwise specified or approved by Owner and Engineer. Accuracy of other staking (e.g., structures, pipeline, road) shall be plus or minus 0.04 foot horizontally and plus or minus 0.02 foot vertically, unless otherwise specified or approved by Owner and Engineer.
  3. Vertical accuracy shall be plus or minus 0.1 feet for general site grading and 0.02 feet for structural features (e.g. pipes, manholes) unless otherwise specified or approved by Owner and Engineer.
  4. Horizontal and vertical accuracy for general topographic surveys of the upland support and staging areas and removal areas shall be plus or minus 0.1 foot, unless otherwise specified or approved by Owner and Engineer.
  5. Survey calculations shall include an error analysis sufficient to demonstrate required accuracy.

### 3.02 REQUIRED SURVEYS

- A. Pre-Construction Surveys
1. Perform Pre-Construction Survey of intended support and staging areas to document existing area conditions. The survey shall be completed prior to disturbance of existing conditions. Support areas shall include any areas to be used by the Contractor for staging and access to support the Work.
  2. Perform Pre-Construction Survey of the removal areas (i.e., tar well, northern gas holder, southern gas holder).
  3. Provide pre-construction conditions prior to start of work. Documentation of pre-construction conditions shall consist of digital photographs. Photographs shall be numbered. A key plan shall be provided to show the location and general direction of each photograph.

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4. Pre-Construction Surveys must be accepted by Engineer before commencing intrusive activities in the area.
- B. Interim Survey and Monitoring
1. Collect interim removal surface data during excavation. Interim monitoring results (i.e., approximate extent, approximate depth) shall be included in the Contractor's daily progress reports and will be made available to the Owner and/or Engineer upon request.
  2. Collect interim backfill surface data during backfill. Interim backfill monitoring will be performed similar to the interim removal surface monitoring described in Paragraph 3.02-B-2 above. Interim monitoring results (i.e., approximate extent, approximate depth) will be included in the Contractor's daily progress reports and will be made available to the Owner and/or Engineer upon request.
- C. Post-Removal Surveys
1. Perform Post-Removal Surveys in each removal area within 5 work days following completion of excavation. Contractor shall submit this survey comparison to the Engineer for review and approval.
  2. Complete the Post-Removal Surveys at the same locations and along the same lines as used in the pre-construction survey as described in Paragraph 3.02-A-2.
  3. Post-Removal Surveys must be accepted by the Engineer before commencing backfill placement in each area.
- D. Post-Restoration Surveys
1. Perform Post-Restoration Survey of the remediated areas to confirm that the required restoration elevations have been met and the required terms of Contract completed. The post-restoration survey will be completed at the same locations and along the same lines as used in the pre-construction survey as described in Paragraph 3.02-A-2.
  2. Perform Post-Restoration Survey of support and staging areas within 5 work days following completion of restoration activities of those areas. Post-Restoration Surveys shall cover the full extent of the areas disturbed by the work including support areas and restoration areas (including all replaced/restored site features). Post-Restoration Surveys shall include location of all installed products including underground facilities (e.g., replacement pipes).
  3. Provide conditions following site restoration. Documentation of post-restoration conditions shall consist of digital photographs and videos. The post-restoration conditions documentation shall consist of the same elements as the pre-construction conditions documentation and shall also note any discrepancies from the pre-construction conditions.
  4. Post-Restoration Surveys of the removal areas shall be submitted to the Owner and Engineer for approval not more than 2 weeks after completion of the survey. The post-restoration survey drawings of upland support and staging areas shall be submitted to the Owner and Engineer for approval prior to demobilization and not more than 2 weeks after completion of the survey.
- E. Contractor's surveyor shall calculate the actual thickness and quantities (to the nearest cubic yard) of soil excavated and backfill material placed for each removal area. The quantity calculations shall be submitted to the Engineer for approval.

- F. Engineer will verify the soil excavation and backfill placement elevations achieve the specified requirements. If required excavation or backfill placement has not been achieved as determined by the Engineer, Contractor shall implement corrective action and re-survey the area at no additional expenses to the Owner.

END OF SECTION



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## SECTION 01 71 33

### PROTECTION OF WORK AND PROPERTY

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Contractor will be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in this Section.
2. To prevent damage, injury, or loss, Contractor's actions shall include the following:
  - a. Storing materials, supplies, and equipment in an orderly, safe manner that does not unduly interfere with the progress of the Work or work of other contractors or utility companies.
  - b. Providing suitable storage facilities for materials and equipment subject to damage or degradation by exposure to weather, theft, breakage, or other cause.
  - c. Placing upon the Work or any part thereof only loads consistent with the safety and integrity of that portion of the Work and existing construction.
  - d. Frequently removing and disposing of refuse, rubbish, scrap materials, and debris caused by Contractor's operations so that, at all times, the site is safe, orderly, and workmanlike in appearance.
  - e. Providing temporary barricades and guard rails around openings, scaffolding, temporary stairs and ramps, excavations, elevated walkways, and other hazardous areas.
  - f. Protecting surrounding area from splashing during ISS mixing. Cleaning surrounding surfaces and structures if splashing with ISS materials.
3. Do not, except after written consent from proper parties, enter or occupy privately-owned land with personnel, tools, materials, or equipment, except on lands and easements provided by Owner. Contractor shall not seek out such written consent unless specifically authorized by Owner to do so.
4. Contractor has full responsibility for preserving public and private property and facilities on and adjacent to the site. Direct or indirect damage done by, or on account of, any act, omission, neglect, or misconduct by Contractor in executing the Work, shall be restored by Contractor, at its expense to condition equal to that existing before damage was done.

#### PART 2 – PRODUCTS (NOT USED)

#### PART 3 – EXECUTION

##### 3.01 BARRICADES AND WARNING SIGNALS

###### A. General:

1. Where the Work is performed on or adjacent to roadway, access road, right-of-way, or public place:
  - a. Provide barricades, fences, lights, warning signs, danger signals, watchmen, and take other precautionary measures for protecting persons, property, and the Work.
  - b. Paint barricades to be visible at night.
  - c. From sunset to sunrise, furnish and maintain at least one light at each barricade.

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- d. Erect sufficient barricades to keep vehicles from being driven on or into Work under construction.
- e. Furnish watchmen in sufficient numbers to protect the Work.
- 2. Provide temporary barricades to protect personnel and property for Work not in or adjacent to vehicular travel areas, including indoor work, in accordance with Laws and Regulations.
- 3. Contractor's responsibility for maintaining temporary barricades, signs, lights, and for providing watchmen shall continue until the Work is accepted in accordance with the Contract Documents.

### 3.02 PROTECTION OF EXISTING STRUCTURES

#### A. Underground Facilities:

- 1. Underground Facilities known to Owner and Engineer, except water, gas, sewer, electric, and communications services to individual buildings and properties, are shown on the Design Drawings. Information shown for Underground Facilities is the best available to Owner and Engineer but is not guaranteed to be correct or complete.
- 2. Utility Mark-Out:
  - a. Clearly delineate areas of demolition, trenching, excavation, or other subsurface Work at the site.
  - b. Provide required notification to local one-call notification system (Dig Safely New York) at least two working days, but not more than 10 working days, before planned start of demolition, trenching, excavation, or other subsurface Work.
  - c. Conduct private utility mark-out.
  - d. Walk the site and review utility markings before proceeding with demolition, trenching, excavation, or other subsurface Work.
  - e. Protect and preserve staking, markings, or other designations until no longer required for proper and safe Work at or near Underground Facilities.
  - f. Contact potential utility or industrial companies identified in previous steps, located near worksite.
  - g. Protect and preserve staking, markings, or other designations until no longer required for proper and safe Work at or near Underground/Subaquatic Facilities.
  - h. Bring to the immediate attention of the Owner and the Engineer, prior to implementation of any intrusive activities, any differences identified between the utilities shown on the Design Drawings and those encountered in the field prior.
- 3. Explore ahead of trenching, excavation, or other subsurface Work, and uncover obstructing Underground Facilities sufficiently to determine their location, to prevent damage to Underground Facilities, and to prevent service interruption to building or parcels served by Underground Facilities. If Contractor damages an Underground Facility, or the material surrounding or supporting the same, Contractor will immediately notify Owner, Engineer, and the owner of the damaged facility and restore it to original condition, in accordance with requirements of the owner of the damaged facility. Such repair or restoration Work shall be performed at no additional cost to Owner.
  - a. Undertake such emergency response actions as may be required.
  - b. Collect, containerize, characterize, and properly dispose of any oils or pollutants released from the damaged facility.
  - c. Provide provisions for alternate or temporary service until damaged facility is repaired.
  - d. Provide assistance to the owner of the damaged facility during repairs unless authorized by the facility's owner to undertake such repairs directly.
- 4. Necessary changes in the location of the Work may be directed by Engineer to avoid Underground Facilities not shown or indicated on the Contract Documents.

5. If permanent relocation of an existing Underground Facilities is required and is not otherwise shown or indicated in the Contract Documents, Contractor will be directed in writing to perform the Work. When the relocation Work results in a change in the Contract Price, Contract Times, contract modification procedures and payment for such Work shall be in accordance with the Contract Documents.

**B. Surface Structures:**

1. Surface structures are existing buildings, retaining walls, other structures, and other facilities at or above ground surface, including their foundations or any extension below ground surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, exposed piping and utilities, poles, exposed wires, posts, signs, markers, curbs, walks, fencing, and other facilities visible at or above ground surface.
2. Existing surface facilities, including but not limited to guard rails, posts, guard cables, signs, poles, markers, curbs, and fencing, that are damaged or temporarily removed to facilitate the Work shall be replaced and restored to their original condition at Contractor's expense.

**C. Protection of Underground Facilities and Surface Structures:**

1. Contractor will sustain in their places and protect from direct or indirect injury all Underground Facilities and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting will be done carefully and as required by the party owning or controlling such facility or structure. Before proceeding with the Work of sustaining and supporting such facility or structure, Contractor will satisfy Engineer that methods and procedures to be used have been approved by party owning same.
2. Contractor will bear all risks attending the presence or proximity of all Underground Facilities and surface structures within or adjacent to the limits of the Work, in accordance with the Contract Documents. Contractor will be responsible for damage and expense for direct or indirect injury caused by its Work to facilities and structures. Repair immediately and completely damage caused by its Work, to the satisfaction of the owner of damaged facility or structure.
3. Comply with 16 NYCRR 753 (Protection of Underground Facilities) and other Laws and Regulations regarding the protection of Underground Facilities.

**D. Coordinate Work in this Part 3.03 with Sections 02 41 00 (Demolition) and 31 23 00 (Excavation and Fill).**

**3.03 PROTECTION OF EXISTING MONITORING WELLS**

- A. Clearly mark, maintain, and protect existing monitoring wells shown or indicated to remain.**
- B. Repair or decommission and replace at Contractor's expense existing monitoring wells damaged during the Work.**
1. Decommissioning shall be in accordance with the NYSDEC Groundwater Monitoring Well Decommissioning Policy (CP-43).
  2. Replace decommissioned monitoring well with new well of equal construction. Install at location selected by Engineer.

**3.04 PROTECTION OF INSTALLED MATERIALS, EQUIPMENT, AND LANDSCAPING**

- A. Protect installed materials and equipment to prevent damage from subsequent operations. Remove protection facilities when no longer needed prior to completion of the Work.**

- B. Control traffic to prevent damage to equipment, materials, and surfaces.
- C. Provide coverings to protect materials and equipment from damage.

END OF SECTION

## SECTION 01 74 05

### CLEANING

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. Execute cleaning during the Project, at completion of the Work, and as required by this Section.
  - 2. Maintain in a clean manner the site, the Work, and areas adjacent to or affected by the Work.

##### 1.02 REFERENCE STANDARDS

- A. The following standards are referenced in this Section:
  - 1. NFPA 241, Safeguarding Construction, Alteration, and Demolition Operations.

##### 1.03 PROGRESS CLEANING

- A. General: Clean the site, work areas, and other areas occupied by Contractor at least weekly. Dispose of materials in accordance with the following:
  - 1. Comply with NFPA 241 for removing combustible waste materials and debris.
  - 2. Do not hold non-combustible materials at the site more than three days if the temperature is expected to rise above 80 degrees F. When temperature is less than 80 degrees F, dispose of non-combustible materials within seven days of their generation.
  - 3. Provide suitable containers for storage of waste materials and debris.
  - 4. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately.
- B. Site:
  - 1. Keep outdoor, dust-generating areas wetted down or otherwise control dust emissions in accordance with Section 01 57 05 - Temporary Controls.
  - 2. At least weekly, brush-sweep roadways and paved areas at the site that are used by construction vehicles or otherwise affected by construction activities.
- C. Work Areas:
  - 1. Clean areas where the Work is in progress to level of cleanliness necessary for proper execution of the Work.
  - 2. Remove liquid spills promptly and immediately report spills to Owner and Engineer, and authorities having jurisdiction.
  - 3. Where dust would impair proper execution of the Work, broom-clean or vacuum entire work area, as appropriate.
  - 4. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- D. Installed Work: Keep installed Work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of material or equipment installed, using only cleaning agents and methods specifically recommended by material or equipment manufacturer. If manufacturer does not recommend specific cleaning agents or methods, use cleaning agents and methods that are not hazardous to health and property and that will not damage exposed surfaces.

- E. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration until Substantial Completion.
- F. Waste Disposal:
  - 1. Properly dispose of waste materials, surplus materials, debris, and rubbish off the site.
  - 2. Do not burn or bury rubbish and waste materials at the site.
  - 3. Do not discharge volatile or hazardous substances, such as mineral spirits, oil, or paint thinner, into storm sewers or sanitary sewers.
  - 4. Do not discharge wastes into surface waters or drainage routes.
  - 5. Contractor shall be solely responsible for complying with Laws and Regulations regarding storing, transporting, and disposing of waste.
- G. During handling and installation of materials and equipment, clean and protect construction in progress and adjoining materials and equipment already in place. Apply protective covering where required for protection from damage or deterioration, until Substantial Completion.
- H. Clean completed construction as frequently as necessary throughout the construction period.

#### 1.04 CLOSEOUT CLEANING

- A. Complete the following prior to requesting inspection for Substantial Completion:
  - 1. Clean and remove from the site rubbish, waste material, debris, and other foreign substances.
  - 2. Sweep paved areas broom-clean. Remove petrochemical spills, stains, and other foreign deposits.
  - 3. Hose-clean sidewalks and loading areas.
  - 4. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
  - 5. Leave surface waterways, drainage routes, storm sewers, and gutters open and clean.
  - 6. Repair pavement, roads, sod, and other areas affected by construction operations and restore to specified condition. If condition is not specified, restore to pre-construction condition.
  - 7. Clean exposed exterior and interior hard-surfaced finishes to dirt-free condition, free of spatter, grease, stains, fingerprints, films, and similar foreign substances.
  - 8. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, and similar spaces.
  - 9. Remove non-permanent tags and labels.
  - 10. Leave the site clean, and in neat, orderly condition, satisfactory to Owner and Engineer.

#### PART 2 – PRODUCTS (NOT USED)

#### PART 3 – EXECUTION (NOT USED)

END OF SECTION

## SECTION 01 74 19

### CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. This Section includes administrative and procedural requirements for:
    - a. Recycling non-hazardous, uncontaminated demolition and construction waste.
    - b. Disposing of non-hazardous, uncontaminated demolition and construction waste.
- B. Coordination:
  - 1. Coordinate recycling and disposing of waste as specified under this and other Sections.
- C. Related Sections:
  - 1. Section 01 31 13 - Project Coordination.
  - 2. Section 02 41 00 - Demolition.
  - 3. Section 02 61 05 - Removal and Disposal of Contaminated Material.
  - 4. Section 31 11 00 - Clearing and Grubbing.
  - 5. Section 31 23 00 - Excavation and Fill.
- D. Performance Requirements:
  - 1. Practice efficient waste management in using materials in the Work.
  - 2. Employ reasonable means to divert demolition and construction waste from landfills and incinerators. Facilitate recycling of materials, including the following:
    - a. Demolition Waste:
      - 1) Concrete.
      - 2) Concrete reinforcing steel.
      - 3) Brick.
      - 4) Concrete masonry units.
      - 5) Structural steel and miscellaneous steel and metal.
    - b. Construction Waste:
      - 1) Site-clearing waste.
      - 2) Packaging:
        - a) Paper.
        - b) Cardboard and boxes.
        - c) Pallets and wood crates.
  - 3. Dispose of demolition and construction waste only at Owner-approved facilities.

##### 1.02 TERMINOLOGY

- A. The following words or terms are not defined but, when used in this Section, have the following meaning:
  - 1. "Construction waste" is building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
  - 2. "Disposal" is removal to an off-site location of demolition and construction waste and subsequent sale, recycling, reuse, or placement in an Owner-approved landfill or incinerator facility conforming to Laws and Regulations and acceptable to authorities having jurisdiction.



3. "Recycle" is recovery of demolition waste or construction waste for subsequent processing in preparation for reuse.
4. "Recycle and reuse" is recovery of demolition waste or construction waste and subsequent processing and reuse in the Work.

### 1.03 QUALITY ASSURANCE

#### A. Regulatory Requirements:

1. Comply with hauling and disposal Laws and Regulations of authorities having jurisdiction.

### 1.04 SUBMITTALS

#### A. Informational Submittals:

1. Waste Management Plan: Submit acceptable plan for managing demolition and construction waste within 14 days of the date the Contract Times commence running, and before removing any waste from the site. Include the following:
  - a. For materials that will be recycled and reused in the Work, procedures and equipment for preparing recycled materials before incorporating them into the Work.
  - b. Procedures for separating each type of recyclable waste, including sizes of containers, container labeling, and designated location at the site where materials will be separated and stored.
  - c. List of local, Owner-approved disposal facilities that will be used for demolition and construction waste. Include name, address, and telephone number of each recycling or processing facility, landfill, and incinerator facility. Identify type of waste to be disposed of at each facility.
2. Waste Profiles:
  - a. Preliminary Waste Profiles: The Contractor is responsible for obtaining a waste profile from the proposed disposal facility. The Engineer shall prepare and submit waste profile, listing Owner's name and address of the site as generator of waste, for each landfill and incinerator facility. Owner will sign and return each acceptable waste profile to Contractor.
  - b. Final Waste Profiles: Submit counter-signed waste profile and proof of acceptance of waste for each landfill and incinerator facility.
3. Disposal Records:
  - a. Recycling and Processing Facility Records: Submit counter-signed manifests, weight tickets, receipts, and invoices on a monthly basis throughout the Project, and concurrent with each Application for Payment.
  - b. Landfill and Incinerator Facility Records: Submit counter-manifests, weight tickets, receipts, and invoices on a monthly basis throughout the Project, and concurrent with each Application for Payment.

### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Recyclable Waste: On a daily basis, remove all recyclable materials from the work area in acceptable containers.
- B. Provide separate collection containers as required by recycling haulers and to prevent contamination of materials, including protection from the elements as applicable.
- C. Replace loaded containers with empty containers as demand requires, at least weekly.
- D. Handling: Deposit recyclable materials in containers in clean (no mud, adhesives, solvents, or petroleum or coal tar contamination), debris-free condition.

- E. If contamination chemically combines with materials so that materials cannot be cleaned, do not deposit into recycle containers.
- F. Environmental Requirements: Transport recyclable waste materials from the work area to recycling containers, and carefully deposit in containers in manner to minimize noise and dust. Close the covers of container immediately after materials are deposited. Do not place recyclable waste materials on the ground adjacent to container.

## PART 2 – PRODUCTS (NOT USED)

## PART 3 – EXECUTION

### 3.01 WASTE MANAGEMENT

- A. Provide handling, containers, storage, signage, transportation, and other items required to manage wastes during the Project.
- B. Site Access and Temporary Controls:
  - 1. Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent facilities.
    - a. Designate and label specific areas of the site necessary for separating materials to be recycled or reused.
    - b. Provide temporary controls in accordance with the Contract Documents.
- C. Shipping Documents: The Engineer shall prepare a non-hazardous waste manifest for each shipment of demolition and construction waste. Owner or an authorized agent will review and sign each manifest as generator of waste.

### 3.02 RECYCLING WASTE

- A. General:
  - 1. Recycle paper and beverage containers used by Contractor's personnel, Subcontractors, and Suppliers.
  - 2. Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at the site to the maximum extent practical.
    - a. Provide appropriately marked containers or bins for controlling recyclable waste until recyclable materials are removed from the site. Post list of acceptable and unacceptable materials at each container and bin. Inspect containers and bins for contamination and remove contaminated materials if found.
    - b. Before removing from the site, prepare and process recyclable waste as required by recycling or processing facility.
    - c. Stockpile processed materials at the site without intermixing with other materials. Place, grade, and shape stockpiles to drain water. Cover to prevent dust and blowing debris.
    - d. Stockpile materials away from the construction area. Do not store within drip line of trees.
    - e. Remove recyclable waste from the site and from Owner's property and transport to Owner-approved recycling or processing facility.

- B. Recycling and Reuse of Demolition Waste:
  - 1. Concrete:
    - a. Remove reinforcement and other metals from concrete and sort with other metals.
    - b. All concrete shall be removed, transported, and disposed of away from the site, unless otherwise approved by Engineer.
  - 2. Masonry:
    - a. Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
    - b. All masonry shall be removed, transported, and disposed of away from the site, unless otherwise approved by Engineer.
- C. Recycling Demolition Waste:
  - 1. Metals:
    - a. Separate metals by type.
    - b. Stack structural steel according to size, type of member, and length.
    - c. Remove and dispose of bolts, nuts, washers, and other rough hardware.
  - 2. Electrical Devices: Separate switches, receptacles, meters, circuit breakers, and other devices by type and protect from the elements.
- D. Recycling Construction Waste:
  - 1. Site-Clearing Wastes:
    - a. Cut trees, branches, shrubs, brush, and logs into manageable lengths.
    - b. If required by recycling or processing facility, chip trees, branches, shrubs, brush, and logs before removing from the site.
  - 2. Packaging:
    - a. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store at dry location.
    - b. Pallets: Require that goods delivered on pallets have the pallets removed from site, to the extent possible. For pallets that remain at the site, break down pallets into component wood pieces. Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, and treated wood materials.
    - c. Crates: Break down crates into component wood pieces. Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, and treated wood materials.

### 3.03 DISPOSAL OF WASTE

- A. General: Except for items or materials to be recycled or recycled and reused, remove from the site and properly dispose of waste at Owner-approved facility such as permitted landfill or incinerator, or other method acceptable to Owner and authorities having jurisdiction.
  - 1. Except as otherwise specified, remove from the site all waste and debris from the Work as it accumulates. Upon completion of the Work, remove materials, equipment, waste, and debris and leave the site clean, neat, and orderly. Comply with the Contract Documents regarding cleaning and removal of trash, debris, and waste.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials at the site.

### END OF SECTION

SECTION 01 77 19  
CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope:
  - 1. Provisions of this section apply to the procedural requirements for closeout of Work executed by the Contractor.
- B. Related Sections:
  - 1. Section 01 11 00 - Summary of Work.
  - 2. Section 01 29 76 - Progress Payment Procedures.
  - 3. Section 01 78 39 - Project Related Documents.

1.02 SUBMITTALS

- A. Provide all documentation pertaining to all components of Work executed by the Contractor and requiring inspection prior to submitting an application for Final Certification Inspection including, but not limited to, tables showing actual excavated and backfilled volumes, Construction Drawings, certified survey data, executed warranties, certified weigh slips from the disposal facilities, maintenance agreements, inspection certificates and similar required documentation for specific units of Work.
- B. Truck volume counts and measurement summary. Following completion of construction and as a pre-requisite for Final Certification Inspection, the Contractor shall provide the Engineer with final truck volume counts and measurement summary tables. Provide supporting data that was used to develop the measurement summary tables.
- C. Prepare and submit Closeout Documents in accordance with Section 01 78 39 - Project Record Documents.

1.03 INSPECTION PROCEDURES

- A. Substantial Completion:
  - 1. Preliminary Procedures: Prior to requesting an inspection for Substantial Completion, the Contractor shall complete the following:
    - a. Prepare a list of items to be completed and corrected, including the value of the items on the list, and the reasons why the items are not completed. Submit the list to the Engineer.
    - b. Advise the Engineer, in writing, of pending insurance changeover requirements, if applicable.
    - c. Terminate and remove temporary facilities, including mockups, construction tools, and similar elements from the site, as necessary.
    - d. Complete grading, restoration, and final cleaning.

2. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of the request, the Engineer will proceed with the inspection or notify the Contractor of unfulfilled requirements. The Engineer will prepare the Certificate of Substantial Completion after inspection or will notify the Contractor of items, either on Contractor's list or additional items identified by the Engineer, that must be completed or corrected before the Certificate of Substantial Completion will be issued. Any outstanding items required for Substantial Completion at this time will be documented as the formal punch-list for Substantial Completion:
    - a. Re-inspection: Request re-inspection when the punch-list is completed or corrected.
    - b. Results of completed inspection will form the basis of requirements for Final Completion.
- B. Final Acceptance:
1. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
    - a. Submit a Request for Payment accordance with the procedures specified in Section 01 29 76 - Progress Payment Procedures.
    - b. Submit a Certification for the Engineer stating that all items, actions, and requirements of the punch-list have been completed, corrected, satisfied, or otherwise resolved.
  2. Inspection: Submit a written request for final inspection for acceptance. The Engineer will prepare a Recommendation of Final Payment after inspection or will notify the Contractor of work that must be completed or corrected before the Certificate will be issued.

## PART 2– PRODUCTS (NOT USED)

## PART 3 – EXECUTION

### 3.01 FINAL CLEANING

- A. At the time of project closeout, clean and restore the Work area to its pre-construction condition. Complete the following operations before requesting the Engineer's inspection for certification of substantial completion:
1. Remove non-permanent protection and labels.
  2. Remove debris.
  3. Inspect Project Work Limits.

END OF SECTION

SECTION 01 78 39  
PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope:
  - 1. Maintain and submit to Engineer record documents in accordance with this Section.

1.02 SUBMITTALS

- A. Closeout Submittals:
  - 1. Record Documents: Submit in accordance with Part 1.04 of this Section.

1.03 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintain in Contractor's field office, in clean, dry, legible condition, complete sets of the following record documents:
  - 1. Drawings, Specifications, and Addenda.
  - 2. Shop Drawings, Samples, and other Contractor submittals, including records of test results, reviewed or accepted, as applicable, by Engineer.
  - 3. Change Orders, Work Change Directives, Field Orders, photographic documentation, survey data, permits, and all other documents pertinent to the Work.
- B. Provide files and racks for proper storage and easy access to record documents. File record documents in accordance with the edition of the Construction Specification Institute's "MasterFormat" used for organizing the Project Manual, unless otherwise accepted by Engineer.
- C. Make record documents available for inspection upon request of Owner or Engineer.
- D. Do not use record documents for purpose other than serving as Project record. Do not remove record documents from Contractor's field office without Engineer's approval.

1.04 SUBMITTAL OF RECORD DOCUMENTS

- A. Prior to readiness for final payment, submit to Engineer one copy of the following record documents:
  - 1. Drawings.
  - 2. Specifications and Addenda.
- B. Submit record documents with transmittal letter on Contractor letterhead complying with letter of transmittal requirements in Section 01 33 00 - Submittal Procedures.
- C. Record documents submittal shall include certification, with original signature of an official authorized to execute legal agreements on behalf of Contractor, reading as follows:

*"[Insert Contractor's corporate name] has maintained and submitted record documentation in accordance with Specification Section 01 78 39 - Project Record Documents, and other elements of Contract Documents, for the National Grid, Non-Owned Rensselaer Former MGP Site, City of Rensselaer, Rensselaer County, New York. We certify that each record document submitted is complete, accurate, and legible relative to the Work performed under our Contract, and that the record documents comply with the requirements of the Contract Documents.*

*[Provide signature, print name, print signing party's corporate title, and date]"*

## 1.05 RECORDING CHANGES

### A. General:

1. At the start of the Project, label each record document to be submitted as "PROJECT RECORD" using legible, printed letters. Letters on record copy of the Drawings shall be two inches high.
2. Keep record documents current. Make entries on record documents within two working days of receipt of information required to record the change.
3. Do not permanently conceal the Work until required information has been recorded.
4. Accuracy of record documents shall be such that future searches for items shown on the record documents may rely reasonably on information obtained from Engineer-accepted record documents.
5. Marking of Entries:
  - a. Use erasable, colored pencils (not ink or indelible pencil) for marking changes, revisions, additions, and deletions to record documents.
  - b. Clearly describe the change by graphic line and make notations as required. Use straight-edge to mark straight lines. Writing shall be legible and sufficiently dark to allow scanning of record documents into legible electronic files.
  - c. Date all entries on record documents.
  - d. Call attention to changes by drawing a "cloud" around the change(s) indicated.
  - e. Mark initial revisions in red. In the event of overlapping changes, use different colors for subsequent changes.

### B. Drawings:

1. Record changes on a copy of the Drawings. Submittal of Contractor-originated or -produced drawings as a substitute for recording changes on the Drawings is unacceptable.
2. Record changes on plans, sections, schematics, and details as required for clarity, making reference dimensions and elevations (to Project datum) for complete record documentation.
3. Record actual construction, including:
  - a. Horizontal and vertical location of existing Underground Facilities and surface structures demolished, realigned, or abandoned in-place, referenced to permanent surface improvements. For each Underground Facility or surface structure, provide dimensions to at least two permanent, visible surface improvements.
  - b. Horizontal and vertical limits of excavation.
  - c. Depths of various elements of foundation relative to Project datum.
  - d. Horizontal and vertical location of new Underground Facilities referenced to permanent surface improvements. For each Underground Facility, including pipe fittings, provide dimensions to at least two permanent, visible surface improvements.
  - e. Location of exposed utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.

- f. Changes in structural and architectural elements of the Work, including changes in reinforcing.
    - g. Field changes of dimensions, arrangements, and details.
    - h. Changes made in accordance with Change Orders, Work Change Directives, and Field Orders.
    - i. Changes in details on the Contract Drawings. Submit additional details prepared by Contractor when required to document changes.
  - 4. Supplemental Drawings:
    - a. In some cases, drawings produced during construction by Engineer or Contractor supplement the Design Drawings and shall be included with record documents submitted by Contractor. Supplemental record drawings shall include the following:
      - 1) Drawings provided with Change Orders, Work Change Directives, and Field Orders.
      - 2) Drawings that cannot be incorporated into the Drawings due to space limitations.
      - 3) Certified survey drawings, in accordance with Part 1.06 of this Section.
    - b. Supplemental drawings provided with record drawings shall be integrated with the Drawings and include necessary cross-references between drawings. Supplemental record drawings shall be on sheets the same size as the Drawings.
    - c. When supplemental drawings developed by Contractor using computer-aided drafting/design (CADD) software are to be included in record drawings, submit electronic files for such drawings in AutoCAD 2009 format as part of record drawing submittal. Submit electronic files on compact disc labeled, "Supplemental Record Drawings", together with Contractor name, Project name, and Contract name and number.
- C. Specifications and Addenda:
- 1. Mark each Section to record:
    - a. Manufacturer, trade name, catalog number, and Supplier of each product and item of equipment actually provided.
    - b. Changes made by Addendum, Change Orders, Work Change Directives, and Field Orders.

## 1.06 CERTIFIED SURVEY DRAWINGS

- A. Prepare the following survey drawings:
  - 1. Pre-Construction survey, depicting the pre-construction horizontal and vertical limits of each excavation and support area in accordance with Section 01 71 26 – Construction Surveying and Layout, including spot elevations and topographic contours,
  - 2. Post-Removal survey, depicting the horizontal and vertical limits of material removal for each removal area in accordance with Section 01 71 26 – Construction Surveying and Layout, including spot elevations and topographic contours.
  - 3. Post-Remediation survey, depicting the final horizontal and vertical limits of backfill/restoration for each removal area and each support area in accordance with Section 01 71 26 – Construction Surveying and Layout, including subgrade spot elevations and topographic contours.
  - 4. Final Site plan, depicting final (post-construction) site conditions.
- B. Drawing Requirements:
  - 1. General Content:
    - a. Property lines, easements, and rights-of-way.
    - b. Topographic contours at minimum one-foot intervals.
    - c. Horizontal and vertical location of buildings, foundations, and walls.



- d. Horizontal location of exposed piping and utilities, poles, exposed wires, posts, signs, markers, curbs, fencing, gates, guard rails, guard cables, and other facilities visible at or above ground surface.
  - e. Horizontal limits of lawns, pavements, roads, walks, drives, and other surface improvements.
  - f. Horizontal and vertical location of monitoring wells, including ground surface elevation, outer casing elevation, and inner casing elevation.
  - g. Horizontal location, size (diameter), and species of trees and other plantings.
- 2. Scale: One inch equals 20 feet.
  - 3. Sheet Size: 34 inches wide by 22 inches high.

C. Certification:

- 1. Each survey drawing shall be signed and sealed by a professional land surveyor licensed and registered in the State of New York.

1.07 ELECTRONIC FILES FURNISHED BY ENGINEER

A. CADD files will be furnished by Engineer upon the following conditions:

- 1. Contractor shall submit to Engineer a letter on Contractor letterhead requesting CADD files and providing specific definition(s) or description(s) of how files will be used, and specific description of benefits to Owner if the request is granted.
- 2. Contractor shall execute Engineer's standard agreement for release of electronic files and shall abide by all provisions of the agreement for release of electronic files.
- 3. Layering system incorporated in CADD files shall be maintained as transmitted by Engineer. CADD files transmitted by Engineer containing cross-referenced files shall not be bound by Contractor. Drawing cross-references and paths shall be maintained. If Contractor alters layers or cross-reference files, Contractor shall restore all layers and cross-references prior to submitting record documents to Engineer.
- 4. Contractor shall submit record drawings to Engineer in same CADD format that files were furnished to Contractor.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

## SECTION 02 41 00

### DEMOLITION

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Providing all labor, materials, equipment, and incidentals as shown, specified, and required for demolition, removal, and disposal/recycle/reclamation work.
2. The work under this Section applies to demolition and removal of existing materials as shown or indicated in the Contract Documents. The Work includes but is not necessarily limited to demolition of asphalt pavement, concrete sidewalks, curbs, and guard rails as needed, to facilitate excavation.
3. Demolitions and removals specified under other Sections shall comply with requirements of this Section.
4. Performing demolition Work within areas shown or indicated.
5. Paying all fees associated with transporting and disposing of materials and equipment resulting from demolition.

###### B. Coordination:

1. Review procedures under this and other Sections and coordinate Work that must be performed with or before demolitions and removals.

###### C. Related Sections:

1. Section 01 57 05 – Temporary Controls.
2. Section 01 74 05 – Cleaning.
3. Section 01 74 19 – Construction Waste Management and Disposal.
4. Section 02 51 00 – Decontamination.
5. Section 02 61 05 – Removal and Disposal of Contaminated Material.
6. Section 31 23 00 – Excavation and Fill.

##### 1.02 REFERENCE STANDARDS

###### A. The following standards are referenced in this Section.

1. NFPA 51, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work.

##### 1.03 QUALITY ASSURANCE

###### A. Regulatory Requirements:

1. Laws and Regulations applying to the Work under this Section include, but are not limited to, the following:
  - a. 29 CFR 1910.251 through 29 CFR 1910.255, Subpart Q – Welding, Cutting, and Brazing.
  - b. 29 CFR 1926.350 through 29 CFR 1926.354, Subpart J – Welding and Cutting.
  - c. 29 CFR 1926.850 through 29 CFR 1926.860, Subpart T – Demolition.
  - d. 12 NYCRR 23-1.25, Welding and Flame Cutting Operations.
  - e. 12 NYCRR 23-3.1 through 12 NYCRR 23-3.3, Subpart 23-3 – Demolition Operations.
  - f. 16 NYCRR 753, Protection of Underground Utilities.
2. Obtain required permits and approvals for demolition, removal, and disposal Work.
3. Comply with requirements of authorities having jurisdiction.

## 1.04 SUBMITTALS

### A. Informational Submittals:

1. Demolition and Removal Plan: Submit acceptable plan for demolition and removal Work not less than 21 days prior to starting demolition Work. Include the following:
  - a. Plan for coordinating shut-offs, locating, capping, temporary services, and continuing utility services.
  - b. Other proposed procedures as applicable.
  - c. List of proposed equipment for demolition and removal Work.
  - d. Planned sequence of demolition operations, including coordination with excavation and restoration Work.
  - e. Detailed schedule of demolition Work in accordance with the accepted Progress Schedule.
2. Qualifications Statements: Submit name and qualifications of entity performing electrical removals, including copy of licenses required by authorities having jurisdiction.
3. Notification of Intended Demolition Start: Submit in accordance with Paragraph 3.01.A of this Section.

## PART 2 – PRODUCTS (NOT USED)

## PART 3 – EXECUTION

### 3.01 PREPARATION

#### A. Notification:

1. At least 48 hours prior to commencing demolition or removal Work, notify Owner and Engineer in writing of planned start of demolition Work. Do not start removals without permission of Engineer.

#### B. Protection of Surrounding Areas and Facilities:

1. Perform demolition and removal Work in manner that prevents damage and injury to property, structures, occupants, the public, and facilities. Do not interfere with use of, and free and safe access to and from, structures and properties.
2. Conduct the Work with minimum interference to vehicular and pedestrian traffic. Closing or obstructing of roads, drives, sidewalks, and passageways adjacent to the Work is not allowed unless indicated otherwise in the Contract Documents.
3. Provide temporary barriers, lighting, sidewalks, sheds, and other necessary protection.
4. Protect construction and facilities indicated to remain against damage and soiling during demolition Work. Repair damage at Contractor's expense.

#### C. Existing Utilities: Comply with the following:

1. Should uncharted or incorrectly charted Underground Facilities be encountered, cooperate with utility owners in keeping adjacent services and facilities in operation.
2. Before proceeding with demolition, locate; identify; drain, purge, or de-energize; and disconnect, seal, or cap as required all utilities serving the structure being demolished.
3. Coordinate and pay for shutdown of utility services with assistance from the Owner as required relative to contacting utility owners.

### 3.02 DEMOLITION – GENERAL

- #### A. Locate construction equipment used for demolition Work and remove demolished materials and equipment to avoid imposing excessive loading on facilities and Underground Facilities.

- B. Pollution Controls:
1. Use water sprinkling, temporary enclosures, and other suitable methods to limit emissions of dust and dirt to lowest practical level. Comply with Section 01 57 05 – Temporary Controls and Laws and Regulations.
  2. Do not use water when water may create hazardous or objectionable conditions such as icing, flooding, or pollution.
  3. Clean adjacent structures, facilities, properties, and improvements of dust, dirt, and debris caused by demolition Work, in accordance with Section 01 74 05 – Cleaning.
- C. Explosives: Use of explosives is prohibited.
- D. Hot Work: Comply with NFPA 51 and Laws and Regulations.
1. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
  2. Maintain adequate ventilation when using cutting torches.
- E. Structure Demolition:
1. Unless otherwise approved by Engineer, proceed with demolition from top down. Complete demolition Work above each tier before disturbing supporting members of lower levels.
  2. Demolish concrete and masonry in small sections.
  3. Remove structural framing members and lower to ground using hoists, cranes, or other suitable methods. Do not throw or drop to the ground.
  4. Break up and remove foundations and slabs-on-grade unless otherwise shown or indicated as remaining in place.
  5. Break up and remove below-grade construction, including basements, foundation walls, slabs, and footings, to below final excavation elevations shown or indicated, unless otherwise directed by Engineer. Upon completing such removals, measure, survey, and record portions of below-grade construction, if any, that remain in place.
- F. Demolition of Site Improvements:
1. Pavement, Sidewalks, Curbs, and Gutters: Demolition of asphalt or concrete pavement, sidewalks, curbs, and gutters, as applicable, shall terminate at saw-cut edges. Edges shall be linear and have a vertical cut face.
  2. Fencing, Guardrails, and Bollards: Remove to the limits shown or indicated. Completely remove below-grade posts and concrete.
  3. Manholes, Vaults, Chambers, and Handholes: Remove to the limits shown or indicated.
  4. Underground Facilities Other than Manholes, Vaults, Chambers, and Handholes:
    - a. Before proceeding with demolition, locate; identify; drain, purge, or de-energize; and make safe for removal and capping all Underground Facilities being demolished. Collect, containerize, and properly dispose of chemicals, gases, or other dangerous materials recovered from Underground Facilities.
    - b. Remove Underground Facilities to the extent shown or indicated. Where extent is not shown or indicated, extent of removal shall be 24 inches (horizontally) outside of excavations and six inches below subgrade elevations shown or indicated.
    - c. Unless otherwise shown or indicated, cap ends of piping to remain in accordance with Part 3.04 of this Section.
    - d. Upon completing removals, measure, survey, and record portions of Underground Facilities, if any, that remain.

### 3.03 STRUCTURAL REMOVALS

- A. Remove structures to the appropriate limits to facilitate soil excavation and/or restoration as shown or indicated in the Contract Documents, unless otherwise directed by Engineer. Removals beyond limits shown or indicated shall be at Contractor's expense.
- B. Recycling and Reuse of Demolished Materials:
  - 1. Remove, transport, recycle and/or dispose of all concrete and masonry materials, reinforcing steel, structural metals, miscellaneous metals, wire mesh, and other items contained in or upon the structures to be demolished away from the site, unless otherwise approved by Engineer. Comply with Sections 01 74 19 – Construction Waste Management, and Disposal and 31 23 00 – Excavation and Fill.

### 3.04 MECHANICAL REMOVALS

- A. Demolition and Removals of Piping and Similar Items:
  - 1. Before proceeding with demolition, drain or purge piping and make safe for removal and capping.
  - 2. Remove to the approximate extent shown or indicated existing storm sewer piping. Provide caps or plugs on ends of remaining piping.
  - 3. Caps, Closures, Blind Flanges, and Plugs:
    - a. Provide closure pieces, where shown or required to complete the Work.
    - b. Where used in this Section, the term "cap" means the appropriate type closure for the piping being closed, including caps, blind flanges, plugs, and other closures.
    - c. Caps shall be compatible with the piping to which the cap is attached, fluid-tight and gas-tight, and appropriate for the fluid conveyed in the pipe.
    - d. Unless otherwise shown or indicated, caps shall be mechanically fastened, fused, or welded to pipe. Plug piping with means other than specified in this Section only when so shown or indicated in the Contract Documents or when allowed by Engineer.
  - 4. When Underground Facilities are altered or removed, properly cut and cap piping left in place, unless otherwise shown or indicated.

### 3.05 DISPOSAL OF DEMOLISHED MATERIALS

- A. Except for items or materials to be recycled and reused, remove from the site all debris, waste, rubbish, and material resulting from demolition operations and equipment used in demolition Work. Comply with Sections 01 74 05 – Cleaning, 01 74 19 – Construction Waste Management and Disposal, and 02 61 05 – Removal and Disposal of Contaminated Material.
- B. Transportation and Disposal:
  - 1. Non-Hazardous Material: Properly transport and dispose of non-hazardous demolition debris at an appropriate, Owner-approved facility in accordance with Laws and Regulations. Non-hazardous material does not contain Asbestos, PCBs, Petroleum, Hazardous Waste, Radioactive Material, or other material designated as hazardous in Laws and Regulations.
  - 2. Hazardous Material: When handling and disposal of hazardous materials is included in the Work, properly transport and dispose of hazardous materials in accordance with Laws and Regulations and the Contract Documents.

END OF SECTION

SECTION 02 51 00  
DECONTAMINATION

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope:
  - 1. The decontamination of all vehicles, equipment, and personnel that come into contact with excavated or impacted materials at the site.
  - 2. The construction and maintenance of decontamination areas.
  - 3. Furnishing all materials, equipment, and labor necessary to construct and maintain decontamination areas and decontaminate vehicles, equipment, and personnel.
- B. Related Sections:
  - 1. 02 61 05 - Removal and Disposal of Contaminated Material.
  - 2. 31 23 00 - Excavation and Fill.

1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

- A. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (October 1985), as prepared by the National Institute of Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), United States Coast Guard (USCG), and United States Environmental Protection Agency (USEPA).

1.03 SUBMITTALS

- A. Safety Data Sheets (SDS) for all cleaning/decontamination solutions shall be included in the Contractor's Health and Safety Plan. SDS forms must be provided for review by the Owner and Engineer prior to being brought on-site.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL REQUIREMENTS

- A. All construction vehicles leaving the site shall be decontaminated by the Contractor (as necessary) to prevent the tracking of soil off-site (including vehicles transporting clean fill to the site). Vehicles and equipment that come into contact with excavated or impacted materials at the site shall be visually inspected and decontaminated by the Contractor (to the satisfaction of the Owner, Engineer, and/or New York State Department of Environmental Conservation) within the equipment decontamination area prior to handling backfill material or leaving the site. Any visible soils or other debris shall be promptly removed and disposed of in a manner consistent with the materials excavated.

- B. Precautions shall be taken to limit contact between the vehicle/equipment, personnel performing the decontamination activities, and any decontamination liquids that may accumulate in the decontamination area. Personnel engaged in decontamination activities shall use personal protective equipment, including disposable clothing, as required by the Contractor's Health and Safety Plan (HASP).
- C. Wash water, solids, and other materials generated during decontamination activities shall be collected by the Contractor and handled/managed in accordance with Section 31 23 00 - Removal and Disposal of Contaminated Material. Accumulated liquids shall be removed by the Contractor on a periodic basis so as to not exceed the capacity of the decontamination area.

### 3.02 DECONTAMINATION AREAS

- A. The Contractor is responsible for constructing and maintaining decontamination area(s) to accommodate all loads, vehicles, equipment, and migration scenarios
- B. The Contractor is responsible for constructing the decontamination area at the locations shown on the Design Drawings. Alternative locations within the Project Work Limits shall be approved by the Owner/Engineer prior to construction.
- C. Vehicle/equipment decontamination areas shall be constructed as specified on the Design Drawings. Alternate decontamination area configuration/construction shall be approved by the Engineer prior to construction.
- D. Construct and maintain appropriately-sized decontamination areas for its personnel. Personnel decontamination areas shall be located within the contamination reduction zone and include those facilities necessary to decontaminate personnel upon exiting the work area (exclusion zone), in accordance with the Contractor's HASP, and in accordance with local, state, and federal laws and regulations. At a minimum, personnel decontamination areas shall include run-on/run-off controls.

END OF SECTION

## SECTION 02 61 05

### REMOVAL AND DISPOSAL OF CONTAMINATED MATERIAL

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Provide all labor, materials, equipment, and incidentals as specified and required to remove from the site and dispose of contaminated material.
2. The Work includes handling, segregating, dewatering, temporary storage as necessary, loading, transporting, and disposing of contaminated material at appropriate, Owner-selected or Owner-approved facilities in accordance with Laws and Regulations.
3. Pay all fees (unless otherwise paid by the Owner) associated with transporting and disposing of contaminated material. Any fees to be paid by the Owner will be identified in the bid documents.

###### B. Coordination:

1. Coordinate disposing of waste as specified under this and other Sections.

###### C. Related Sections:

1. Section 01 41 23 – SWPPP and Permit.
2. Section 01 51 41 – Temporary Pumping.
3. Section 01 74 05 – Cleaning.
4. Section 01 74 19 – Construction Waste Management and Disposal.
5. Section 02 51 00 – Decontamination.
6. Section 31 23 00 – Excavation and Fill.

##### 1.02 REFERENCE STANDARDS

###### A. Terminology:

1. The following words or terms are not defined but, when used in this Section, have the following meaning:
  - a. "Construction wastewater" is water used for working or processing or resulting from dewatering or decontamination operations.
  - b. "Contaminated material" is material containing coal tar or site-related contaminants of concern. Examples of potential contaminated material include, but are not limited to, the following:
    - 1) Construction wastewater.
    - 2) Demolition waste.
    - 3) Excavation waste.
    - 4) Non-aqueous phase liquid (NAPL)
  - c. "Disposal" is removal to an off-site location of contaminated material and subsequent recycling, reuse, or disposal in an Owner-approved or Owner-selected landfill or incinerator conforming to Laws and Regulations and acceptable to authorities having jurisdiction.
  - d. "Excavation waste" is earth; sand; clay; gravel; hardpan; soft, weathered, or decomposed rock; debris; and other materials removed from within the excavation limits that does not comply with requirements for fill, or is in excess of the quantity required for fill.



B. Reference Standards:

1. The following standards are referenced in this Section:
  - a. ASTM D5199, Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.
  - b. ASTM D5261, Standard Test Method for Measuring Mass per Unit Area of Geotextiles.
  - c. GRI GM17, Standard Specification for Test Methods, Test Properties and Testing Frequency for Linear Low-Density Polyethylene (LLDPE) Smooth and Textured Geomembranes.
  - d. GRI GT12, Standard Specification for Test Methods and Properties for Nonwoven Geotextiles Used as Protection (or Cushioning) Materials.
  - e. USEPA SW-846 Method 9095, Paint Filter Liquids Test.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Laws and Regulations applying to the Work under this Section include, but are not limited to, the following:
  - a. 29 CFR 1910, Occupational Safety and Health Standards.
  - b. 29 CFR 1926, Safety and Health Regulations for Construction.
  - c. 40 CFR 261.3, 264, and 265, Resource Conservation and Recovery Act (RCRA).
  - d. 49 CFR 171.8, Transportation, Definitions and Abbreviations.
  - e. 6 NYCRR 364, Waste Transporter Permits.
  - f. 6 NYCRR 375, Environmental Remediation Programs.
2. Comply with applicable provisions and recommendations of the following:
  - a. NYSDEC Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants (MGPs) (DER-4).
  - b. NYSDOT Standard Specifications and Standard Sheets.
3. Obtain required permits and approvals for excavation and fill Work, including work permits from right-of-way owners.
4. Comply with requirements of authorities having jurisdiction.

1.04 SUBMITTALS

A. Action Submittals:

1. Product Data: Submit manufacturer's product data for proposed soil drying agent.
2. Waste profiles and manifests/waste shipping papers. Submit to Engineer/Owner for review prior to transporting waste materials off-site.

B. Informational Submittals:

1. Waste Transporter Permits: Submit copy of valid NYSDEC waste transporter permit for each transporter hauling contaminated material.
2. Waste profiles for all materials transported for off-site treatment or disposal.
3. Chain of Custody records.
4. Disposal Records: Submit for each disposal facility on a weekly basis throughout the project, and concurrent with each Application for Payment:
  - a. Counter-signed manifests/bills of lading.
  - b. Weight Tickets.
  - c. Receipt.
  - d. Invoices.
  - e. Certificates of disposal.

## 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store soil drying agent in closed water-proof super sacks not exceeding 1 ton in weight. Bulk deliveries and on-site storage of soil drying agent are prohibited.

## PART 2 – PRODUCTS

### 2.01 MATERIALS

- A. Soil Drying Agent: Provide cement kiln dust, lime kiln dust, or approved non-biodegradable sorbent containing no more than 50 percent reactive (free) calcium oxide (CaO) and magnesium oxide (MgO) by weight.
- B. Influent/Effluent Holding Tanks (Frac Tanks): Provide two 18,100- to 21,000-gallon water storage tanks for the temporary storage of water to be generated during the remedial construction activities. The tank shall be equipped with valving and piping as needed to receive extracted groundwater (and other liquids generated during the Project) to transfer collected water to a tanker truck for transport to an off-site treatment/disposal facility. Provide portable pre-fabricated spill containment berms for the Frac Tanks.

## PART 3– EXECUTION

### 3.01 GENERAL

- A. General:
  - 1. Segregate waste streams as required by waste transporters and disposal facilities. Crush excavated rock and debris, as necessary, to render material suitable for disposal.
- B. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent facilities.
  - 1. Designate and label specific areas of the site necessary for separating and storing wastes.
  - 2. Provide temporary controls in accordance with the Contract Documents.
- C. Waste Characterization:
  - 1. Contractor shall determine disposal facility characterization requirements (i.e., analyses and frequencies) for each waste stream.
  - 2. Contractor shall collect waste characterization samples under the observation of the Engineer, including:
    - a. Identifying and subcontracting with a certified analytical laboratory.
    - b. Obtaining appropriate glassware.
    - c. Collecting and submitting the sample for analysis.
    - d. Coordinating with the laboratory and paying for laboratory testing.
  - 3. Contractor shall prepare waste profiles for each waste stream for review and approval by selected disposal facility.
- D. Maintain a running summary of off-site waste shipments for each waste stream including sequential load number, manifest number, date of shipment, facility ticket number, and facility weight.

### 3.02 DEWATERING OF EXCAVATED SOILS

- A. Dewater excavated soils as necessary to pass Paint Filter testing procedures (USEPA SW-846 Method 9095) before leaving the site, as well as comply with additional moisture requirements from treatment and disposal facilities.
- B. Dewatering may include one or more of the following:
  - 1. Active dewatering of soils before or during excavation in accordance with Section 01 51 41 – Temporary Pumping.
  - 2. Blending of dry soils excavated from above the water table with wet soils excavated from below the water table.
  - 3. Stockpiling excavated soils within the removal limits on a temporary basis to allow for gravity dewatering.
  - 4. Use of approved soil drying agent to amend soils excavated from below the water table. Unless otherwise directed by Owner, excavated soils shall be amended with no more than four percent soil drying agent by weight.
- C. If used, approved drying agents shall only be mobilized to and stored at the site in 1-ton totes. Bulk shipments are prohibited.

### 3.03 DEBRIS PROCESSING AND SEGREGATION

- A. Segregate waste streams as required by Contractor's waste transportation and disposal Subcontractors. The Contractor is responsible for segregating soil from brick, concrete, metal, and other debris not suitable for off-site LTDD (for material being sent off-site for thermal treatment).
- B. As necessary, clean excavated debris of NAPL before crushing.
- C. Crush excavated rock and debris, as necessary, to render material suitable for off-site disposal.
- D. Collect and store any NAPL generated during the work (e.g., from dewatering, demolition of former MGP structures, etc.) shall be collected and stored in new USDOT-compliant containers.

### 3.04 TEMPORARY STORAGE OF CONTAMINATED MATERIAL

- A. General:
  - 1. Provide temporary containment areas adequate to support and withstand traffic loads during the Project. Locate temporary containment areas at approved locations.
  - 2. Waste materials shall be stored in locations approved by the Owner so as not to endanger the Work, and so that easy access may be had at all times to all parts of the Work area.
  - 3. If on-site staging is necessary, waste materials shall be stored in locations (typically with excavation areas for upland soils) approved by the Owner so as not to endanger the work, and so that easy access may be had at all times to all parts of the work area. Stored materials shall be kept neatly piled and trimmed. Visually impacted material shall be stored within the limits of the active excavations or alternate locations approved by the Owner/Engineer and/or NYSDEC (within a lined material staging area).

4. The Contractor is responsible for providing safe and adequate vehicle/equipment access to and egress from excavations. The Contractor shall adhere to the access restrictions specified in the Contract Documents relating to excavation support structures. The Contractor shall not drive, load, or store any equipment or materials within such restricted areas.
  5. Special precautions shall be taken to permit access at all times to fire hydrants, fire alarm boxes, driveways, and other points where access may involve the safety and welfare of the general public. Site access for utility personnel shall be maintained at all times.
- B. Excavated Soil and Debris:
1. It may be necessary to store excavated soils on-site on a temporary basis to accommodate one or more of the following:
    - a. Construction sequencing.
    - b. Disposal facility scheduling issues.
    - c. Soil dewatering requirements.
  2. Excavated soils shall only be stockpiled within the limits of excavation or in a properly constructed material staging area.
    - a. Stockpiles shall be kept neatly piled and trimmed.
    - b. Stockpiles shall be securely covered at all times (during both working and non-working hours) with minimum 10-mil polyethylene liners when not in use. Liners shall be properly anchored to prevent uplift due to wind conditions and shall be installed to minimize the ponding of precipitation.
    - c. Based on site conditions, the Owner may elect to limit the maximum allowable stockpile size. Limitations to stockpile size shall not result in any additional cost to the Owner.
    - d. Stockpiles shall be inspected daily (at a minimum) and any noted deficiencies shall be immediately corrected by the Contractor to the satisfaction of the Owner/Engineer.
  3. Temporary stockpiles shall be transported off-site for disposal within 24 hours of placement unless a longer duration is approved by the Owner/Engineer.
- C. Construction Wastewater:
1. Liquids that must be collected and handled include, but are not limited to:
    - a. Rainfall runoff which accumulates in excavation areas to any depth.
    - b. Direct precipitation in soil removal areas to any depth.
    - c. Water generated from soil dewatering operations.
    - d. Water generated from equipment and personnel decontamination/cleaning activities.
    - e. Groundwater/surface water encountered during remediation activities.
  2. Take precautions to minimize the solids present in the water extracted from the excavation area (e.g., construction a sump and keeping the intake of the pump off the bottom and away from the sidewalls of the area being dewatered). The sump shall consist of or a combination of the following methods.
    - a. A sump backfilled with washed gravel.
    - b. A perforated vessel (i.e., a corrugated metal pipe or drum), wrapped with a non-woven geotextile fabric and/or filled with gravel.
  3. Collect, extract, and convey all water generated during the Project to the on-site Frac Tanks for storage.
  4. Project-related water shall be transported off-site for treatment/disposal at an Owner-selected or Owner-approved facility.
  5. Closely coordinate and monitor the system operations with respect to potential impacts and disruptions to the overall implementation of the project. Under no circumstances shall and Project-related water be discharges to any location without the prior consent of the Engineer.

6. Continuously monitor the operation of the extraction system and at no time leave the system operating without qualified attending personnel present at the site.

D. NAPL:

1. NAPL, if encountered, may represent a hazardous waste (subject to characterization by Contractor) and shall be managed in accordance with all applicable Laws and Regulations, including 6 NYCRR Parts 370-374 and 376, unless and until determined to be non-hazardous.
2. NAPL-containing drums or containers shall be stored in a secure storage area equipped with secondary containment (generally consisting of an impermeable liner and run-on/run-off control). The storage area shall include appropriate signage to identify it as a hazardous waste storage area.
3. A hazardous waste label, with generator information, accumulation start date, and other required information, shall be completed by the Contractor and affixed to each container.
4. Containers shall be transported off-site for disposal at an appropriate Owner-approved facility within 90 days of the accumulation date.
5. The total volume of NAPL in the satellite accumulation area shall not exceed 50 gallons at any time without prior notification to and approval by the Owner.
6. Once full, containers will be marked with an accumulation end date by the Owner/ Engineer and shall be re-located by the Contractor to a separate, demarcated storage area equipped with secondary containment. The storage area shall include appropriate signage to identify it as a hazardous waste storage area.
7. Coordinate the transportation of containers for off-site for treatment/ disposal at an Owner-selected facility within 90 days of the end accumulation date.

3.05 LOADING, TRANSPORTATION, AND DISPOSAL

- A. Contaminated material shall be transported in vehicles with current New York State Waste Transporter Permits pursuant to 6 NYCRR Part 364. Waste Transporter Permits shall be submitted to the Engineer before Contractor mobilization, and current copies of those permits shall be maintained on-site by the Contractor for the duration of the Project.
- B. All vehicles transporting contaminated material shall be fully-lined with minimum 6-mil polyethylene sheeting, an equivalent material, or otherwise water-tight, and shall be equipped with functioning tailgate locks and non-mesh (solid), waterproof tarpaulins.
- C. Load contaminated material in a manner as to avoid contamination of their exteriors, including tires (e.g., loaded with 10-mil polyethylene sheeting draped over the side of the truck).
- D. A manifest (hazardous or non-hazardous as appropriate) shall be prepared by the Contractor and provided in sufficient quantity to the Engineer prior to transporting materials off-site for treatment/disposal. Each manifest will be signed by the Owner (as the Generator) or an authorized agent. Counter-signed waste manifests and facility disposal receipts (indicating the actual quantity of waste received at the treatment/disposal facility) shall be maintained by the Engineer on-site in the project file.
- E. The Engineer shall be responsible for the preparation of a log for each disposal facility that indicates, at a minimum, the following information regarding each truck load:
  1. Load number (sequential).
  2. Uniform Hazardous Waste Manifest Number or Bill of Lading Number.
  3. Transporters name
  4. Truck ID number (tractor or trailer number).

5. Estimated tare weight.
  6. Material type (nonhazardous, hazardous, debris).
  7. Destination.
- F. Transfer collected Project-related water from the on-site Frac Tanks to a tanker truck for transport to an Owner-approved off-site treatment/disposal facility. The Contractor shall be responsible for scheduling and coordinating the transport of all Project-related water.
- G. Inspect vehicles before leaving the site. Clean vehicles of visible soil or debris within temporary decontamination area in accordance with Section 02 51 00 - Decontamination.
- H. Keep all streets, sidewalks, and pavements clean and free from dirt, mud, stone, and other hauled materials. Comply with Section 01 74 05 - Cleaning.
- I. Vehicles transporting contaminated material shall follow approved haul routes as specified in CERP.

END OF SECTION

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NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

REMOVAL AND DISPOSAL OF CONTAMINATED MATERIALS  
02 61 05 – 8  
REVISION NO. 00  
DATE ISSUED: NOVEMBER 2020

## SECTION 03 00 05

### CONCRETE

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Providing all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install concrete, reinforcing and related materials.
2. The Work includes:
  - a. Providing concrete consisting of Portland cement, fine and coarse aggregates, water, and approved admixtures; combined, mixed, transported, placed, finished, and cured.
  - b. Fabricating and placing reinforcing, including ties and supports.
  - c. Providing and installing:
    - 1) Cast-in-place sidewalks.
    - 2) Granite curb bedding.
3. Width, thickness, geometry, and extent of concrete work shall be as shown or indicated on the Design Drawings.

###### B. Coordination:

1. Review installation procedures under other Sections and coordinate the installation of items to be installed in the concrete Work.

###### C. Related Sections:

1. Section 31 23 00 - Excavation and Fill.

##### 1.02 REFERENCE STANDARDS

###### A. The following standards are referenced in this Section:

1. ACI 301, Specifications for Structural Concrete.
2. ACI 304R, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
3. ACI 305R, Guide to Hot Weather Concreting.
4. ACI 306R, Guide to Cold Weather Concreting.
5. ACI 309R, Guide for Consolidation of Concrete.
6. ACI 318, Building Code Requirements for Structural Concrete and Commentary.
7. ACI 347, Guide to Formwork for Concrete.
8. ACI SP-66, ACI Detailing Manual.
9. ASTM A1064/A1064M, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
10. ASTM C31/C31M, Standard Practice for Making and Curing Concrete Test Specimens in the Field.
11. ASTM C94/C94M, Standard Specification for Ready-Mixed Concrete.
12. ASTM C117, Standard Test Method for Materials Finer than 75- $\mu$ m (No. 200) Sieve in Mineral Aggregates by Washing.
13. ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
14. ASTM C138/C138M, Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
15. ASTM C143/C143M, Standard Test Method for Slump of Hydraulic-Cement Concrete.
16. ASTM C172/C172M, Standard Practice for Sampling Freshly Mixed Concrete.
17. ASTM C231/C231M, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

CONCRETE  
03 00 05 – 1  
REVISION NO. 00  
DATE ISSUED: NOVEMBER 2020

Arcadis of New York, Inc.



18. ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
19. ASTM C1077, Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.
20. ASTM E329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
21. CRSI MSP, Manual of Standard Practice.
22. NYSDOT Standards and Specifications.

### 1.03 QUALITY ASSURANCE

#### A. Qualifications:

1. Testing Laboratory: Retain the services of an independent testing laboratory experienced in the design and testing of concrete materials and mixes to perform material evaluation tests and to design concrete mixes. Testing laboratory shall comply with ASTM C1077 and ASTM E329, and shall be responsible for quality assurance and field quality control testing required in this Section.

#### B. Quality Assurance Testing:

1. Verify each concrete mix design by laboratory trial batch, unless indicated otherwise. Perform the following testing on each trial batch:
  - a. Aggregate gradation for fine and coarse aggregates in accordance with ASTM C117 and ASTM C136.
  - b. Slump in accordance with ASTM C143/C143M.
  - c. Air content in accordance with ASTM C231/C231M.
  - d. Compressive strength based on three cylinders, each tested at seven days and at 28 days in accordance with ASTM C39/C39M.
2. Submit for each trial batch the following information:
  - a. Project identification name and number (if applicable).
  - b. Date of test report.
  - c. Complete identification of aggregate source of supply.
  - d. Tests of aggregates for compliance with the Contract Documents.
  - e. Scale weight of each aggregate.
  - f. Absorbed water in each aggregate.
  - g. Brand, type, and composition of cementitious materials.
  - h. Brand, type, and quantity of each admixture.
  - i. Quantity of water used in trial batch.
  - j. Proportions of each material per cubic yard.
  - k. Gross weight and yield per cubic yard of trial mixture.
  - l. Measured slump.
  - m. Measured air content.
  - n. Compressive strength developed at seven days and 28 days, from not less than three test cylinders cast for each seven-day and 28-day test, and for each design mix.
3. Requirement for laboratory trial batch may be waived by Engineer if sufficient field test data documenting compliance with specified material properties and performance properties is submitted to and accepted by Engineer. Tests shall have been made on concrete with identical mix design to mix design proposed for the Work, including sources of aggregate and manufacturers of cementitious materials and admixtures.

## 1.04 SUBMITTALS

### A. Action Submittals:

1. Shop Drawings:
  - a. Submit list of concrete materials and proposed concrete mix designs. Include results of tests performed to qualify the materials and to establish the mix designs.
  - b. Laboratory Trial Batch Reports: Submit laboratory test reports for concrete cylinders, materials, and mix design tests.
2. Product Data:
  - a. Submit manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures.

### B. Informational Submittals:

1. Qualifications Statements: Submit name and qualifications of testing laboratory to be employed, and qualifications of testing laboratory's personnel that will perform quality assurance and field quality control testing required in this Section. If more than one laboratory will be employed, submit qualifications statement for each laboratory.
2. Delivery Tickets: Submit copy of delivery ticket for each load of concrete delivered to or mixed at the site or support area. Each delivery ticket shall contain information in accordance with ASTM C94/C94M along with project name, contract number, date, mix type, mix time, quantity delivered to or mixed at the site, and quantity of water introduced.
3. Field Quality Control Submittals: Submit laboratory test reports for field quality control testing performed in accordance with Part 3.09 of this Section.

## 1.05 DELIVERY, STORAGE, AND HANDLING

### A. Transportation, Delivery, and Handling:

1. Deliver concrete reinforcing products to the site bundled, tagged, and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings on approved Shop Drawings.
2. Materials used for concrete shall be clean and free from foreign matter during transportation and handling and kept separate until measured and placed into concrete mixer.
3. Implement suitable measures during hauling, piling, and handling to ensure that segregation of coarse and fine aggregate particles does not occur, and grading is not affected.

### B. Storage:

1. Store formwork materials above ground on framework or blocking. Cover wood for forms and other accessory materials with protective, waterproof covering. Provide for adequate air circulation or ventilation under cover.
2. Store concrete reinforcing materials to prevent damage and accumulation of dirt and excessive rust. Store on heavy wood blocking so that reinforcing does not come into contact with the ground. Space framework or blocking supports to prevent excessive deformation of stored materials.
3. For storage of concrete materials, provide bins or platforms with hard, clean surfaces.

## PART 2– PRODUCTS

### 2.01 CONCRETE MIXES

- A. Class “A” Concrete Mix shall have a minimum compressive strength of 4,000 psi at 28 days and shall conform to the NYSDOT Standards and Specifications, Section 501-3 for Class “A” mix (or approved equal).
- B. Granite curb bedding material shall be any class concrete or concrete mixture proportioned in accordance with NYSDOT Standards and Specifications, Section 609-2.05.
- C. Slump Limits:
  - 1. Proportion and design mixes to result in concrete slump at point of placement of not less than one inch and not more than four inches.
  - 2. When using high-range water reducers, slump prior to addition of admixture shall not exceed three inches. Slump after adding admixture shall not exceed eight inches at point of placement.
- D. Adjustment of Concrete Mix:
  - 1. Concrete mix design adjustments may be requested by Contractor when warranted by characteristics of materials, site conditions, weather, test results, or other, similar circumstances.
  - 2. Submit for Engineer’s approval laboratory test data for adjusted concrete mix designs, including compressive strength test results.
  - 3. Implement adjusted mix designs only after Engineer’s approval.
  - 4. Adjustments to concrete mix designs shall not result in additional costs to the Owner.

### 2.02 FORM MATERIALS

- A. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection. Design the formwork system to resist all applied loads including pressures from fluid concrete and construction loads.
- B. Full depth wood forms may be used for sidewalks. Wood forms shall be free from warp and have sufficient strength to resist springing out of shape. Wood forms shall be well staked or otherwise held to the established lines and grades of the walk and shall be thoroughly wetted prior to placement of concrete.

### 2.03 REINFORCING MATERIALS

- A. Welded Wire Reinforcement: ASTM A1064/A1064M. Furnish in flat sheets, not rolls.
- B. Unless otherwise shown or indicated, provide not less than six-inch by six-inch, No. 6/6 wire fabric.
  - 1. Wire fabric shall be used on all slabs having an area of 36 square feet or more; all slabs having dimensions greater than 6 feet; and at all driveways. Wire fabric for concrete reinforcement shall be embedded as mid-depth in the slab.
- C. Provide supports for reinforcing including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing in place.
  - 1. Use wire bar-type supports complying with CRSI MSP recommendations, except as specified in this Section. Do not use wood, brick, or other unacceptable materials.

2. For all concrete surfaces where legs of supports are in contact with forms, provide supports having either hot-dip galvanized, plastic-protected, or stainless-steel legs in accordance with CRSI MSP.
3. Supports shall be provided in sufficient quantity and spacing to avoid deformation of reinforcing when placed on the supports.

## 2.04 RELATED MATERIALS

- A. Membrane-Forming Curing Compound: ASTM C309, Type ID.
- B. Expansion Joint Material: provide performed bituminous expansion joint filler complying with ASTM D1751.

## PART 3 – EXECUTION

### 3.01 INSPECTION

- A. Examine the substrate and conditions under which the Work will be performed and notify Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected in a manner acceptable to Engineer.
- B. Subgrade:
  1. Verify that earthwork is completed to correct line and grade. Contractor shall use Type 2 Subbase to adjust subgrade elevations where necessary.
  2. Verify that subgrade is smooth, properly compacted, and free of frost and excessive moisture in accordance with Section 31 23 00 - Excavation and Fill.
  3. Verify subgrade is free of large stones, tree roots, and any other foreign substances.
  4. Excavate and remove all tree roots to a depth of 6 inches below the bottom of sidewalks. Backfill the area with an approved material and compact prior to sidewalk installation.
  5. Do not commence the Work under this Section until conditions are satisfactory.

### 3.02 AGGREGATE BASE

- A. Install aggregate fill in accordance with Section 31 23 00 - Excavation and Fill. Properly compact aggregate fill to thickness shown or indicated in the contract documents.

### 3.03 FORMWORK

- A. Construct formwork in accordance with ACI 347 such that concrete members and structures are of correct size, shape, alignment, elevation, and position.
- B. Conventional Forms
  1. Set forms to line and grade. Forms shall be free from warp.
  2. Install full length forms to match existing alignment and geometry.
  3. Forms shall extend full depth and be secured so no displacement occurs during concrete placing.
- C. Clean and adjust forms prior to placing concrete. Apply form release agents or wet forms as required. Re-tighten forms during and after concrete placing, when required, to eliminate cement paste leaks.

- D. Removing Formwork:
1. Comply with ACI 301 and ACI 347, except as otherwise indicated in the Contract Documents.
  2. Forms may be removed after curing for 24 hours at not less than 50 degrees F. Concrete shall be sufficiently hard to not be damaged by form removal operations.
  3. Removal time for formwork is subject to Engineer's acceptance.
  4. Repair form tie-holes in accordance with ACI 301.

### 3.04 REINFORCING, JOINTS, AND EMBEDDED ITEMS

- A. Comply with applicable recommendations of Laws and Regulations and standards referenced in this Section, including CRSI MSP, for details and methods of placing and supporting reinforcing.
- B. Clean reinforcing to remove loose rust and mill scale, earth, ice, and other materials which act to reduce or destroy bond between reinforcing material and concrete.
- C. Position, support, and secure reinforcing against displacement during formwork construction and concrete placing. Locate and support reinforcing by means of metal chairs, runners, bolsters, spacers, and hangers, as required.
1. Do not secure reinforcing to formwork using wire, nails, or other ferrous metal. Metal supports subject to corrosion shall not be in contact with formed or exposed concrete surfaces.
  2. Unless otherwise shown or indicated, locate reinforcing centered in the concrete section.
- D. Provide sufficient quantity of supports of strength required to carry reinforcing. Do not place reinforcing more than two inches beyond the last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
- E. Install welded wire reinforcement in lengths as long as practical. Lap adjoining sections a minimum of one full mesh plus two inches and lace splices with 16-gage wire. Do not make end laps midway between supporting beams, or directly over beams of continuous structures. Offset end laps in adjacent widths to prevent continuous laps.
- F. Do not place concrete until reinforcing is inspected and Engineer indicates that conditions are acceptable for placing concrete. Concrete placed in violation of this paragraph will be rejected. Notify Engineer in writing at least two working days prior to proposed concrete placement.

### 3.05 CONCRETE PLACING

- A. If applicable, Site Mixing: Use drum-type batch machine mixer, mixing not less than 1.5 minutes for one cubic yard or smaller capacity. Increase required mixing time by a minimum of 15 seconds for each additional cubic yard or fraction thereof.
- B. Ready-Mixed Concrete: Comply with ASTM C94/C94M.
- C. Concrete Placing:
1. Place concrete in a continuous operation within planned joints or sections in accordance with ACI 304R.
  2. Do not begin placing concrete until work of other trades affecting concrete is completed.
  3. Wet concrete and subgrade surfaces to saturated surface dry condition immediately prior to placing concrete.

4. Curbs: Place concrete using methods that prevent segregation of the mix. Consolidate concrete along face of forms with an internal vibrator.
  5. Sidewalks: Place concrete in one-course, monolithic construction, for full width and depth.
  6. Deposit concrete as near its final location as practical to avoid segregation due to re-handling or flowing.
  7. Avoid separation of the concrete mixture during transportation and placing. Concrete shall not free-fall for distance greater than four feet during placing.
  8. Complete concrete placing within 90 minutes of addition of water to the dry ingredients.
- D. Consolidate placed concrete in accordance with ACI 309R using mechanical vibrating equipment supplemented with hand rodding and tamping, such that concrete is worked around placing and other embedded items and into all parts of formwork. Insert and withdraw vibrators vertically at uniformly-spaced locations. Do not use vibrators to transport concrete within the formwork. Vibration of formwork or placing is not allowed.
- E. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placing, and curing.
1. In hot weather, comply with ACI 305R.
  2. In cold weather, comply with ACI 306R.

### 3.06 QUALITY OF CONCRETE WORK

- A. Make concrete solid, compact, smooth, and free of laitance, cracks, and cold joints.
- B. Cut out and properly replace to extent directed by Engineer, or repair to satisfaction of Engineer, surfaces that contain cracks or voids, are unduly rough, or are defective in any way. Patches or plastering are unacceptable.
- C. Repair, removal, and replacement of defective concrete directed by Engineer shall be at no additional cost to the Owner.

### 3.07 CURING

- A. Begin initial curing as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than ten days or curing compound which resists salt action shall be applied within three days, see Section 3.07C. Continue curing by using moisture-retaining cover or membrane-forming curing compound. Cure formed surfaces by moist curing until formwork is removed. Provide protection, as required, to prevent damage to exposed concrete surfaces. Total curing period shall not be less than seven days. Curing methods and materials shall be compatible with scheduled finishes.
- B. Cure sidewalks at driveways for not less than three days prior to opening to vehicle traffic. In colder weather, curing period shall be not less than ten days prior to opening to vehicle traffic unless other provisions to determine strength are provided and approved by the Engineer.
- C. All sidewalks constructed from November 1 through April 30 shall be treated with a penetrating type protective sealer per NYSDOT Item 717-03 to protect the fresh surface against spalling caused by salt infiltration.

### 3.08 FINISHING

#### A. Sidewalk and Slabs:

1. Float Finish:
  - a. Smooth exposed surface by screeding and floating. Perform hand-screeding when conventionally-formed concrete is provided.
  - b. Work edges of sidewalks, back top edge of curb, and transverse joints; and round to 1/4-inch radius.
2. Non-Slip Broom Finish:
  - a. Immediately after float finishing, slightly roughen concrete surface by drawing a fine-hair fiber bristle broom across surface, perpendicular to line of traffic.

### 3.09 FIELD QUALITY CONTROL

#### A. Site Tests:

1. Perform sampling and testing for field quality control during placement of concrete. Comply with the following:
  - a. Sampling of Fresh Concrete: ASTM C172/C172M. Engineer will direct where samples are to be obtained.
  - b. Slump: ASTM C143/C143M. Perform one test for each concrete load at point of discharge.
  - c. Air Content: ASTM C231. Perform one test for every two concrete loads at point of discharge, and when a change in the concrete is observed.
2. Submit test results, certified by testing laboratory, to Engineer within 24 hours of completion of test.
3. When there is evidence that strength of in-place concrete does not comply with the Contract Documents, employ the services of concrete testing laboratory to obtain cores from hardened concrete for compressive strength determination. Cores and tests shall comply with ASTM C42/C42M.

### 3.10 REPAIR AND CLEANING

- A. Repair or replace broken or defective curbs and sidewalk as directed by Engineer.
- B. Sweep the concrete curb and sidewalk Work and wash free of stains, discolorations, dirt, and other foreign material.

END OF SECTION

## SECTION 31 05 05

### AGGREGATES FOR EARTHWORK

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Work Specified

1. Furnishing temporary and permanent fill materials from off-site sources as specified in this Section for backfilling excavations, restorations of surfaces, and other purposes required by the Contract Documents.
2. Fill materials consist of:
  - a. General Fill
  - b. Type 2 Subbase
  - c. Type 2 Crushed Stone
  - d. Type "D" Sand
  - e. Controlled Low-Strength Material (CLSM)

###### B. Related Sections:

1. Section 02 61 05 - Removal and Disposal of Contaminated Materials.
2. Section 31 23 00 - Excavation and Fill.

##### 1.02 APPLICABLE CODES, STANDARDS, AND SPECS

###### A. The following standards are referenced in this Section:

1. ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft<sup>3</sup> [600 kN-m/m<sup>3</sup>]).
2. ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
3. ASTM D4832, Standard Test Method for Preparation and Testing of Controlled Low-Strength Material.
4. ASTM D4972, Standard Test Methods for pH of Soils.
5. ASTM D6103, Standard Test Method for Flow Consistency of CLSM.
6. ASTM D6913, Standard Test Method for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.
7. Total volatile organic compounds (VOCs) in accordance with USEPA SW-846 Method 8260C.
8. Total semi-volatile organic compounds (SVOCs) in accordance with USEPA SW-846 Method 8270D.
9. Total polychlorinated biphenyls (PCBs) in accordance with USEPA SW-846 Method 8082.
10. Pesticides in accordance with USEPA SW-846 Method 8081B.
11. Herbicides in accordance with USEPA SW-846 Method 8151A.
12. Target Analyte List (TAL) Metals in accordance with USEPA SW-846 Method 6010C/6020A/7471B.
13. Total mercury in accordance with USEPA SW-846 Method 7471.
14. Total Cyanide in accordance with USEPA SW-846 Method 9012B.
15. pH in accordance with USEPA SW-846 Method 9045C.
16. Per- and Polyfluoroalkyl Substances (PFAS) in accordance with USEPA Modified Method 537.



- B. Regulatory Requirements: Laws and Regulations applying to the Work under this Section include:
1. NYSDEC, Technical Guidance for Site Investigations and Remediation (DER-10).
  2. NYSDEC, Title 6 of the Official Compilation of Codes, Rules, and Regulations (6 NYCRR) Part 375 (Environmental Remediation Programs).
  3. NYSDEC, Sampling, Analysis, and Assessment of Per-and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs.
  4. New York State Department of Transportation (NYSDOT), Standard Specifications.

### 1.03 QUALITY ASSURANCE

A. Qualifications:

1. Engineer's Testing Laboratory:
  - a. The Engineer shall retain the services of an independent testing laboratory to perform quality assurance testing required in this Section. Testing laboratory shall comply with ASTM E329, and shall be experienced in the types of testing required.
  - b. Testing laboratory shall have current National Environmental laboratory Approval program (NELAP) and New York State Environmental Laboratory (ELAP) certification for specific methods (including Perfluorooctane Sulfonate [PFOA] and Perfluorooctanoic Acid [PFOS]) they are performing from a recognized state or federal laboratory accreditation program.
2. Contractor's Testing Laboratory:
  - a. The Contractor shall retain the services of an independent testing laboratory to perform quality assurance testing required in this Section. Testing laboratory shall comply with ASTM E329, and shall be experienced in the types of testing required.
  - b. Testing laboratory shall have current NELAP and New York State ELAP certification for specific methods they are performing from a recognized state or federal accreditation program.
3. Off-Site Fill Sources:
  - a. Source of off-site general fill shall be from a NYSDEC-permitted mine, pit, or quarry.
  - b. Imported fill materials shall be free of foreign chemical contaminants and meet the lower of the 6 NYCRR Part 375 residential use or groundwater protection soil cleanup objectives (SCOs) set forth in 6 NYCRR Part 375 and included in Appendix 5 of DER-10.

B. Quality Assurance Material Testing for Off-site Materials:

1. Materials used in the Work may require testing and retesting, as directed by Engineer, during the Project. In addition to providing a representative sample (see Part 1.04 of this Section), provide the Engineer with free access to material stockpiles and facilities at all times.
2. Engineer reserves the right to visit each material source and conduct visual observation of the materials proposed for use. Coordinate access with the material sources for the Engineer to perform visits.
3. Quality assurance testing of the imported materials shall be performed at the source location prior to shipment to the site unless otherwise approved by the Engineer.
4. The Engineer reserves the right to reject material based on the results of conformance tests. Rejected materials shall be removed from the site at no cost to the Owner (if delivered without Engineer approval).
5. Engineer Required Quality Assurance Material Testing: Perform the testing described below at the frequency indicated. Additional sampling may be required if concerns arise that the characteristics of the fill materials have changed.

- a. Chemical Testing: For each material with greater than 10 percent by weight passing the No. 80 sieve, as determined by gradation testing performed in accordance with this Section, perform chemical testing as follows:
  - 1) Frequency:
    - a) For material imported from a virgin mine/pit, collect samples at the following frequency:
      - i. One composite sample
    - b) For material imported from sources other than a virgin mine/pit, collect samples at the frequency as presented in DER-10 Table 5.4(e)10.
  - 2) Analysis: Collected samples shall be submitted for the following:
    - a) Discrete Grab Samples:
      - i. 1,4-Dioxane by USEPA SW-846 Method 8260C.
    - b) Composite Samples:
      - i. PFAS by USEPA Modified Method 537
- 6. Contractor Required Quality Assurance Material Testing: Perform the testing described below at the frequency indicated. Additional sampling may be required if concerns arise that the characteristics of the fill materials have changed.
  - a. Geotechnical Testing:
    - 1) Gradation in accordance with ASTM D6913. Perform one test for each type and source of material indicated in Part 2.
    - 2) Compaction characteristics in accordance with ASTM D698. Perform one test for each type and source of material requiring compaction.
    - 3) Atterberg Limits in accordance with ASTM D4813. Perform one test for each type and source of material requiring compaction.
  - b. Chemical Testing: For each material with greater than 10 percent by weight passing the No. 80 sieve, as determined by gradation testing performed in accordance with this Section, perform chemical testing as follows:
    - 1) Frequency:
      - a) For material imported from a virgin mine/pit, collect samples at the following frequency:
        - i. Two discrete grab samples
        - ii. One composite sample
      - b) For material imported from sources other than a virgin mine/pit, collect samples at the frequency as presented in DER-10 Table 5.4(e)10.
    - 2) Analysis: Collected Samples shall be submitted for the following:
      - a) Discrete Grab Samples:
        - i. VOCs by USEPA SW-846 Method 8260C.
      - b) Composite Samples:
        - i. SVOCs by USEPA SW-846 Method 8270D.
        - ii. PCBs by USEPA SW-846 Method 8082.
        - iii. Pesticides by USEPA SW-846 Method 8081B.
        - iv. Herbicides by USEPA SW-846 Method 8151A.
        - v. TAL metals by USEPA SW-846 Method 6010C/6020A/7471B.
        - vi. Total mercury by USEPA SW-846 Methods 7471.
        - vii. Total cyanide by USEPA SW-846 Method 9012B.
        - viii. pH by USEPA SW-846 Method 9045C.
  - c. Physical Testing:
    - 2) CLSM
      - a) Provide materials, labor, and services for sampling and testing of one cylinder for each lift of CLSM placed. Test each cylinder at 28 days for

verification that strength is a minimum 50 psi. Cylinders to be collected at random intervals as determined by the Engineer.

- b) Provide curing and protection of cylinders until such time that they are ready to be transported to testing laboratory until the required break date.
7. If testing results indicate that a proposed off-site fill material does not comply with the Contract Documents, identify and propose a new off-site source of the specified material in accordance with Part 1.04 of this Section. Costs for retesting of rejected materials and installed Work shall be the Contractor's responsibility.
8. Do not ship off-site fill materials to the site until proposed materials, sources, and Suppliers are accepted by the Engineer

#### 1.04 SUBMITTALS

##### A. Action Submittals:

1. Borrow Source Characterization Report: At least four weeks prior to import of materials to the site, submit a Borrow Source Characterization Reports for each source and each material type specified in Part 2. The Borrow Source Characterization Reports shall include, at a minimum following:
  - a. The material source, including name, address, and contact information.
  - b. A certification letter from the borrow source owner or operator certifying that the source is not from an industrial site or suspected to have been modified by the addition of manufactured chemicals and that the material does not contain oil or hazardous material as supported by test data to be provided with certification letter and a copy of applicable current permits (e.g., NYSDEC mining permit).
2. Representative Sample: At least four weeks prior to proposed import of materials to the site, submit a representative sample of each off-site fill material to the Engineer to perform the grain size profile and analytical testing, as appropriate, and as required by Part 1.03 of this Section.
3. Material Testing Results:
  - a. At least four weeks prior to import of materials to the site, submit to the Engineer, as necessary, analytical testing data, grain size profile results, and physical testing data for each material tested as specified in Paragraph 1.03.B.6.
4. NYSDEC's Request to Import/reuse Fill or Soil Form:
  - a. For each proposed import or reuse material, Engineer shall submit to the NYSDEC all required laboratory data and a completed Request to Import/Reuse Fill or Soil form (Attachment A) for NYSDEC review and approval prior to importing fill material or using reuse materials.

##### B. Informational Submittals:

1. Delivery Tickets. Submit copy of delivery ticket for each load of off-site material delivered to the site and a summary table for each type of off-site material delivered to the site. Each delivery ticket shall indicate Supplier name and source address, project name, contract number, date, material type, NYSDOT item number when applicable, and weight delivered as measured on certified scales at the source location.
2. For CLSM provide the following:
  - a. Description of Contractor's proposed CLSM mixture design, including sources and proportions of CLSM ingredients.
  - b. CLSM producer's certification that the mixture design will achieve the strength specified in this Section.
  - c. Contractor's proposed method of placement for CLSM.

- d. Certified batch reports for CLSM delivered to the Site providing documentation that the CLSM was prepared in accordance with the approved mixture design.
- e. Submit test reports of compressive strength testing of CLSM in accordance with the frequency required in Paragraph 1.03 of this Section.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Notify the Engineer one (1) week in advance of delivery of all granular materials.

#### 1.06 SCHEDULING

- A. Anticipate and schedule Work, including excavation, backfilling, and restoration, to accommodate the sampling, analysis and review of fill materials by the Engineer, as appropriate.

### PART 2– PRODUCTS

#### 2.01 GENERAL

- A. Any off-site materials brought on-site for use as fill must be from a NYSDEC permitted mine, pit, or quarry and meet the requirements of this Section.
- B. If quality assurance testing shows that the material does not meet the requirements of this Section, the Contractor must identify a new source for the material and provide the required data and materials for testing by the Engineer, as appropriate, for the new source of material prior to the use of such material on-site.

#### 2.02 MATERIALS

- A. General Fill:
  - 1. General fill shall consist of clean common earth fill, free from excessive moisture, organic material, coatings, sharp angular stones, unsatisfactory soils, nuisance seeds and other deleterious materials, and having the following gradation by weight as specified in Table 31 05 05-A:

**TABLE 31 05 05-A  
GRADATION REQUIREMENTS FOR GENERAL FILL**

<b>U.S. Sieve Size</b>	<b>Percentage by Weight Passing Sieve</b>
1.5-inch (37.5 mm)	90-100
No. 4 (4.76 mm)	40-75
No. 40 (0.425 mm)	25-60
No. 200 (0.075 mm)	10-30

- 2. General fill material shall have a liquid limit not greater than 45, and plasticity index not greater than 25.
- B. Type 2 Subbase:
  - 1. Material shall meet the NYSDOT Standard Specification Section 304-2.02 or similar.
  - 2. Gradation shall be as specified in Table 31 05 05-B.

**TABLE 31 05 05-B  
GRADATION REQUIREMENTS FOR SUBBASE COURSE TYPE 2**

<b>U.S. Sieve Size</b>	<b>Percentage by Weight Passing Sieve</b>
2-inch (50 mm)	100
¾-inch (6.3 mm)	25-60
No. 40 (0.425 mm)	35-70
No. 200 (0.075 mm)	0-15

3. Plasticity index of material passing the No. 40 sieve shall not exceed 5.0.

**C. Type 2 Crushed Stone**

1. Material shall meet the requirements set forth by the NYSDOT, for Type 2 Crushed Stone (NYSDOT Material Designation 703-0202).

**TABLE 31 05 05-C  
GRADATION REQUIREMENTS FOR TYPE 2 CRUSHED STONE**

<b>U.S. Sieve Size</b>	<b>Percentage by Weight Passing Sieve</b>
1.5-inch (37.5 mm)	100
1-inch (25.4 mm)	25-60
½-inch (12.7 mm)	35-70

**D. Type "D" Sand:**

1. Material shall be free of foreign chemical contaminants and shall comply with the soil cleanup objectives for Restricted Residential Use, as set forth in 6 NYCRR 375-6.8(b).
2. Gradation shall be as specified in Table 31 05 05-D.

**TABLE 31 05 05-D  
GRADATION REQUIREMENTS FOR TYPE "D" SAND**

<b>U.S. Sieve Size</b>	<b>Percentage by Weight Passing Sieve</b>
3/8 -inch (9.5 mm)	100
No. 4 (4.8 mm)	95-100
No. 8 (2.4 mm)	80-100
No. 16 (1.2 mm)	50-85
No. 30 (0.6 mm)	25-60
No. 50 (0.3 mm)	10-30
No. 100 (0.15 mm)	2-10

**E. CLSM**

1. Self-compacted, cementitious fill material consisting of cement, fly ash, fine aggregate and water.
2. Type I or II Portland Cement conforming to the chemical and physical requirements of those respective types as specified in AASHTO M 85. Minimum of 50 pounds per cubic yard.
3. Fly Ash conforming to ASTM C618 Class F or C with loss on ignition less than 3 percent; no limit on quantity.
4. Clean (potable) water free from oil, salts, acid, strong alkalis, vegetable matter, and other impurities that would have an adverse effect of the quality of the CLSM.
5. Fine Aggregates: Conform to ASTM C33 (normal weight aggregate). Materials containing deleterious substances (spalling causing) are not acceptable.
6. CLSM ingredients shall be mixed to produce a uniform product with a flow of 4 to 8 inches prior to placement (as determined by ASTM D6103) and capable of achieving a 28-day unconfined compressive strength between 50 and 150 psi, in accordance with ASTM D4832.

7. CLSM ingredients shall be proportioned by the ready mixed concrete supplier on the basis of field experience and laboratory trial mixtures to produce a cohesive and non-segregating mixture meeting the specified properties.

### PART 3– EXECUTION

#### 3.01 GENERAL

- A. Fill materials will be placed in accordance with the Design Drawings, Specifications (e.g., Section 31 23 00 - Excavation and Fill), and/or Contract Documents.
- B. Dispose of materials displaced through the use of the above materials in accordance with Section 02 61 15 - Handling and Disposal of Impacted Materials.
- C. Restore to design grade any settlements in the finished work at no additional cost to the Owner.

#### 3.02 CLSM

- A. CLSM shall be batched and delivered in accordance with AASHTO M 157.
- B. CLSM may be transported in open haul units provided the material is placed within 30 minutes of the end of mixing. A rotating drum unit capable of 2 to 6 rotations per minute shall be used to transport CLSM that cannot be placed within 30 minutes after the end of mixing.
- C. CLSM shall be placed at a uniform rate using methods identified by the Contractor and approved by the Engineer.
- D. Maximum lift thickness of CLSM shall be 24 inches. Placement of subsequent lifts can be performed with an unconfined compressive strength of 20 psi is achieved for the in-place CLSM.
- E. CLSM shall not be placed in frozen, wet, or soggy ground. The minimum ambient temperature at the time of placement shall be 35°F.

#### 3.03 ATTACHMENTS

- A. The attachment listed below, which follow after the “End of Section” designation, are part of this Section:
  1. Attachment A: NYSDEC Request to Import/Reuse Fill or Soil form (three pages).

END OF SECTION

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NATIONAL GRID  
FINAL REMEDIAL DESIGN  
NON-OWNED RENSSELAER FORMER MGP SITE  
CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK

AGGREGATES FOR EARTHWORK  
31 05 05 – 8  
REVISION NO. 00  
DATE ISSUED: NOVEMBER 2020

Arcadis of New York, Inc.

## SECTION 31 05 19.13

### GEOTEXTILES FOR EARTHWORK

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. Provide all labor, materials, tools, equipment, and services as shown, specified, and required to furnish and install geotextiles.
- B. Related Sections:
  - 1. Section 31 23 00 - Excavation and Fill.

##### 1.02 REFERENCE STANDARDS

- A. The following standards are referenced in this Section:
  - 1. AASHTO M 288, Standard Specification for Geotextile Specification for Highway Applications.

##### 1.03 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Manufacturer: Geotextile manufacturer shall be a specialist in the manufacture of geotextile separation and stabilization fabrics, and shall have produced and successfully installed a minimum of five million square feet.

##### 1.04 SUBMITTALS

- A. Action Submittals:
  - 1. Product Data: Submit geotextile manufacturer's data, specifications, installation instructions, dimensions, and lot and roll numbers of the field-delivered materials.
- B. Informational Submittals:
  - 1. Certificates: Submit affidavit certifying that the geotextile furnished complies with the requirements of this Section. Do not ship geotextile to the site until affidavit is submitted to Engineer.

##### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Each roll of geotextile delivered to the site shall be labeled by the manufacturer identifying the manufacturer's name, product identification, lot number, roll number, and roll dimensions.
- B. All rolls and packages shall be inspected by Contractor upon delivery to the site. Contractor shall notify Engineer if any loss or damage exists to geotextile. Replace loss and repair damage to new condition, in accordance with manufacturer's instructions.
- C. Geotextile shall be protected from ultraviolet light exposure, precipitation or other inundation, mud, dirt, dust, puncture, cutting, or any other damaging or deleterious conditions. Geotextile rolls shall be shipped and stored in relatively opaque and watertight wrappings.



## PART 2 – PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

- A. SKAPS Industries.
- B. TenCate Mirafi.
- C. U.S. Fabrics.
- D. Hanes Geo Components
- E. Approved equal.

### 2.02 MATERIALS

- A. Non-Woven Geotextile
  - 1. Non-woven geotextile shall be of needle-punched construction and consist of long-chain polymeric fibers or filaments composed of polypropylene. The non-woven geotextile shall be chemically inert to naturally encountered chemicals, acids, and bases and resist biological degradation.
  - 2. Non-woven geotextile shall be used as a cushioning layer above and below the high-density polyethylene (HDPE) geomembrane liner in containment areas and decontamination areas.
  - 3. The non-woven geotextile shall meet GRI GT12 specifications and have the following MARVs:

**TABLE 31 05 19.13-A  
REQUIREMENTS FOR NON-WOVEN GEOTEXTILE**

<b>Property</b>	<b>ASTM Test Method</b>	<b>Units</b>	<b>MARV</b>
Unit Weight	D5261	oz/yd <sup>2</sup>	12
Grab Tensile Strength	D4632	lb	300
Grab Tensile Elongation	D4632	%	50
Trapezoidal Tear Strength	D4533	lb	115
Puncture Strength	D4833	lb	140
UV Resistance (at 500 hours)	D4355	%strength retained	70

## PART 3 – EXECUTION

### 3.01 INSPECTION

- A. Examine the areas and conditions under which the Work will be performed and notify Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected in a manner acceptable to Engineer.

### 3.02 PREPARATION

- A. Excavate or fill subgrade, as required, to bring subgrade to elevations shown or indicated. Maintain all angles of repose. Confirm that subgrade is at proper elevations and that no

further earthwork is required to bring the subgrade to proper elevations. Provide subgrade elevations that slope parallel to finished grade and in the direction shown on the Design Drawings.

- B. Remove all stones greater than two inches in any dimension, construction debris, trash, rubble, and all other extraneous materials from the subgrade.
- C. Notify Engineer that subgrade has been prepared, and obtain Engineer's approval before installing geotextile.

### 3.03 INSTALLATION

- A. Geotextiles shall be placed (rolled out) in the direction of most frequent vehicular travel.
- B. Adjoining edges of geotextiles shall be overlapped 12 inches.
- C. Geotextiles shall be weighted with sandbags or equivalent when required. Such sandbags shall be installed during placement and shall remain until replaced with cover materials.
- D. During placement of geotextiles, care shall be taken not to entrap in the geotextile stone, excessive dust, mud, or moisture that could damage or cause clogging of the geotextile, or hamper subsequent seaming.
- E. Use proper tools to cut and size geotextiles; exercise care while cutting geotextiles.
- F. Geotextiles shall not be exposed to precipitation prior to being installed, and shall not be exposed to direct sunlight for more than 15 days.

### 3.04 GEOTEXTILE REPAIR

- A. Any holes or tears in the fabric shall be repaired as follows:
  - 1. On Slopes: A fabric patch shall be sewn into place using a double sewn lock stitch (1/4 inch to 3/4 inch apart and no closer than one inch from any edge). Should any tear exceed 10 percent of the width of the roll, that roll shall be removed from the slope and replaced.
  - 2. Non-Slopes: A fabric patch shall be spot-seamed in place with a minimum of 24 inches of overlap in all directions.

### 3.05 PLACEMENT OF COVER MATERIALS

- A. Place cover materials in such a manner as to ensure that geotextiles are not damaged or dislodged.

END OF SECTION

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## SECTION 31 05 19.16

### GEOMEMBRANES FOR EARTHWORK

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Furnishing and installing 40 mil textured high-density polyethylene (HDPE) geomembrane liner for material staging areas (if constructed), and decontamination areas as specified in this section and in accordance with the manufacturer's recommendations/specifications.
- B. Quality assurance (QA)/quality control (QC) testing of HDPE geomembrane liner as specified in this section and in accordance with the manufacturer's recommendations/ specifications.

##### 1.02 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

- A. ASTM International (ASTM). The following ASTM specifications are referenced in this section and are to be considered part of this section:
  - 1. D792 - Standard Test Methods for Density and Specific Gravity (Relative Gravity) of Plastics by Displacement
  - 2. D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
  - 3. D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique
  - 4. D1603 - Standard Test Method for Carbon Black Content in Olefin Plastics
  - 5. D3895 - Standard Test Method for Oxidative Induction Time of Polyolefins by Differential Scanning Calorimetry
  - 6. D4218 - Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
  - 7. D4437 - Standard Practice for Non-destructive Testing (NDT) for Determining the Integrity of Seams Used in Joining Flexible Polymeric Sheet Geomembranes
  - 8. D4833 - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
  - 9. D5397 - Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
  - 10. D5596 - Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
  - 11. D5721 - Standard Practice for Air-Oven Aging of Polyolefin Geomembranes
  - 12. D5885 - Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High Pressure Differential Scanning Calorimetry
  - 13. D5994 - Standard Test Method for Measuring Core Thickness of Textured Geomembrane
  - 14. D6693 - Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
  - 15. D7466 - Standard Test Method for Measuring the Asperity Height of Textured Geomembrane
- B. Geosynthetics Research Institute (GRI). The following GRI test methods are referenced in this section and are to be considered part of this section:
  - 1. GM11 Accelerated Weathering of Geomembranes using a Fluorescent UVA-Condensation Exposure Device
  - 2. GM13 Test Methods, Test Properties, and Testing Frequencies for High-Density Polyethylene (HDPE) Smooth and Textured Geomembranes

- C. Where reference is made to one of the above codes, standards, specifications, or publications, the revisions in effect at the time of bid shall apply.

### 1.03 SUBMITTALS

- A. Written certification that the minimum test values provided in Part 2.02 of this section are guaranteed by the manufacturer.
- B. Manufacturer's standard warranty for the geomembrane.
- C. Results of QC tests conducted by the manufacturer. QC test results shall include lot and roll identification numbers representative of the field-delivered material. At a minimum, results shall be submitted for:
  - 1. Thickness (ASTM D5994).
  - 2. Asperity Height (ASTM D7466).
  - 3. Density (ASTM D1505).
  - 4. Tensile Properties (ASTM D6693).
  - 5. Tear Resistance (ASTM D1004).
  - 6. Puncture Resistance (ASTM D4833).
  - 7. Stress Crack Resistance (ASTM D5397).
  - 8. Carbon Black Content (ASTM D1603).
  - 9. Carbon Black Dispersion (ASTM D5596).
  - 10. Oxidative Induction Time (OIT) (ASTM D3895 or D5885).
  - 11. Oven Aging at 85°C (ASTM D5721).
  - 12. Ultraviolet (UV) Resistance (GRI GM11).
- D. Contractor's written certification (provided prior to the installation of the geomembrane) that the field-delivered material has not been damaged due to improper transportation, handling, or storage.
- E. HDPE lot and roll number of field-delivered material.

## PART 2 – PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

- A. Solmax Geosynthetics.
- B. GSE Lining Technology, Inc.
- C. Poly-Flex, Inc.
- D. Approved equal

### 2.02 MATERIALS

- A. HDPE Geomembrane
  - 1. HDPE geomembrane liner shall meet the following minimum test values:

**TABLE 31 05 19.16-A  
REQUIREMENTS FOR HDPE**

Property	Test Method	Test Value
Thickness (min. avg.) <ul style="list-style-type: none"> <li>Lowest individual for 8 out of 10 values</li> <li>Lowest individual for any of the 10 values</li> </ul>	ASTM D5994	38 mil 36 mil 34 mil
Asperity Height (min. avg.) (See Note 1)	ASTM D7466	10 mil
Density (min. avg.)	ASTM D1505/D792	0.940 g/cm <sup>3</sup>
Tensile Properties (min. avg.) (See Note 2) <ul style="list-style-type: none"> <li>Yield Strength</li> <li>Break Strength</li> <li>Yield Elongation</li> <li>Break Elongation</li> </ul>	ASTM D6693 (Type IV)	84 lb/in 60 lb/in 12% 100%
Tear Resistance (min. avg.)	ASTM D1004	28 lb
Puncture Resistance (min. avg.)	ASTM D4833	60 lb
Stress Crack Resistance (See Note 3)	ASTM D5397	300 hrs
Carbon Black Content (range)	ASTM D1603 (See Note 4)	2.0 – 3.0%
Carbon Black Dispersion	ASTM D5596	See Note 5
OIT (min. avg.) (See Note 6) <ul style="list-style-type: none"> <li>Standard OIT</li> <li>or</li> <li>High Pressure OIT</li> </ul>	ASTM D3895  ASTM D5885	100 min.  400 min.
Oven Aging at 85°C (% retained after 90 days) (See Notes 6 and 7) <ul style="list-style-type: none"> <li>Standard OIT (min. avg.)</li> <li>or</li> <li>High Pressure OIT (min. avg.)</li> </ul>	ASTM D5721  ASTM D3895  ASTM D5885	  55%  80%
UV Resistance (See Note 8) <ul style="list-style-type: none"> <li>Standard OIT (min. avg.)</li> <li>or</li> <li>High Pressure OIT (min. avg.) – % retained after 1,600 hours (See Note 10)</li> </ul>	GRI GM11  ASTM D3895  ASTM D5885	  See Note 9  50%

**Notes:**

- Of 10 readings; 8 out of 10 must be ≥ 5 mils (see also Note 6).
- Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction.  
Yield elongation is calculated using a gage length of 1.3 inches  
Break elongation is calculated using a gage length of 2.0 inches
- The notched constant tensile load (NCTL) test is not appropriate for testing geomembranes with textured or irregular rough surfaces. Test should be conducted on smooth edges of textured rolls or on smooth sheets made from the same formulation as being used for the textured sheet materials. The yield

stress used to calculate the applied load for the NCTL test should be the manufacturer's mean value via manufacturer quality control testing.

4. Other test methods, such as ASTM D4218 or microwave methods, are acceptable if an appropriate correlation to ASTM D1603 can be established.
5. Carbon black dispersion (only near spherical agglomerates) for 10 different views:  
9 in Categories 1 or 2 and 1 in Category 3
6. The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content of the geomembrane.
7. It is also recommended to evaluate samples at 30 and 60 days to compare with the 90-day response.
8. The condition of the test should be 20-hour UV cycle at 75°C followed by 4-hour condensation at 60°C.
9. Not recommended since the high temperature of the Standard OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.
10. UV resistance is based on percent retained value regardless of the original High Pressure OIT value.

2. The geomembrane shall be free of defects, such as holes or blisters, or any contamination by foreign matter.
3. QC testing shall be performed by an independent laboratory at the Contractor's expense. QC test results shall be submitted to the Engineer for review a minimum of two weeks prior to mobilizing the material to the site.

B. Welding Material

1. The resin used in the welding material must be identical to the liner material.
2. All welding materials shall be of a type recommended and supplied by the manufacturer and shall be delivered in the original sealed containers, each with an indelible label bearing the brand name, Manufacturer's mark number, and complete directions as to proper storage.

2.03 DELIVERY, HANDLING, AND STORAGE

- A. The Contractor shall be liable for any damage incurred by the liner material prior to and during transportation to the site.
- B. The handling, storage, and care of the liner material prior to and following installation at the site are the responsibility of the Contractor.
- C. Any damage caused to the liner material during delivery, handling, and storage shall be repaired at the Contractor's expense.

2.04 WARRANTY

- A. The Contractor shall provide a written warranty stating that the materials and workmanship provided are free from defects for the duration of the project.
- B. The written warranty shall provide for the complete repair or replacement of the liner material, including all incidental costs associated with the defect, at no cost to the Owner.
- C. All repairs or replacements shall be performed within a reasonable period of time, as determined by the Owner/Engineer.

## PART 3 – EXECUTION

### 3.01 INSTALLATION

#### A. General Requirements

1. The liner shall be placed, seamed, and tested in accordance with the manufacturer's recommendations/specifications.
2. The installation of geomembrane liner shall be performed on geotextile-covered surfaces free from stones or other protruding objects.
3. No liner shall be placed onto an area that has become softened by precipitation. Appropriate methods of moisture control are the responsibility of the Contractor.
4. The liner shall not be installed on frozen soil material. Such material shall be removed and replaced with acceptable material.

All surfaces on which the liner is to be installed shall be acceptable to the Engineer at the time of installation.

#### B. Placement

1. The placement of geomembrane panels shall follow all instructions on the boxes or wrapping containing the material that describe the proper methods of unrolling the panels.
2. Liner deployment shall not be undertaken if weather conditions will preclude material seaming following deployment.
3. During placement, geomembrane shall be visually inspected for uniformity, tears, punctures, blisters, or other damage or imperfections. Any such damage or imperfections shall be immediately repaired and re-inspected at the Contractor's expense.
4. No equipment used shall damage the liner by handling, trafficking, leakage of hydrocarbons, or other means.
5. No personnel working on the liner shall smoke, wear damaging shoes, or engage in other activities that could damage the liner.
6. The prepared surface underlying the liner shall not be allowed to deteriorate after acceptance, and shall remain acceptable up to the time of liner installation and until completion of the project.
7. Adequate temporary loading and/or anchoring (e.g., sand bags), not likely to damage the liner, shall be placed to prevent uplift by wind (in case of high winds, continuous loading is recommended along edges of panels to minimize risk of wind flow under the panels).
8. Direct contact with the liner shall be minimized. In high-traffic areas, the liner shall be protected by geotextiles, extra geomembrane, or other suitable materials.
9. The method used to unroll or adjust the panels shall not cause excessive scratches or crimps in the liner and shall not damage the supporting soil or underlying geotextile (where applicable).
10. The method used to place the panels shall minimize the potential for wrinkles (especially differential wrinkles between adjacent panels).
11. Any damage to the geomembrane panels or portions of the panels as a result of placement shall be replaced or repaired at the Contractor's expense. The decision to replace or repair any panel or portions of panels shall be made by the Engineer.

### 3.02 SEAMING

- #### A.
1. All personnel performing seaming operations shall be qualified by experience or by successfully passing seaming tests.



- B. Generally, all seams whether field or factory, shall be oriented parallel to the line of slope, not across slope. At liner penetrations and corners, the number of seams shall be minimized.
- C. The area of the liner to be seamed shall be cleaned and prepared in accordance with the manufacturer's specified procedures. Any abrading of the liner shall not extend more than 0.5 inch on either side of the weld. Care shall be taken to eliminate or minimize the number of wrinkles and "fish-mouths" resulting from seam orientation.
- D. Field seaming is prohibited when either the air or sheet temperature is below 32°F, when the sheet temperature exceeds 122°F, or when the air temperature is above 104°F. At air or sheet temperatures between 32°F and 40°F, seaming shall be conducted directly behind a preheating device. In addition, seaming shall not be conducted when the liner material is wet from precipitation, dew, fog, etc., or when winds are in excess of 20 miles per hour.
- E. Seaming shall not be performed on frozen or excessively wet underlying surfaces.
- F. Seams shall have an overlap beyond the weld large enough to perform destructive peel tests, but shall not exceed 5 inches.
- G. The Contractor shall perform trial seams on excess liner material. A 1-foot by 3-foot seamed liner sample shall be fabricated with the seam running down the 3-foot length in the center of the sample. Such trial seaming shall be conducted prior to the start of each seaming succession for each seaming crew, every 4 hours, after any significant change in weather conditions or liner temperature, or after any change in seaming equipment. From each trial seam, four field test specimens shall be taken. The test specimens shall be 1-inch by 12-inch strips cut perpendicular to the trial seam. Two of these specimens shall be shear tested and two shall be peel tested using a field tensiometer, and recorded as pass (failure of liner material) or fail (failure of seam). Upon initial failure, a second trial seam shall be made; if both trial seams fail, then the seaming device and its operator shall not perform any seaming operations until the deficiencies are corrected and two successive passing trial seams are produced. Completed trial seam samples cannot be used as portions of a second sample and must be discarded.
- H. Where "fish-mouths" occur, the material shall be cut, overlapped, and an overlap weld shall be applied. Where necessary, patching using the same liner material shall be welded to the geomembrane.
- I. Acceptable seaming methods include:
  - 1. Extrusion welding using extrudate with identical physical, chemical, and environmental properties.
  - 2. Hot-wedge welding using a proven fusion welder and master seamer.
- J. The seaming device shall not have any sharp edges that might damage the liner. Where self-propelled seaming devices are used, it shall be necessary to prevent "bulldozing" of the device into the underlying soil.
- K. The Contractor shall perform non-destructive seam testing on all field seams.
  - 1. Non-destructive seam testing shall be conducted under the direct observation of the Engineer.
  - 2. Air pressure testing may be used if double-track hot-wedge welding has been used to seam the liner. Using approved pressure testing equipment, the following procedures shall be followed:

- a. Seal both ends of the air channel separating the double-track hot-wedge welds.
  - b. Insert pressure needle into air channel and pressurize the air channel to 27 psi.
  - c. Monitor pressure gauge for 3 minutes and determine whether pressure is maintained without a loss of more than 2 psi.
  - d. If the pressure test fails, then localize the leak and mark the area for repair.
3. Vacuum testing shall be used on all seams not tested using air pressure testing. Using an approved vacuum box, the following procedures shall be followed:
  - a. Apply a soapy water mixture over the seam.
  - b. Place vacuum box over soapy seam and form a tight seal.
  - c. Create a vacuum by reducing the vacuum box pressure to 5 psi for 10 seconds.
  - d. Observe through the vacuum box window any bubbles.
  - e. Where bubbles are observed, mark seam for repair.
  - f. Move vacuum box further down seam, overlapping tested seam by 3 inches.
  - g. Where hot-wedge seaming has been performed, the overlap shall be cut back to the weld.

### 3.03 LINER REPAIR

- A. All imperfections, flaws, construction damage, and seam failures shall be repaired by the Contractor at no additional cost to the Owner.
- B. Acceptable repair methods include:
  1. Patching, used to repair holes, tears, undispersed raw materials, and contamination by foreign matter.
  2. Grinding and re-welding, used to repair small sections of extruded seams.
  3. Spot Welding or Seaming, used to repair pinholes or other minor, localized flaws.
  4. Capping, used to repair large lengths of failed seams.
  5. Topping, used to repair areas of inadequate seams which have an exposed edge.
  6. Removing bad seams and replacing with a strip of new material welded into place.

END OF SECTION

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## SECTION 31 09 13

### GEOTECHNICAL INSTRUMENTATION AND MONITORING

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

###### A. Work Specified:

1. Furnish and installation of geotechnical instrumentation in accordance with this Section and as shown on the Design Drawings.
2. Provide and maintain safe means of access to all geotechnical instrumentation for the duration of the Project.

###### B. Related Sections:

1. Section 01 15 00 – Contractor's Project Operations Plan.
2. Section 01 32 26 – Construction Progress Reporting.
3. Section 01 71 26 – Construction Surveying and Layout.
4. Section 32 50 00 – Excavation Support and Protection.

##### 1.02 QUALITY ASSURANCE

###### A. Qualifications

1. Instrumentation personnel to be hired by the Contractor must have at least 4 years of direct field experience in installation and monitoring of the types of instruments specified herein and interpreting instrumentation data. The instrumentation installer must be able to demonstrate that they have successfully completed a minimum of 5 projects where displacement monitoring points or vibration monitoring instrumentation have been installed and operated.
2. Responsibilities include, but are not necessarily limited to, the following:
  - a. Installing and removing all geotechnical instrumentation.
  - b. Calibrating geotechnical instrumentation at frequencies recommended by the manufacturer.
  - c. Coordinating instrument maintenance and repairs.
  - d. Collecting and recording instrument readings.
  - e. Managing a database of geotechnical monitoring data at the Site.
  - f. Preparing and submitting daily geotechnical monitoring reports in accordance with Article 1.03 of this Section.
  - g. Responding to exceedances of notification or action levels during the Work.
  - h. Notifying Engineer and appropriate Contractor personnel when alert or action levels are exceeded during the Work.

###### B. Instrument Calibration:

1. A factory calibration will be conducted on all geotechnical instrumentation, as applicable, at the place of manufacture before shipment to the Site. Review calibration record for each instrument and match to serial number of the instrument. Submit factory calibration records to the Engineer upon request.
2. During the Work, calibrate geotechnical instrumentation at frequencies recommended by the manufacturer, in accordance with manufacturer's calibration and quality assurance requirements. Document all instrument readings, field reference checks, and calibrations in a dedicated log.

3. Preventative maintenance and repair of geotechnical instrumentation, if required, will only be performed by qualified personnel, or authorized representatives of the manufacturer.
4. Prepare and retain at the Site electronic or written records of all instrument calibrations, preventative maintenance, and repairs. Submit to the Engineer upon request.

C. Pre-Installation Testing

1. Examine geotechnical instrumentation and accessories upon delivery to the Site for damage due to shipment.
2. Verify instruments and accessories are in working order before installing.
3. Immediately remove from the Site, and replace at the Contractor's expense, damaged or malfunctioning instruments and accessories.

### 1.03 SUBMITTALS

A. Informational Submittals: Submit prior to the start of work:

1. Qualifications: Submit qualifications of proposed instrumentation personnel.
2. Prior to the start of work, submit a Geotechnical Instrumentation Installation Plan as part of the Contractor's Project Operations Plan. This plan will include the following:
  - a. Shop Drawings that detail the proposed means, methods, and locations (plan and elevation) for installing the instruments. Details will include manufacturer's specifications and installation/operating procedures. Shop Drawings will include proposed alignment of associated cables, benchmark location, robotic total station locations, and proposed data logging location, as appropriate.
  - b. Manufacturer's technical specifications indicating that the displacement monitoring points meet the minimum requirements outlined in this Section.
  - c. Manufacturer's technical specifications indicating that the vibration monitoring equipment meet the minimum requirements outlined in this Section.
  - d. Instrumentation Installation Methods: Submit the following:
    - 1) Relevant health and safety measures applicable to geotechnical installation and removal.
    - 2) Detailed descriptions of the proposed installation procedures for the geotechnical instrumentation.
    - 3) Manufacturer's installation recommendations and requirements.
    - 4) Methods for demarcating the location of geotechnical instruments.
    - 5) Proposed methods for reinstalling the instruments if they are damaged, fail to operate properly, or otherwise require temporary removal and reinstallation.
    - 6) Proposed means of protecting geotechnical instrumentation during completion of the work.

B. Action Submittals:

1. Geotechnical Monitoring Report (may be provided in Daily Construction Report, submitted in accordance with Section 01 32 26 – Construction Progress Reporting): Submit data collected as required in Article 3.02 of this Section, in accordance with Article 1.06 of this Section. Provide survey data to the Engineer no later than 10:00 a.m., of the subsequent workday after the day covered in the associated report.
2. Submit electronic or written records of all field checks of seismograph equipment, performed in accordance with Article 3.02 of this Section, to the Engineer upon request.

#### 1.04 DELIVERY, STORAGE AND HANDLING

- A. Prior to installation, store all special sensors and accessory hardware in a dry location protected from direct sunlight, moisture, theft, extreme temperatures (>90 and <20 degrees Fahrenheit [°F]), physical, and chemical hazards.
- B. All instruments will be calibrated and in working order at the time of installation and will be verified on-site by the Engineer, immediately prior to installation.
- C. All appropriate precautions for working with electricity, as indicated in the Contractor's Health and Safety Plan, will be followed at time of installation.

#### 1.05 INSTRUMENTATION

- A. Install all instruments in the presence of the Engineer. Allow access to the work area at all times for the purpose of observing instrumentation and obtaining data.
- B. Contractor will be responsible for any and all damage incurred to utilities and structures during geotechnical instrumentation installation.
- C. Protect and maintain instrumentation until the end of the Project. Any instrumentation damaged or otherwise rendered non-functional shall be repaired or replaced with a new installation within 24 hours at no additional cost to the Owner. Repair or replacement work will conform to the requirements specified herein for the respective type of geotechnical instrumentation.
- D. Provide and maintain well-delineated protection devices at the surface of all instrumentation.

#### 1.06 GEOTECHNICAL MONITORING REPORT

- A. Prepare daily geotechnical monitoring reports throughout the project, or at a reduced frequency if requested by the Owner. Include in each report, at a minimum, the following:
  - 1. Contractor's name.
  - 2. Owner's name.
  - 3. Project name.
  - 4. Site name and location.
  - 5. Date and day of the week.
  - 6. High and low temperatures and general weather conditions.
  - 7. General location and brief description of Work performed at the Site.
  - 8. Displacement Monitoring Records: Provide the following for each optical survey point:
    - a. Location.
    - b. Time and reading for each monitoring event.
    - c. The coordinates (northing and easting) and elevation of each optical survey point.
    - d. Both raw and reduced data will be provided on summary tables and plots. Data plots will show absolute vertical deformation versus time and absolute horizontal deformation versus time.
  - 9. Vibration Monitoring Records: Provide the following for each seismograph:
    - a. Serial number.
    - b. Location.
    - c. Start time, stop time, and duration of monitoring.
    - d. Maximum peak particle velocity for monitoring period.

- e. Histograms of longitudinal, transverse, and vertical readings in units of inches per second.
- 10. Exceedances (if any) of the notification and action levels specified in this Section.  
Provide the following:
  - a. Time, location, and instrument reading of exceedance.
  - b. Summary of Work being performed at time of exceedance.
  - c. Corrective actions taken or to be taken in response to exceedance.
- 11. Site plan showing approximate locations of all geotechnical instrumentation at the Site.  
Label each instrument with its serial number.

## PART 2 – PRODUCTS

### 2.01 GENERAL

- A. Geotechnical instrumentation will be specifically designed, manufactured, and installed for the application intended and environmental conditions required.
- B. Furnish power and batteries in sufficient supply to allow for continuous real-time monitoring and data-logging for a period of not less than 12 hours.

### 2.02 DISPLACEMENT MONITORING POINTS

- A. Survey of displacement points will be conducted using a Theodolite and will meet a 0.05 inch tolerance (or repeatability) over the course of 3 readings in order to know that any variances in movements are not due to the equipment tolerance, but rather they are due to actual movements due to removal activities.
- B. Displacement Monitoring Points will be fixed prisms, reflective targets (e.g. Leica Retro reflective target), or an approved equivalent that will allow the points to be optically surveyed.

### 2.03 SEISMOGRAPHS

- A. Provide portable seismographs with triaxial geophones for the continuous monitoring of vibrations during excavation support installation (including slide rails and in-situ solidification [ISS]) and removal operations.
  - 1. Manufacturer: Provide products of one of the following:
    - a. GeoSonics/Vibra-Tech, Inc.
    - b. Instantel.
    - c. Or equal.
  - 2. Range: 0.01 to 10 inches per second.
  - 3. Resolution: 0.005 inch per second.
  - 4. Accuracy: Plus-or-minus five percent.
  - 5. Frequency Response Range: Two to 250 Hertz.
- B. Furnish seismographs, complete with readout displays, data loggers, protective housings, software, and other accessories recommended by manufacturer for the intended application.

## 2.04 SPARE EQUIPMENT

- A. Furnish and retain at the Site spare instrumentation, readout indicators, data loggers, batteries, and accessories to allow for uninterrupted monitoring in the event of instrument damage or malfunction.

## PART 3 – EXECUTION

### 3.01 INSPECTION

- A. Examine the areas and conditions under which geotechnical instrumentation will be installed and notify Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected in a manner acceptable to Engineer.

### 3.02 INSTALLATION

- A. General:
  - 1. Install geotechnical instrumentation in accordance with manufacturer's instructions.
  - 2. Lay out and stake or mark individual instrument locations for approval of Engineer.
  - 3. Adjust locations when requested and obtain Engineer's acceptance of layout before installing. Note that the Engineer may indicate that vibration monitoring is only required at select locations (i.e., based on proximity of intrusive activities).
  - 4. Make minor adjustments, as required, to protect and maintain equipment.
- B. Displacement Monitoring Points:
  - 1. Establish a benchmark and displacement monitoring points using a qualified surveyor.
  - 2. Notify the Engineer at least 24 hours prior to installing each instrument.
  - 3. Install displacement monitoring points as shown on Design Drawings in locations approved by the Engineer (horizontal and vertical) and in accordance with the manufacturer's specifications.
- C. Vibration Monitoring Equipment:
  - 1. Mount vibration monitoring equipment in approved locations and in accordance with the manufacturer's specifications as shown on Design Drawings.
  - 2. Ensure the seismographs are installed properly and in accordance with manufacturer recommendations at the start of each workday during which monitoring is required (see Article 3.03 of this Section) and before intrusive activities are initiated for the day.
  - 3. Secure equipment at the end of each workday and after all monitored site activities have been completed for the day.

### 3.03 MONITORING

- A. Displacement Monitoring Points:
  - 1. Monitoring Schedule
    - a. Once installed, survey and document the baseline coordinates (northing and easting) and elevation of each displacement monitoring point before any material removal activities begin.
    - b. Survey and document the coordinates (northing and easting) and elevation of each displacement monitoring point once a day during removal and backfilling activities.
  - 2. Notification Level: 0.3 inches of horizontal or vertical displacement from baseline as determined during baseline monitoring.



- a. If the notification level of movement is exceeded, notify Engineer immediately.
    - b. Conduct additional optical surveying on a repeatable basis for the location where the movement occurred, and any other displacement monitoring points deemed necessary by the Engineer, for at least two times per day for two consecutive days to determine if further movement occurs.
    - c. Work can continue with displacement monitoring continuing.
  - 3. Action Level: 0.5 inches of horizontal or vertical displacement from baseline as determined during baseline monitoring.
    - a. If the action level of movement is exceeded, notify Engineer immediately.
    - b. Stop all work.
    - c. Depending upon the current limits of work in the holder, the Contractor may be required to temporarily backfill the area to a depth approved by the Engineer while the submittal is being prepared and reviewed.
    - d. Prepare a submittal indicating what activity caused the exceedance and what steps the Contractor will take to prevent further exceedances of the limits. No work in the vicinity of the exceedance shall be restarted until the submittal is reviewed and approved by the Engineer.
- B. Vibration Monitoring:
- 1. Monitoring Schedule
    - a. Baseline Monitoring:
      - 1) Perform baseline vibration monitoring before initiating any pile driving operations at the Site.
      - 2) Baseline monitoring shall be performed continuously between the hours of 7:00 a.m. and 5:00 p.m. over a period of not less than three working days.
    - b. Routine Monitoring:
      - 1) Continuously monitor vibrations at required locations during all excavation support installation (including slide rails and ISS) and removal operations.
      - 2) During the workday, perform hourly or more frequent field checks of seismographs to verify proper function. Document the date, day of the week, time, and outcome of each field check in a dedicated log. Immediately remove from service, and replace at Remediation Contractor's expense, damaged or malfunctioning instruments. Prepare and retain at the Site, electronic or written records of all field checks.
      - 3) Download monitoring data from seismographs at the end of each day.
  - 2. Notification Level: peak particle velocity of 1.0 inch per second.
    - a. If the notification level of movement is exceeded, notify Engineer immediately.
    - b. Continue work and review ongoing construction activities and discuss with Engineer, potential modification to means and methods to reduce vibration.
  - 3. Action Level: peak particle velocity of 1.5 inches per second.
    - a. If the action level of movement is exceeded, notify Engineer immediately.
    - b. Stop all work.
    - c. Contractor must propose a method to continue work activities, to be reviewed by the Engineer and the Owner, that prevents further vibration in exceedance of the action level (e.g., modifying sheet pile driving/removal techniques, sequencing, or equipment).

### 3.04 PROTECTION AND MAINTENANCE

- A. Protect geotechnical instrumentation from damage due to construction operations, weather, and vandalism. Provide suitable protective barriers, covers, and enclosures around instruments in construction areas.

- B. Exercise caution during the progress of Work to prevent damage to geotechnical instrumentation. Immediately remove from service, and repair or replace at Contractor's expense, geotechnical instrumentation damaged during the Work.

### 3.05 REMOVAL

- A. Remove instrumentation only when directed by the Owner or Engineer.
- B. Repair any damaged or disturbed surfaces to original condition.
- C. All instrumentation will become the property of the Contractor.

END OF SECTION

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SECTION 31 23 00  
EXCAVATION AND FILL

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:

1. Excavating materials to facilitate the Work as specified on the Design Drawings or as directed by the Engineer.
2. Backfilling excavation with acceptable materials to the required lines and grades. Acceptable materials shall conform with the requirements of Section 31 05 16 - Aggregates for Earthwork.
3. Preparation of subgrade for pavement surfacing is included under this Section.
4. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof, except rock requiring drilling, blasting, or special equipment for removal.
5. Providing all labor, materials, equipment, and incidentals required to perform all excavating, filling, and grading ash shown, specified, and required to complete the Work.

B. Coordination:

1. Review procedures under this and other Sections and coordinate Work that must be performed with or before excavation and fill Work.

C. Related Sections:

1. Section 01 35 49 – Community Air Monitoring Plan.
2. Section 01 41 26 – Storm Water Pollution Prevention Plan and Permit.
3. Section 01 51 41 – Temporary Pumping
4. Section 01 57 05 – Temporary Controls.
5. Section 01 71 23 – Field Engineering.
6. Section 01 74 19 – Construction Waste Management and Disposal.
7. Section 02 41 00 – Demolition.
8. Section 02 61 05 – Removal and Disposal of Contaminated Material.
9. Section 31 09 13 – Geotechnical Instrumentation and Monitoring.
10. Section 31 50 00 – Excavation Support and Protection.

1.02 REFERENCES

A. Terminology:

1. The following words or terms are not defined but, when used in this Section, have the following meaning:
  - a. "Debris" means man-placed buried material including, but not limited to, brick, concrete, metal, wood, ash, cinders, and glass.
  - b. "Earth" means materials, such as sand, gravel, sediment, clay, loam, ashes, cinders, pavements, muck, roots, pieces of timber, soft or disintegrated rock, not requiring blasting, barring, or wedging from their original beds, and specifically excluding all ledge or bedrock and individual boulders, masonry, or debris larger than 0.5 cubic yard in volume.
  - c. "Backfill" means the refilling of excavated areas to the elevations indicated on the Design Drawings or as directed using specified materials for refilling of excavated areas; and the compacting of all materials used in filling or refilling by rolling, ramming, or as may be required and approved by the Owner.

- B. American Society for Testing and Materials (ASTM)
  - 1. ASTM D6938, Standard Test method for In-Place Density and Water Content of Soils and Soil-Aggregate by Nuclear methods (Shallow Depth)

### 1.03 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Retain the services of an independent testing laboratory to perform quality assurance and field quality control testing required in this Section. Testing laboratory shall comply with ASTM D6938, and shall be experienced in the types of testing required.
  - 2. Off-Site Fill Sources: Source of off-site general fill and subbase material shall be in accordance with Section 31 05 05 - Aggregates for Earthwork.
- B. Regulatory Requirements:
  - 1. Laws and Regulations applying to the Work under this Section include, but are not limited to, the following:
    - a. 29 CFR 1926.650 through 29 CFR 1926.652, Subpart P – Excavations.
    - b. 6 NYCRR 360, Solid Waste Management Facilities.
    - c. 6 NYCRR 375, Environmental Remediation Programs.
    - d. 12 NYCRR 23-4.1 through 12 NYCRR 23-4.5, Subpart 23-4 – Excavation Operations.
    - e. 16 NYCRR 753, Protection of Underground Utilities.
  - 2. Comply with applicable provisions and recommendations of the following:
    - a. NYSDEC Technical Guidance for Site Investigation and Evaluation (DER-10).
    - b. NYSDOT Standard Specifications and Standard Sheets.
  - 3. Obtain required permits and approvals for excavation and fill Work, including work permits from right-of-way owners.

### 1.04 SUBMITTALS

- A. Action Submittals: Submit the following:
  - 1. Excavation and Backfilling Plan: Submit acceptable plan for excavation, backfilling, and related Work not less than 14 days prior to starting excavation Work. Include the following:
    - a. Plan for coordinating shut-offs, locating, capping, temporary services, and continuing utility services.
    - b. Proposed excavation, dewatering, backfilling, and compaction procedures. Where different procedures or equipment will be used for different types of material or at different locations at the site, indicate where each procedure and equipment item will be used.
    - c. List of proposed equipment for excavation, dewatering, backfilling, and compaction Work.
    - d. Planned sequence of excavation and backfilling operations.
    - e. Detailed schedule of excavation and backfilling Work in accordance with the accepted Progress Schedule.
    - f. Method(s) for monitoring excavation and backfill progress.
  - 2. Soil Solidification Gravity Wall Installation and Removal Plan in accordance with Section 31 50 00- Excavation Support and Protection.
  - 3. Tar Well Removal and Soil Removal Slide Rail Installation Plan in accordance with Section 31 50 00 – Excavation Support and Protection.

B. Informational Submittals:

1. Testing Laboratory Qualifications: Submit qualifications for the firm proposed for field nuclear density testing of granular materials.
2. Field Quality Control Submittals: Submit laboratory test reports for field quality control testing performed in accordance with Part 3.09 of this Section.
3. Keep a daily log of dewatering, storage, and water disposal that is readily available for inspection by the Owner and Engineer. The log will, at a minimum, keep the following:
  - a. Daily total gallons generated by dewatering activities.
  - b. Site-specific daily weather and precipitation records.
  - c. Observations or activities relevant to the dewatering operations, including, but not limited to, equipment repairs/replacements, service interruptions, etc.

1.05 SITE CONDITIONS

A. Subsurface Information:

1. The Contract Documents indicate information available relative to subsurface conditions at the site. Such information and data are not intended as a representation or warranty of continuity of conditions between soil borings or test pits, nor of groundwater levels at dates and times other than date and time when measured, nor that purpose of obtaining the information and data were appropriate for use by Contractor. Owner and Engineer will not be responsible for interpretations or conclusions drawn therefrom by Contractor.
2. Soil borings and other exploratory operations may be made by Contractor, at no additional cost to Owner. Coordinate Contractor-performed test borings and other exploratory operations with Owner and utility owners as appropriate. Perform such explorations without disrupting or otherwise adversely affecting operations of Owner or utility owners. Comply with Laws and Regulations relative to required notifications.

B. Existing Structures:

1. The Contract Documents show or indicate certain structures and Underground Facilities adjacent to or within the limits of the Work. Such information was obtained from existing records and is not guaranteed to be correct or complete. Contractor shall explore ahead of demolition, trenching, excavation, or other subsurface Work to determine the exact location of all existing structures and Underground Facilities. Existing structures and Underground Facilities shall be supported and protected from damage by Contractor. Immediately repair and restore existing structures and Underground Facilities damaged by Contractor without additional cost to Owner.
2. Movement or operation of construction equipment over Underground Facilities shall be at Contractor's sole risk and only after Contractor has prepared and submitted to Engineer and utility owners (as applicable), and received acceptance therefrom, a plan describing Contractor's analysis of the loads to be imparted and Contractor's proposed measures to protect structures and Underground Facilities during the Project.
3. Coordinate with utility owners for shut off of services in active piping and conduits, and for testing, shut off of services, and draining, purging, or de-energizing where specified or required of piping and conduits of unknown status. When required by utility owner, Owner will assist Contractor with utility owner notifications. Completely remove buried piping and conduits indicated for removal and not otherwise indicated as being abandoned or to remain in place. Comply with Section 02 41 00 - Demolition for such removals.
4. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, except when such interruption is indicated in the Contract Documents or when allowed in writing by Engineer after acceptable temporary utility services are provided by Contractor for the affected structure or property.

## PART 2 – PRODUCTS

### 2.01 EXCAVATION EQUIPMENT

- A. Utilize typical earth moving equipment to facilitate completion of the work to the design limits. Soil removal and handling equipment shall include, but not be limited to excavators and loaders.

### 2.02 ODOR, VAPOR AND DUST CONTROL

- A. Requirements for odor, vapor, and dust control are presented in Section 01 57 05 – Temporary Controls and the CAMP.

### 2.03 BACKFILL

- A. Fill materials shall meet the requirements of Section 31 05 16 – Aggregates for Earthwork.
- B. Use drum-type, power driven, hand guided vibratory compactor, or by hand-guided vibratory plate tamper to meet backfill compaction specifications. Propose in a written request to alternate compaction methods. Alternate compaction methods shall be reviewed and approved by the Owner and/or Engineer.
- C. Contractor is responsible for achieving the required compaction density requirements.

## PART 3 – EXECUTION

### 3.01 MAINTENANCE AND PROTECTION OF UTILITIES

- A. Maintain and protect utilities in accordance with Section 01 71 33 – Protection of Work and Property.

### 3.02 INSPECTION

- A. Provide Engineer with sufficient notice and with means to examine areas and conditions under which excavating, filling, and grading Work will be performed. Engineer will advise Contractor in writing when Engineer is aware of conditions that may be detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

### 3.03 PREPARATION

- A. Erosion and Sediment Control: Provide temporary erosion and sediment controls in accordance with Section 01 57 05 - Temporary Controls, and comply with Section 01 41 26 - Storm Water Pollution Prevention and Permit.
- B. Odor, Vapor, and Dust Control: Provide odor, vapor, and dust controls in accordance with Section 01 57 05 - Temporary Controls, and comply with Section 01 35 49 - Community Air Monitoring Plan.
- C. Site Preparation:
  - 1. Comply with Section 02 41 00 - Demolition.

D. Temporary Barriers:

1. Provide temporary barrier surrounding excavations and excavation work areas to provide temporary protection to persons and property. Barrier shall have openings only at vehicular, equipment, and worker access points.
2. Minimum Material Requirements for Temporary Barriers:
  - a. Temporary barrier shall not be less snow fence-type fencing, four feet high.
  - b. Fence shall be constructed of vertical hardwood slats measuring not less than 1.5 inches by 1/4 inch interwoven with strands of horizontal wire, or shall be of equivalent plastic construction.
  - c. Posts:
    - 1) Posts shall be steel, either "U"-, "Y"-, or "T"-shaped, or channel section.
    - 2) Posts shall have a nominal weight of not less than 1/3-pound per linear foot, exclusive of the anchor.
    - 3) Posts shall have tapered anchors weighing not less than 0.67 pound, each firmly attached by means of welding, riveting, or clamping.
    - 4) Posts shall have corrugations, knobs, notches, or studs placed and constructed to engage a substantial number of fence line wire in the proper position.
  - d. Provide each post with sufficient quantity of galvanized wire fasteners or clamps, of not less than 0.120 inch in diameter, for attaching fence wire to post.

3.04 DEWATERING

A. General:

1. Comply with Section 01 51 41 – Temporary Pumping.
2. Provide and maintain adequate drainage and dewatering equipment to remove, temporarily store, and dispose all surface water and groundwater entering excavations, or other work areas.
3. Keep all working areas at the site free of surface water at all times.
4. Provide temporary diversion berms, dikes, temporary pumping, and other work necessary for diverting or removing rainfall and all other accumulations of surface water from excavation areas and any other on-site locations.
5. Contractor shall not be entitled to relief from the compaction requirements due to insufficient or ineffective dewatering.

B. Temporary Dewatering System Design:

1. Methodology of dewatering shall be determined by the Contractor and approved by the Engineer.
2. Design, provide, operate, and maintain the dewatering system. Include trenches, sumps, pumps, hoses, piping, well points, and similar facilities necessary to depress and maintain groundwater level below the base of each excavation until backfilling operations are completed and acceptable to the Engineer.
3. Design and operate dewatering system to avoid settlement and damage to existing structures and facilities, and to minimize the turbidity of the collected water.
4. Locate elements of temporary dewatering system to allow continuous dewatering operation without interfering with the Work to the extent practicable.
5. All removed water shall be contained in on-site Frac Tanks equipped with valving and piping as needed to perform the following:
  - a. Receive extracted groundwater, precipitation, and other liquids generated during the work.
  - b. Transfer the collected water to a tanker truck, off-site treatment facility, or other location approved by the Owner and Engineer.
6. Provide portable, pre-fabricated spill containment berms for the Frac Tanks.



- C. Temporary Dewatering System Operation:
1. Before excavation below groundwater level, place system into operation to lower water to specified levels and then operate it continuously until fill materials have been placed or until dewatering is no longer required by the Engineer.
  2. If, in Engineer's opinion, groundwater levels are not being lowered or maintained as required, provide additional or alternate temporary dewatering devices, as necessary, at no additional cost to the Owner.
  3. Schedule and execute all excavation and backfill activities to minimize the volume of potentially contaminated water generated.
  4. Remove water from excavations as fast as water collects and store in the on-site Frac Tanks.
  5. Contractor is responsible for the security, fueling, and monitoring of the dewatering system during the Work. Normal engine, pump, and system maintenance, as may be required, is also the responsibility of the Contractor.
  6. Remove dewatering system from the site upon completion of dewatering.

### 3.05 EXCAVATION

- A. Perform all excavation required to complete the Work as shown, specified, and required. Excavation shall include removing and handling of earth, sand, clay, gravel, hardpan, soft, weathered, or decomposed rock, pavements, rubbish, and other materials within the excavation limits.
- B. Excavation Protection:
1. Provide excavation protection systems in accordance with all applicable Laws and Regulations to prevent injury to persons and property, including surface structures and Underground Facilities.
  2. Provide excavation protection systems in accordance with Section 31 50 00 - Excavation Support and Protection.
- C. Maintain excavations in dry condition in accordance with Part 3.04 of this Section.
- D. Subgrades:
1. Subgrades shall be firm and intact, dense, and thoroughly compacted and consolidated; shall be free of standing water and mud, muck, and other soft or unsuitable materials; and shall remain firm and intact under all construction operations. Subgrades that are otherwise solid but become soft or mucky on top due to construction operations shall be reinforced with general fill material.
  2. If, in Engineer's opinion, subgrade becomes softened or mucky because of construction delays, failure to dewater properly, or other cause within Contractor's control, the subgrade shall be excavated to firm material, trimmed, and backfilled with compacted general fill material at Contractor's expense.
- E. Disposal of Excavated Materials:
1. Material removed from the excavations shall be transported off-site for disposal/treatment, unless otherwise approved by Engineer.
  2. Handling and disposal of waste material shall be in accordance with Laws and Regulations and Section 02 61 05 - Removal and Disposal of Contaminated Material.
- F. Unauthorized Excavation: All excavations outside the lines and grades shown or indicated and that are not approved by Engineer, together with removing and disposing of the excavated material and backfilling with suitable material, shall be at Contractor's expense. Fill unauthorized excavations with properly-compacted general fill material at Contractor's expense.

### 3.06 FILL AND COMPACTION

- A. Provide and compact all fill required for the finished grades as shown and as specified in this Section.
- B. Place fill in excavations as promptly as progress of the Work allows, but not until completing the following:
  - 1. Surveying and recording of horizontal and vertical limits of excavation.
  - 2. Inspection, testing, approval, and recording of horizontal and vertical locations of Underground Facilities.
  - 3. Complying with backfill submittal requirements and receiving approval of backfill materials from the Engineer.
  - 4. Removal of trash and debris.
- C. Fill that includes organic materials or other unacceptable material shall be removed and replaced with approved fill material in accordance with the Contract Documents.
- D. Placement – General:
  - 1. Place fill to the grades shown or indicated. Bring up evenly on all sides fill around structures and Underground Facilities.
  - 2. Furnish and use equipment capable of adding measured amounts of water to the fill materials to bring fill materials to a condition within required moisture content range. Furnish and use equipment capable of dicing, aerating, and mixing the fill materials to ensure reasonable uniformity of moisture content throughout the fill materials, and to reduce moisture content of borrow materials by air drying, when necessary. When subgrade or lift of fill materials required moisture-conditioning before compaction, fill material shall be sufficiently mixed or worked on the subgrade to ensure uniform moisture content throughout the lift of material to be compacted. Materials at moisture content in excess of specified limit shall be dried by aeration or stockpiled for drying.
  - 3. Place fill materials at moisture content and density specified in Paragraph 3.06.F and Table 31 23 00-A of this Section. Furnish and use equipment capable of adding measured amounts of water to the fill materials to bring fill materials to a condition within required moisture content range. Furnish and use equipment capable of dicing, aerating, and mixing the fill materials to ensure reasonable uniformity of moisture content throughout the fill materials, and to reduce moisture content of borrow materials by air drying, when necessary. When subgrade or lift of fill materials requires moisture-conditioning before compaction, fill material shall be sufficiently mixed or worked on the subgrade to ensure uniform moisture content throughout the lift of material to be compacted. Materials at moisture content in excess of specified limit shall be dried by aeration or stockpiled for drying.
  - 4. Perform compaction with equipment suitable for the type of fill material placed. Select and use equipment capable of providing the minimum density required in the Contract Documents. Furnish and use equipment capable of compacting in restricted areas next to structures and around piping and Underground Facilities. Effectiveness of the equipment selected by Contractor shall be tested at start of compacted fill Work by constructing a small section of fill within or adjacent to the area where fill will be placed. Record total number of coverages with selected compaction equipment and perform field moisture content and density tests to ensure that specified compaction of fill has been obtained. If tests on the test section of fill indicate that required compaction has not obtained, do one or more of the following:
    - a. Increase the amount of coverages.
    - b. Decrease the lift thicknesses.
    - c. Use different compaction equipment.

5. Place fill materials in horizontal, loose lifts, not exceeding specified uncompacted thickness. Place fill in a manner ensuring uniform lift thickness after placing. Mechanically compact each lift, by not less than two complete coverages of the compactor. One coverage is defined as the conditions reached when all portions of the fill lift have been subjected to the direct contact of compactor's compacting surface. Compaction of fill materials by inundation with water is unacceptable.
  6. Do not place fill materials when standing water is present on surface of the area where fill will be placed. Do not compact fill when standing water is present on the fill to be compacted. Do not place or compact fill in a frozen condition or on top of frozen material. Fill containing organic materials or other unacceptable material previously described shall be removed and replaced prior to compaction.
  7. If required densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly-functioning compaction equipment, Contractor shall perform all work required to provide the required densities. Such work shall include, at no additional cost to Owner, complete removal of unacceptable fill areas and replacement and re-compaction until acceptable fill is provided.
  8. Repair, at Contractor's expense, observed or measured settlement. Make repairs and replacements as required within five days after being so advised by Engineer.
- E. Subbase Placement:
1. Provide subbase material where shown to the limits shown or indicated.
  2. Place subbase material in compacted lifts not exceeding depth of six inches each.
- F. Compaction Density Requirements:
1. Compaction required for all types of fills shall be in accordance with Table 31 23 00-A of this Section. Moisten material or aerate the material as necessary to provide the moisture content that will facilitate obtaining the required compaction.

**TABLE 31 23 00-A  
MINIMUM DENSITY REQUIREMENTS**

<b>Fill Material</b>	<b>Maximum Uncompacted Lift Thickness (inches)</b>	<b>Percent Compaction (ASTM D698)</b>
General Fill		
More Than Five Feet Below Final Grade	18	95
Less Than Five Feet Below Final Grade	12	95
Subbase Material		
Below Pavements and Sidewalks	6	98
All Other Locations	12	95

2. Wet and thoroughly mix fill to achieve optimum moisture content plus-or-minus 2%.
3. Replace natural, undisturbed soils or compacted soil subsequently disturbed or removed by construction operations with materials compacted as indicated in Table 31 23 00-A of this Section.
4. Field quality control testing for density, to verify that specified density was obtained, shall be performed within the top five feet of the excavation.
5. When field quality control testing indicates unsatisfactory compaction, provide additional compaction necessary to obtain the specified compaction. Perform additional compaction Work at no additional cost to Owner until specified compaction is obtained. Such work includes complete removal of unacceptable (as determined by Engineer) fill areas and replacement and re-compaction until acceptable fill is provided in accordance with the Contract Documents.

- G. Replacement of Unacceptable Excavated Materials: In cases where over-excavation to replace unacceptable soil materials is required, backfill the excavation to required subgrade with general fill material and thoroughly compact in accordance with Paragraph 3.06.F and Table 31 23 00-A of this Section.

### 3.07 GRADING

- A. General:
1. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.
  2. Smooth subgrade surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- B. Grading Outside Building: Grade areas adjacent to building/retaining wall lines to drain away from structures and to prevent ponding. Finish surfaces free of irregular surface changes, and comply with the following:
1. Grassed Areas or Areas Covered with Gravel, Stone, Wood Chips, or Other Special Cover: Finish areas to receive topsoil or special cover to within not more than one inch above or below the required subgrade elevations.
  2. Sidewalks: Shape surface of areas under sidewalks to line, grade, and cross section, with finish surface not more than one inch above or below the required subgrade elevation.
  3. Pavements: Shape surface of areas under pavements to line, grade, and cross section, with finish surface not more than 1/2 inch above or below the required subgrade elevation.
- C. Compaction: After grading, compact subgrade surfaces to achieve required subgrade elevations and percentage of maximum density for each material classification.

### 3.08 SUBBASE COURSE

- A. General:
1. Place subbase material, in layers of specified thickness, over ground surface to support pavement base course.
  2. After completing filling and grading, shape and compact subgrade to an even, firm foundation in accordance with this Section. Remove unsuitable subgrade materials, including soft materials, boulders, vegetation, and loose stones, and replace with compacted fill material as directed by Engineer.
- B. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course.
- C. Subbase Course Placement:
1. Place subbase course material on prepared subgrade in layers of uniform thickness, in accordance with indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placing operations.
  2. Provide geotextile separation fabric over the prepared subgrade in accordance with Section 31 05 19.13 - Geotextiles for Earthwork.
  3. Compaction and Grade Control: Comply with compaction requirements for excavation and fill in this Section, and the following requirements:
    - a. Compaction with roller shall begin at the sides of the area to be paved or receive crushed stone surfacing, and shall continue toward the center. Continue compaction until there is no movement of the course ahead of the roller.

- b. After rolling, check for grade with a line not less than 40 feet in length; depressions over 1/2-inch deep shall be filled to satisfaction of Engineer.
4. After completing compaction, other than that necessary for bringing material for the next course, do not haul or drive over the compacted subbase.
5. Do not install subbase in excess of 500 feet in length without compacting to prevent softening of the subgrade.
6. If subgrade material becomes churned up into or mixed with the subbase material, remove the mixed material and replace with clean, compacted subbase material.

### 3.09 FIELD QUALITY CONTROL

#### A. Daily Inspections:

1. Perform daily or more frequent inspections of all excavations, adjacent areas, and protective systems as required by Laws and Regulations and this Section to ensure their continued effectiveness and integrity, and the safety of exposed employees.
2. Inspections shall be performed by the Contractor's competent person, together with the Engineer:
  - a. Prior to the start of Work and as needed throughout the day.
  - b. After every rainstorm or other hazard-increasing occurrence.
3. During each inspection, note the condition of each excavation, the adjacent areas, and protective systems, and any evidence of situations that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions.
4. Where Contractor's competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions or corrective actions have been taken to ensure their safety.
5. Document the date, time, and outcome of each inspection in a dedicated log. Submit copy of inspection log to the Owner and Engineer with daily construction reports.

#### B. Compaction Testing:

1. Notify the Engineer at least 72 hours in advance of scheduled compaction testing. Engineer may designate areas to be tested.
2. Perform field moisture content and density tests in accordance with ASTM D6938 to verify that specified compaction of fill materials has been obtained. Comply with the following:
  - a. General Fill Material: At least one density and moisture content test shall be conducted for each 1,000 square feet of surface area for each lift of fill within excavation areas or as directed by the Engineer.
  - b. Additional tests may be required as determined by the Engineer.
3. Submit test results, certified by testing laboratory, to Engineer within 24 hours of completion of test.
4. If testing laboratory reports or inspections indicate fill compaction below specified density, remove unacceptable materials as necessary and replace with specified materials and provide additional compaction at Contractor's expense until subgrades and fills are acceptable. Costs for retesting of subgrade or fills that did not originally comply with specified density shall be paid by the Contractor.

END OF SECTION

## SECTION 31 50 00

### EXCAVATION SUPPORT AND PROTECTION

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

###### A. Scope:

1. Furnish, install, monitor, maintain, and selectively remove excavation support and protection systems capable of supporting excavation sidewalls, and resisting soil and hydrostatic pressures and superimposed and construction loads as described in this Section and shown on the Design Drawings.
2. Install excavation support systems, including slide rail system and in-situ soil solidification (ISS) gravity wall, without damaging existing buildings, pavement, adjacent roadways, subsurface utilities and other improvements adjacent to the excavation.
3. It is the Contractor's responsibility to review the excavation area configuration and the available information concerning subsurface conditions in order to anticipate subsurface conditions that may be encountered during installation of the support systems.

###### B. Coordination:

1. Notify the Engineer at least five days prior to beginning soil solidification gravity wall installation operations and slide rail excavation support installation. Notification shall not relieve the Contractor of its responsibilities for performing the work in accordance with the Contract Documents. Prior to notification, the Contractor shall ensure that all required submittals have been submitted to the Engineer and returned by the Engineer as "Reviewed" or "Reviewed and Noted".

###### C. Related Sections:

1. Section 01 35 43.13 – Environmental Procedures for Hazardous Materials.
2. Section 01 57 05 – Temporary Controls.
3. Section 02 73 00 – Construction Water Management and Disposal.
4. Section 31 05 05 – Aggregates for Earthwork.
5. Section 31 23 00 – Excavation and Fill.

##### 1.02 REFERENCE STANDARDS

###### A. The following standards are referenced in this Section:

1. ASTM D1633 – Unconfined Compressive Strength of Molded Soil – Cement Cylinders.
2. ASTM D5084 – Measurement of Hydraulic Conductivity of Saturated Porous Materials using a Flexible Wall Permeameter.
3. ASTM C150 – Standard Specification for Portland Cement.
4. ASTM A572/A572M – Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
5. AISC 325, Steel Construction Manual.
6. CFR Title 29, Part 1926, Safety and Health Regulations for Construction.

### 1.03 QUALITY ASSURANCE

- A. Contractor to provide the materials, equipment, and level and experience of labor necessary to install the ISS gravity wall and slide rail excavation support systems consistent with the Contract Documents.
- B. Qualifications
  - 1. Contractor (or subcontractor performing installation) must be able to demonstrate that they have successfully completed a minimum of three (3) soil solidification projects of similar scope and size.
  - 2. Contractor's Project Manager/Superintendent must demonstrate a minimum of five years of relevant experience with soil solidification work and must have a minimum of two years of experience as a Project Manager/Superintendent.
  - 3. Engage an experienced shoring system installer possessing a minimum of five years of experience installing trench boxes and slide rail shoring systems substantively similar to those specified, to perform all slide rail excavations indicated in the Contract Documents.
  - 4. Other key personnel must demonstrate a minimum of two years of experience with soil solidification and installing excavation support and protection system projects of similar scope and size. Other key personnel include technical staff and equipment and mixing plant operators involved with the soil solidification activities.

### 1.04 SUBMITTALS

- A. Action Submittals: Submit the following the sooner of seven days prior to the pre-construction conference or 30 days prior to mobilization to site:
  - 1. ISS Gravity Wall Installation and Removal Plan:
    - 1. Detailed description of soil stabilization process, equipment, and specifications, including the grout mixture installation, to be utilized for soil solidification operations.
    - 2. Proposed method to confirm that the mix design meets the performance criteria including proposed quality control sampling program (e.g., sample collection methods and testing procedures).
    - 3. Layout drawing depicting the limits of the soil solidification area, as well as proposed soil solidification layout/pattern to illustrate continuous soil solidification consolidation.
    - 4. Procedures for the tracking/labeling of soil solidification progression, determining/verifying location coordinates and depths including global positioning system (GPS) or physical measurement equipment/methods.
    - 5. Detailed description of soil solidification equipment and layout, power requirements, backup equipment, equipment failure replacement/repair procedures and estimated related downtimes.
    - 6. Detailed description and procedures for preparing soil solidification mixtures and specific application methods to ensure proper in-situ proportions and sequencing.
    - 7. Estimated production rate expressed as volume of soil solidification per day and estimated schedule for completion of soil stabilization efforts.
    - 8. Procedures for the removal of subsurface obstructions (if encountered) or for the offset of the wall if obstructions cannot be removed.
    - 9. Procedures to minimize surface water flow into the work areas.
    - 10. Equipment and procedures used to remove, replace, relocate, protect and maintain existing utilities during solidification.
    - 11. Equipment and procedures used to maintain the stability of existing site features during solidification.

2. Slide Rail Installation and Removal Plan (specific to the Tar Well removal area indicated or where proposed by the Contractor):
    1. Include a description of proposed methods and sequencing for installing shoring system to the limits shown on the Contract Drawings.
    2. Provide the name, address, affiliation, and license number of Contractor's Professional Engineer for the slide rail system and resume of relevant experience.
    3. Provide excavation support system shop drawings certified (stamped and signed) by a Professional Engineer licensed and registered in New York State. Include the following:
      - 1) Slide rail bay layout including bay dimensions and locations of slide rail components.
      - 2) Design calculations and assumptions for construction and roadway-related surcharges, including magnitude and location relative to slide rail excavation area.
      - 3) Manufacturer's product data, specifications, installation instructions, structural properties (moment of inertia and moment capacity), dimensions, and connection details for system components.
- B. Informational Submittals: Submit the following:
1. Qualifications: Provide evidence/summaries of qualifications required under Part 1.03 including resumes for key project personnel including Project Manager/Superintendent, engineering and technical staff, and equipment and mixing plant operators.
  2. Daily Soil Solidification Report: Submit daily a report which includes the following:
    1. Grout batch calculations.
    2. Soil solidification equipment used.
    3. Total volume of soil solidification completed, volume of soil solidification completed for the day, and an updated map identifying and depicting completed soil solidification areas and associated IDs.
    4. Documentation of any unforeseen site conditions.
    5. Documentation of equipment failures and/or maintenance/repairs.
    6. Documentation of modifications or deviations from the approved ISS Gravity Wall Installation and Removal Plan, or this Section.
  3. Daily Slide Rail Installation Progress Report: Submit a daily report which includes the following:
    1. Slide Rail Components Installed and/or removed.
    2. Equipment used.
    3. Total soil volume removed.
    4. Total soil volume backfilled.
    5. Documentation of any unforeseen site conditions.
    6. Documentation of equipment failures and/or maintenance/repairs.
  4. Weekly Soil Solidification Report:
    1. Total quantity of material solidified for the week in terms of total cubic yards and the number and depth of installed soil solidification locations.
    2. Total quantities of materials (water and reagents) used for the week, and waste quantities (if any).
    3. Summary of material deliveries for the week, including, but not limited to, backup in the form of bills of lading, weight tickets, flow meter records.
    4. Soil solidification progress schedule and percent complete, and modifications to the progress schedule based on soil stabilization production rates.



5. Documentation of material swell, and a description of collection/handling methods and quantities of excess materials.
6. Equipment cleaning methods, and quantities of cleaning fluids/materials generated.

#### 1.05 GROUT MIX DESIGN

- A. Provide grout mix materials (i.e., reagents and water) in sufficient quantities to allow for uninterrupted soil solidification activities and the production rate as determined by the Contractor.
- B. Calculate and provide in an acceptable format, the following soil solidification grout mix parameters:
  1. Volume of soil being treated in each soil solidification area, including the volume of treated soil as a result of overlap from adjacent areas.
  2. Based on an approximate average dry unit weight of 100 pounds per cubic foot (pcf), show the calculation that indicates the weight of soil being treated in each soil solidification area.
  3. If the Contractor proposes to use mix designs other than those provided in this Section, conduct bench-scale treatability testing to document the proposed mix designs' hydraulic conductivity and unconfined compressive strength (UCS) using soil from the site and potable water. Bench-scale testing for Contractor-proposed mix designs shall be conducted at no additional cost to the Engineer and Owner. Additionally, if the Contractor conducts soil solidification activities using a mix design other than those provided in this Section and does not meet the performance criteria provided in this Section, the soils shall be re-solidified, removed, or otherwise addressed by the Contractor at the Contractor's expense with Engineer approval.
  4. Show the calculation that indicates the quantity of grout materials required for each soil stabilization area by a percentage of the total weight of treated soil. The following mix design shall be used for soil solidification:
    1. The following percentage of solidified mixture component is relative to the total calculated dry weight of the soil treated:
      - 1) Portland cement (PC) at 10.0 percent.
  5. Show calculations of volume expansion of treated soils (swelling) based on amounts of water within grout mixture and estimated groundwater contained within each soil solidification area. Minimize to extent practicable the volume expansion for ease of management of the site.
  6. Final grout mix must have a flowing viscosity less than 10 centipoise and have a density lower than 95 pcf.
  7. The water to binder ratio to be added to the baseline composite grout mixture. In-situ field conditions may warrant a change in grout mix water content. If this is the case, the Contractor must submit a request to the Engineer for approval to alter the grout mixture water quantities.

#### 1.06 PERFORMANCE CRITERIA

- A. Ensure the performance of the soil solidification area meets the requirements set forth in the Contract Documents and this Section. Contractor shall be responsible for meeting the performance requirements by any means necessary and any replacement or repairs will be incurred at the Contractor's expense.

- B. Verify that the soil solidification matrix meets the specified performance standards, including, but not limited to, the following:
  - 1. Hydraulic conductivity (permeability) shall be less than  $1 \times 10^{-6}$  centimeters per second.
  - 2. Unconfined compressive strength (UCS) of the treated soil matrix shall be greater than 50 pounds per square inch (psi) and less than 100 psi after 28 days.
- C. Soil solidification mixing shall cover the entire wall area and meet all target depths as depicted on the Design Drawings. Contractor shall provide sufficient overlap between mixed areas such that no soil within the established wall area limits goes untreated.
- D. Soil solidification activities shall be performed in a manner that minimizes the potential swell and the quantity of flowable material at ground surface.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the site in such quantities and at such times to ensure continuity of excavation operations and soil solidification mixing and installation activities.
- B. Store slide rail components to minimize potential for distortion or damage. Protect steel member and packaged material from corrosion and deterioration.
- C. Store grout products to minimize exposure to weather, or other elements that may cause products to be un-useable.
- D. Handle slide rail systems and grout products using only handling holes or lifting devices to prevent distortion or damage.
  - 1. Do not drag delivered items across the ground.
  - 2. Before assembly, surface that will contact each other will be thoroughly cleaned. All parts will be assembled accurately as specified by the manufacturer.

#### 1.08 SITE CONDITIONS

- A. The Contract Documents indicate information available relative to subsurface conditions at the Site. Such information and data are not intended as a representation or warranty of continuity of conditions between soil borings or test pits, nor of groundwater levels at dates and times other than date and time when measured, nor that purpose of obtaining the information and data were appropriate for use by Contractor. Owner and Engineer will not be responsible for interpretations or conclusions drawn therefrom by Contractor.
- B. The Contract Documents show or indicate certain below grade structures adjacent to or within the limits of the Work. Such information was obtained from existing records and is not guaranteed to be correct or complete. Remediation Contractor shall explore ahead of trenching, excavation, or other subsurface work to determine the exact location of all existing structures.

## PART 2 - PRODUCTS

### 2.01 ISS GRAVITY WALL

#### A. Soil Solidification Equipment

1. It is assumed that soil solidification will be performed using an appropriately sized excavator to complete bucket mixing to the required depths.

#### B. Grout Mixture

1. Provide all required reagent materials in sufficient quantities to complete the soil solidification activities specified, without delay.
2. Grout mixture shall include Portland cement Type I/II.
3. Provide a means for accurate measurement and documentation verifying the required grout material quantities are maintained, as specified.
4. Maintain sufficient reagent material on site to achieve a maximum production rate for a minimum of 3 days. The Contractor is responsible for the coordination of an appropriate material delivery schedule to accommodate this indicated stock requirement.

#### C. Grout Mixture Water

1. Provide on-site potable water for grout mixing. Arrange for and obtain appropriate permits for the use of hydrant water or temporary hook up of site potable water. Contractor shall be responsible for all fees associated with water usage. If an offsite source of water is utilized other than city-provided water, the Contractor must submit documentation of the source of water for Engineer review.
2. Provide a means for accurate measurement and documentation of water quantities utilized for grout batch mixtures. The water measurement devices must be capable of measuring totalized and instantaneous flows. Measuring devices must be calibrated to within +/-2 percent to accurately measure the required quantity of water necessary for each grout batch mixture. Provide documentation for equipment calibration and calibration schedule.
3. If water for soil solidification gravity wall mixing activities is stored on-site, the water storage containers/tanks must be clean and free of any waste residuals or debris.

### 2.02 SLIDE RAIL SHORING SYSTEM

#### A. General

1. Provide materials that are either new or in serviceable (like-new) condition.
2. Unless others shown or indicated, all materials for structural steel and miscellaneous metal work shall comply with applicable provisions of the latest edition of the AISC Steel Construction Manual.
3. All system components, as delivered and installed, shall be free of winds, warps, local deformations, or unauthorized bends.
4. Holes and other provisions for field connections shall be accurate, so that proper fit and a positive interlock will result when components are assembled in the field.

#### B. Slide Rail Shoring System:

1. Provide modular, re-usable shoring system of steel posts, panels, and braces conforming to ASTM A572 (Grade 50). Posts and panels shall have reinforced cutting edges (bottoms) to facilitate installation. Obtain posts, panels, braces, and accessories (if any) from a single manufacturer.

1. Posts: Provide steel posts with single or double rails, and lengths to accommodate the required excavation depths.
2. Panels: Provide 4-inch-thick steel panels with heights and lengths to accommodate the required excavation depths and width specified on the Design Drawings.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Examine the areas and conditions under which the Work will be performed and notify Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected in a manner acceptable to the Engineer.

### 3.02 PREPARATION

- A. General
  1. Contractor shall remove, replace, relocate, protect and maintain existing utilities and structures as necessary. Damages to existing utilities or structures caused by installing excavation support and protection systems shall be promptly repaired at the Contractor's expense.
  2. Protect existing sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, dewatering, and other hazards that could develop during excavation support installation, excavation, and/or backfilling Work.
- B. Pre-trenching
  1. Before proceeding with excavation support system operations, excavate and clear alignments of existing asphalt, and any near surface subbase materials, debris, cobbles, and other obstructions.
    1. Contractor shall pre-excavate within ISS gravity wall limits to depths necessary to account for swelling of the solidified material and management of that material.
    2. Contractor shall clear alignment of slide rail systems to a maximum depth of two feet below ground surface for panel alignments and hand-clear post locations to a depth of five feet below ground surface. Remove, empty, or clear subsurface obstructions ahead of installation where specified and required.
  2. Perform all work required in connection with excavating, stockpiling, maintaining, shoring, and backfilling trenches.
  3. Exercise care during pre-trenching Work to avoid damaging and disrupting existing structures, pavement/roadways, and utilities to remain. Contractor shall be responsible for repairing, at its expense, damage caused during the Work to existing structures, pavement/roadways, and utilities to remain. Comply with Laws and Regulations and Section 31 23 00 - Excavation and Fill.
  4. There shall be no separate payment for pre-trenching.

### 3.03 GRAVITY WALL INSTALLATION

#### A. Mixture Preparation

1. Complete and submit a form calculating the required quantities of water and grout materials for the batch mix design. The following grout mixture information must be documented.
  1. Quantity of reagents added.
  2. Soil solidification Area ID.
  3. Identification of soil solidification overlap and reduction in grout volume due to overlap (where applicable).
2. Add the calculated quantities of grout mixture ingredients (water and specified reagent quantities) to the mixing plant and thoroughly mix the grout mixture to achieve a homogeneous mixture.
3. The equipment must provide adequate pressure and flow rate and a means of measuring pressure and flow such that grout is delivered at a constant rate throughout the soil solidification area.
4. Grout mixture must not be allowed to stand for a period of greater than 90 minutes.
5. Processed grout that reaches a temperature of 90°F or greater should be discarded.
6. Contractor shall provide spare parts/pumps/mixing equipment to be available on site during full-scale operations to minimize potential downtime.

#### B. Solidification

1. Contractor shall maintain the stability of excavation and adjacent embankment during solidification.
2. Contractor shall mix grout with the soil until a homogeneous mixture of soil and grout is achieved through the required vertical limits of the soil solidification gravity wall.
3. Contractor shall not solidify more than 25 consecutive feet of soil solidification gravity wall in one day. Contractor shall plan/sequence soil stabilization wall installation activities accordingly.
4. Grout mix and similar materials that are spilled or misplaced outside the limits of the gravity wall shall be promptly contained, cleaned, and reported as required in the Storm Water Pollution Prevention Plan, Section 01 35 43.13 – Environmental Procedures for Hazardous Materials and Section 01 57 05 – Temporary Controls.
5. If refusal is encountered prior to achieving the target anticipated depths, notify the Engineer immediately. Upon notification, the Engineer may request the Contractor to remove the obstruction. The Contractor shall have available on-site an excavator capable of reaching to refusal depths in order to remove obstructions encountered during soil solidification activities. Contingency measures for addressing obstructions as follows (in order), to be implemented with approval from the Engineer:
  1. Removal of the obstruction.
  2. Encasement of the obstruction.
  3. Widen the ISS gravity wall.
  4. Adjust ISS gravity wall alignment.
6. Information relative to each installed soil solidification area shall be documented throughout the soil solidification efforts. Documentation for each soil solidification area shall, at a minimum, include the following:
  1. Soil solidification area ID.
  2. Soil solidification area coordinates.
  3. Surface elevation at top of soil solidification.

4. Total installed depth of soil solidification (elevation).
5. Location/Depth of post-mix representative sample.
6. Start time and finish time.
7. Quantity of grout installed.
8. Soil mixing technique and duration.
9. Diagram of soil solidification area depicting location and overlap configuration.

C. Excavation

1. General:

1. Excavation and backfill shall be performed in accordance with Section 31 23 00 – Excavation and Fill.
2. Contractor shall not excavate within 15 feet of the soil solidification gravity wall prior to successful QA/QC performance test results in accordance with Part 3.06 of this Section.

D. Gravity Wall Removal

1. Following completion of deep soil removal area excavation and backfill, remove gravity wall material in accordance with Section 31 23 00 – Excavation and Fill.
2. Unless otherwise shown on the Design Drawings, removal shall at minimum be to 4 ft below final grade for the entire wall. Deeper removal shall be performed at the locations shown on the Design Drawings to top of till.

### 3.04 SLIDE RAIL EXCAVATION SUPPORT INSTALLATION

A. Slide Rail System Installation

1. Before assembly, surface to be in contact with each other shall be thoroughly cleaned. All parts shall be assembled accurately as shown on the Constructor's Shop Drawings.
2. Sequence installation and excavation at the site as specified on the Design Drawings, or as directed by the Engineer.
3. Install system components in accordance with the manufacturer's specifications and to meet all applicable Laws and Regulations, including 29 CFR 1926, Subpart P (Excavations). Install excavation support components to ensure minimum interference with roads, streets, and adjacent facilities. Ensure minimum off-sets and clearances are maintained as shown on the Design Drawings.
4. Excavate soils and remove existing structures (Tar Well) and move panels downward as excavation progresses.
5. Excavation of materials beyond the bottom of the slide rail components shall not exceed the limits establish in Laws and Regulations. Install additional panels as required to advance excavations to required depth.
6. Monitor, prevent, and correct any tendency of system components to bend, twist or rotate, and/or move out of alignment during installation.
7. If excavation support system components are rejected from work because of deviation from location, excessive bending, twisting, or other reasons, the Contractor shall take suitable corrective action at no additional cost to the Owner.
  1. Suitable correction action includes extracting, furnishing, and installing of replacement components, so that all components installed meet the requirements of this Section. The Engineer will review corrective actions prior to installation.

B. Slide Rail System Removal

1. Remove excavation support and protection systems when approved by the Engineer and when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures.
2. Remove system components in stages during backfilling, and exercise care to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities. Repair any damages at the Contractor's expense.
3. Backfill any voids resulting from removal of system components with general fill as specified in Sections 31 05 05 - Aggregates for Earthwork and 31 23 00 - Excavation and Fill.
4. Remove and containerize all soil and debris that is adhered to the system components prior to movement within the Contract Work Limits. Decontaminate system components at the end of use of the system.

3.05 MONITORING

- A. Visually monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or leaks, to ensure that excavation remains stable and free of standing water.
- B. Immediately notify Engineer of any movement, cracking, or settlement of the ground surface surrounding the excavation, or of any visual damage to or movement of adjacent structures, utilities, or other facilities.

3.06 FIELD QUALITY CONTROL

- A. If after "best efforts" have been implemented, the ISS gravity wall cannot be constructed or slide rail posts and/or panels cannot be installed to the depths shown on the Drawings, the methods to be employed to address these conditions will be discussed between the Contractor, Owner, and Engineer to formulate an approach to address impacted materials to the depths depicted in the Contract Documents.
- B. ISS Performance Monitoring:
  1. Engineer must be on-site during all soil solidification operations. Engineer will observe the installation of each soil solidification area to document the soil mixing process.
  2. Engineer will visually inspect each batch of mixed grout prior to its use in a soil solidification area. The grout batch will be visually inspected to verify that the material has been sufficiently mixed to create a homogeneous grout mixture.
  3. Contractor shall collect verification soil solidification samples at a frequency of one set for every 500 cubic yards of mixed soil, and test the samples for permeability and compressive strength (ASTM D5084 and D1633, respectively). Each set of samples shall consist of four 3-inch by 6-inch sample specimens (cylinders) of homogenized solidified soils obtained from the soil solidification monolith surface, mid-point, and other depths to be determined with the Engineer.
  4. No excavation adjacent to treated soil solidification may occur until the soil solidification has tested successfully.

END OF SECTION

## SECTION 32 12 00

### FLEXIBLE PAVING

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Scope:
  - 1. Provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install flexible, hot-mix, hot-laid, asphalt concrete pavement.
  - 2. The Work includes:
    - a. Preparation such as saw-cutting, cold milling, cleaning, compaction, and other preparation for installing flexible pavements.
    - b. Providing asphalt concrete paving materials.
    - c. Providing tack coat material.
    - d. Providing pavement markings where shown or indicated.
    - e. Providing quality controls and testing.
- B. Coordination:
  - 1. Review installation procedures under this and other Sections and coordinate the installation of items that must be installed with or before flexible paving.
- C. Related Sections:
  - 1. Section 31 23 00 – Excavation and Fill.
  - 2. Section 31 05 16 – Aggregates for Earthwork.

##### 1.02 REFERENCE STANDARDS

- A. The following standards are referenced in this Section:
  - 1. ASTM D2950/D2950M - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
  - 2. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
  - 3. ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>[600 kN-m/m<sup>3</sup>]).
  - 4. ASTM D6938 – Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
  - 5. AASHTO M248 – Standard Specification for Ready-Mixed and yellow Traffic paints; current edition.

##### 1.03 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Asphalt Concrete Production Facility: Production facility for asphalt concrete, tack coat materials, and other bitumastic materials shall be approved by NYSDOT for furnishing such materials for NYSDOT highways.
  - 2. Contractor's Testing Laboratory: Retain the services of an independent testing laboratory to perform testing and determine compliance with the Contract Documents of the materials provided under this Section. Testing laboratory shall comply with ASTM E329, and shall be experienced in the types of testing required.



- B. Regulatory Requirements:
1. Reference Specifications and Details: Comply with applicable requirements of the NYSDOT Standard Specifications (effective September 1, 2016) and Standard Sheets.
- C. Quality Assurance Testing:
1. Test bituminous materials and asphalt concrete mix design for each asphalt concrete material in accordance with reference specifications indicated in Part 1.03 of this Section.
  2. In lieu of quality assurance testing, submit evidence and certification of material compliance with reference specifications indicated in Part 1.03 of this Section. When evidence of conformance submitted is not acceptable to the Engineer, perform quality assurance testing.
  3. To facilitate testing laboratory:
    - a. Secure and deliver to testing laboratory representative Samples of materials that Contractor proposes to furnish and that are required to be tested.
    - b. Furnish such labor as is necessary to obtain and handle Samples at the site or at asphalt concrete production facility and other material sources.
    - c. Advise testing laboratory and Engineer sufficiently in advance of operations to allow for completion of quality assurance tests and for the assignment of personnel.

#### 1.04 SUBMITTALS

- A. Action Submittals:
1. Shop Drawings:
    - a. Submit the proposed asphalt concrete mix design for each asphalt concrete material, and other bituminous materials, required under this Section. Provide complete data on materials, including location in the Work, source, material content and percentages, temperatures, and all other pertinent data.
    - b. Proposed gradation for each aggregate to be used for subbase and in asphalt paving material. Submit gradation test results for the same material furnished on a previous project. Indicate the proportion of reclaimed asphalt pavement.
    - c. In lieu of the information required under Paragraphs 1.04.A.1.a and 1.04.A.1.b, above, submit certificates of compliance with the reference specifications indicated in Part 1.03 of this Section, for each for the following:
      - 1) Each asphalt concrete mix design required.
      - 2) Bituminous materials required.
      - 3) Aggregates to be used in asphalt paving, from each material source and each required gradation.
      - 4) Density of uncompacted asphalt concrete material.
      - 5) Density of previously-compacted, previously-tested asphalt concrete material.
      - 6) Density and voids analysis for each asphalt concrete material test specimen.
      - 7) Evidence of asphalt concrete plant inspection and compliance with the reference specifications indicated in Part 1.03 of this Section.
- B. Informational Submittals:
1. Qualifications Statements:
    - a. Asphalt Concrete Production Facility: Submit name, address, and proof of NYSDOT approval for asphalt concrete production facility.
    - b. Contractor's Testing laboratory: Submit name and qualifications of testing laboratory to be employed, and qualifications of testing laboratory's personnel that will perform quality assurance and field quality control testing required in this Section. If more than one laboratory will be employed, submit qualifications statement for each laboratory.
  2. Quality Assurance Test Data Submittals:
    - a. Submit for quality assurance tests required.

3. Delivery Tickets:
  - a. Submit copy of delivery ticket for each load of asphalt concrete, tack coat materials, and other materials obtained from asphalt concrete production facility, signed by Contractor.
4. Field Quality Control Submittals:
  - a. Submit results of required field quality control testing.

## 1.05 SITE CONDITIONS

- A. Environmental Requirements:
  1. Temperature:
    - a. For base course and binder course paving lifts equal to or greater than two inches thick, atmospheric temperature shall be 40 degrees F and rising.
    - b. For top course paving or other pavement courses in lifts less than two inches thick, temperature of surface on which pavement is to be placed shall be 50 degrees F or greater.
  2. Prohibitions:
    - a. Do not place flexible paving materials when weather is foggy or during precipitation.
    - b. Do not place flexible paving materials when the base on which the material will be placed contains moisture in excess of optimum.
    - c. Place flexible paving materials only when Engineer concurs that weather conditions are suitable.

## PART 2 – PRODUCTS

### 2.01 SYSTEM PERFORMANCE

- A. System Description:
  1. Subbase Course: Provide NYSDOT Type 2 subbase course of the thickness shown or indicated, in accordance with Section 31 05 16 – Aggregates for Earthwork and reference specifications indicated in Part 1.03 of this Section.
  2. Asphalt Roadway Course: Provide the following:
    - a. Base Course: 3 inches compacted thickness (min. or match existing).
    - b. Binder Course: 2.5 inches compacted thickness (min. or match existing).
    - c. Surface Course: 1.5 inches compacted thickness (min. or match existing).
  3. Asphalt Parking Lot/Driveway: Provide the following:
    - a. Base Course: 2.5 inches compacted thickness.
    - b. Top Course: 1.5 inches compacted thickness.

### 2.02 ASPHALT CONCRETE MIXES

- A. Asphalt Concrete Mixtures: Provide the following materials designed and manufactured in accordance with the reference specifications indicated in Part 1.03 of this Section:
  1. Base Course: NYSDOT Item No. 402.378302, 37.5, Base Course HMA, 80 Series Compaction.
  2. Binder Course: NYSDOT Item No. 402.258302, 25.0 F9 Binder Course HMA, 80 Series Compaction.
  3. Top Course: NYSDOT Item No. 402.128302, 12.5 F2 Top Course HMA, 80 Series Compaction.

## 2.03 BITUMINOUS MATERIALS

- A. Bituminous Materials for Asphalt Concrete:
  - 1. Bituminous materials for asphalt concrete shall comply with the reference specifications indicated in Part 1.03 of this Section, for the asphalt concrete mixes specified.
- B. Tack Coat:
  - 1. Tack coat shall be emulsified asphalt that conforms to the requirements of Section 702 (Table 702-7 and/or 702-8) of the reference specifications indicated in Part 1.03 of this Section.

## 2.04 AGGREGATES IN FLEXIBLE PAVEMENTS

- A. Aggregates for Asphalt Concrete:
  - 1. Aggregate materials used in flexible pavement shall be in accordance with the reference specifications indicated in Part 1.03 of this Section, for the asphalt concrete mix designs indicated.

## 2.05 PAVEMENT MARKING PAINT

- A. Lane and Parking Area Marking Paint: Alkyd-resin type, ready-mixed, AASHTO M248, Type S or N.
  - 1. Color: White.
  - 2. Color: Yellow.

# PART 3 – EXECUTION

## 3.01 INSPECTION

- A. Examine the subgrade, subbase, and base on which flexible paving will be installed and notify Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.
- B. Do not place materials on subgrades or subbase that is muddy or has water thereon.

## 3.02 PREPARATION

- A. Preparation: Before starting installation of flexible paving, perform the following:
  - 1. Grade Control: Establish and maintain throughout flexible paving installation the required lines and grades, including crown and cross-slope for each asphalt concrete course during construction operations.
  - 2. Subgrade: The subgrade shall be shaped to line and grade and compacted with self-propelled rollers. Compaction shall be to 95 percent Standard Proctor Maximum Density (ASTM D698) throughout the sub-grade.
  - 3. Provide and compact subbase as required to achieve the finished grades as shown and as specified in this Section. Subbase material shall be compacted to 95% Standard Proctor Maximum Density (ASTM D698). Before installing asphalt pavement, obtain Engineer's concurrence that subgrade and subbase are suitable for installing asphalt pavement.

### 3.03 INSTALLATION OF FLEXIBLE PAVING

#### A. General:

1. Provide final pavement surfaces of uniform texture, at required grades and cross-sections.
2. Construct paved surfaces to the lines, grades, and typical sections shown or indicated. If grading is not provided, match existing lines and grades.

#### B. Installation of Asphalt Concrete:

1. Asphalt concrete mixture shall be transported to the site of paving and placed as soon as possible after mixing.
2. Placement of each asphalt concrete course shall be completed over the full width of the section under construction during each day's paving operations.
3. Spread and finish asphalt concrete courses by means of self-propelled mechanical spreading and finishing equipment. Compacted thickness of layers placed shall not exceed 150 percent of specified thickness unless approved in writing by Engineer.
4. Compaction:
  - a. Rollers:
    - 1) Use sufficient rolling equipment to satisfactorily compact and finish the quantity of asphalt concrete placed.
    - 2) During rolling operations, roller speed shall not exceed three miles per hour. When sufficient number of rollers is not available, reduce the quantity of asphalt concrete placed to accommodate the available rollers' speed.
    - 3) Required rollers shall in acceptable operating condition, prior to placing of asphalt concrete.
    - 4) Use of vibratory rollers in lieu of steel-wheeled rollers is acceptable, however when thickness of asphalt concrete is one inch or less, rolling shall be in the static mode.
  - b. Rolling of initially-placed asphalt concrete material, or breakdown rolling, shall begin as soon as the asphalt concrete mixture will bear the roller without undue displacement.
  - c. Rolling shall be longitudinal, overlapping on successive trips by not less than one-half roller rear wheel width, and not more than three-quarters of roller rear wheel width. Alternate trips of the roller shall be of slightly different lengths.
  - d. At all times, roller motion shall be slow enough to avoid displacing the asphalt concrete.
  - e. Operate rollers continuously from breakdown of laid asphalt concrete through finish rolling.
  - f. Perform finish rolling using a steel-wheeled roller or a vibratory steel-wheel roller operating in the static mode.
  - g. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.
  - h. At each location not accessible to roller, thoroughly compact asphalt concrete with tampers and finish, where necessary, with a hot smoothing iron to provide uniform, smooth layer over the entire area so compacted.
5. Each compacted asphalt concrete course shall be within plus-or-minus 1/4 inch of the indicated thickness. Total thickness of flexible pavement shall be within plus-or-minus 1/2 inch of the indicated thickness.
6. Placement of Adjacent Strips of New Asphalt Concrete:
  - a. When more than one width of asphalt concrete material will be placed, a six-inch wide strip of asphalt concrete adjacent to the area on which the future material is to be placed shall not be rolled until such future material is placed.
  - b. Do not leave the unrolled strip unrolled for more than two hours after placement unless the six-inch unrolled strip is first heated with a joint heater.

- c. After the first strip or width of asphalt concrete is compacted, place, finish, and compact the second width or strip as required for the first width, except that rolling shall be extended to include the six-inch strip of the first width not previously compacted.
- C. Construction Joints:
  - 1. Construction joints shall be made in such a manner as to ensure a neat junction, thorough compaction, and bond throughout.
  - 2. Provide a transverse joint extending over the full width of the strip being laid and at right angles to its centerline at the end of each work day and at other times when the placement of hot-mix asphalt concrete will be suspended for a period of time that will allow asphalt concrete mixture to chill.
  - 3. Thoroughly compact by rolling the forward end of a freshly laid strip of asphalt concrete before the asphalt concrete mixture becomes chilled. When the Work is resumed, the end shall be cut vertically for the full depth of the layer.
- D. Joining of Pavements:
  - 1. When pavement is to join existing or previously-laid pavement, the existing or previously-laid pavement shall be neatly and carefully edged to allow for overlapping and feathering of the subsequent course of asphalt concrete material.
  - 2. Where new pavement is to meet existing pavement, the existing pavement shall be saw-cut and notched.
  - 3. Where new pavement will meet existing asphalt pavement, remove existing pavement 12 inches onto undisturbed existing pavement course at edges where new pavement will meet existing pavement.
  - 4. Tack Coat:
    - a. Provide tack coat material at the following locations:
      - 1) At edges where new pavement will connect to existing or previously-installed pavement.
      - 2) On surface of existing or previously-installed pavement course over which new pavement will be installed, prior to placement of the subsequent pavement course. Tack coat may be deleted when a succeeding layer of asphalt pavement is being applied over a freshly-placed asphalt pavement course that has been subjected to very little or no traffic, with approval of Engineer.
      - 3) Where new pavement will abut curbing, concrete gutters, drainage structures and frames, manhole cover frames, valve boxes, and similar items.
    - b. Tack Coat Installation: Install tack coat immediately prior to installing pavement. Place pavement while tack coat is wet. Apply tack coat in accordance with reference specifications indicated in Part 1.03 of this Section.
- E. Curing:
  - 1. Do not allow traffic onto pavement until directed by the Engineer. Traffic will not be allowed on new asphalt concrete pavement until surface temperature is less than 140 degrees F.
  - 2. Hold construction traffic on new pavement to a minimum as acceptable to the Engineer.
- F. Defective Pavement Work:
  - 1. When directed by the Engineer, remove and replace defective flexible paving Work. Cut out such areas of defective pavement and fill with fresh asphalt concrete materials, compacted to required density.

### 3.04 FIELD QUALITY CONTROL

- A. Site Tests: Employ a testing laboratory to perform field quality control testing.
1. Testing Laboratory Scope:
    - a. Perform field density tests to verify that required compaction of asphalt materials has been obtained.
    - b. Test the proposed materials for compliance with the Contract Documents, as directed by Engineer.
    - c. Submit reports of all test results to Engineer and Contractor.
  2. Asphalt Concrete Mix Temperature: Measure temperature at time of placement, record, and submit to Engineer.
  3. Surface Smoothness:
    - a. Test finished surface of each flexible paving course for smoothness, using a 10-foot straightedge applied parallel to and at right angles to centerline of paved areas.
    - b. Check surfaced areas at intervals as directed by the Engineer.
    - c. Surfaces will be acceptable relative to smoothness when measurements are equal to or less than the following:
      - 1) Base Course: 3/8 inch vertical in 10 feet horizontal.
      - 2) Binder Course: 3/8 inch vertical in 10 feet horizontal.
      - 3) Top Course: 1/4 inch vertical in 10 feet horizontal.
      - 4) Crowned Surfaces:
        - a) Test crowned surfaces with a crown template, centered and at right angles to the crown.
        - b) Surfaces will be acceptable when variance is equal to or less than 1/4 inch from the template.
    - d. Elevation: Finished surface of pavement shall be within plus-or-minus 1/2 inch of elevations shown or indicated.
  4. Density:
    - a. Asphalt: Test in accordance with ASTM D2950/D2950M. Test one sample every 1,000 square feet of pavement. Test for each asphalt concrete course installed.
    - b. Subbase: test in accordance with ASTM D6938/D6938M. Test one sample every 1,000 square feet of pavement. Test for each lift of sub-base course installed.
    - c. In addition, when directed by the Engineer, compare density of in-place flexible paving materials against laboratory specimen or certificates on same asphalt pavement mixture, using nuclear density device.
    - d. Criteria for Acceptance: Density of in-place asphalt pavement material shall be not less than 90 percent of the recorded laboratory specimen or certificate density. Density shall be not greater than 98 percent.
  5. Asphalt Concrete Pavement Thickness: Depth check readings shall be taken for each course of compacted pavement at a frequency of one reading every 1,000 square feet of compacted pavement. Comply with thickness tolerance specified in Part 3.03 of this Section.
  6. Repair holes from test specimens in accordance with this Section's requirements for repairing defective Work.
  7. Submit test results, certified by testing laboratory, to Engineer within 24 hours of completion of test.

### 3.05 ADJUSTING

- A. Frames and Covers:
1. Set frames of drainage structures, manholes, valve boxes, and similar items to final grade. Adjust frames of existing structures and frames furnished under other Sections. Frames shall be at substantially similar elevation to finished top course of pavement.

2. Replace covers and gratings of existing structures immediately following adjusting associated frames. Install covers and gratings of structures provided under the Project as quickly as possible.
3. Where there is a delay between adjusting of frames and installation of top course, provide temporary bituminous material around perimeter of each frame to smooth vehicle access over the frame. Maintain and repair temporary bituminous material as required until placement of top course. Remove temporary bituminous material before installing top course.

B. Pavement Adjustment:

1. Repair or replace in manner acceptable to the Engineer areas of pavement that are observed to pond or collect water.

3.06 CLEANING

- A. After completing paving operations, clean surfaces of excess or spilled bituminous materials, excess asphalt concrete, and foreign matter.

3.07 PROTECTION

- A. Protect finished pavement until pavement has become properly hardened and cool.
- B. Cover openings of drainage structures, manholes, valve boxes, and similar items in the paved area until permanent coverings are provided.

END OF SECTION

# APPENDIX C

## Community Air Monitoring Plan (CAMP)



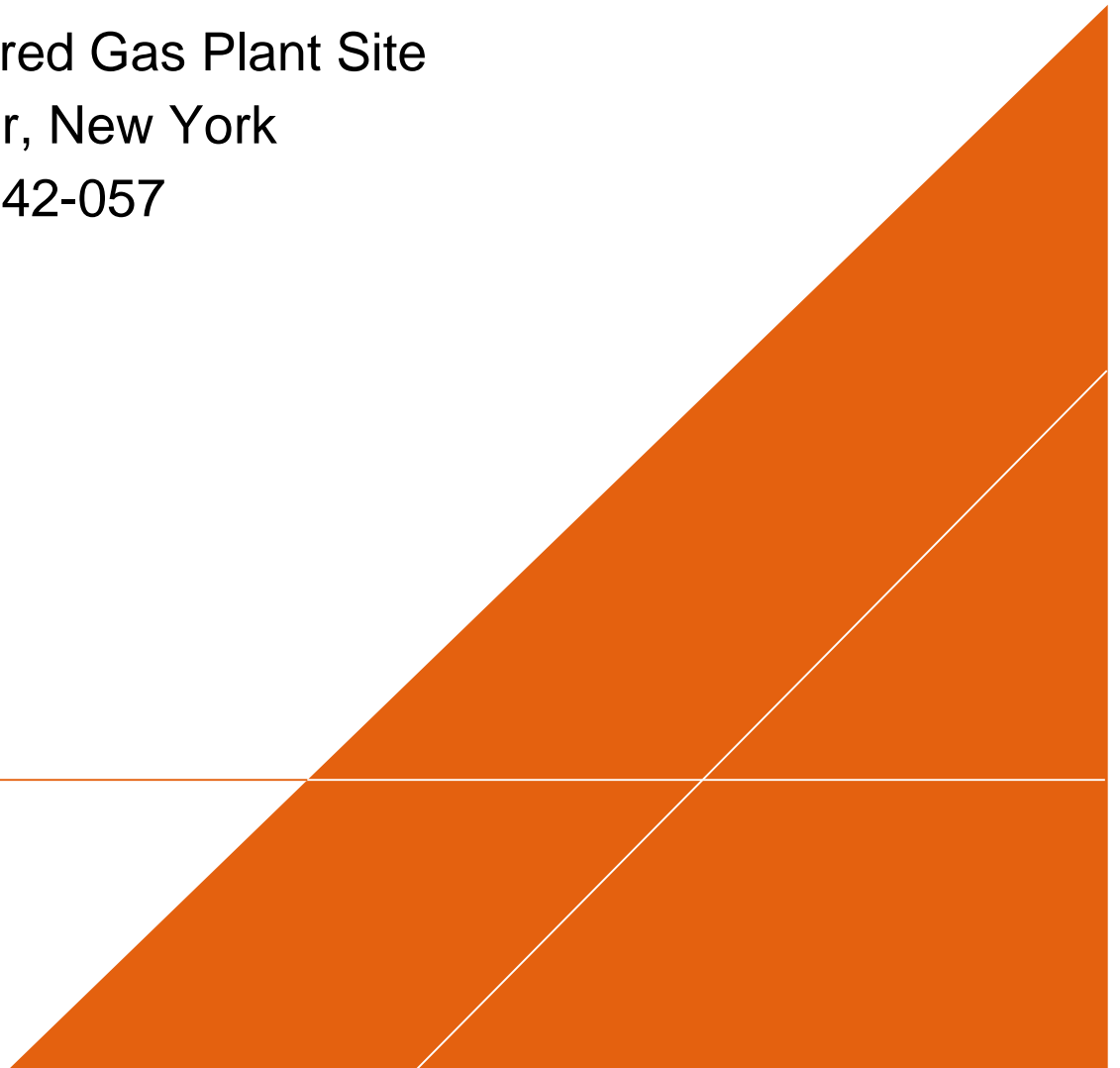




# COMMUNITY AIR MONITORING PLAN

Rensselaer Non-Owned Former  
Manufactured Gas Plant Site  
Rensselaer, New York  
Site No. 4-42-057

November 2020



## COMMUNITY AIR MONITORING PLAN

Rensselaer Non-Owned Former MGP  
Site  
Rensselaer, New York  
Site No. 4-42-057

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## ATTACHMENTS

- 1 Generic Community Air Monitoring Plan
- 2 Vapor Emission Response Plan

## 1 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared to support the implementation of the New York State Department of Environmental Conservation- (NYSDEC-) selected remedy for the National Grid Non-Owned Rensselaer former manufactured gas plant (MGP) site (the site) located in Rensselaer, New York (Site No. 4-42-057). Details related to the remedial activities are presented in the accompanying Final Remedial Design Report (Remedial Design). Specification Sections referenced in this CAMP are included in Appendix B of the Remedial Design.

The purpose of this CAMP is to describe the monitoring activities that will be conducted by the Contractor to monitor for potential airborne releases of constituents of concern (COCs) during the implementation of remedial activities. This CAMP specifies the air emission action levels, air monitoring procedures, monitoring schedule, and data collection and reporting to be performed during the implementation of remedial activities.

As indicated in Specification Section 01 35 49 – Community Air Monitoring Plan, the Contractor is responsible for providing all labor, materials, and equipment necessary to implement the community air monitoring program specified herein and is ultimately responsible for confirming that all corrective measures associated with the community air monitoring program (including the control of dust, vapors, and odors) are conducted in accordance with this CAMP and Specification Section 01 57 05 – Temporary Controls.

### 1.1 Site Location and Description

The former MGP site is located on Washington Street in the City of Rensselaer, Rensselaer County, New York. The former MGP site is comprised of the former MGP area, including remnants of two gas holders, a tar well, and MGP facilities. The former MGP site is currently paved and used as a parking lot for the Capital View Office Park which houses the Albany Regional office for the New York State (NYS) Office of Children and Family Services (OCFS). Additional details regarding the site description are provided in the Remedial Design.

### 1.2 Summary of Remedial Activities

In general, the remedial activities to be performed at the site consist of excavation of soils from the limits shown on the Design Drawings (Appendix A of the Remedial Design). Approximately 1,800 cubic yards (neat-line, in-situ) of material will be removed. Additional details regarding remedial activities are provided in the Remedial Design.

## 2 ODOR, VAPOR, AND DUST CONTROL

As defined in the New York State Department of Health (NYSDOH) Generic CAMP (included as Attachment 1), intrusive remedial activities to be performed at the site have the potential to generate localized impacts to air quality. Remedial components that have the potential to generate air emissions include, but may not be limited to, the following:

- Installation of erosion and sediment controls and other site preparation activities.
- Saw-cutting of pavement or concrete.
- Excavation of soils.
- Material handling (e.g., offloading of materials, manipulation of materials to render them suitable for off-site treatment/disposal, stockpiling of materials, and loading of materials for transport to an off-site treatment/disposal facility).
- Backfilling.
- Restoration of excavation and support areas.
- Other ancillary intrusive activities.

Odor, vapor, and dust emissions resulting from these activities will be controlled using a combination of the following:

- Water spray
- BioSolve® PinkWater®
- Polyethylene sheeting (for covering material stockpiles)
- Vapor suppression foam (i.e., Rusmar AC-645 Long-Duration Foam)

BioSolve® PinkWater® and Rusmar AC-645 Long-Duration Foam will be mobilized to the site before any intrusive or dust-generating activities are initiated and will be maintained on the site in sufficient supply throughout the project. As warranted based on noted odors, a solution of BioSolve® PinkWater® and water (mixed per manufacturer's specifications) will be sprayed on soils during active excavation/load-out activities. As warranted based on noted odors, Rusmar AC-645 Long-Duration Foam will be sprayed on excavated soils to form a thick, viscous vapor barrier before extended work breaks and at the end of each workday.

The following construction techniques and site management practices will also be used during the project to control odor, vapor, and dust emissions:

- Removing and backfilling, and loading, handling, and unloading excavated material and clean fill material, in a manner that minimizes the generation of airborne dust.
- Hauling excavated material and clean fill material in properly covered vehicles.
- Proper handling/processing.
- Restricting vehicle speeds on active haul routes.

## COMMUNITY AIR MONITORING PLAN

- Covering stockpiles of clean fill material with polyethylene liners (anchored appropriately to resist wind forces) before extended work breaks and at the end of each workday.
- Complying with applicable erosion and sediment control requirements of Specification Section 01 57 05 – Temporary Controls.

As required by Specification Section 01 57 05 – Temporary Controls, odor, vapor, and dust controls will be proactively utilized by the Contractor during the work to:

- Prevent exceedances of the total volatile organic compounds (VOCs) and Particulate Matter of 10 microns in diameter or smaller (PM<sub>10</sub>) action levels specified in Specification Section 01 35 49 – Community Air Monitoring Plan and Section 3.4 of this CAMP.
- Mitigate MGP-related odor emissions to the extent practicable and to the satisfaction of National Grid, the Engineer, NYSDEC, and NYSDOH.

### 3 AIR MONITORING PROCEDURES

The community air monitoring program is intended to be a discrete program that will be operated in conjunction with the exclusion zone (i.e., work zone) air monitoring program (conducted by the Contractor). The Contractor will conduct real-time community air monitoring throughout the remedial construction. Monitoring will be conducted at representative locations at the perimeter of the work zone (i.e., Excavation Areas) for VOCs and PM<sub>10</sub>. However, particulate monitoring will not be performed during precipitation events.

Additionally, each air monitoring station and the meteorological station shall be equipped with a telemetry package to allow for real-time management of community air monitoring data by Contractor personnel and real-time observation of community air monitoring data by the Engineer in accordance with Specification Section 01 35 49 – Community Air Monitoring Plan. Additional information regarding the monitoring locations, equipment, and action levels is presented below.

#### 3.1 Monitoring Location Selection and Deployment

A full set of monitoring stations (i.e., one upwind and two downwind stations) will be required at the perimeter of the work zone. Monitoring station locations will be determined daily based on data from the on-site meteorological monitoring station and the nature of the anticipated remediation activities. An upwind location for both VOC and PM<sub>10</sub> monitoring will be selected at the start of each workday and two downwind locations (based on predominant wind direction) for both VOC and PM<sub>10</sub> monitoring will also be selected. The VOC and PM<sub>10</sub> monitoring stations will be deployed each day before the start of work activities. If wind direction shifts radically during the workday and for an extended period of time, such that the upwind location and downwind locations no longer fall within acceptable guidelines ( $\pm 60$ -degree compass change from the original wind direction), the monitoring stations will be relocated so that the upwind and downwind locations are maintained. Air monitoring location changes will be documented in a field logbook.

#### 3.2 Volatile Organic Compound Monitoring

Real-time monitoring for VOCs will be conducted at the site during remedial activities. As required by the NYSDOH Generic CAMP (Attachment 1), VOCs will be monitored continuously during intrusive and/or potential dust-generating activities (e.g., excavation, backfilling, and material handling activities) using instrumentation equipped with electronic data-logging capabilities. A real-time VOC monitor equipped with a photoionization detector and calibrated per manufacturer's specifications, will be used to monitor for VOCs. Monitoring equipment requirements can be found in Specification Section 01 35 49 – CAMP. All time-weighted average (TWA) concentrations (calculated for continuous 15-minute increments [e.g., 08:00 to 08:15, 08:15 to 08:30]) and any instantaneous readings taken to facilitate activity decisions will be recorded using an electronic data logger and/or in the field logbook.

#### 3.3 Total Suspended Particulate Monitoring

Real-time monitoring for PM<sub>10</sub> will be conducted during remedial activities at the site. As required by the NYSDOH Generic CAMP (Attachment 1) and requirements for Fugitive Dust and Particulate Monitoring (Attachment 2), real-time airborne PM<sub>10</sub> monitoring will be conducted continuously during intrusive and/or

potential dust-generating activities (e.g., excavation, backfilling, and material handling activities) using instrumentation equipped with electronic data-logging capabilities. A real-time PM<sub>10</sub> monitor will be used for PM<sub>10</sub> monitoring. Monitoring equipment requirements can be found in Specification Section 01 35 49 – CAMP. All TWA concentrations (calculated for continuous 15-minute increments [e.g., 08:00 to 08:15, 08:15 to 08:30]) and any instantaneous readings taken to assess an appropriate course of action will be recorded using an electronic data logger and/or in the field logbook.

Fugitive dust migration will be visually assessed during all work activities, and reasonable dust-suppression techniques will be used during any site activities that may generate fugitive dust (as discussed in Section 2).

### 3.4 Alert and Action Levels

Alert and action levels for VOCs and ambient air PM<sub>10</sub> concentrations are provided below and specified in Specification Section 01 35 49 – Community Air Monitoring Plan. Alert and action levels are to be used to initiate corrective actions, if necessary, based on real-time monitoring. Each piece of monitoring equipment will have alarm capabilities (audible and/or visual) to indicate exceedances of the alert levels.

#### 3.4.1 Alert and Action Levels for VOCs

As outlined in the NYSDOH Generic CAMP (Attachment 1) if the ambient air concentration for VOCs exceeds 2.5 parts per million (ppm) above background (i.e., upwind location) for the 15-minute TWA, work may continue. The Contractor will attempt to identify the potential source of the exceedance and employ additional odor, vapor, and/or dust controls, as necessary, to abate emissions.

If the ambient air concentrations for VOCs persist at levels in excess of 5 ppm but less than 25 ppm above background, all work activities will be halted, National Grid will be immediately notified, the source of the elevated VOC concentrations identified, corrective actions to reduce or abate the emissions will be completed or modify construction techniques, as necessary, and continue air monitoring. Work activities may resume provided that the 15-minute average VOC concentration remains below the alert levels.

If the ambient air concentrations for VOCs exceed 25 ppm above background, work shall not resume until authorized by National Grid.

#### 3.4.2 Alert and Action Levels for PM<sub>10</sub>

As outlined in the NYSDOH Generic CAMP (Attachment 1), as well as the Fugitive Dust and Particulate monitoring requirements (as presented in Attachment 2), if the ambient air concentration for PM<sub>10</sub> exceeds 100 micrograms per cubic meter (µg/m<sup>3</sup>) above average background (i.e., upwind location) for the 15-minute TWA, or visible dust is observed leaving the work area, work may continue if dust suppression techniques are implemented. The Contractor will attempt to identify the potential source of the exceedance and shall employ additional dust controls, or modify construction techniques, to abate emissions.

If the ambient air concentration for PM<sub>10</sub> exceeds 150 µg/m<sup>3</sup> ppm above average background for the 15-minute TWA, or visible dust is observed leaving the work area, the Contractor shall stop all work activities, immediately notify National Grid, identify the source of elevated PM<sub>10</sub> concentrations, complete corrective actions to reduce or abate the emissions or modify construction techniques, as necessary, and continue



air monitoring. Work activities may resume provided that the 15-minute TWA concentration remains below the action levels.

### 3.5 Manufactured Gas Plant-Related Odor Monitoring

During working hours, the Contractor will conduct periodic walks around the perimeter of the work area(s) to monitor for MGP-related odors. These perimeter checks will be performed more frequently, as necessary, depending on the work being performed and meteorological factors such as change in wind direction. Meteorological factors that can influence odor generation and dissemination generally include temperature, humidity, precipitation, atmospheric pressure, wind direction, and wind speed. These factors can work synergistically with a positive or negative impact on MGP-related odor generation and transport/dispersion. For example, MGP-related odors generally tend to be less prevalent with lower temperatures, precipitation, or high humidity. Additionally, MGP-related odor dissemination is greatly influenced by wind direction and wind speed. Meteorological factors, including wind direction, will be monitored during the remedial construction activities.

If MGP-related odors are noticed along the perimeter of the work area, work will continue and odor-, vapor-, and dust-suppression techniques employed to abate emissions. Additionally, construction techniques will be evaluated and modified, if necessary and appropriate, and more frequent checks of the work area perimeter for MGP-related odors will be performed.

Odor complaints (if any) will be directed to the Contractor. The legitimacy of the complaint will be verified based on the work activities being performed, the predominant wind direction, and other meteorological factors. In response to verified odor complaints, perimeter monitoring will continue, and additional odor, vapor, and dust controls will be employed to abate emissions. Additionally, construction techniques will be evaluated and modified, if necessary and appropriate.

If MGP-related odors continue to be noticed at the perimeter of the work area, work will be stopped while activities are reevaluated. The source or cause of the MGP-related odors will be identified and additional modifications of construction techniques or additional methods to abate emissions will be implemented. Work will resume provided the measures are successful at abating the odors noticed along the work area perimeter. If the odor complaint cannot be resolved through implementation of the stated controls, NYSDEC will then investigate the complaint further.

### 3.6 Meteorological Monitoring

Meteorological monitoring will be conducted continuously at the site using a portable meteorological monitoring system. The meteorological monitoring system will be deployed at a location in accordance with siting criteria established by the United States Environmental Protection Agency and NYSDEC for meteorological monitoring systems (Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV - Meteorological Measurements, as revised March 2008; and New York State Division of Air Resources Policy 2 (DAR-2) - "Oversight of Private Air Monitoring Networks," dated December 16, 1997). Use of these guidelines enables the meteorological monitoring system to provide representative observations of the local meteorological conditions. A digital meteorological monitoring system will be used to collect the meteorological data. At a minimum, the meteorological monitoring system will monitor wind speed, wind direction, relative humidity, and ambient temperature. The meteorological monitoring system will be equipped with electronic data-logging capabilities.

### **3.7 Instrument Calibration**

Contractor shall calibrate air monitoring equipment daily (at a minimum), or other frequency recommended by the manufacturer. All instrument readings, field reference checks, and calibrations will be recorded in the field logbook.

## 4 MONITORING SCHEDULE AND REPORTING

The following subsections identify the monitoring schedule and data collection/reporting requirements.

### 4.1 Monitoring Schedule

Air monitoring will be conducted prior to initiation of the remedial action to establish adequate baseline data and until such time that significant material handling activities are complete (i.e., removal of stockpiled impacted materials for off-site transportation and treatment/disposal). As previously indicated, real-time VOC and PM<sub>10</sub> monitoring will be performed during intrusive and/or potential dust-generating activities (e.g., excavation, backfilling, and material handling activities).

The frequency of air monitoring will be relative to the level of site work activities being conducted and may be adjusted as the work proceeds and in consideration of the monitoring results. Air monitoring for VOCs and PM<sub>10</sub> may be discontinued during periods of heavy precipitation that would otherwise result in unreliable data or damage to the monitoring equipment. Meteorological monitoring will be performed continuously during work activities.

### 4.2 Reporting

The Contractor will prepare a weekly summary of the 15-minute average community air monitoring results (for VOCs and PM<sub>10</sub>) to be submitted to the Engineer, who will in turn submit the report to National Grid, NYSDEC, and NYSDOH. The summary will also include, but not be limited to, a description of community air monitoring exceedances (if any), work activities associated with the exceedances, and corrective actions implemented to address the exceedances.

The time and outcome of each MGP-related odor perimeter check will be documented in a daily log, specifically noting the presence or absence of MGP-related odors and identifying the general location(s) along the perimeter where MGP-related odors (if any) are noticed. These daily logs, as well as documentation of any odor complaints received from the public, will be included in the aforementioned CAMP reports.

The weekly summary will be submitted in an electronic format. A copy of the data will be maintained at the Contractor field office trailer.

# ATTACHMENT 1

## Generic Community Air Monitoring Plan



**Appendix 1A**  
**New York State Department of Health**  
**Generic Community Air Monitoring Plan**

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

**Continuous monitoring** will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

**Periodic monitoring** for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. A periodic monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

#### VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

#### Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter ( $\text{mcg}/\text{m}^3$ ) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed  $150 \text{ mcg}/\text{m}^3$  above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than  $150 \text{ mcg}/\text{m}^3$  above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within  $150 \text{ mcg}/\text{m}^3$  of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

# ATTACHMENT 2

## Vapor Emission Response Plan





## **Appendix 1B**

### **Fugitive Dust and Particulate Monitoring**

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.
2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.
3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:
  - (a) Objects to be measured: Dust, mists or aerosols;
  - (b) Measurement Ranges: 0.001 to 400 mg/m<sup>3</sup> (1 to 400,000 :ug/m<sup>3</sup>);
  - (c) Precision (2-sigma) at constant temperature: +/- 10 :g/m<sup>3</sup> for one second averaging; and +/- 1.5 g/m<sup>3</sup> for sixty second averaging;
  - (d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
  - (e) Resolution: 0.1% of reading or 1g/m<sup>3</sup>, whichever is larger;
  - (f) Particle Size Range of Maximum Response: 0.1-10;
  - (g) Total Number of Data Points in Memory: 10,000;
  - (h) Logged Data: Each data point with average concentration, time/date and data point number
  - (i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
  - (j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
  - (k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
  - (l) Operating Temperature: -10 to 50° C (14 to 122° F);
  - (m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.
4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.
5. The action level will be established at 150 ug/m<sup>3</sup> (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m<sup>3</sup>, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m<sup>3</sup> above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m<sup>3</sup> continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM<sub>10</sub> at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

- (a) Applying water on haul roads;
- (b) Wetting equipment and excavation faces;
- (c) Spraying water on buckets during excavation and dumping;
- (d) Hauling materials in properly tarped or watertight containers;
- (e) Restricting vehicle speeds to 10 mph;
- (f) Covering excavated areas and material after excavation activity ceases; and
- (g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m<sup>3</sup> action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

# APPENDIX D

## Community and Environmental Response Plan (CERP)





# COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

Rensselaer Non-Owned Former  
Manufactured Gas Plant Site  
Rensselaer, New York  
Site No. 4-42-057

November 2020

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## COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

Rensselaer Non-Owned Former  
MGP Site  
Rensselaer, New York  
Site No. 4-42-057

Prepared for:  
National Grid  
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Date:  
November 2020

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## FIGURE

Figure 1 Traffic Control Plan

## 1 INTRODUCTION

This Community and Environmental Response Plan (CERP) has been prepared to support the implementation of the New York State Department of Environmental Conservation- (NYSDEC-) selected remedy for the National Grid Non-Owned former manufactured gas plant (MGP) site (the site) located in Rensselaer, New York (Site No. 4-42-057). Details related to the remedial activities are presented in the accompanying Final Remedial Design Report (Remedial Design).

This CERP has been prepared in accordance with New York State Department of Environmental Conservation's (NYSDEC's) May 2010 DER-10: Technical Guidance for Site Investigation and Remediation (DER-10). The purpose of this CERP is to present a summary of the site monitoring and work practices that will be completed to address potential short-term impacts to the surrounding community and/or environmental resources during remedial construction. Additional details regarding site monitoring and work practices referenced in this CERP are presented in the Remedial Design and its associated appendices consisting of:

- Design Drawings (Appendix A)
- Technical Specifications (Appendix B)
- Community Air Monitoring Plan (CAMP) (Appendix C)
- Storm Water Pollution Prevention Plan (SWPPP) (Appendix E)

Section 2 of this CERP summarizes the monitoring to be conducted during remedial construction activities, and Section 3 describes site management and controls.

### 1.1 Site Location and Description

The former MGP site is located on Washington Street in the City of Rensselaer, Rensselaer County, New York. The former MGP site is comprised of the former MGP area, including remnants of two gas holders, a tar week, and MGP facilities. The former MGP site is currently paved and used as a parking lot for the Capital View Office Park which houses the Albany Regional office for the New York State (NYS) Office of Children and Family Services (OCFS). Additional details regarding the site description are provided in the Remedial Design.

### 1.2 Summary of Remedial Activities

In general, the remedial activities to be performed at the site consist of excavation of soils from the limits shown on the Design Drawings (Appendix A of the Remedial Design). Approximately 1,800 cubic yards (neat-line, in-situ) of material will be removed. Additional details regarding remedial activities are provided in the Remedial Design.

### 1.3 Project Responsibilities

Responsibilities of the Owner (National Grid), the Engineer, and the Contractor, as they relate to the implementation of this CERP, are as follows:

## COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

- National Grid – Primary responsibility is to contract and coordinate with the Contractor and Engineer to implement the required work activities in conformance with the Remedial Design.
- Engineer – Responsibility is to provide project management/construction oversight to observe and monitor implementation of the remedial activities. The Engineer is also responsible for collecting imported fill characterization samples (for analysis for 1,4-Dioxane and Per- and polyfluoroalkyl substances [PFAS] only), as necessary, and contracting with a laboratory for analysis of collected samples.
- Contractor – Primary responsibility is to complete remedial activities as presented in the Remedial Design. The Contractor is responsible for performing community air monitoring in accordance with the site-specific CAMP. The Contractor is responsible for implementing controls to address community air monitoring exceedances, if necessary. The Contractor is also responsible for conducting and implementing the general site management practices and controls described in Section 3. The Contractor is also responsible for collecting waste characterization and imported fill characterization samples, as necessary, and contracting with a laboratory for analysis of collected samples.



## 2 SITE MONITORING

This section presents a summary of site monitoring that will be conducted during implementation of the remedial activities to evaluate potential short-term impacts to the surrounding community.

### 2.1 Community Air Monitoring

The Contractor will conduct community air monitoring during intrusive and/or potential dust-generating activities (e.g., soil removal, backfilling, and material handling activities). The site-specific CAMP and Specification Section 01 35 49 – Community Air Monitoring Plan presents detailed requirements for air monitoring procedures. As indicated in the CAMP, the Contractor will conduct air monitoring procedures in accordance with the May 2010 New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (included as Attachment 1 to the CAMP) and generally consists of monitoring for volatile organic compounds (VOCs) and particulates (PM<sub>10</sub>) at multiple locations to establish upwind (i.e., site background) conditions and to evaluate air quality at the downwind perimeter of the active work areas.

The Contractor will be required to implement the emission control and dust-suppression measures specified in Specification Section 01 57 05 – Temporary Controls if VOC and/or PM<sub>10</sub> alert or action levels (as presented in the CAMP) are exceeded.

### 2.2 Odor Monitoring

During working hours, the Contractor will conduct periodic walks around the perimeter of the work area to monitor for MGP-related odors, in accordance with the CAMP. The perimeter checks will be performed more frequently, as necessary, depending on the work being performed.

If MGP-related odors are noticed along the perimeter of the work area:

- The Contractor will continue working and employ odor, vapor, and dust suppression techniques (in accordance with Specification Section 01 57 05 – Temporary Controls) to abate emissions.
- The Contractor will evaluate and modify construction techniques, if necessary and appropriate.
- The Contractor will conduct more frequent checks of the work area perimeter for MGP-related odors.

If MGP-related odors continue to be noted at the perimeter of the work area:

- The Contractor will stop work while the Engineer and Contractor re-evaluate construction techniques.
- After identifying the source or cause of the MGP-related odors, the Contractor will modify construction techniques and/or employ additional methods to abate emissions.
- The Contractor will resume provided the measures are successful at abating noticeable odors at the work area perimeter.

Detailed requirements of odor monitoring are presented in the CAMP.

## **2.3 Vibration Monitoring**

The Contractor will be responsible for installing vibration (seismographs) and conducting vibration monitoring throughout the remedial construction. Monitoring will be conducted at the locations shown on Design Drawing S-101. Details for vibration monitoring instrumentation, installation, and monitoring (including notification and action levels) are presented in Specification Section 31 09 13 – Geotechnical Instrumentation and Monitoring.

## **2.4 Structural Documentation Inspections**

Prior to intrusive work (i.e., soil excavation activities), the Engineer will conduct a pre-construction structural inspection of the garage structure at 332 Broadway. The Engineer will also conduct a post-construction structural inspection in the same manner and for the same features as the pre-construction structural inspection to confirm pre-construction conditions were maintained.

### 3 SITE MANAGEMENT AND CONTROLS

This section presents a summary of site management practices and controls that will be implemented to minimize potential short-term impacts to the surrounding community during remedial activities.

#### 3.1 Site Security

Public access to the site and work areas will be restricted during the remedial activities, to the extent practicable. The Design Drawings and Specification Sections 01 58 13 – Temporary Project Signage, 01 57 33 – Security, and 01 71 33 – Protection of Work and Property present details and requirements for providing site security and project signage.

#### 3.2 Street and Sidewalk Closures

The Contractor will conduct street and sidewalk closures to maintain highway and pedestrian traffic and preserve the safety of motorists, site workers, and pedestrians during completion of the remedial construction activities.

The Contractor will install traffic controls for the section of Huyck Square between Washington Street and Academy Street prior to initiating construction activities. As shown on Figure 1, traffic controls will include portable concrete barriers, lighted cones/drums, and appropriate signage. Huyck Square will be closed throughout the duration of construction activities. Additionally, the Contractor will install traffic controls along Academy street as necessary to complete the tar well excavation.

The Contractor will obtain any and all required local permits to facilitate street and sidewalk closures and will be responsible for performing all traffic control work in accordance with this CERP.

#### 3.3 Erosion and Sediment Controls

The Contractor will provide, install and maintain all erosion and sediment control measures (e.g., silt fence, straw bales, straw fiber rolls) to prevent silting and muddying of existing drainage systems, streams, rivers, etc. The Design Drawings, SWPPP, and Specification Sections 01 41 26 – SWPPP and Permit and 01 57 05 – Temporary Controls provide details regarding locations and types of required controls.

The Contractor will install and maintain erosion and sediment control measures in accordance with the latest edition of the NYSDEC New York State Standards and Specifications for Erosion and Sediment Control. At a minimum, the Contractor will inspect erosion and sediment control measures daily and after storm events. The Contractor is required to summarize inspection results in weekly inspection reports. Report requirements are provided in Specification Section 01 41 26 - SWPPP and Permit.

In general, the Contractor will take all precautions to prevent, or reduce to a minimum, any damage to surface water from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials within or adjacent to existing and new drainage systems or other nearby water bodies. The Contractor is prohibited from the following:

- Dumping spoil material into any drainage way, surface waters, or unspecified locations.

## COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

- Pumping silt-laden water from trenches or from within the removal areas into any drainage way, surface waters, or unspecified locations.
- Damaging vegetation beyond the extent necessary for remedial construction.
- Disposing of trees, brush, and other debris in any stream corridors, drainage way, or unspecified locations.

Following completion of the remedial activities, the Contractor will restore disturbed surfaces as indicated in the Remedial Design.

### 3.4 Waste Management

In general, waste materials generated during implementation of the remedial activities will be managed based on the results of the waste characterization sampling. National Grid, the Engineer, and/or the Contractor will be responsible for the following activities, in accordance with the Remedial Design:

- Contracting with a conditionally exempt waste disposal vendor (e.g., low-temperature thermal desorption [LTTD] treatment facility, non-hazardous solid and liquid waste disposal facilities, etc.).
- Acting as the “Generator” for material resulting from the remediation activities for off-site treatment and/or disposal of the waste.
- Coordinating with potential disposal facilities to verify waste characterization analytical requirements prior to the collection of waste characterization samples.
- Preparing waste profiles for off-site treatment/disposal of solid and liquid wastes to be generated as part of the remediation activities.
- Reviewing and signing (as an authorized agent for National Grid) waste manifests/bills of lading for shipments of waste materials generated by the remediation activities.
- Maintaining an on-site project log containing waste manifests/bill of lading for wastes generated by the remediation activities.
- Contracting and coordinating with waste haulers and waste disposal vendors for treatment/disposal of non-hazardous solid and liquid wastes to be generated as part of the remediation activities.

#### 3.4.1 Solid Waste

Excavated soil will be transported to a National Grid-approved and permitted LTTD facility for treatment and a non-hazardous solid waste landfill in accordance with the Remedial Design.

#### 3.4.2 Liquid Waste

Liquid Waste generated may include:

- Groundwater and perched water from the excavations.
- Precipitation and surface-water runoff that enters the excavations.
- Water generated by decontamination of equipment, trucks, and personnel.

Water is anticipated to be temporarily containerized on-site and transported off-site for treatment/disposal. The Contractor will be responsible for contracting with appropriate waste hauler and treatment/disposal facility.

### 3.4.3 Non-Aqueous Phase Liquid

The Contractor will collect and place free-phase non-aqueous phase liquid (NAPL) in appropriate containers (e.g., 55-gallon drums), if encountered in sufficient quantities to be recovered during excavation or material dewatering activities. The Engineer will collect and submit samples of NAPL (as appropriate) for waste characterization prior to off-site disposal at a National Grid-approved facility. Following characterization, the Contractor will coordinate with the off-site disposal facility for the transportation and disposal of the containerized NAPL.

## 3.5 Transportation Controls

This section presents minimum transporter requirements to be followed during loading and transportation of solid and liquid non-hazardous and hazardous wastes generated by the remedial activities at the site. The term “transporter” means the transporter and the Contractor if/when the transporter is subcontracted to the Contractor.

The transporter will provide all necessary supervision, labor, training, permits, hazardous waste manifests (when required), personal protective equipment (PPE), tools, equipment, materials, and all items incidental and necessary to transport solid waste between individual work areas on-site (i.e., removal area and/or temporary support areas) and from the site to the permitted disposal facilities.

Any truck found to be unacceptable by the Engineer will be rejected, and the cost for any rejected truck shall be incurred by the transporter. If NYSDEC on-site personnel find any trucks to be unacceptable, NYSDEC should notify National Grid (or the Contractor directly), which, in turn, shall notify the truck driver.

The transporter shall adhere to the following rules while at the site, in transit from the site to the waste disposal facility, and at the waste disposal facility:

- Prior to entry to the site, truck drivers shall stage trucks only in areas designated by the Contractor. While staged, truck engines shall be shut off. Trucks shall not idle for more than 5 minutes.
- Truck drivers shall announce their arrival at the site to the Contractor.
- Truck drivers are generally restricted to their trucks and designated waiting areas. Drivers are not permitted to access the site without permission from National Grid, the Contractor, or the Engineer.
- Transporters must supply and wear hard hats, safety glasses, safety shoes, long pants (jogging pants or warm-up pants are not permitted), and gloves, at a minimum, at all times when outside the truck cab for personal protection. Transporters are responsible for supplying any other protective equipment necessary for completing their tasks in a safe manner.
- Transporters shall line the entire waste transport container (dump truck box, dump trailer, roll-off waste container, etc.) that will be used to haul hazardous solid waste, conditionally exempt MGP site remediation waste, or non-hazardous waste (e.g., to top of the side boards) with 6-mil thick

## COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

polyethylene sheeting. Waste transport containers used to haul construction and demolition (C&D) debris may also need to be lined as indicated above. All waste transport containers shall have a watertight tailgate with a gasket between the box and tailgate, and tailgates shall be secured with locking turnbuckles. If free liquids are observed to be leaking from the container of the truck once loaded, the truck cannot leave the loading area.

- All trucks are subject to inspection by the Engineer upon arrival at the site. If trucks are not clean (as determined by the Engineer), they will be rejected. Cleaning of trucks is not permitted at the site.
- Engineer will verify that truck/trailer is listed on transporters New York State Part 364 Waste Transporter Permit prior to loading.
- All trucks shall be equipped with working audible and visual backup signals.
- When waste transport containers are being loaded, and when directed by the Contractor, the engine shall be shut off. The engine may be restarted, and the truck driven away only after the "all clear" direction is provided to the driver by the loading equipment operator or by a site representative.
- No waste transport container shall be loaded above the sideboards and no waste shall be permitted to spill out of the waste transport container. Before trucks leave the loading areas, the exterior of the waste hauling portion of the vehicle and tires shall be cleaned (by the Contractor's site workers) to remove any residual waste.
- The Contractor's site workers shall reposition the cover bars over the waste material. Drivers shall not walk over waste material.
- Before leaving the loading area, drivers shall cover truck loads with a solid fabric (i.e., vinyl, reinforced polyethylene) that extends over the entire load and is secured to resist wind forces at highway speeds.
- Drivers shall obey all traffic signs and notices (obey the posted speed limit) and comply with weight restrictions.
- Drivers and operators shall obey rules posted on the site and contained in any of the site-specific Health and Safety Plans used at the site by the Contractor.
- Drivers and operators shall report any accidents to the Contractor and cooperate with any subsequent accident investigation.
- No children under 16 years of age shall be allowed at the site.
- No passengers are allowed in the active work area(s) or loading area(s).
- Truck driver's operators shall slow down and use extra caution during inclement weather (i.e., rain, fog, snow).
- Truck driver's operators shall use extra caution around blind corners (watch for pedestrians and construction equipment).
- Smoking, eating, and/or drinking is not permitted within the active work area(s) or loading area(s), but may be permitted in designated areas of the Support Zone.

## COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

After disposal of waste, the transporter is responsible for properly decontaminating the waste hauling portion of the vehicle.

The preferred trucking routes for the off-site transportation of solid and liquid wastes generated by the remedial activities at the site are listed below. The preferred trucking route for waste transporters, as well as haulers transporting materials to the site, includes the following roadways (in order of closest to farthest from the site):

- Huyck Square
- Washington Street
- Broadway
- US-20

Final trucking routes will be approved by National Grid and/or the Engineer prior to use.

### 3.6 Decontamination

The Contractor will decontaminate (as necessary) all personnel and equipment that comes into contact with excavated or impacted materials prior to leaving the work areas to prevent the tracking of soil off-site (including vehicles transporting clean fill to the site), in accordance with Specification Section 02 51 00 – Decontamination. The Contractor will conduct decontamination within the decontamination area(s), constructed as illustrated on the Design Drawings (Appendix A of the Remedial Design), as appropriate based on the work being performed. At a minimum, the Contractor will perform decontamination activities until no visible soil, debris, or stains are present on the equipment surfaces (to the satisfaction of National Grid, the Engineer, and/or NYSDEC).

Project equipment (including, but not limited to, removal equipment, trucks, pumps, and hand tools) that comes in contact with excavated or impacted materials will be decontaminated prior to using the equipment to handle clean material and/or equipment being removed from the site. Any visible soils or other debris will be promptly removed and disposed of in a manner consistent with the materials excavated.

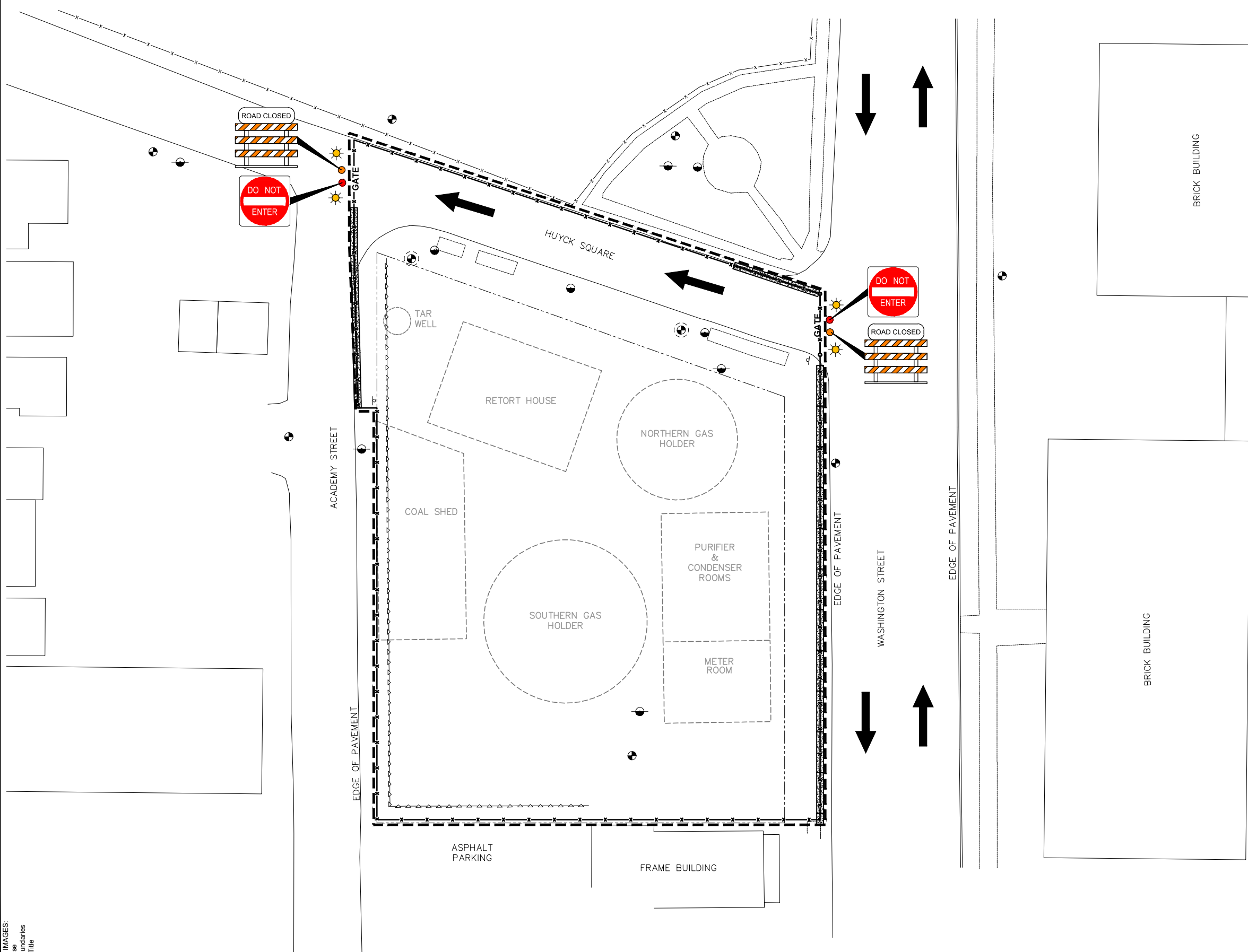
# FIGURE 1

Traffic Control Plan



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XREFS: IMAGES:  
Design-X-Base  
Design-X-Boundaries  
C&ERP-Fig-1.tte



- LEGEND:**
- PROJECT WORK LIMITS
  - EXISTING MONITORING WELL (SHALLOW)
  - EXISTING MONITORING WELL (DEEP)
  - EXISTING MONITORING WELL (BEDROCK)
  - DECOMMISSIONED MONITORING WELL
  - x--- TEMPORARY SITE SECURITY FENCE
  - ROAD CLOSED  
TYPE 3 BARRICADE
  - DO NOT ENTER SIGN
  - TRAVEL DIRECTION ARROW
  - DRUM WITH LIGHTS

- NOTES:**
1. ALL TRAFFIC CONTROL DEVICES SHALL BE PER NEW YORK STATE DEPARTMENT OF TRANSPORTATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PART 6, TEMPORARY TRAFFIC CONTROL.
  2. BARRICADES SHALL COMPLY WITH MUTCD SECTION 6F.68.
  3. JERSEY BARRIER WALL WITH CHAIN LINK FENCE DETAILS AND SPECIFICATIONS SHOWN ON DESIGN DRAWING G-503.
  4. INSTALL "DO NOT ENTER" SIGNS ON TEMPORARY SITE SECURITY FENCE GATES IN THE LOCATIONS SHOWN ON THIS FIGURE.
  5. DRUMS SHALL COMPLY WITH MUTCD SECTION 6F.67 AND LIGHTS SHALL COMPLY WITH MUTCD SECTION 6F.83.



NATIONAL GRID  
RENSSELAER, NEW YORK  
RENSSELAER NON-OWNED FORMER MGP SITE  
**COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN**

**TRAFFIC CONTROL PLAN**

ARCADIS

Design & Consultancy  
for natural and built assets

FIGURE  
**1**

# APPENDIX E

## Storm Water Pollution Prevention Plan (SWPPP)





# STORM WATER POLLUTION PREVENTION PLAN

Rensselaer Non-Owned Former  
Manufactured Gas Plant Site  
Rensselaer, New York  
Site No. 4-42-057

November 2020

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## STORM WATER POLLUTION PREVENTION PLAN

# STORM WATER POLLUTION PREVENTION PLAN

Rensselaer Non-Owned Former MGP  
Site  
Rensselaer, New York  
Site No. 4-42-057

Prepared for:

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Our Ref.:

30004017

Date:

November 2020

# STORM WATER POLLUTION PREVENTION PLAN

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## STORM WATER POLLUTION PREVENTION PLAN

### ATTACHMENT

#### 1 Natural Resources Conservation Service Soil Map

## 1 INTRODUCTION

This Storm Water Pollution Prevention Plan (SWPPP) has been prepared to support the implementation of the New York State Department of Environmental Conservation- (NYSDEC-) selected remedy for the National Grid Non-Owned Rensselaer former manufactured gas plant (MGP) site (the site) located in Rensselaer, New York (Site No. 4-42-057). Details related to the remedial activities are presented in the accompanying Final Remedial Design Report (Remedial Design). Design Drawings referenced in this SWPPP are included in Appendix A to the Remedial Design. Specification Sections referenced in this SWPPP are included in Appendix B to the Remedial Design.

This SWPPP summarizes the storm water management practices that will be implemented during the remedial construction activities to control potential impacts to site-related storm water runoff. This SWPPP has been prepared in accordance with the substantive requirements of the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Storm Water Discharges from Construction Activity (SPDES General Permit) (NYSDEC 2015).

### 1.1 Summary of Remedial Activities

In general, the remedial activities to be performed at the Site consist of excavation of soils from the limits shown on the Design Drawings (Appendix A of the Remedial Design). Approximately 1,800 cubic yards (neat-line, in-situ) of material will be removed. Additional details regarding remedial activities are provided in the Remedial Design.

The total area of soil disturbance is less than one acre. Additional details regarding remedial activities are provided in the Remedial Design.

### 1.2 Revisions

This SWPPP will be kept current so that at all times it accurately documents the erosion and sediment control practices that are being used or will be used during construction. At a minimum, this SWPPP will be amended:

1. Whenever the current provisions prove to be ineffective at minimizing pollutants in storm water discharges from the site.
2. Whenever there is a change in design, construction, operation, or maintenance at the site that has or could have an effect on the discharge of pollutants.
3. To address issues or deficiencies identified during an inspection by the Contractor's qualified inspector, NYSDEC, or other regulatory authority having jurisdiction.

### 1.3 SWPPP Organization

The remainder of this SWPPP is organized into four sections as follows:

- Section 2 (Site Background) – Presents general information regarding existing (pre-construction) conditions at the site.

## STORM WATER POLLUTION PREVENTION PLAN

- Section 3 (Erosion and Sediment Controls) – Summarizes the means and methods that will be used to control erosion, sediment, and turbidity during the remedial construction activities.
- Section 4 (Pollution Prevention Practices) – Summarizes the pollution prevention and control measures that will be implemented during the remedial construction activities.
- Section 5 (References) – Presents a list of documents used in the preparation of this SWPPP.



## 2 SITE BACKGROUND

This section provides general information regarding the pre-remediation conditions at the site.

### 2.1 Site Location and Description

The former MGP site is located on Washington Street in the City of Rensselaer, Rensselaer County, New York. The former MGP site is comprised of the former MGP area, including remnants of two gas holders, a tar well, and MGP facilities. The former MGP site is currently paved and used as a parking lot for the Capital View Office Park which houses the Albany Regional office for the New York State (NYS) Office of Children and Family Services (OCFS). Additional details regarding the site description are provided in the Remedial Design.

A Natural Resources Conservation Service soil map is included as Attachment 1 of this SWPPP. As indicated on the soil map, the land in the project area consists of urban land.

### 2.2 Site Operational History

The East Albany Gas Light Company (EAGLC) began gas manufacturing operations at the site circa 1876. In general, the former MGP initially consisted of a single gas holder and the former retort house and used the coal carbonization process which did not use a petroleum feedstock (no information was identified during previous investigations to indicate that the carbureted water gas process was used at the site). Between 1900 and 1909, the site changed ownership three times: Kinderhook Light and Power Company took ownership in 1900; Hudson Railway & Power Company in 1902; and Albany & Southern Railroad Company in 1909. Additionally, according to the 1909 Sanborn® fire insurance map, the MGP was expanded to include an additional gas holder, coal shed, tar well, and meter, purifier and condenser rooms.

Between 1918 and 1925, the manufactured gas production ceased, and the plant became part of the F.C. Huyck & Sons Felt Mill (located on the property east of the MGP). According to the 1925 Sanborn® fire insurance map, the coal shed was converted into a garage, a carpentry shop was built following demolition of the large gas holder, and the remaining MGP facilities were used as chemical laboratories. Additional Sanborn® fire insurance maps indicate that the remaining MGP structures were demolished between 1949 and 1967.

### 2.3 Surface Water Hydrology

The topography of the former MGP site slopes gently downward from the south to the north. The former MGP site primarily consists of a paved parking lot with minimal vegetation in the southern portion of the project area and contains no distinctive surface water runoff pathways (e.g., drainage ditches or storm drains). Mill Creek/Huyck Pond is located approximately 100 feet north of Huyck Square and flows to the Hudson River, which is located approximately 800 feet west of the site. A dam structure is present at Mill Creek/Huyck Pond and there is a general east to west flow in the pond, towards the Hudson River.

### 3 EROSION AND SEDIMENT CONTROLS

This section presents the means and methods for erosion and sediment control to be utilized as part of remedial construction activities.

#### 3.1 Remedial Design Components

This section summarizes the erosion and sediment controls that will be used or constructed during the remedial construction activities. Erosion and sediment controls will be installed, inspected, and maintained by the Contractor in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (NYS Standards and Specifications) (NYSDEC 2016) and the following components of the Remedial Design:

- Specification Section 01 41 26 – SWPPP and Permit
- Specification Section 01 57 05 – Temporary Controls
- Design Drawing G-103 – Site Preparation Plan
- Design Drawing G-501 – Erosion and Sediment Control Details
- Design Drawing C-101 – Soil Removal Plan

Temporary erosion and sediment controls will be installed before initiating any intrusive activities, and additional controls will be installed during construction (as needed) to achieve the storm water management objectives of this SWPPP and the SPDES General Permit (included as part of Specification Section 01 41 26 – SWPPP and Permit).

#### 3.2 Temporary Structural Measures

Fiber roll will be used to reduce or otherwise control the potential for off-site migration of suspended sediments in storm water runoff and will be installed before any existing soils or vegetation are disturbed at the site or support area. Fiber roll will be installed and maintained by the Contractor in accordance with Section 5A of the NYS Standards and Specifications, Specification Section 01 57 05 – Temporary Controls, and the Design Drawings.

#### 3.3 Periodic Inspections

The Contractor and Engineer will inspect erosion and sediment controls at the frequency specified in Section 01 41 26 – SWPPP and Permit. Contractor personnel responsible for periodic inspections will meet the requirements of a “qualified inspector” as defined in Appendix A of the SPDES General Permit. The results of each inspection, including any corrective actions to be taken, will be documented using the Storm Water Inspection Report form included in Specification Section 01 41 26 – SWPPP and Permit.

Any deficiencies observed during an inspection, and any maintenance activities or corrective actions required to address those deficiencies, will be communicated to the Engineer within one working day after the inspection. Maintenance activities and corrective actions will be initiated within two working days of the inspection and will be completed before the next scheduled inspection. If site conditions prevent the completion of maintenance activities or corrective actions before the next scheduled inspection, such

## STORM WATER POLLUTION PREVENTION PLAN

conditions will be documented in the Storm Water Inspection Report, and the maintenance activities/corrective actions will be completed as soon as site conditions permit.

Erosion and sediment controls will be inspected and maintained by the Contractor for the duration of the remedial construction activities, and until such time as all disturbed or open-soil areas at the site have achieved “final stabilization” as defined in Appendix A of the New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges (NYSDEC 2015).

### **3.4 Site Restoration**

All disturbed areas will be restored to pre-construction grades and conditions. A final inspection will be performed by the Engineer to verify that all restoration areas have achieved final stabilization. If restoration areas are not sufficiently stabilized, corrective actions will be taken by the Contractor and a second final site inspection will be performed. Upon acceptance of the final site stabilization, the Contractor will remove any temporary erosion and sediment controls (e.g., fiber roll) that are no longer needed.

### **3.5 Post-Construction Storm Water Management Controls**

Due to the nature of the work being performed (i.e., removal of impacted material under a NYSDEC-approved Remedial Design), post-construction surface water quality and quantity controls are not required.

## 4 POLLUTION PREVENTION PRACTICES

This section summarizes the prevention practices that will be implemented by the Contractor to control impacted materials, spills, and construction debris from becoming sources of pollutants in site-related storm water runoff.

### 4.1 Remedial Design Components

Pollution prevention measures will comply with the following components of the Remedial Design Report:

- Specification Section 01 35 29 – Contractor's Health and Safety Plan
- Specification Section 01 35 43.13 – Environmental Procedures for Hazardous Materials
- Specification Section 01 57 05 – Temporary Controls
- Specification Section 01 74 05 – Cleaning
- Specification Section 01 74 19 – Construction Waste Management and Disposal
- Specification Section 02 41 00 – Demolition
- Specification Section 02 51 00 – Decontamination
- Specification Section 02 61 05 – Removal and Disposal of Impacted Materials
- Design Drawing G-103 – Site Preparation Plan
- Design Drawing G-501 – Erosion and Sediment Control Details
- Design Drawing C-101 – Soil Removal Plan

### 4.2 Impacted Material Handling, Transportation, and Treatment/Disposal

This section outlines the handling, transportation, and treatment/disposal methods to be implemented for impacted material as part of remedial construction activities.

#### 4.2.1 Soil

Soil will be excavated to the horizontal and vertical limits depicted on the Design Drawings. Soil to be transported over public roadways will be loaded into properly licensed and permitted vehicles (pursuant to Title 6, Part 364 of the New York Codes, Rules, and Regulations [6 NYCRR Part 364]), and will be transported in accordance with applicable laws and regulations. Transport vehicles will be watertight, fully lined with polyethylene liners (or equivalent), and will be equipped with functioning tailgate locks and non-mesh (solid), waterproof tarpaulins.

Before leaving the site, transport vehicles will be staged and inspected and will be cleaned of any visible soil (within a temporary decontamination area). Upon leaving the site, transport vehicles will follow approved haul routes as specified in the CERP.

### 4.2.2 Debris

Debris generated during the remedial activities is anticipated to include bricks, concrete, and/or metal. Such materials will be segregated as appropriate from other excavated materials, downsized (as required by disposal facilities), and handled separately, where practicable. Debris free of visible impacts (e.g., bricks and concrete) will be disposed of at an appropriate facility approved by National Grid and handled in accordance with Specification Section 02 61 15 – Handling and Disposal of Impacted Materials. Before leaving the site, transport vehicles will be staged and inspected within a temporary decontamination area and will be cleaned of any visible debris. Upon leaving the site, transport vehicles will follow approved haul routes as specified in the CERP.

### 4.2.3 Construction-Related Water

All construction-related waters generated during remedial activities (i.e., decontamination water, water from sediment dewatering, and water removed from material staging areas) will be collected and containerized on-site. Following waste characterization sampling by the Engineer, the Contractor will transport project waters off-site for treatment/disposal.

## 4.3 Spill Prevention, Control, and Response

As required by Specification Section 01 35 29 – Contractor's Health and Safety Plan, the Contractor will prepare a site-specific Health and Safety Plan (HASP) that addresses spill prevention and control, and response procedures to spills and other site emergencies during the remedial construction activities. The HASP will include evacuation procedures for site personnel, directions and a figure showing the route to the local hospital, and a contact list with telephone numbers for local and state emergency responders (e.g., police, ambulance, fire, and poison control).

### 4.3.1 Spill Prevention

The Contractor's spill prevention practices will include, at a minimum, the following:

- Performing regular inspections of construction vehicles, equipment, and portable fuel tanks to check for leaks.
- Performing routine maintenance on construction vehicles and equipment in accordance with the manufacturer's specifications.
- Promptly repairing or replacing damaged or defective construction vehicles and equipment.
- Storing on-site fuel tanks within a secondary containment area or providing alternate secondary containment (e.g., double-walled fuel tanks, containment dikes).
- Refueling vehicles on level ground within a designated area away from steep slopes and storm water runoff conveyance features (e.g., ditches/diversions, storm sewers). Never performing refueling over the water without booms and/or absorbent pads.
- Attending to construction vehicles and equipment while refueling.
- Turning off internal combustion engines before refueling with a flammable liquid.

## STORM WATER POLLUTION PREVENTION PLAN

- Replacing the cap on vehicle fuel tanks before starting the engine.
- Securing/locking fuel pump dispensers when not in use to avoid accidental fuel release.
- Storing construction vehicles and equipment away from site hazards and sensitive resources, to the extent practicable.
- During material transport operations, inspecting all vehicles prior to leaving the site to ensure no contaminated material is on the outside of the vehicle (i.e., tail gate, tires), and that the containment area within the vehicle is properly secured so that no contaminated material spills onto public roadways or waterways.

### 4.3.2 Spill Control and Response

At the site, the Contractor will maintain a sufficient quantity of fire extinguishers, spill kits, and oil-absorbent pads, rolls, and booms as required to contain spills (should they occur) and prevent the potential migration of pollutants beyond the work area. In the event of a spill, the Contractor will immediately notify National Grid and implement the following response measures:

1. **Stop/Isolate Source:** As conditions allow, the Contractor will attempt to stop or isolate the source of the spill by closing valves and/or shutting down affected vehicles or equipment.
2. **Containment:** If the spilled material is floating on a water surface, spill-absorbent pads/booms will be placed across the path of the floating spill. If the spilled material sinks below the water surface, a dam, weir, or other containment method will be used to stop the flow of the spilled material. If the spill occurs on land, a containment unit will be constructed to stop the flow of the spilled material and sorbents will be applied as necessary.
3. **Cleanup:** Spills in water will be recovered using pumps and sorbents as necessary until the spilled material is recovered and no sheen or other evidence of the spill is observed on the water surface. Spills on land will be recovered using pumps, sorbents, and heavy equipment, as necessary until the spilled material is recovered. Construction vehicles and equipment used in the cleanup, or otherwise affected by the spill, will also be cleaned/decontaminated.
4. **Collection, Storage, and Disposal:** Impacted materials, sorbents, and other wastes will be collected and stored in New York State Department of Transportation-approved containers. The containers will be labeled with the waste type and date of accumulation and will be transported off-site for disposal at a permitted facility in accordance with all applicable laws and regulations.
5. **Post-Spill Maintenance:** Following the cleanup of the spill, the Contractor will verify that all impacted materials, vehicles, and equipment have been either transported off-site for disposal, or decontaminated, as appropriate. The vehicle or piece of equipment that may have caused the spill will also be repaired. If the vehicle or piece of equipment cannot be repaired, it will be removed from the site and replaced.

Spill notifications and reporting to the necessary agencies will be coordinated by National Grid and/or the Engineer. Appropriate emergency response groups, including the local fire department, NYSDEC, and the National Response Center, will be contacted immediately if the spill or material release has

## STORM WATER POLLUTION PREVENTION PLAN

impacted soil, groundwater, or surface water, or is beyond the capabilities of on-site personnel to control using the methods described above.

### 4.4 Dust Controls

Dust controls will be used to prevent surface and air movement of dust from disturbed or open-soil areas and material staging areas that may cause off-site damage, health hazards, and traffic safety problems. Dust controls will be proactively employed by the Contractor in accordance with Specification Section 01 57 05 – Temporary Controls, and may include one or more of the following practices:

- Excavating, loading, handling, and backfilling materials in a manner that minimizes the generation of dust.
- Hauling excavated materials and clean backfill materials in properly tarped/covered transport vehicles.
- Restricting vehicle speeds on temporary access roads and active haul routes.
- Covering excavations and temporary stockpiles with 10-mil polyethylene liners (anchored appropriately to resist wind forces) or suppressions foams/sprays before extended work breaks and at the end of each workday.
- Wetting down active haul roads.

### 4.5 Good Housekeeping Practices

Good housekeeping practices will be employed to reduce the potential for construction materials to enter site-related storm water runoff. The Contractor will maintain the site in a neat and orderly condition throughout the remedial construction activities in accordance with Specification Section 01 74 05 – Cleaning. This will include the 1) routine collection and disposal of trash, rubbish, and sanitary wastes; 2) proper storage of construction materials and equipment at the site; and 3) routine cleaning of public rights-of-way, streets, and sidewalks.

## 5 REFERENCES

- National Cooperative Soil Survey (Natural Resources Conservation Service). 2019. Soils information downloaded on November 12, 2019 from NRCS Web Soil Survey website:  
<http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>. Source information based on Rensselaer County, New York Soil Survey Area Version 16. September 16, 2019.
- NYSDEC. 2015. SPDES General Permit for Stormwater Discharges from Construction Activity, Permit No. GP-0-10-001. January 29.
- NYSDEC. 2016. New York State Standards and Specifications for Erosion and Sediment Control. November.



# ATTACHMENT 1

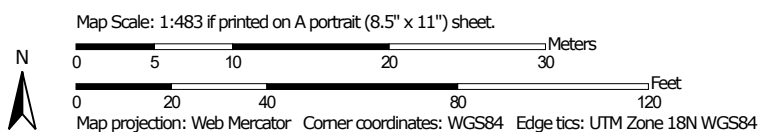
NRCS Soil Map



# Soil Map—Rensselaer County, New York



Soil Map may not be valid at this scale.



**Natural Resources  
Conservation Service**

Web Soil Survey  
National Cooperative Soil Survey

11/12/2019  
Page 1 of 3


## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rensselaer County, New York

Survey Area Data: Version 16, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 1, 2014—Sep 22, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ur	Urban land	0.6	100.0%
<b>Totals for Area of Interest</b>		<b>0.6</b>	<b>100.0%</b>

# ATTACHMENT 1

March 23, 2018 PDI Summary Report Letter



Mr. John Spellman, P.E.  
New York State Department of Environmental Conservation  
Division of Environmental Remediation  
625 Broadway, 11<sup>th</sup> Floor  
Albany, New York 12233-7014

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**Subject:**  
Pre-Design Investigation Results  
Rensselaer Non-Owned Former MGP Site (#V00488)

ENVIRONMENTAL

Dear Mr. Spellman:

On behalf of National Grid, this letter presents a summary of the Phase I pre-design investigation (PDI) completed at National Grid's Non-Owned Former Manufactured Gas Plant (MGP) site (the Site) located in Rensselaer, New York (Site No. V00488). The overall objective of the Phase I PDI was to obtain data to support the remedial design for the New York State Department of Environmental Conservation- (NYSDEC-) selected site remedy.

Date:  
March 13, 2018

Contact:  
Jason Golubski, P.E.

Phone:  
315.671.9437

Email:  
jason.golubski@arcadis.com

Our ref:  
B0036730.0000 #10

The following sections present a description of the PDI activities and results, proposed modification to the extent of remedial construction activities, and a schedule for preparing the remedial design.

## PHASE I PDI ACTIVITIES AND RESULTS

Phase I PDI activities were generally conducted from November 2016 through December 2017 in accordance with the NYSDEC-approved July 2016 *Remedial Design Work Plan* (RDWP) and supporting documents. Prior to conducting the Phase I PDI activities, Arcadis conducted a site meeting on September 19, 2016 to discuss PDI activities with the Office of Child and Family Services (OCFS). In accordance with OCFS's request, intrusive activities (e.g., monitoring well decommissioning/installation, soil boring drilling, and test pit excavation) were generally conducted on dates when the OCFS was closed (e.g., on holidays and weekends), including:

- November 10 to 11, 2016
- January 14 to 17, 2017
- February 19 to 20, 2017
- July 8 to 9, 2017

In accordance with the RDWP, Arcadis conducted community air monitoring for volatile organic compounds (VOCs) and particulate matter with a diameter of 10 micrometers or less (PM<sub>10</sub>) during intrusive activities (i.e., monitoring well

installation, soil boring drilling, and test pit excavation). Action levels (as defined in the RDWP) for VOCs and PM<sub>10</sub> were not exceeded during the PDI activities. Upwind and downwind VOC and dust levels recorded during the PDI activities are provided as Attachment 1. Note that VOC data from November 11 to November 12, 2016 and from July 8 to July 9, 2017 could not be retrieved due to an equipment malfunction; manual readings for PDI activities conducted in November 2016 are provided in lieu of the electronic data.

PDI locations are shown on Figure 1.

### **Cultural Resources Investigation**

Based on the results of the Phase IA Cultural Resources Investigation (as presented in the May 2014 *Remedial Investigation Report* [RI Report]), the site overburden strata between the fill and the glacial till has the potential to contain cultural materials. Therefore, Arcadis submitted a request for consultation to the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) on October 20, 2016 to determine if any additional cultural resource investigation activities were required (e.g., a Phase IB subsurface investigation) and to further assess the presence/absence of archeological or historic artifacts at the site prior to the implementation of the NYSDEC-selected remedy. Arcadis also contacted the Office of Indian Nations Affairs on October 25, 2016 to determine if Native American consultation was required.

As indicated in OPRHP's correspondence (dated November 3, 2016), no additional subsurface investigations to assess potential cultural resources are required, as the extent of the anticipated remedial activities will have no impact on historical properties/places. Additionally, during a November 3, 2016 telephone conversation with NYSDEC's Native American liaison (Mr. David Witt), NYSDEC indicated that a Native American consultation is also not required. Relevant correspondence with OPRHP and Office of Indian Nations Affairs is included as Attachment 2.

### **Utility Coordination and Markout**

In support of each PDI mobilization, Arcadis contacted Dig Safety New York (DigSafe) to perform a public utility markout, prior to conducting intrusive activities. Additionally, Arcadis subcontracted with National GPR Service, Inc. (National GPR) to conduct an independent private utility markout. National GPR utilized ground-penetrating radar (GPR) to further evaluate the potential presence of subsurface utilities and obstructions, as well as to confirm the location of the former gas holders/tar well prior to conducting PDI activities.

It should be noted that during the utility markout, an 8-inch cast iron gas main was identified in Huyck Square. Based on a February 15, 2017 telephone conversation with representatives of public utility locator USIC, LLC, the 8-inch gas main is currently inactive and is capped at Washington Street.

### **NAPL Investigation**

Arcadis conducted NAPL investigation activities to further assess the absence/presence of mobile NAPL in the area immediately north of the northern gas holder and the tar well (i.e., near or within Huyck Square). NAPL investigation activities consisted of decommissioning select existing monitoring wells, installing new NAPL monitoring wells, and conducting periodic NAPL monitoring activities. Existing monitoring wells were decommissioned and replaced with new monitoring wells because the existing wells were not constructed with sumps. Therefore, the existing wells were unable to verify the absence or

presence of NAPL. Additionally, the new wells were located to provide better spatial distribution along the property boundary to evaluate NAPL mobility.

### **Monitoring Well Decommissioning**

Arcadis' drilling subcontractor (Parratt-Wolff, Inc. [Parratt-Wolff]) decommissioned monitoring wells MW-102-05 and MW-103-05 (located immediately north of the northern gas holder and the tar well, respectively) in accordance with NYSDEC's November 3, 2009 guidance CP-43 *Groundwater Monitoring Well Decommissioning Policy*. Well decommissioning activities consisted of pulling the upper five feet of well casing and grouting the wells in place (to ground surface) with a non-shrink grout. Well decommissioning logs are included as Attachment 3.

Note that approximately  $\frac{1}{4}$  to  $\frac{1}{2}$  gallon of a NAPL/water mixture was recovered from monitoring well MW-102-05 prior to decommissioning.

### **Monitoring Well Installation**

Parratt-Wolff installed three new NAPL monitoring wells (i.e., MW-116 to MW-118) in the area immediately north of the northern gas holder and the tar well. New NAPL monitoring wells MW-116 and MW-118 were installed adjacent to the previously decommissioned monitoring wells MW-103-05 and MW-102-05, respectively, and new NAPL monitoring well MW-117 was installed between these locations to provide spatial distribution of the new wells along Huyck Square. The borings for the new NAPL monitoring wells were drilled using hollow-stem auger (HSA) techniques. Well construction included 2-inch diameter schedule 40 PVC installed to the top of till (depths ranging from approximately 20 to 23 feet below grade), with a 2-foot long sump installed into the till, and a flush-mount curb box. Monitoring well construction/soil boring logs are included as Attachment 4.

During drilling, NAPL (i.e., brownish-black oil-like NAPL) was only observed at monitoring well MW-117 from approximately 13.2 to 13.7 feet below grade. Field observations from the soil borings completed to during installation of the new wells are summarized in Table 1.

Approximately 24 hours following installation, Arcadis developed the new NAPL monitoring wells using a positive displacement pump and dedicated polyethylene tubing. The wells were developed by alternately surging and purging the well screen until the water removed from the wells was reasonably free of visible sediment (50 nephelometric turbidity units [NTUs]).

### **NAPL Monitoring**

Following installation and development of the new monitoring wells, Arcadis conducted periodic NAPL monitoring of the entire well monitoring network (i.e., new and existing wells) to assess the absence/presence of mobile NAPL, specifically in the area immediately north of the northern gas holder and the tar well. NAPL monitoring activities generally consisted of gauging monitoring wells for the presence and thickness of NAPL using an oil-water interface probe.

NAPL monitoring was initially conducted approximately one week following the installation and development of the new NAPL monitoring wells and then monthly for a period of eight months. Arcadis (on behalf of National Grid) then requested (via an August 22, 2017 letter to NYSDEC) to discontinue NAPL monitoring activities, as no significant quantities of NAPL accumulated in any of the wells during the initial 8-month monitoring period. In accordance with NYSDEC's September 8, 2017 response letter,



NAPL monitoring frequency was reduced to bi-monthly and conducted two more times; in October and December 2017.

Significant quantities of NAPL were not observed in any of the wells, including the newly installed monitoring wells along Huyck Square. Minor amounts of NAPL (i.e., from blebs on the probe/tape up to 0.1 feet of NAPL) were periodically observed in monitoring wells MW-102R-10, MW-106D-08, and MW-118. However, NAPL was not consistently observed and quantities were not recoverable, indicating that mobile NAPL is not present. NAPL monitoring results are presented in the attached Table 2.

### **Soil Investigation**

Arcadis conducted soil investigation activities in support of developing the design for soil excavation activities. Specifically, soil investigation activities were conducted to:

- Obtain geotechnical data necessary to evaluate and design soil excavation support systems.
- Confirm holder and tar well locations.
- Obtain waste characterization data to support profiling for off-site treatment/disposal (and facilitate direct-loading) of excavated materials during the remedial design.

### **Geotechnical Sampling**

Parratt-Wolff drilled four geotechnical soil borings (B-134 to B-137) using HSA methods to depths up to 24.2 feet below grade (i.e., to refusal). Soil sampling was performed continuously at each geotechnical soil boring to the top of bedrock using 2-inch diameter split spoon sampling devices. Standard Penetration Testing (SPT) was conducted to assess the relative density of the in-place soils following ASTM D1586. Additionally, five (5) feet of bedrock coring (ASTM D2113) was completed at soil borings B-136 and B-137 to evaluate rock strength. Bedrock was continuously cored using HQ-sized coring equipment resulting in a 3.8-inch diameter borehole. Once completed, each borehole was grouted to the existing grade, with the exception of B-135 which was completed to facilitate the installation of monitoring well MW-118. During drilling, a NAPL coating (i.e., brownish-black oil-like NAPL) was only observed at soil boring B-136 from approximately 10 to 12 feet below grade. Field observations from the geotechnical soil borings are summarized on Table 1. Soil boring logs are included as part of Attachment 4.

A total of 21 soil samples were submitted for geotechnical testing to Kenney Geotechnical Engineering Services, PLLC. The results of the geotechnical testing will be used during preparation of the remedial design. Geotechnical testing reports are included as Attachment 5.

### **Test Pits**

Parratt-Wolff excavated eight test pits (i.e., TP-106, TP-107, and TP-109 through TP-114) to confirm the location of the former gas holders/tar well, as well as to locate/identify shallow foundations, obstructions and/or other subsurface features. Relative to the RDWP, variations in the test pits excavated during the PDI included:

- TP-108 was not completed because a large section of the northern gas holder was located and observed to be structurally competent at TP-107.
- TP-111 through TP-114 were completed (in addition to the test pits proposed in the RDWP) to further investigate the location of the southern holder wall.

Parratt-Wolff saw-cut the asphalt pavement prior to excavating the test pits. Excavated material was temporarily staged on polyethylene sheeting adjacent to the test pits. Parratt-Wolff backfilled each test pit by replacing the excavated material in the reverse order that it was removed (i.e., excavated materials were placed back into the test pits at approximately the same depths and locations from which they were removed). Visually clean soils were used to cover visually impacted material (when encountered).

Relevant observations were documented and photographed, and include:

- **Tar Well** – The wall of the tar well was encountered at approximately 5.5 feet below grade at the northern portion of test pit TP-106. Pockets of viscous NAPL were observed on top of the uncovered tar well structure.
- **Northern Gas Holder** – The wall of the northern gas holder (consisting of red brick) was initially encountered at approximately 2 feet below grade east of the southern wall of TP-107A. Test pit TP-107B was then excavated perpendicular to test pit TP-107A to further uncover the holder wall. The holder wall appears to be structurally competent based on visual observations; water appears to be contained inside holder wall at a higher elevation compared with water outside the wall.
- **Southern Gas Holder** – The wall of the southern gas holder was not encountered during excavation of test pits TP-109 through TP-113. A small section of red brick wall was initially encountered at approximately 1.3 feet below grade at test pit TP-114A; which was excavated within the limits of TP-102-05 (where the holder wall was reportedly encountered during the RI). TP-114B was then excavated to further investigate the brick wall; however, the brick wall was not structurally competent or continuous based on visual observations. Stone/concrete structures were encountered at test pits TP-109 and TP-110 at depths of approximately 9 feet and 3 feet below grade, respectively. A pocket of NAPL (1 foot in diameter) was observed approximately 9 to 10 feet below grade at the bottom of TP-109, south of the encountered stone structure. In test pit TP-111, NAPL saturated soil was observed approximately 3.5 to 6 feet below grade and pockets of NAPL (4 to 8 inches in diameter) were observed approximately 6 to 9 feet below grade throughout the bottom of the test pit. NAPL was also observed, in varying amounts from blebs to saturated soils, approximately 5 to 10 feet below grade on the northern portion of test pit TP-113.

Test pit logs are included as Attachment 6 and an associated photo log is included as Attachment 7.

### **Soil Boring Drilling**

As noted above, the southern gas holder wall was not encountered during excavation of the test pits. Based on a review of historic and PDI field observations, the excavation limits for the southern gas holder were defined except for the area immediately north of the holder. Therefore, additional soil borings were drilled to support the delineation of the soil removal limits in the area north of the southern gas holder, in accordance with the Arcadis, May 30, 2017 letter to the NYSDEC and NYSDEC's June 2, 2017 approval letter.

Parratt-Wolff drilled five soil borings (B-138 to B-142) using HSA methods to depths up to 18 feet below grade (i.e., to refusal). During the PDI activities, soil boring B-138 was moved approximately 15 feet north from its proposed location due to the presence of obstructions. Soil sampling was performed continuously at each soil boring to the top of bedrock using 2-inch diameter split spoon sampling devices. SPT was conducted, in accordance with ASTM D1586, to assess the relative density of the in-place soils on soil borings B-141 and B-142. Once completed, each borehole was grouted to the existing grade. No

significant visual impacts (i.e., NAPL in quantities greater than blebs) were observed in any of the five soil borings. Field observations from the confirmation soil borings are summarized on Table 1. Soil boring logs are included in Attachment 4.

### **Waste Characterization Sampling**

Arcadis collected six waste characterization samples to evaluate treatment/disposal requirements of materials to be excavated during remedial construction. Composite soil samples were collected from 1) visually clean material excavated from the upper portion of test pits TP-106, TP-107, TP-109, and TP-110 and 2) visually impacted material excavated from the lower portion of test pits TP-109 and TP-110. Waste characterization samples were submitted to SGS Accutest Laboratories (SGS Accutest) for chemical analysis in accordance with the City of Albany Landfill and ESMI's Fort Edward, New York facility analytical requirements, respectively. Waste characterization analytical results are summarized in Table 3. Analytical reports are included as Attachment 8.

### **Investigation Derived Waste**

Arcadis containerized all IDW generated during PDI activities on-site. Soil cuttings, personal protective equipment, spent disposable sampling materials, and water generated during sampling and decontamination activities were segregated by waste type and placed in DOT-approved 55-gallon steel drums. Each drum/container was appropriately labeled (i.e., with the contents, generator, location, and date). National Grid's waste disposal vendors, Clean Harbors and Capitol Environmental, Inc, transported the generated IDW for off-site treatment/disposal. Disposal documentation is included as Attachment 9.

### **Site Survey**

Arcadis' surveying subcontractor (Paul James Olszewski, PLS, PLLC) completed a site survey to document Phase I PDI sampling locations and develop a one-foot contour topographic map of the site. The site survey is included as Attachment 10 and will be used as the base map for the forthcoming remedial design.

### **Site Restoration**

As the existing asphalt pavement has been significantly disturbed as the result of several investigations conducted at the site (an active parking lot) over the past several years, the entire asphalt surface was resurfaced in September 2017.

### **REVISED SOIL REMOVAL LIMITS**

As indicated in the September 2015 Decision Document, tar saturated (or tar coated) soil with total polycyclic aromatic hydrocarbons (PAHs) concentrations greater than 500 milligrams per kilogram (mg/kg) will be excavated as part of the site remedy.

Based on the results of the Phase I PDI, proposed revised soil removal limits are shown on Figure 2. Rationale for establishing the limits for each of the proposed removal areas is presented below:

- Tar well – During the excavation of RI test pit TP-105-8, viscous black tar was observed in the interior of the tar well and seeping from a perforation in the wall of the tar well. Based on the results of the Phase I PDI, the limits of this removal area have not significantly changed relative to the limits

presented in the Decision Document and RDWP. The limits of this removal area are defined based on the following:

- Northern Limit – The northern limit of this removal area is defined by geotechnical soil boring B-134. No visual impacts were observed at geotechnical soil boring B-134.
- Southern Limit – The southern limit of this removal area is defined by the tar well structure encountered during the excavation of Phase I PDI test pit TP-106. Pockets of NAPL were observed at this test pit from approximately 2.5 to 4 feet below grade on top of uncovered tar well wall at approximately 5.5 feet below grade; no impacts were observed outside the tar well structure (i.e., south of the tar well).
- Eastern Limit – The eastern limit of this removal area is defined by RI test pit TP-103-05. No visual impacts were observed in this test pit.
- Northern Gas Holder – NAPL/tar was initially observed in soil borings B-104-05 and B-128-10, installed during the RI. Based on the results of the Phase I PDI, the limits of this removal area have not changed relative to the limits presented in the RDWP. Based on visual observations during excavation of TP-107, the holder wall appeared to be structurally competent and the water level inside the holder wall appeared to be at a different elevation as compared with water outside the wall. Therefore, the limits of removal are defined by the holder walls.
- Southern Gas Holder – NAPL/tar was initially observed in RI soil boring B-127-10. Based on the results of the Phase I PDI activities, this removal area has been revised relative to the limits presented in the RDWP. The limits of this removal area are defined based on the following:
  - Northern Limit – The northern portion of this removal area is defined by soil borings B-139, B-140, B-142, and by the northern gas holder. During drilling of B-136, oil-like NAPL was observed from approximately 10 to 12 feet below grade. Additionally, NAPL was observed approximately 3.5 to 9 feet below grade during the excavation of the test pit TP-111. NAPL was also observed approximately 5 to 10 feet below grade on the northern portion of test pit TP-113. NAPL was not observed at soil borings B-139, B-140, and B-142.
  - Eastern Limit – The eastern limit of this removal area is defined by test pit TP-114. Visual impacts were not observed at this test pit.
  - Southern Limit – The southern limit of this removal area is defined by test pit TP-112. Small NAPL blebs were observed in the northern end of this test pit; however, visual impacts were not observed at the southern end of TP-112.

Although NAPL was sporadically observed during installation of the new monitoring wells immediately south of Huyck Square, no recoverable NAPL was observed in any of the wells during the year-long NAPL monitoring program. Therefore, consistent with the RDWP and as noted below, additional remedial activities are not warranted in the area of Huyck Square as part of the forthcoming remedial construction.

Additionally, the results of the Phase I PDI activities will be used during the remedial design to evaluate potential excavation support system(s).

## PHASE II PDI

As discussed above, and as indicated in the RDWP, in-situ soil solidification (ISS) or targeted excavation would be completed in the area of Huyck Square if significant quantities of NAPL were observed in the newly installed monitoring wells. However, since significant NAPL was not observed during the PDI monitoring events, additional investigation (Phase II PDI) and remedial construction activities in the vicinity of Huyck Square are not warranted.

## REMEDIAL DESIGN SCHEDULE

Based on the results of the Phase I PDI activities presented herein, sufficient site data exists to proceed with the remedial design. An anticipated schedule for the remedial design and construction of the site remedy is presented in the following table.

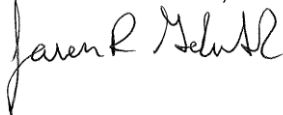
Schedule Component	Date
Submit Preliminary Remedial Design Report to NYSDEC	October 2018
Receive NYSDEC comments	February 2019
Submit Draft Final Remedial Design Report to NYSDEC	May 2019
Receive NYSDEC comments	August 2019
Submit Final Remedial Design Report to NYSDEC	October 2019
Bid Document Preparation and Remedial Contractor Procurement	October 2019 – February 2020
Remedial Construction	Summer 2020

This schedule for preparing remedial design documents and construction of the selected remedy is dependent on several factors, including receipt of NYSDEC approvals on project submittals.

Please do not hesitate to contact me at 315.671.9114 or National Grid's project manager, Mr. Steve Beam, at 315.428.5690 or [steve.beam@nationalgrid.com](mailto:steve.beam@nationalgrid.com), if you have any questions concerning the information presented herein.

Sincerely,

Arcadis of New York, Inc.



Jason Golubski, P.E.  
Senior Environmental Engineer

Mr. John Spellman

March 13, 2018

Copies:

Steve Beam, National Grid

Terry Young, P.E., Arcadis

David Rodriguez, Arcadis

Enclosures:

**Tables**

- 1 Summary of Phase I PDI Field Observations
- 2 Summary of NAPL Gauging Activities
- 3 Waste Characterization Analytical Results

**Figures**

- 1 PDI Locations
- 2 Proposed Soil Removal

**Attachments**

- 1 Community Air Monitoring Data
- 2 Correspondence from OPRHP/the Office of Indian Nations Affairs
- 3 Well Decommissioning Logs
- 4 Soil Boring/Well Construction Logs
- 5 Geotechnical Results
- 6 Test Pit Logs
- 7 Test Pit Photo Log
- 8 Waste Characterization Analytical Results
- 9 Waste Disposal Documentation
- 10 Site Survey

# TABLES



**Table 1**  
**Summary of Phase I PDI Field Observations**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Test Pit / Boring ID	Date	Field Observations					Description
		Odor	Sheens	Staining	Blebs/ Coating	NAPL	
B-134	1/15/2017- 1/16/17	No	No	No	No	No	No observed impacts
B-136	1/14/2017	Yes	Yes	No	No	Yes	6.5 - 10 ft bgs: iridescent sheen, strong tar-like odor 10 - 12 ft bgs: brownish-black oil-like NAPL, strong tar-like odor 12 - 14 ft bgs: iridescent sheen, strong tar-like odor
B-137	1/14/2017	No	No	No	No	No	No observed impacts
B-138	7/8/2017	Yes	No	Yes	No	No	8 - 9.5 ft bgs: reddish-brown staining, slight tarlike odor
B-139	7/8/2017	Yes	No	Yes	No	No	5 ft bgs slight tar-like odor 7 ft bgs slight tar-like odor 9 ft bgs reddish-brown staining
B-140	7/8/2017	Yes	No	Yes	No	No	6 - 9 ft bgs reddish-brown staining, moderate tar-like odor (no staining at 7.5 ft bgs) 9 - 11 ft bgs slight tar-like odor (strong tar-like odor at 10.2 ft bgs)
B-141	7/9/2017	Yes	No	Yes	No	No	7 ft bgs reddish-brown staining, strong tar-like odor 7.5 ft bgs slight tar-like odor 8.5 ft bgs reddish-brown staining, strong tar-like odor 9 ft bgs slight tar-like odor
B-142	7/9/2017	Yes	No	Yes	No	No	8 - 11 ft bgs reddish-brown staining, and strong tar-like odor
MW-116	1/15/2017	Yes	Yes	Yes	No	No	12 - 14 ft bgs: slight tar-like odor, reddish brown staining 16 - 17.5 ft bgs: iridescent sheen, slight tar-like odor
MW-117	1/14/2017	Yes	Yes	Yes	Yes	Yes	7.2 - 10 ft bgs: NAPL blebs (quarter size), strong tar-like odor 9.3 - 9.4 ft bgs: seam of brownish-black oil-like NAPL 12 ft bgs: reddish-brown to black staining 13.2 - 13.7 ft bgs: brownish-black oil-like NAPL, strong tar-like odor 14 - 16 ft bgs: iridescent sheen, slight tar-like odor 17 - 18 ft bgs: browning-black oil-like NAPL, slight tar like odor 16 - 19 ft bgs: iridescent sheen 19 - 20 ft bgs: browning-black oil-like NAPL



**Table 1**  
**Summary of Phase I PDI Field Observations**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Test Pit / Boring ID	Date	Field Observations					Description
		Odor	Sheens	Staining	Blebs/ Coating	NAPL	
MW-118/B-135	1/14/2017	Yes	Yes	No	No	No	11 - 22 ft bgs: Iridescent sheen 16 - 20 ft bgs: strong tar-like odor
TP-106	11/10/2016	Yes	Yes	No	No	Yes	0.8 - 2.5 ft bgs: slight tar-like odor 2.5 - 4 ft bgs: pockets of viscous coal tar 4 - 6 ft bgs slight tar-like odor
TP-107(A)	11/10/2016	Yes	No	Yes	No	No	1.5 - 3.5 ft bgs: staining, strong tar-like odor 3.5 - 10.5 ft bgs: gasoline-like odor
TP-107(B)	11/11/2016	Yes	No	No	No	No	0.5 - 4 ft bgs: Slight tar-like odor
TP-109	1/16/2017	Yes	No	Yes	No	Yes	5 - 9 ft bgs: staining, tar-like odor 9 - 10 ft bgs: NAPL, heavy staining, strong tar-like odor
TP-110	11/11/2016	Yes	No	Yes	No	No	1.5 - 4 ft bgs: staining, strong tar-like odor 4 - 5 ft bgs: moderate tar-like odor
TP-111	2/19/2017	Yes	Yes	No	No	Yes	3.5 - 6 ft bgs: NAPL, sheen, strong tar-like odor 6 - 9 ft bgs: NAPL, sheen, strong tar-like odor
TP-112	2/19/2017	Yes	Yes	No	Yes	No	0.5 - 6 ft bgs: small blebs, sheen, faint tar-like odor
TP-113	2/20/2017	Yes	Yes	No	Yes	Yes	5 - 10 ft bgs: NAPL, blebs, sheen, strong tar-like and petroleum-like odor
TP-114	2/20/2017	No	No	No	No	No	No observed impacts

**Notes:**

bgs = below ground surface

ft = feet, foot

NAPL = non-aqueous phase liquid

**Table 2**  
**Summary of NAPL Gauging Activities**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Well ID/Date	Depth to Water (ft bgs)	Depth to NAPL (ft bgs)	Depth to Bottom (ft bgs)	PID (ppm)	Approximate NAPL Volume Removed (gallon)
<b>MW-101-05</b>					
1/25/2017	Car parked over well	---	---	---	0.0
2/15/2017	5.14	---	13.49	0.00	0.0
3/21/2017	5.67	---	13.49	0.00	0.0
4/26/2017	5.17	---	13.48	0.00	0.0
5/23/2017	5.45	---	13.48	0.00	0.0
6/19/2017	5.80	---	13.48	0.00	0.0
7/8/2017	5.71	---	13.48	0.00	0.0
8/14/2017	5.82	---	13.48	1.30	0.0
10/12/2017	5.72	---	13.48	0.00	0.0
12/27/2017	6.20	---	13.48	0.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-102R-10</b>					
1/25/2017	5.35	39.50	39.52	0.00	0.0
2/15/2017	6.26	39.49	39.52	1.30	0.0
3/21/2017	6.75	---	39.55	1.20	0.0
4/26/2017	6.59	---	39.50	2.10	0.0
5/23/2017	6.76	---	39.54	2.70	0.0
6/19/2017	6.72	---	39.54	3.20	0.0
7/8/2017	6.70	---	39.54	1.00	0.0
8/14/2017	6.68	---	39.54	4.40	0.0
10/12/2017	6.78	---	39.54	0.00	0.0
12/27/2017	7.18	---	39.54	3.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-104-08</b>					
1/25/2017	Car parked over well	---	---	---	0.0
2/15/2017	7.31	---	15.71	0.00	0.0
3/21/2017	7.16	---	15.73	0.00	0.0
4/26/2017	6.92	---	15.73	0.00	0.0
5/23/2017	7.01	---	15.73	0.00	0.0
6/19/2017	7.40	---	15.73	0.00	0.0
7/8/2017	7.55	---	15.73	0.00	0.0
8/14/2017	7.41	---	15.73	0.30	0.0
10/12/2017	7.92	---	15.73	0.00	0.0
12/27/2017	8.08	---	15.73	0.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-104R-10</b>					
1/25/2017	Car parked over well	---	---	---	0.0
2/15/2017	8.56	---	41.77	0.00	0.0
3/21/2017	Car parked over well	---	---	---	0.0
4/26/2017	8.22	---	41.78	0.00	0.0
5/23/2017	Car parked over well	---	---	---	0.0
6/19/2017	---	---	---	---	0.0
7/8/2017	Car parked over well	---	---	---	0.0
8/14/2017	Car parked over well	---	---	---	0.0
10/12/2017	Car parked over well	---	---	---	0.0
12/27/2017	9.40	---	41.78	0.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>

**Table 2**  
**Summary of NAPL Gauging Activities**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Well ID/Date	Depth to Water (ft bgs)	Depth to NAPL (ft bgs)	Depth to Bottom (ft bgs)	PID (ppm)	Approximate NAPL Volume Removed (gallon)
<b>MW-105-08</b>					
1/25/2017	Well locked	---	---	---	0.0
2/15/2017	11.45	---	18.88	0.00	0.0
3/21/2017	11.44	---	20.62	0.00	0.0
4/26/2017	11.30	---	20.60	0.00	0.0
5/23/2017	11.45	---	20.62	0.00	0.0
6/19/2017	11.79	---	20.62	0.10	0.0
7/8/2017	11.90	---	20.62	0.00	0.0
8/14/2017	12.15	---	20.62	0.00	0.0
10/12/2017	12.40	---	20.62	0.00	0.0
12/27/2017	Frozen	---	---	---	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-106D-08</b>					
1/25/2017	Well locked	---	---	---	0.0
2/15/2017	10.13	27.69	27.70	187	0.0
3/21/2017	10.31	---	27.88	382	0.0
4/26/2017	10.13	---	27.88	26.8	0.0
5/23/2017	10.35	---	27.78	154	0.0
6/19/2017	10.70	---	27.78	172	0.0
7/8/2017	10.71	---	27.78	96.1	0.0
8/14/2017	11.05	---	27.78	270	0.0
10/12/2017	11.32	---	27.78	175	0.0
12/27/2017	11.03	---	27.78	480.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-106S-08</b>					
1/25/2017	Well locked	---	---	---	0.0
2/15/2017	10.87	---	22.32	72.0	0.0
3/21/2017	10.91	---	22.32	79.9	0.0
4/26/2017	10.89	---	22.32	47.0	0.0
5/23/2017	11.02	---	22.33	36.0	0.0
6/19/2017	11.32	---	22.33	62.0	0.0
7/8/2017	11.41	---	22.33	30.0	0.0
8/14/2017	11.76	---	22.33	52.9	0.0
10/12/2017	11.81	---	22.33	3.30	0.0
12/27/2017	11.25	---	22.33	31.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-106R-10</b>					
1/25/2017	Well locked	---	---	0.00	0.0
2/15/2017	9.00	---	44.18	0.00	0.0
3/21/2017	9.21	---	44.48	0.00	0.0
4/26/2017	9.00	---	44.48	0.00	0.0
5/23/2017	9.34	---	44.48	1.40	0.0
6/19/2017	9.60	---	44.48	0.00	0.0
7/8/2017	9.65	---	44.48	0.00	0.0
8/14/2017	10.02	---	44.48	0.00	0.0
10/12/2017	10.32	---	44.48	0.00	0.0
12/27/2017	10.09	---	44.48	0.30	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>

**Table 2**  
**Summary of NAPL Gauging Activities**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Well ID/Date	Depth to Water (ft bgs)	Depth to NAPL (ft bgs)	Depth to Bottom (ft bgs)	PID (ppm)	Approximate NAPL Volume Removed (gallon)
<b>MW-107-08</b>					
1/25/2017	Car parked over well	---	---	---	0.0
2/15/2017	3.90	---	15.80	0.00	0.0
3/21/2017	7.16	---	15.73	0.00	0.0
4/26/2017	5.10	---	15.88	0.00	0.0
5/23/2017	5.14	---	15.88	0.00	0.0
6/19/2017	5.41	---	15.88	0.00	0.0
7/8/2017	5.56	---	15.88	0.00	0.0
8/14/2017	5.85	---	15.88	0.30	0.0
10/12/2017	5.95	---	15.88	0.00	0.0
12/27/2017	5.45	---	15.88	0.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-108-09</b>					
1/25/2017	7.95	---	17.28	0.00	0.0
2/15/2017	8.01	---	17.26	0.00	0.0
3/21/2017	8.00	---	17.28	0.00	0.0
4/26/2017	7.71	---	17.26	0.00	0.0
5/23/2017	7.82	---	17.26	0.00	0.0
6/19/2017	8.15	---	17.26	0.00	0.0
7/8/2017	8.46	---	17.26	0.00	0.0
8/14/2017	8.82	---	17.26	0.00	0.0
10/12/2017	9.28	---	17.26	0.00	0.0
12/27/2017	9.10	---	17.26	0.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-108R-10</b>					
1/25/2017	9.67	---	54.51	0.00	0.0
2/15/2017	9.32	---	54.54	0.30	0.0
3/21/2017	9.60	---	54.48	0.60	0.0
4/26/2017	8.75	---	54.50	0.00	0.0
5/23/2017	8.97	---	54.50	0.00	0.0
6/19/2017	9.27	---	54.50	0.30	0.0
7/8/2017	9.71	---	54.50	0.00	0.0
8/14/2017	9.47	---	54.50	0.00	0.0
10/12/2017	9.51	---	54.50	0.00	0.0
12/27/2017	9.42	---	54.50	0.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-109D-09</b>					
1/25/2017	7.48	---	37.15	0.00	0.0
2/15/2017	7.20	---	37.16	0.00	0.0
3/21/2017	7.91	---	37.30	0.00	0.0
4/26/2017	7.04	---	37.23	0.00	0.0
5/23/2017	7.30	---	37.20	0.50	0.0
6/19/2017	7.42	---	37.20	0.00	0.0
7/8/2017	7.32	---	37.36	0.00	0.0
8/14/2017	8.05	---	37.36	0.00	0.0
10/12/2017	8.38	---	37.36	0.00	0.0
12/27/2017	8.65	---	37.36	0.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>

**Table 2**  
**Summary of NAPL Gauging Activities**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Well ID/Date	Depth to Water (ft bgs)	Depth to NAPL (ft bgs)	Depth to Bottom (ft bgs)	PID (ppm)	Approximate NAPL Volume Removed (gallon)
<b>MW-109S-09</b>					
1/25/2017	7.55	---	17.14	0.00	0.0
2/15/2017	6.94	---	17.14	0.00	0.0
3/21/2017	7.26	---	17.16	0.00	0.0
4/26/2017	6.91	---	17.16	0.00	0.0
5/23/2017	6.83	---	17.16	0.00	0.0
6/19/2017	7.45	---	17.16	0.00	0.0
7/8/2017	7.65	---	17.16	0.00	0.0
8/14/2017	8.21	---	17.16	0.00	0.0
10/12/2017	8.55	---	17.16	0.00	0.0
12/27/2017	8.53	---	17.16	0.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-110-08</b>					
1/25/2017	8.00	---	17.01	0.00	0.0
2/15/2017	7.68	---	17.02	0.00	0.0
3/21/2017	7.95	---	17.05	0.00	0.0
4/26/2017	6.80	---	17.06	0.00	0.0
5/23/2017	7.81	---	17.06	0.00	0.0
7/8/2017	8.06	---	17.06	0.00	0.0
8/14/2017	8.50	---	17.06	0.00	0.0
10/12/2017	8.92	---	17.06	0.00	0.0
12/27/2017	8.70	---	17.06	0.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-110R-10</b>					
1/25/2017	7.00	---	44.49	0.00	0.0
2/15/2017	6.92	---	44.48	0.00	0.0
3/21/2017	7.02	---	44.50	0.00	0.0
4/26/2017	7.70	---	44.50	0.00	0.0
5/23/2017	7.81	---	44.50	0.00	0.0
7/8/2017	8.06	---	44.50	0.00	0.0
8/14/2017	7.70	---	44.50	0.00	0.0
10/12/2017	7.95	---	44.50	0.00	0.0
12/27/2017	7.60	---	44.50	0.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-111-09</b>					
1/25/2017	7.48	---	15.98	0.00	0.0
2/15/2017	7.42	---	15.92	0.00	0.0
3/21/2017	7.47	---	16.03	0.00	0.0
4/26/2017	7.46	---	16.02	0.00	0.0
5/23/2017	7.60	---	16.03	0.00	0.0
6/19/2017	7.85	---	16.03	0.00	0.0
7/8/2017	7.87	---	16.03	0.00	0.0
8/14/2017	8.15	---	16.03	0.00	0.0
10/12/2017	8.31	---	16.03	0.00	0.0
12/27/2017	8.02	---	16.03	0.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>

**Table 2**  
**Summary of NAPL Gauging Activities**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Well ID/Date	Depth to Water (ft bgs)	Depth to NAPL (ft bgs)	Depth to Bottom (ft bgs)	PID (ppm)	Approximate NAPL Volume Removed (gallon)
<b>MW-112-10</b>					
1/25/2017	8.61	---	18.65	0.00	0.0
2/15/2017	8.78	---	18.60	0.00	0.0
3/21/2017	8.68	---	18.65	0.00	0.0
4/26/2017	8.28	---	16.60	0.00	0.0
5/23/2017	8.32	---	18.64	0.00	0.0
6/19/2017	8.85	---	18.64	0.00	0.0
7/8/2017	9.03	---	18.64	0.00	0.0
8/14/2017	9.21	---	18.64	0.00	0.0
10/12/2017	10.61	---	18.64	0.00	0.0
12/27/2017	9.53	---	18.64	0.00	0.0
<i>Approximate Volume Removed from well</i>					<b>0.0</b>
<b>MW-112R-10</b>					
1/25/2017	8.61	---	38.90	0.00	0.0
2/15/2017	8.65	---	38.90	0.00	0.0
3/21/2017	8.81	---	38.51	0.00	0.0
4/26/2017	8.30	---	38.62	0.00	0.0
5/23/2017	5.54	---	38.62	0.00	0.0
6/19/2017	8.85	---	38.62	0.00	0.0
7/8/2017	8.83	---	38.62	0.00	0.0
8/14/2017	9.15	---	38.62	0.20	0.0
10/12/2017	9.55	---	38.62	0.00	0.0
12/27/2017	9.60	---	38.62	0.00	0.0
<i>Approximate Volume Removed from well</i>					<b>0.0</b>
<b>MW-113R-10</b>					
1/25/2017	4.91	---	46.12	0.00	0.0
2/15/2017	7.00	---	46.12	0.00	0.0
3/21/2017	7.64	---	46.12	0.00	0.0
4/26/2017	7.60	---	46.12	0.00	0.0
5/23/2017	7.76	---	46.12	0.00	0.0
6/19/2017	7.74	---	46.12	0.20	0.0
7/8/2017	7.60	---	46.12	0.00	0.0
8/14/2017	7.62	---	46.12	0.20	0.0
10/12/2017	7.44	---	46.12	0.00	0.0
12/27/2017	7.70	---	46.12	0.00	0.0
<i>Approximate Volume Removed from well</i>					<b>0.0</b>
<b>MW-114-12</b>					
1/25/2017	Well locked	---	---	---	0.0
2/15/2017	3.52	---	7.63	0.00	0.0
3/21/2017	3.52	---	7.70	0.30	0.0
4/26/2017	3.38	---	7.70	0.00	0.0
5/23/2017	3.51	---	7.68	0.00	0.0
6/19/2017	---	---	---	---	0.0
7/8/2017	3.70	---	7.68	0.00	0.0
8/14/2017	3.92	---	7.68	0.00	0.0
10/12/2017	3.90	---	7.68	0.00	0.0
12/27/2017	Frozen	---	---	---	0.0
<i>Approximate Volume Removed from well</i>					<b>0.0</b>

**Table 2**  
**Summary of NAPL Gauging Activities**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Well ID/Date	Depth to Water (ft bgs)	Depth to NAPL (ft bgs)	Depth to Bottom (ft bgs)	PID (ppm)	Approximate NAPL Volume Removed (gallon)
<b>MW-115-12</b>					
1/25/2017	Well locked	---	---	---	0.0
2/15/2017	2.85	---	7.38	0.00	0.0
3/21/2017	2.91	---	5.10	0.09	0.0
4/26/2017	2.82	---	7.46	0.00	0.0
5/23/2017	2.94	---	7.49	0.00	0.0
6/19/2017	---	---	---	---	0.0
7/8/2017	3.16	---	7.49	0.00	0.0
8/14/2017	3.35	---	7.49	0.00	0.0
10/12/2017	3.40	---	7.49	0.00	0.0
12/27/2017	Frozen	---	---	---	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-116</b>					
1/25/2017	Car parked over well	---	---	---	0.0
2/15/2017	Car parked over well	---	---	---	0.0
3/21/2017	frozen	---	---	---	0.0
4/26/2017	6.14	---	21.71	0.00	0.0
5/23/2017	7.60	---	21.71	0.50	0.0
6/19/2017	8.22	---	22.71	0.70	0.0
7/8/2017	8.38	---	21.71	0.00	0.0
8/14/2017	8.82	---	21.71	1.00	0.0
10/12/2017	9.75	---	21.71	2.00	0.0
12/27/2017	Frozen	---	---	---	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-117</b>					
1/25/2017	6.74	---	22.40	100	0.0
2/15/2017	6.60	---	22.35	100	0.0
3/21/2017	6.75	---	22.60	489	0.0
4/26/2017	6.62	---	22.60	20.0	0.0
5/23/2017	6.70	---	22.60	20.8	0.0
6/19/2017	7.10	---	22.60	6.70	0.0
7/8/2017	7.20	---	22.60	7.80	0.0
8/14/2017	7.53	---	22.60	11.30	0.0
10/12/2017	7.90	---	22.60	2.30	0.0
12/27/2017	7.80	---	22.60	2.10	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>
<b>MW-118</b>					
1/25/2017	5.57	---	23.60	285	0.0
2/15/2017	5.42	---	23.55	500	0.0
3/21/2017	5.58	23.60	23.65	250	0.0
4/26/2017	5.35	23.57	23.65	160	0.0
5/23/2017	5.56	23.55	23.65	139	0.0
6/19/2017	6.05	23.63	23.65	134	0.0
7/8/2017	6.05	---	23.65	145	0.0
8/14/2017	6.38	---	23.65	78	0.0
10/12/2017	6.57	---	23.65	75	0.0
12/27/2017	6.28	---	23.65	52.00	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>

**Table 2**  
**Summary of NAPL Gauging Activities**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Well ID/Date	Depth to Water (ft bgs)	Depth to NAPL (ft bgs)	Depth to Bottom (ft bgs)	PID (ppm)	Approximate NAPL Volume Removed (gallon)
<b>SG-4-10</b>					
1/25/2017	11.18	---	---	---	0.0
2/15/2017	Frozen	---	---	---	0.0
3/21/2017	Frozen	---	---	---	0.0
4/26/2017	10.10	---	---	---	0.0
5/23/2017	10.20	---	---	---	0.0
6/19/2017	10.10	---	---	---	0.0
7/8/2017	10.30	---	---	---	0.0
8/14/2017	10.45	---	---	---	0.0
10/12/2017	10.40	---	---	---	0.0
12/27/2017	10.30	---	---	---	0.0
<b>Approximate Volume Removed from well</b>					<b>0.0</b>

**Notes:**

Bgs = below ground surface

ft = feet, foot

NAPL = Non-Aqueous Phase Liquid

PID = Photoionization detector

ppm = parts per million



**Table 3**  
**Waste Characterization Analytical Results**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Location ID: Sample Depth(Feet): Date Collected:	Units	TP-106 3 11/10/16	TP-107 3 11/11/16	TP-109 0 - 5 01/16/17	TP-109 5 - 10 01/16/17	TP-110 0 - 3 11/11/16	TP-110 3 - 3.5 11/11/16
<b>VOCs</b>							
1,1,1-Trichloroethane	mg/kg	0.0016 U	0.0016 U	NA	0.11 U	NA	0.21 U
1,1,2,2-Tetrachloroethane	mg/kg	0.004 U	0.0041 U	NA	0.11 U	NA	0.53 U
1,1,2-Trichloroethane	mg/kg	0.0016 U	0.0016 U	NA	0.11 U	NA	0.21 U
1,1-Dichloroethane	mg/kg	0.0016 U	0.0016 U	NA	0.055 U	NA	0.21 U
1,1-Dichloroethene	mg/kg	0.0016 U	0.0016 U	NA	0.055 U	NA	0.21 U
1,2,3-Trichlorobenzene	mg/kg	NA	NA	NA	0.28 U	NA	NA
1,2,4-Trichlorobenzene	mg/kg	NA	NA	NA	0.28 U	NA	NA
1,2-Dibromo-3-chloropropane	mg/kg	NA	NA	NA	0.11 U	NA	NA
1,2-Dibromoethane	mg/kg	NA	NA	NA	0.055 U	NA	NA
1,2-Dichlorobenzene	mg/kg	NA	NA	NA	0.055 U	NA	NA
1,2-Dichloroethane	mg/kg	0.0016 U	0.0016 U	NA	0.055 U	NA	0.21 U
1,2-Dichloropropane	mg/kg	0.0016 U	0.0016 U	NA	0.11 U	NA	0.21 U
1,3-Dichlorobenzene	mg/kg	NA	NA	NA	0.055 U	NA	NA
1,4-Dichlorobenzene	mg/kg	NA	NA	NA	0.055 U	NA	NA
2-Butanone (MEK)	mg/kg	0.008 U	0.0082 U	NA	0.55 U	NA	1.1 U
2-Hexanone	mg/kg	0.004 U	0.0041 U	NA	0.28 U	NA	0.53 U
4-Methyl-2-pentanone (MIBK)	mg/kg	0.004 U	0.0041 U	NA	0.28 U	NA	0.53 U
Acetone	mg/kg	0.0202 B	0.0153 B	NA	0.55 U	NA	1.1 U
Benzene	mg/kg	0.0121	0.0023	NA	0.0234 J	NA	0.11 U
Bromochloromethane	mg/kg	NA	NA	NA	0.28 U	NA	NA
Bromodichloromethane	mg/kg	0.0016 U	0.0016 U	NA	0.11 U	NA	0.21 U
Bromoform	mg/kg	0.0016 U	0.0016 U	NA	0.28 U	NA	0.21 U
Bromomethane	mg/kg	0.008 U	0.0082 U	NA	0.28 U	NA	1.1 U
Carbon disulfide	mg/kg	0.0187	0.0017 J	NA	0.0427 J	NA	0.53 U
Carbon tetrachloride	mg/kg	0.0016 U	0.0016 U	NA	0.11 U	NA	0.21 U
Chlorobenzene	mg/kg	0.0016 U	0.0016 U	NA	0.11 U	NA	0.21 U
Chloroethane	mg/kg	0.008 U	0.0082 U	NA	0.28 U	NA	1.1 U
Chloroform	mg/kg	0.0016 U	0.0016 U	NA	0.11 U	NA	0.21 U
Chloromethane	mg/kg	0.004 U	0.0041 U	NA	0.28 U	NA	0.53 U
cis-1,2-Dichloroethene	mg/kg	0.0016 U	0.0016 U	NA	0.055 U	NA	0.21 U
cis-1,3-Dichloropropene	mg/kg	0.0016 U	0.0016 U	NA	0.11 U	NA	0.21 U
Cyclohexane	mg/kg	NA	NA	NA	0.0514 J	NA	NA
Dibromochloromethane	mg/kg	0.004 U	0.0041 U	NA	0.11 U	NA	0.53 U
Dichlorodifluoromethane	mg/kg	NA	NA	NA	0.28 U	NA	NA
Ethylbenzene	mg/kg	0.0009 J	0.0016 U	NA	7.22	NA	1.33
Freon 113	mg/kg	NA	NA	NA	0.28 U	NA	NA
Isopropylbenzene	mg/kg	NA	NA	NA	1.56	NA	NA
m,p-Xylene	mg/kg	NA	NA	NA	0.236	NA	NA
Methyl Acetate	mg/kg	NA	NA	NA	0.28 U	NA	NA
Methyl Tert Butyl Ether	mg/kg	NA	NA	NA	0.055 U	NA	NA
Methylcyclohexane	mg/kg	NA	NA	NA	0.49	NA	NA
Methylene chloride	mg/kg	0.0016 U	0.0016 U	NA	0.28 U	NA	0.21 U
o-Xylene	mg/kg	NA	NA	NA	2.73	NA	NA
Styrene	mg/kg	0.004 U	0.0041 U	NA	0.11 U	NA	0.53 U
Tetrachloroethene	mg/kg	0.0016 U	0.0016 U	NA	0.0324 J	NA	0.21 U
Toluene	mg/kg	0.0032 JB	0.00073 JB	NA	0.0683	NA	0.077 J
trans-1,2-Dichloroethene	mg/kg	0.0016 U	0.0016 U	NA	0.055 U	NA	0.21 U
trans-1,3-Dichloropropene	mg/kg	0.0016 U	0.0016 U	NA	0.11 U	NA	0.21 U
Trichloroethene	mg/kg	0.0016 U	0.0016 U	NA	0.055 U	NA	0.21 U
Trichlorofluoromethane	mg/kg	NA	NA	NA	0.28 U	NA	NA
Vinyl chloride	mg/kg	0.008 U	0.0082 U	NA	0.11 U	NA	1.1 U

**Table 3**  
**Waste Characterization Analytical Results**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Location ID: Sample Depth(Feet): Date Collected:	Units	TP-106 3 11/10/16	TP-107 3 11/11/16	TP-109 0 - 5 01/16/17	TP-109 5 - 10 01/16/17	TP-110 0 - 3 11/11/16	TP-110 3 - 3.5 11/11/16
<b>VOCs (cont.)</b>							
Xylene (total)	mg/kg	0.0029	0.0016 U	NA	2.97	NA	1.46
<b>VOCs-TCLP</b>							
1,1-Dichloroethene	mg/L	0.2 U	0.2 U	0.005 U	NA	0.2 U	NA
1,2-Dichloroethane	mg/L	0.2 U	0.2 U	0.005 U	NA	0.2 U	NA
1,4-Dichlorobenzene	mg/L	0.2 U	0.2 U	0.005 U	NA	0.2 U	NA
2-Butanone (MEK)	mg/L	1 U	1 U	0.1 U	NA	1 U	NA
Benzene	mg/L	0.0586 J	0.1 U	0.0025 U	NA	0.1 U	NA
Carbon tetrachloride	mg/L	0.2 U	0.2 U	0.005 U	NA	0.2 U	NA
Chlorobenzene	mg/L	0.2 U	0.2 U	0.005 U	NA	0.2 U	NA
Chloroform	mg/L	0.2 U	0.2 U	0.005 U	NA	0.2 U	NA
Tetrachloroethene	mg/L	0.2 U	0.2 U	0.005 U	NA	0.0248 J	NA
Trichloroethene	mg/L	0.2 U	0.2 U	0.005 U	NA	0.2 U	NA
Vinyl chloride	mg/L	0.2 U	0.2 U	0.005 U	NA	0.2 U	NA
<b>SVOCs</b>							
1,1'-Biphenyl	mg/kg	NA	NA	NA	3.34	NA	NA
1,2,4,5-Tetrachlorobenzene	mg/kg	NA	NA	NA	0.19 U	NA	NA
1,2,4-Trichlorobenzene	mg/kg	0.31 U	0.27 U	NA	NA	NA	0.3 U
1,2-Dichlorobenzene	mg/kg	0.31 U	0.27 U	NA	NA	NA	0.3 U
1,3-Dichlorobenzene	mg/kg	0.31 U	0.27 U	NA	NA	NA	0.3 U
1,4-Dichlorobenzene	mg/kg	0.31 U	0.27 U	NA	NA	NA	0.3 U
1,4-Dioxane	mg/kg	NA	NA	NA	0.038 U	NA	NA
2,3,4,6-Tetrachlorophenol	mg/kg	NA	NA	NA	0.19 U	NA	NA
2,4,5-Trichlorophenol	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
2,4,6-Trichlorophenol	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
2,4-Dichlorophenol	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
2,4-Dimethylphenol	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
2,4-Dinitrophenol	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
2,4-Dinitrotoluene	mg/kg	0.62 U	0.54 U	NA	0.038 U	NA	0.61 U
2,6-Dinitrotoluene	mg/kg	0.62 U	0.54 U	NA	0.038 U	NA	0.61 U
2-Chloronaphthalene	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
2-Chlorophenol	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
2-Methylnaphthalene	mg/kg	0.461	0.0775 J	NA	1.16	NA	4.46
2-Methylphenol	mg/kg	0.62 U	0.54 U	NA	0.075 U	NA	0.61 U
2-Nitroaniline	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
2-Nitrophenol	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
3&4-Methylphenol	mg/kg	0.62 U	0.54 U	NA	0.075 U	NA	0.61 U
3,3'-Dichlorobenzidine	mg/kg	0.62 U	0.54 U	NA	0.075 U	NA	0.61 U
3-Nitroaniline	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
4,6-Dinitro-o-cresol	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
4-Bromophenyl phenyl ether	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
4-Chloro-3-methyl phenol	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
4-Chloroaniline	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
4-Chlorophenyl phenyl ether	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
4-Nitroaniline	mg/kg	0.62 U	0.54 U	NA	0.19 U	NA	0.61 U
4-Nitrophenol	mg/kg	0.62 U	0.54 U	NA	0.38 U	NA	0.61 U
Acenaphthene	mg/kg	0.448	0.0446 J	NA	18	NA	3.27
Acenaphthylene	mg/kg	0.918	0.435	NA	2.83	NA	0.958
Acetophenone	mg/kg	NA	NA	NA	0.19 U	NA	NA
Anthracene	mg/kg	1.3	0.674	NA	10.6	NA	2.2
Atrazine	mg/kg	NA	NA	NA	0.075 U	NA	NA
Benzaldehyde	mg/kg	NA	NA	NA	0.19 U	NA	NA

**Table 3**  
**Waste Characterization Analytical Results**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Location ID: Sample Depth(Feet): Date Collected:	Units	TP-106 3 11/10/16	TP-107 3 11/11/16	TP-109 0 - 5 01/16/17	TP-109 5 - 10 01/16/17	TP-110 0 - 3 11/11/16	TP-110 3 - 3.5 11/11/16
<b>VOCs-TCLP (cont.)</b>							
Benzo(a)anthracene	mg/kg	5.26	2.03	NA	8.93	NA	2.91
Benzo(a)pyrene	mg/kg	5.48	2.27	NA	9.18	NA	2.9
Benzo(b)fluoranthene	mg/kg	4.98	1.82	NA	7.89	NA	1.91
Benzo(g,h,i)perylene	mg/kg	2.46	1.26	NA	4.42	NA	1.4
Benzo(k)fluoranthene	mg/kg	3.85	1.81	NA	1.47	NA	2.07
bis(2-Chloroethoxy)methane	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
bis(2-Chloroethyl)ether	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
bis(2-Chloroisopropyl)ether	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
bis(2-Ethylhexyl)phthalate	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
Butyl benzyl phthalate	mg/kg	0.31 U	0.276	NA	0.075 U	NA	0.3 U
Caprolactam	mg/kg	NA	NA	NA	0.075 U	NA	NA
Carbazole	mg/kg	0.421	0.0765 J	NA	0.224	NA	0.22
Chrysene	mg/kg	4.62	1.78	NA	8.16	NA	2.7
Dibenzo(a,h)anthracene	mg/kg	0.866	0.37	NA	1.17	NA	0.367
Dibenzofuran	mg/kg	0.629	0.223	NA	0.827	NA	0.316
Diethyl phthalate	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
Dimethyl phthalate	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
Di-n-butyl phthalate	mg/kg	0.31 U	0.0234 J	NA	0.075 U	NA	0.3 U
Di-n-octyl phthalate	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
Fluoranthene	mg/kg	7.47	2.91	NA	14.1	NA	5.16
Fluorene	mg/kg	0.642	0.196	NA	9.3	NA	1.72
Hexachlorobenzene	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
Hexachlorobutadiene	mg/kg	0.31 U	0.27 U	NA	0.038 U	NA	0.3 U
Hexachlorocyclopentadiene	mg/kg	0.62 U	0.54 U	NA	0.38 U	NA	0.61 U
Hexachloroethane	mg/kg	0.31 U	0.27 U	NA	0.19 U	NA	0.3 U
Indeno(1,2,3-cd)pyrene	mg/kg	2.91	1.35	NA	3.67	NA	1.41
Isophorone	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
Naphthalene	mg/kg	3.2	0.151	NA	3.39	NA	7.58
Nitrobenzene	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
N-Nitroso-di-n-propylamine	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
N-Nitrosodiphenylamine	mg/kg	0.31 U	0.27 U	NA	0.19 U	NA	0.3 U
Pentachlorophenol	mg/kg	0.62 U	0.54 U	NA	0.15 U	NA	0.61 U
Phenanthrene	mg/kg	3.48	1.54	NA	30.8	NA	7.47
Phenol	mg/kg	0.31 U	0.27 U	NA	0.075 U	NA	0.3 U
Pyrene	mg/kg	6.75	2.78	NA	21.2	NA	7.4
<b>SVOCs-TCLP</b>							
1,4-Dichlorobenzene	mg/L	0.05 U	0.05 U	0.02 U	NA	0.05 U	NA
2,4,5-Trichlorophenol	mg/L	0.1 U	0.1 U	0.05 U	NA	0.1 U	NA
2,4,6-Trichlorophenol	mg/L	0.1 U	0.1 U	0.05 U	NA	0.1 U	NA
2,4-Dinitrotoluene	mg/L	0.1 U	0.1 U	0.02 U	NA	0.1 U	NA
2-Methylphenol	mg/L	0.1 U	0.1 U	0.02 U	NA	0.1 U	NA
3&4-Methylphenol	mg/L	0.1 U	0.1 U	0.02 U	NA	0.1 U	NA
Hexachlorobenzene	mg/L	0.05 U	0.05 U	0.02 U	NA	0.05 U	NA
Hexachlorobutadiene	mg/L	0.05 U	0.05 U	0.01 U	NA	0.05 U	NA
Hexachloroethane	mg/L	0.05 U	0.05 U	0.05 U	NA	0.05 U	NA
Nitrobenzene	mg/L	0.05 U	0.05 U	0.02 U	NA	0.05 U	NA
Pentachlorophenol	mg/L	0.1 U	0.1 U	0.1 U	NA	0.1 U	NA
Pyridine	mg/L	0.1 U	0.1 U	0.02 U	NA	0.1 U	NA
<b>Pesticides</b>							
4,4'-DDD	mg/kg	NA	NA	0.0008 U	NA	NA	NA
4,4'-DDE	mg/kg	NA	NA	0.0008 U	NA	NA	NA

**Table 3**  
**Waste Characterization Analytical Results**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Location ID: Sample Depth(Feet): Date Collected:	Units	TP-106 3 11/10/16	TP-107 3 11/11/16	TP-109 0 - 5 01/16/17	TP-109 5 - 10 01/16/17	TP-110 0 - 3 11/11/16	TP-110 3 - 3.5 11/11/16
<b>Pesticides (cont.)</b>							
4,4'-DDT	mg/kg	NA	NA	0.0137	NA	NA	NA
Aldrin	mg/kg	NA	NA	0.0008 U	NA	NA	NA
alpha-BHC	mg/kg	NA	NA	0.0008 U	NA	NA	NA
alpha-Chlordane	mg/kg	NA	NA	0.0008 U	NA	NA	NA
beta-BHC	mg/kg	NA	NA	0.0008 U	NA	NA	NA
delta-BHC	mg/kg	NA	NA	0.0008 U	NA	NA	NA
Dieldrin	mg/kg	NA	NA	0.0008 U	NA	NA	NA
Endosulfan sulfate	mg/kg	NA	NA	0.0008 U	NA	NA	NA
Endosulfan-I	mg/kg	NA	NA	0.0008 U	NA	NA	NA
Endosulfan-II	mg/kg	NA	NA	0.0008 U	NA	NA	NA
Endrin	mg/kg	NA	NA	0.0008 U	NA	NA	NA
Endrin aldehyde	mg/kg	NA	NA	0.0008 U	NA	NA	NA
Endrin ketone	mg/kg	NA	NA	0.0008 U	NA	NA	NA
gamma-BHC (Lindane)	mg/kg	NA	NA	0.0008 U	NA	NA	NA
gamma-Chlordane	mg/kg	NA	NA	0.0008 U	NA	NA	NA
Heptachlor	mg/kg	NA	NA	0.0008 U	NA	NA	NA
Heptachlor epoxide	mg/kg	NA	NA	0.0008 U	NA	NA	NA
Methoxychlor	mg/kg	NA	NA	0.0016 U	NA	NA	NA
Toxaphene	mg/kg	NA	NA	0.02 U	NA	NA	NA
<b>Pesticide-TCLP</b>							
Chlordane	mg/L	0.005 U	0.005 U	NA	NA	0.005 U	NA
Endrin	mg/L	0.0005 U	0.0005 U	NA	NA	0.0005 U	NA
gamma-BHC (Lindane)	mg/L	0.0005 U	0.0005 U	NA	NA	0.0005 U	NA
Heptachlor	mg/L	0.0005 U	0.0005 U	NA	NA	0.0005 U	NA
Heptachlor epoxide	mg/L	0.0005 U	0.0005 U	NA	NA	0.0005 U	NA
Methoxychlor	mg/L	0.0005 U	0.0005 U	NA	NA	0.0005 U	NA
Toxaphene	mg/L	0.025 U	0.025 U	NA	NA	0.025 U	NA
<b>PCB</b>							
Aroclor 1016	mg/kg	0.043 U	0.037 U	0.04 U	0.036 U	NA	0.04 U
Aroclor 1221	mg/kg	0.043 U	0.037 U	0.04 U	0.036 U	NA	0.04 U
Aroclor 1232	mg/kg	0.043 U	0.037 U	0.04 U	0.036 U	NA	0.04 U
Aroclor 1242	mg/kg	0.043 U	0.037 U	0.04 U	0.036 U	NA	0.04 U
Aroclor 1248	mg/kg	0.043 U	0.037 U	0.04 U	0.036 U	NA	0.04 U
Aroclor 1254	mg/kg	0.043 U	0.037 U	0.04 U	0.036 U	NA	0.04 U
Aroclor 1260	mg/kg	0.043 U	0.037 U	0.04 U	0.036 U	NA	0.04 U
Total PCBs	mg/kg	0.043 U	0.037 U	0.04 U	0.036 U	NA	0.04 U
<b>PCB-TCLP</b>							
Aroclor 1016	mg/L	0.0025 U	0.0025 U	NA	NA	NA	NA
Aroclor 1221	mg/L	0.0025 U	0.0025 U	NA	NA	NA	NA
Aroclor 1232	mg/L	0.0025 U	0.0025 U	NA	NA	NA	NA
Aroclor 1242	mg/L	0.0025 U	0.0025 U	NA	NA	NA	NA
Aroclor 1248	mg/L	0.0025 U	0.0025 U	NA	NA	NA	NA
Aroclor 1254	mg/L	0.0025 U	0.0025 U	NA	NA	NA	NA
Aroclor 1260	mg/L	0.0025 U	0.0025 U	NA	NA	NA	NA
<b>Herbicides</b>							
2,4,5-T	mg/kg	NA	NA	0.0132	NA	NA	NA
2,4,5-TP (Silvex)	mg/kg	NA	NA	0.0081 U	NA	NA	NA
2,4-D	mg/kg	NA	NA	0.041 U	NA	NA	NA
2,4-DB	mg/kg	NA	NA	0.041 U	NA	NA	NA
Dalapon	mg/kg	NA	NA	0.0081 U	NA	NA	NA
Dicamba	mg/kg	NA	NA	0.0081 U	NA	NA	NA

**Table 3**  
**Waste Characterization Analytical Results**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

Location ID: Sample Depth(Feet): Date Collected:	Units	TP-106 3 11/10/16	TP-107 3 11/11/16	TP-109 0 - 5 01/16/17	TP-109 5 - 10 01/16/17	TP-110 0 - 3 11/11/16	TP-110 3 - 3.5 11/11/16
<b>Herbicides (cont.)</b>							
Dichloroprop	mg/kg	NA	NA	0.041 U	NA	NA	NA
Dinoseb	mg/kg	NA	NA	0.041 U	NA	NA	NA
MCPA	mg/kg	NA	NA	4.1 U	NA	NA	NA
MCPP	mg/kg	NA	NA	4.1 U	NA	NA	NA
Pentachlorophenol	mg/kg	NA	NA	0.0041 U	NA	NA	NA
<b>Herb-TCLP</b>							
2,4,5-TP (Silvex)	mg/L	0.01 U	0.01 U	NA	NA	0.01 U	NA
2,4-D	mg/L	0.01 U	0.01 U	NA	NA	0.01 U	NA
<b>TPH</b>							
TPH-DRO (Semi-VOA)	mg/kg	525	101	NA	2,250	NA	2,200
TPH-GRO (VOA)	mg/kg	4.46 J	3.66 J	NA	338	NA	68.1
<b>Metals</b>							
Aluminum	mg/kg	NA	NA	NA	14,300	NA	NA
Antimony	mg/kg	1 U	0.91 U	NA	2.4 U	NA	0.99 U
Arsenic	mg/kg	7	8.6	NA	9.2	NA	4.6
Barium	mg/kg	103	92.7	NA	77	NA	83.6
Beryllium	mg/kg	0.88	0.63	NA	0.68	NA	0.47
Cadmium	mg/kg	0.19 B	0.22 B	NA	0.59 U	NA	0.12 B
Calcium	mg/kg	NA	NA	NA	2,840	NA	NA
Chromium	mg/kg	17.4	14.6	NA	19	NA	13.1
Cobalt	mg/kg	NA	NA	NA	11	NA	NA
Copper	mg/kg	NA	NA	NA	31.7	NA	NA
Iron	mg/kg	NA	NA	NA	27,400	NA	NA
Lead	mg/kg	28	46.1	NA	22	NA	34.9
Magnesium	mg/kg	NA	NA	NA	4,990	NA	NA
Manganese	mg/kg	NA	NA	NA	475	NA	NA
Mercury	mg/kg	0.057	0.21	NA	0.12	NA	0.3
Nickel	mg/kg	26.3	20.6	NA	25.1	NA	19.2
Potassium	mg/kg	NA	NA	NA	1,550	NA	NA
Selenium	mg/kg	1 U	0.91 U	NA	2.4 U	NA	0.99 U
Silver	mg/kg	0.5 U	0.46 U	NA	0.59 U	NA	0.49 U
Sodium	mg/kg	NA	NA	NA	1,200 U	NA	NA
Thallium	mg/kg	1 U	0.11 B	NA	1.2 U	NA	0.99 U
Vanadium	mg/kg	26.7	22.1	NA	22.1	NA	17
Zinc	mg/kg	69.7	76.4	NA	79.8	NA	61.7
<b>Metals-TCLP</b>							
Arsenic	mg/L	0.0044 B	0.002 B	0.5 U	NA	0.0037 B	NA
Barium	mg/L	0.65	0.37 B	1 U	NA	0.75	NA
Cadmium	mg/L	0.0012 B	0.0012 B	0.025 U	NA	0.0013 B	NA
Chromium	mg/L	0.01 U	0.0012 B	0.05 U	NA	0.01 U	NA
Lead	mg/L	0.0012 B	0.0039 B	0.5 U	NA	1.5	NA
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	NA	0.0002 U	NA
Selenium	mg/L	0.025 U	0.025 U	0.5 U	NA	0.025 U	NA
Silver	mg/L	0.005 U	0.005 U	0.05 U	NA	0.005 U	NA
<b>General Chemistry</b>							
Cyanide	mg/kg	2.6	0.62	NA	1.6	NA	1.1
Heat Content, BTU	BTU/LB	NA	NA	NA	1,260	NA	NA
Percent Sulfur	%	NA	NA	NA	0.13 U	NA	NA

**Table 3**  
**Waste Characterization Analytical Results**



**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**Phase I PDI Summary Report**

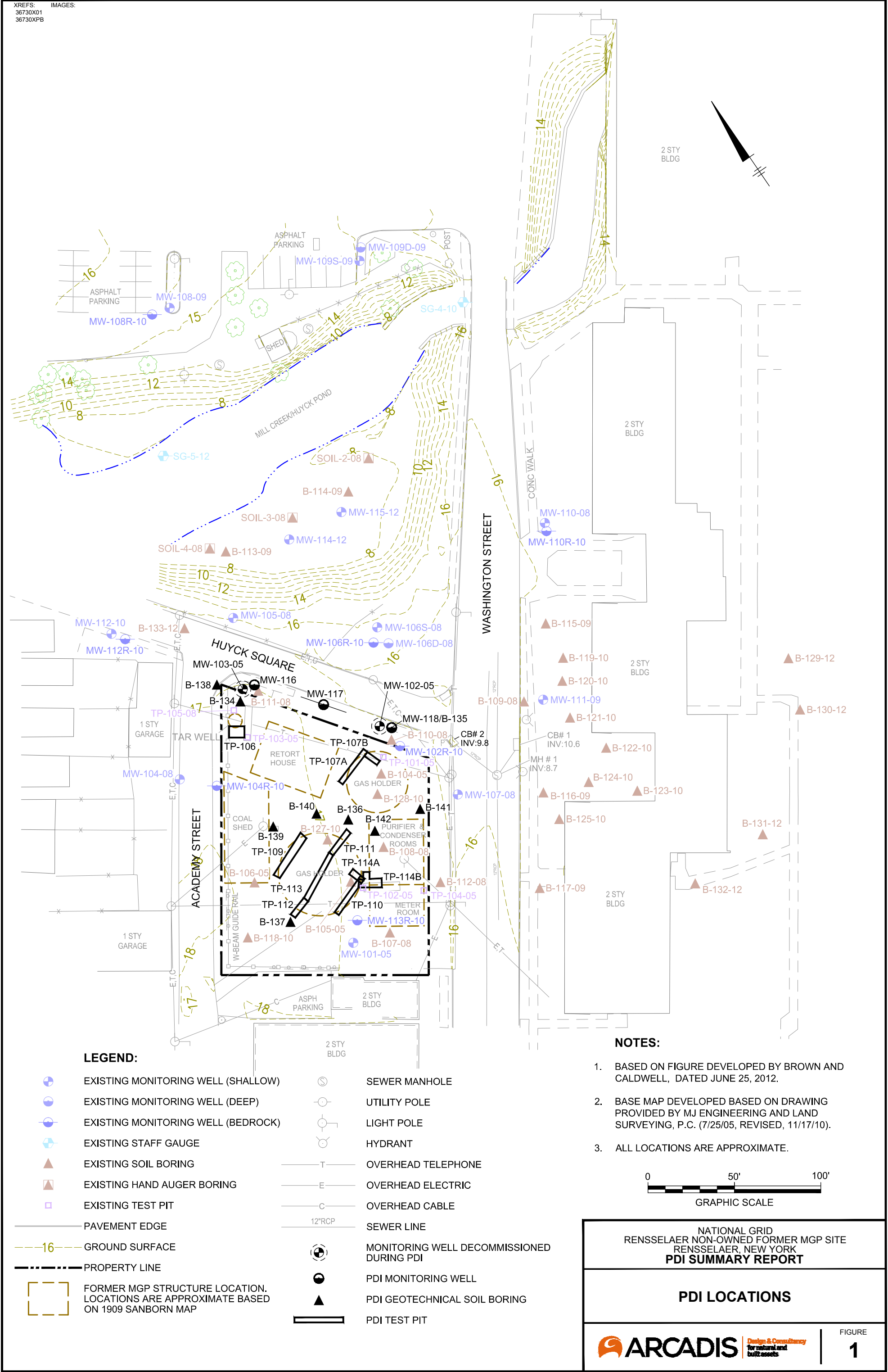
**Notes:**

1. Samples collected by ARCADIS on the date indicated.
2. Samples collected in November 2016 were analyzed by SGS Accutest Laboratories located in Marlborough, MA.
3. Samples collected in January 2017 were analyzed by SGS Accutest Laboratories located in New Jersey, NJ.
4. B - Indicates the analyte was found in associated method blank.
5. J - Indicates the associated numerical value is an estimated concentration.
6. NA - Indicates the compound was not analyzed.
7. U - Indicates the compound was analyzed for but not detected. The associated value is the compound quantitation limit.

FIGURES

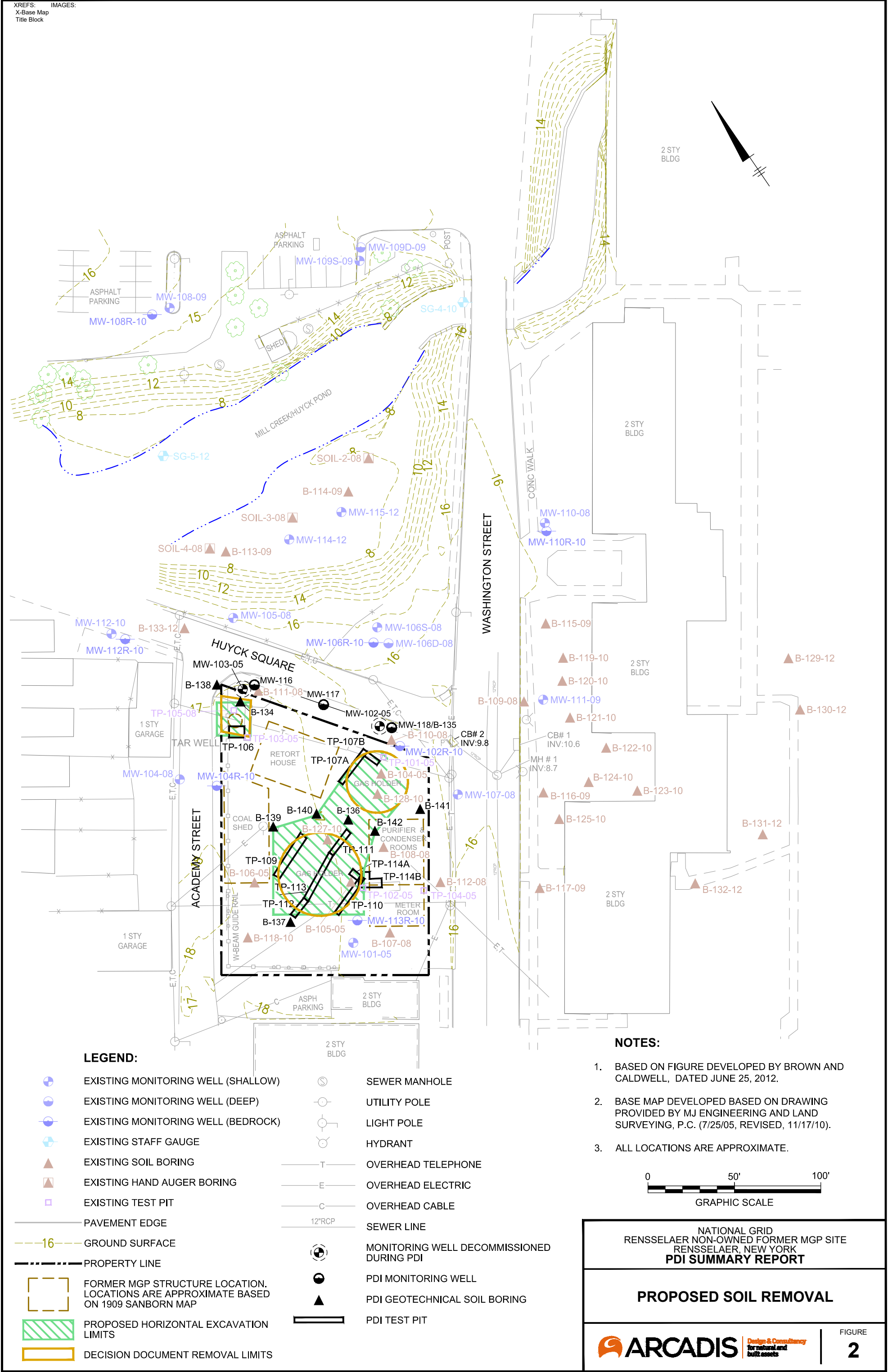


XREFS: IMAGES:  
36730X01  
36730XPB





XREFS: IMAGES:  
X-Base Map  
Title Block



**ATTACHMENT 1 - COMMUNITY AIR  
MONITORING DATA**



# Upwind Dust CAMP Data



# Upwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind Dust	
Date of Monitoring:	11/10/2016	
DustTrak II Model 8530		
Log Interval (mm:ss):	15:00	
Number of points:	28	
Statistics	Average:	0.016
	Minimum:	0.012
	Maximum:	0.041
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
11/10/2016	9:33:22	0.018
11/10/2016	9:48:22	0.015
11/10/2016	10:03:22	0.014
11/10/2016	10:18:22	0.014
11/10/2016	10:33:22	0.013
11/10/2016	10:48:22	0.018
11/10/2016	11:03:22	0.017
11/10/2016	11:18:22	0.015
11/10/2016	11:33:22	0.014
11/10/2016	11:48:22	0.012
11/10/2016	12:03:22	0.012
11/10/2016	12:18:22	0.012
11/10/2016	12:33:22	0.014
11/10/2016	12:48:22	0.013
11/10/2016	13:03:22	0.012
11/10/2016	13:18:22	0.012
11/10/2016	13:33:22	0.012
11/10/2016	13:48:22	0.012
11/10/2016	14:03:22	0.013
11/10/2016	14:18:22	0.013
11/10/2016	14:33:22	0.012
11/10/2016	14:48:22	0.012
11/10/2016	15:03:22	0.031
11/10/2016	15:18:22	0.041
11/10/2016	15:33:22	0.026
11/10/2016	15:48:22	0.017
11/10/2016	16:03:22	0.013
11/10/2016	16:18:22	0.013

# Upwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind Dust	
Date of Monitoring:	11/11/2016	
DustTrak II Model 8530		
Log Interval (mm:ss):	15:00	
Number of points:	25	
Statistics	Average:	0.01
	Minimum:	0.006
	Maximum:	0.021
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
11/11/2016	7:32:57	0.021
11/11/2016	7:47:57	0.02
11/11/2016	8:02:57	0.019
11/11/2016	8:17:57	0.016
11/11/2016	8:32:57	0.008
11/11/2016	8:47:57	0.007
11/11/2016	9:02:57	0.007
11/11/2016	9:17:57	0.007
11/11/2016	9:32:57	0.007
11/11/2016	9:47:57	0.007
11/11/2016	10:02:57	0.006
11/11/2016	10:17:57	0.008
11/11/2016	10:32:57	0.007
11/11/2016	10:47:57	0.008
11/11/2016	11:02:57	0.008
11/11/2016	11:17:57	0.007
11/11/2016	11:32:57	0.008
11/11/2016	11:47:57	0.009
11/11/2016	12:02:57	0.01
11/11/2016	12:17:57	0.01
11/11/2016	12:32:57	0.011
11/11/2016	12:47:57	0.009
11/11/2016	13:02:57	0.009
11/11/2016	13:17:57	0.009
11/11/2016	13:32:57	0.009

# Upwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind Dust	
Date of Monitoring:	1/14/2017	
DustTrak II Model 8530		
Log Interval (mm:ss):	15:00	
Number of points:	23	
Statistics	Average:	0.017
	Minimum:	0.01
	Maximum:	0.056
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
1/14/2017	10:17:59	0.015
1/14/2017	10:32:59	0.012
1/14/2017	10:47:59	0.019
1/14/2017	11:02:59	0.011
1/14/2017	11:17:59	0.01
1/14/2017	11:32:59	0.01
1/14/2017	11:47:59	0.01
1/14/2017	12:02:59	0.01
1/14/2017	12:17:59	0.011
1/14/2017	12:32:59	0.014
1/14/2017	12:47:59	0.012
1/14/2017	13:02:59	0.016
1/14/2017	13:17:59	0.028
1/14/2017	13:32:59	0.01
1/14/2017	13:47:59	0.011
1/14/2017	14:02:59	0.011
1/14/2017	14:17:59	0.011
1/14/2017	14:32:59	0.029
1/14/2017	14:47:59	0.017
1/14/2017	15:02:59	0.056
1/14/2017	15:17:59	0.025
1/14/2017	15:32:59	0.011
1/14/2017	15:47:59	0.021

# Upwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind Dust	
Date of Monitoring:	1/15/2017	
DustTrak II Model 8530		
Log Interval (mm:ss):	15:00	
Number of points:	38	
Statistics	Average:	0.022
	Minimum:	0
	Maximum:	0.06
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
1/15/2017	7:15:18	0.026
1/15/2017	7:30:18	0.029
1/15/2017	7:45:18	0.026
1/15/2017	8:00:18	0.024
1/15/2017	8:15:18	0.032
1/15/2017	8:30:18	0.034
1/15/2017	8:45:18	0.026
1/15/2017	9:00:18	0.053
1/15/2017	9:15:18	0.06
1/15/2017	9:30:18	0.044
1/15/2017	9:45:18	0.02
1/15/2017	10:00:18	0.022
1/15/2017	10:15:18	0.018
1/15/2017	10:30:18	0.018
1/15/2017	10:45:18	0.017
1/15/2017	11:00:18	0.017
1/15/2017	11:15:18	0.017
1/15/2017	11:30:18	0.02
1/15/2017	11:45:18	0.021
1/15/2017	12:00:18	0.019
1/15/2017	12:15:18	0.019
1/15/2017	12:30:18	0.02
1/15/2017	12:45:18	0.018
1/15/2017	13:00:18	0.02
1/15/2017	13:15:18	0.018
1/15/2017	13:30:18	0.02
1/15/2017	13:45:18	0.02
1/15/2017	14:00:18	0.016
1/15/2017	14:15:18	0.015
1/15/2017	14:30:18	0.015
1/15/2017	14:45:18	0.016
1/15/2017	15:00:18	0.013
1/15/2017	15:15:18	0.017
1/15/2017	15:30:18	0.019
1/15/2017	15:45:18	0.02
1/15/2017	16:00:18	0.013
1/15/2017	16:15:18	0.017
1/15/2017	16:30:18	0

# Upwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind Dust	
Date of Monitoring:	1/16/2017	
DustTrak II Model 8530		
Log Interval (mm:ss):	15:00	
Number of points:	37	
Statistics	Average:	0.05
	Minimum:	0.015
	Maximum:	0.347
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
1/16/2017	6:55:19	0.067
1/16/2017	7:10:19	0.035
1/16/2017	7:25:19	0.035
1/16/2017	7:40:19	0.04
1/16/2017	7:55:19	0.055
1/16/2017	8:10:19	0.046
1/16/2017	8:25:19	0.04
1/16/2017	8:40:19	0.044
1/16/2017	8:55:19	0.071
1/16/2017	9:10:19	0.093
1/16/2017	9:25:19	0.059
1/16/2017	9:40:19	0.084
1/16/2017	9:55:19	0.098
1/16/2017	10:10:19	0.347
1/16/2017	10:25:19	0.228
1/16/2017	10:40:19	0.036
1/16/2017	10:55:19	0.03
1/16/2017	11:10:19	0.046
1/16/2017	11:25:19	0.033
1/16/2017	11:40:19	0.033
1/16/2017	11:55:19	0.025
1/16/2017	12:10:19	0.025
1/16/2017	12:25:19	0.018
1/16/2017	12:40:19	0.017
1/16/2017	12:55:19	0.019
1/16/2017	13:10:19	0.019
1/16/2017	13:25:19	0.023
1/16/2017	13:40:19	0.021
1/16/2017	13:55:19	0.017
1/16/2017	14:10:19	0.019
1/16/2017	14:25:19	0.016
1/16/2017	14:40:19	0.018
1/16/2017	14:55:19	0.016
1/16/2017	15:10:19	0.015
1/16/2017	15:25:19	0.017
1/16/2017	15:40:19	0.02
1/16/2017	15:55:19	0.018



# Upwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind Dust	
Date of Monitoring:	2/19/2017	
DustTrak II Model 8533		
Log Interval (mm:ss):	15:00	
Number of points:	23	
Statistics	Average:	0.014
	Minimum:	0.011
	Maximum:	0.018
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
2/19/2017	9:48:46	0.012
2/19/2017	10:03:46	0.012
2/19/2017	10:18:46	0.015
2/19/2017	10:33:46	0.014
2/19/2017	10:48:46	0.013
2/19/2017	11:03:46	0.012
2/19/2017	11:18:46	0.013
2/19/2017	11:33:46	0.013
2/19/2017	11:48:46	0.016
2/19/2017	12:03:46	0.019
2/19/2017	12:18:46	0.012
2/19/2017	12:33:46	0.013
2/19/2017	12:48:46	0.015
2/19/2017	13:03:46	0.012
2/19/2017	13:18:46	0.016
2/19/2017	13:33:46	0.018
2/19/2017	13:48:46	0.012
2/19/2017	14:03:46	0.012
2/19/2017	14:18:46	0.012
2/19/2017	14:33:46	0.011
2/19/2017	14:48:46	0.016
2/19/2017	15:03:46	0.016
2/19/2017	15:18:46	0.013

# Upwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind Dust	
Date of Monitoring:	2/20/2017	
DustTrak II Model 8533		
Log Interval (mm:ss):	15:00	
Number of points:	25	
Statistics	Average:	0.017
	Minimum:	0.01
	Maximum:	0.038
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
2/20/2017	9:48:46	0.03
2/20/2017	10:03:46	0.032
2/20/2017	10:18:46	0.038
2/20/2017	10:33:46	0.025
2/20/2017	10:48:46	0.023
2/20/2017	11:03:46	0.012
2/20/2017	11:18:46	0.011
2/20/2017	11:33:46	0.012
2/20/2017	11:48:46	0.01
2/20/2017	12:03:46	0.012
2/20/2017	12:18:46	0.014
2/20/2017	12:33:46	0.019
2/20/2017	12:48:46	0.018
2/20/2017	13:03:46	0.018
2/20/2017	13:18:46	0.015
2/20/2017	13:33:46	0.015
2/20/2017	13:48:46	0.015
2/20/2017	14:03:46	0.013
2/20/2017	14:18:46	0.014
2/20/2017	14:33:46	0.014
2/20/2017	14:48:46	0.012
2/20/2017	15:03:46	0.017
2/20/2017	15:18:46	0.013
2/20/2017	15:33:46	0.013
2/20/2017	15:48:46	0.013

# Upwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind Dust	
Date of Monitoring:	7/8/2017	
DustTrak II Model 8533		
Log Interval (mm:ss):	1:00	
Number of points:	202	
Statistics	Average:	0.001
	Minimum:	0
	Maximum:	0.007
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
7/8/2017	11:55:53	0.007
7/8/2017	11:56:53	0.005
7/8/2017	11:57:53	0.004
7/8/2017	11:58:53	0.004
7/8/2017	11:59:53	0.004
7/8/2017	12:00:53	0.003
7/8/2017	12:01:53	0.003
7/8/2017	12:02:53	0.003
7/8/2017	12:03:53	0.003
7/8/2017	12:04:53	0.002
7/8/2017	12:05:53	0.002
7/8/2017	12:06:53	0.002
7/8/2017	12:07:53	0.002
7/8/2017	12:08:53	0.002
7/8/2017	12:09:53	0.002
7/8/2017	12:10:53	0.002
7/8/2017	12:11:53	0.002
7/8/2017	12:12:53	0.002
7/8/2017	12:13:53	0.002
7/8/2017	12:14:53	0.002
7/8/2017	12:15:53	0.002
7/8/2017	12:16:53	0.002
7/8/2017	12:17:53	0.001
7/8/2017	12:18:53	0.001
7/8/2017	12:19:53	0.001
7/8/2017	12:20:53	0.001
7/8/2017	12:21:53	0.001
7/8/2017	12:22:53	0.002
7/8/2017	12:23:53	0.001
7/8/2017	12:24:53	0
7/8/2017	12:25:53	0
7/8/2017	12:26:53	0
7/8/2017	12:27:53	0
7/8/2017	12:28:53	0.006
7/8/2017	12:29:53	0.003
7/8/2017	12:30:53	0
7/8/2017	12:31:53	0
7/8/2017	12:32:53	0
7/8/2017	12:33:53	0
7/8/2017	12:34:53	0
7/8/2017	12:35:53	0
7/8/2017	12:36:53	0.001
7/8/2017	12:37:53	0
7/8/2017	12:38:53	0

7/8/2017	12:39:53	0
7/8/2017	12:40:53	0
7/8/2017	12:41:53	0
7/8/2017	12:42:53	0
7/8/2017	12:43:53	0
7/8/2017	12:44:53	0
7/8/2017	12:45:53	0
7/8/2017	12:46:53	0
7/8/2017	12:47:53	0
7/8/2017	12:48:53	0
7/8/2017	12:49:53	0
7/8/2017	12:50:53	0
7/8/2017	12:51:53	0
7/8/2017	12:52:53	0
7/8/2017	12:53:53	0
7/8/2017	12:54:53	0
7/8/2017	12:55:53	0
7/8/2017	12:56:53	0
7/8/2017	12:57:53	0
7/8/2017	12:58:53	0
7/8/2017	12:59:53	0
7/8/2017	13:00:53	0
7/8/2017	13:01:53	0
7/8/2017	13:02:53	0
7/8/2017	13:03:53	0
7/8/2017	13:04:53	0
7/8/2017	13:05:53	0
7/8/2017	13:06:53	0
7/8/2017	13:07:53	0
7/8/2017	13:08:53	0
7/8/2017	13:09:53	0
7/8/2017	13:10:53	0
7/8/2017	13:11:53	0
7/8/2017	13:12:53	0
7/8/2017	13:13:53	0
7/8/2017	13:14:53	0
7/8/2017	13:15:53	0
7/8/2017	13:16:53	0
7/8/2017	13:17:53	0
7/8/2017	13:18:53	0
7/8/2017	13:19:53	0
7/8/2017	13:20:53	0
7/8/2017	13:21:53	0
7/8/2017	13:22:53	0
7/8/2017	13:23:53	0
7/8/2017	13:24:53	0
7/8/2017	13:25:53	0
7/8/2017	13:26:53	0
7/8/2017	13:27:53	0
7/8/2017	13:28:53	0
7/8/2017	13:29:53	0
7/8/2017	13:30:53	0
7/8/2017	13:31:53	0.001
7/8/2017	13:32:53	0
7/8/2017	13:33:53	0.001
7/8/2017	13:34:53	0.001
7/8/2017	13:35:53	0.001
7/8/2017	13:36:53	0.001

7/8/2017	13:37:53	0
7/8/2017	13:38:53	0
7/8/2017	13:39:53	0.001
7/8/2017	13:40:53	0.001
7/8/2017	13:41:53	0.001
7/8/2017	13:42:53	0.001
7/8/2017	13:43:53	0
7/8/2017	13:44:53	0
7/8/2017	13:45:53	0
7/8/2017	13:46:53	0
7/8/2017	13:47:53	0
7/8/2017	13:48:53	0.001
7/8/2017	13:49:53	0.001
7/8/2017	13:50:53	0
7/8/2017	13:51:53	0.001
7/8/2017	13:52:53	0.001
7/8/2017	13:53:53	0.001
7/8/2017	13:54:53	0.001
7/8/2017	13:55:53	0.001
7/8/2017	13:56:53	0.001
7/8/2017	13:57:53	0.001
7/8/2017	13:58:53	0.001
7/8/2017	13:59:53	0.001
7/8/2017	14:00:53	0.001
7/8/2017	14:01:53	0.001
7/8/2017	14:02:53	0.002
7/8/2017	14:03:53	0.001
7/8/2017	14:04:53	0.001
7/8/2017	14:05:53	0.001
7/8/2017	14:06:53	0.001
7/8/2017	14:07:53	0.001
7/8/2017	14:08:53	0.001
7/8/2017	14:09:53	0.001
7/8/2017	14:10:53	0.001
7/8/2017	14:11:53	0.001
7/8/2017	14:12:53	0.001
7/8/2017	14:13:53	0.001
7/8/2017	14:14:53	0.002
7/8/2017	14:15:53	0.002
7/8/2017	14:16:53	0.002
7/8/2017	14:17:53	0.003
7/8/2017	14:18:53	0.002
7/8/2017	14:19:53	0.001
7/8/2017	14:20:53	0.002
7/8/2017	14:21:53	0.001
7/8/2017	14:22:53	0.001
7/8/2017	14:23:53	0.001
7/8/2017	14:24:53	0.001
7/8/2017	14:25:53	0.001
7/8/2017	14:26:53	0.001
7/8/2017	14:27:53	0.001
7/8/2017	14:28:53	0.002
7/8/2017	14:29:53	0.002
7/8/2017	14:30:53	0.002
7/8/2017	14:31:53	0.001
7/8/2017	14:32:53	0.002
7/8/2017	14:33:53	0.002
7/8/2017	14:34:53	0.002

7/8/2017	14:35:53	0.002
7/8/2017	14:36:53	0.001
7/8/2017	14:37:53	0.001
7/8/2017	14:38:53	0.001
7/8/2017	14:39:53	0.001
7/8/2017	14:40:53	0.002
7/8/2017	14:41:53	0.002
7/8/2017	14:42:53	0.002
7/8/2017	14:43:53	0.002
7/8/2017	14:44:53	0.002
7/8/2017	14:45:53	0.003
7/8/2017	14:46:53	0.003
7/8/2017	14:47:53	0.003
7/8/2017	14:48:53	0.003
7/8/2017	14:49:53	0.003
7/8/2017	14:50:53	0.003
7/8/2017	14:51:53	0.003
7/8/2017	14:52:53	0.003
7/8/2017	14:53:53	0.004
7/8/2017	14:54:53	0.003
7/8/2017	14:55:53	0.003
7/8/2017	14:56:53	0.003
7/8/2017	14:57:53	0.003
7/8/2017	14:58:53	0.003
7/8/2017	14:59:53	0.003
7/8/2017	15:00:53	0.003
7/8/2017	15:01:53	0.003
7/8/2017	15:02:53	0.002
7/8/2017	15:03:53	0.002
7/8/2017	15:04:53	0.003
7/8/2017	15:05:53	0.003
7/8/2017	15:06:53	0.003
7/8/2017	15:07:53	0.003
7/8/2017	15:08:53	0.003
7/8/2017	15:09:53	0.003
7/8/2017	15:10:53	0.003
7/8/2017	15:11:53	0.003
7/8/2017	15:12:53	0.003
7/8/2017	15:13:53	0.004
7/8/2017	15:14:53	0.003
7/8/2017	15:15:53	0.004
7/8/2017	15:16:53	0.003

# Upwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind Dust	
Date of Monitoring:	7/9/2017	
DustTrak II Model 8533		
Log Interval (mm:ss):	1:00	
Number of points:	237	
Statistics	Average:	0.001
	Minimum:	0
	Maximum:	0.007
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
7/9/2017	7:21:31	0.029
7/9/2017	7:22:31	0.036
7/9/2017	7:23:31	0.024
7/9/2017	7:24:31	0.024
7/9/2017	7:25:31	0.026
7/9/2017	7:26:31	0.024
7/9/2017	7:27:31	0.037
7/9/2017	7:28:31	0.024
7/9/2017	7:29:31	0.025
7/9/2017	7:30:31	0.026
7/9/2017	7:31:31	0.023
7/9/2017	7:32:31	0.022
7/9/2017	7:33:31	0.028
7/9/2017	7:34:31	0.023
7/9/2017	7:35:31	0.022
7/9/2017	7:36:31	0.031
7/9/2017	7:37:31	0.021
7/9/2017	7:38:31	0.023
7/9/2017	7:39:31	0.022
7/9/2017	7:40:31	0.027
7/9/2017	7:41:31	0.039
7/9/2017	7:42:31	0.024
7/9/2017	7:43:31	0.025
7/9/2017	7:44:31	0.024
7/9/2017	7:45:31	0.032
7/9/2017	7:46:31	0.028
7/9/2017	7:47:31	0.027
7/9/2017	7:48:31	0.026
7/9/2017	7:49:31	0.029
7/9/2017	7:50:31	0.025
7/9/2017	7:51:31	0.024
7/9/2017	7:52:31	0.036
7/9/2017	7:53:31	0.024
7/9/2017	7:54:31	0.02
7/9/2017	7:55:31	0.022
7/9/2017	7:56:31	0.021
7/9/2017	7:57:31	0.029
7/9/2017	7:58:31	0.022
7/9/2017	7:59:31	0.024
7/9/2017	8:00:31	0.022
7/9/2017	8:01:31	0.022
7/9/2017	8:02:31	0.02
7/9/2017	8:03:31	0.019
7/9/2017	8:04:31	0.019

7/9/2017	8:05:31	0.03
7/9/2017	8:06:31	0.021
7/9/2017	8:07:31	0.024
7/9/2017	8:08:31	0.021
7/9/2017	8:09:31	0.026
7/9/2017	8:10:31	0.019
7/9/2017	8:11:31	0.023
7/9/2017	8:12:31	0.018
7/9/2017	8:13:31	0.017
7/9/2017	8:14:31	0.017
7/9/2017	8:15:31	0.018
7/9/2017	8:16:31	0.017
7/9/2017	8:17:31	0.016
7/9/2017	8:18:31	0.015
7/9/2017	8:19:31	0.014
7/9/2017	8:20:31	0.019
7/9/2017	8:21:31	0.016
7/9/2017	8:22:31	0.014
7/9/2017	8:23:31	0.015
7/9/2017	8:24:31	0.015
7/9/2017	8:25:31	0.015
7/9/2017	8:26:31	0.014
7/9/2017	8:27:31	0.014
7/9/2017	8:28:31	0.014
7/9/2017	8:29:31	0.016
7/9/2017	8:30:31	0.016
7/9/2017	8:31:31	0.015
7/9/2017	8:32:31	0.017
7/9/2017	8:33:31	0.015
7/9/2017	8:34:31	0.014
7/9/2017	8:35:31	0.014
7/9/2017	8:36:31	0.014
7/9/2017	8:37:31	0.014
7/9/2017	8:38:31	0.015
7/9/2017	8:39:31	0.016
7/9/2017	8:40:31	0.016
7/9/2017	8:41:31	0.015
7/9/2017	8:42:31	0.015
7/9/2017	8:43:31	0.015
7/9/2017	8:44:31	0.015
7/9/2017	8:45:31	0.014
7/9/2017	8:46:31	0.014
7/9/2017	8:47:31	0.015
7/9/2017	8:48:31	0.016
7/9/2017	8:49:31	0.014
7/9/2017	8:50:31	0.015
7/9/2017	8:51:31	0.015
7/9/2017	8:52:31	0.014
7/9/2017	8:53:31	0.015
7/9/2017	8:54:31	0.013
7/9/2017	8:55:31	0.012
7/9/2017	8:56:31	0.012
7/9/2017	8:57:31	0.014
7/9/2017	8:58:31	0.013
7/9/2017	8:59:31	0.013
7/9/2017	9:00:31	0.015
7/9/2017	9:01:31	0.013
7/9/2017	9:02:31	0.013



7/9/2017	9:03:31	0.013
7/9/2017	9:04:31	0.013
7/9/2017	9:05:31	0.013
7/9/2017	9:06:31	0.012
7/9/2017	9:07:31	0.012
7/9/2017	9:08:31	0.03
7/9/2017	9:09:31	0.029
7/9/2017	9:10:31	0.016
7/9/2017	9:11:31	0.01
7/9/2017	9:12:31	0.009
7/9/2017	9:13:31	0.009
7/9/2017	9:14:31	0.012
7/9/2017	9:15:31	0.009
7/9/2017	9:16:31	0.009
7/9/2017	9:17:31	0.009
7/9/2017	9:18:31	0.009
7/9/2017	9:19:31	0.009
7/9/2017	9:20:31	0.009
7/9/2017	9:21:31	0.009
7/9/2017	9:22:31	0.009
7/9/2017	9:23:31	0.009
7/9/2017	9:24:31	0.009
7/9/2017	9:25:31	0.009
7/9/2017	9:26:31	0.009
7/9/2017	9:27:31	0.01
7/9/2017	9:28:31	0.013
7/9/2017	9:29:31	0.009
7/9/2017	9:30:31	0.009
7/9/2017	9:31:31	0.009
7/9/2017	9:32:31	0.009
7/9/2017	9:33:31	0.009
7/9/2017	9:34:31	0.009
7/9/2017	9:35:31	0.009
7/9/2017	10:23:31	0.044
7/9/2017	10:24:31	0.012
7/9/2017	10:25:31	0.012
7/9/2017	10:26:31	0.01
7/9/2017	10:27:31	0.01
7/9/2017	10:28:31	0.009
7/9/2017	10:29:31	0.009
7/9/2017	10:30:31	0.009
7/9/2017	10:31:31	0.009
7/9/2017	10:32:31	0.009
7/9/2017	10:33:31	0.01
7/9/2017	10:34:31	0.009
7/9/2017	10:35:31	0.009
7/9/2017	10:36:31	0.009
7/9/2017	10:37:31	0.009
7/9/2017	10:38:31	0.009
7/9/2017	10:39:31	0.009
7/9/2017	10:40:31	0.009
7/9/2017	10:41:31	0.009
7/9/2017	10:42:31	0.008
7/9/2017	10:43:31	0.009
7/9/2017	10:44:31	0.009
7/9/2017	10:45:31	0.009
7/9/2017	10:46:31	0.009
7/9/2017	10:47:31	0.008

7/9/2017	10:48:31	0.011
7/9/2017	10:49:31	0.013
7/9/2017	10:50:31	0.01
7/9/2017	10:51:31	0.012
7/9/2017	10:52:31	0.018
7/9/2017	10:53:31	0.023
7/9/2017	10:54:31	0.017
7/9/2017	10:55:31	0.01
7/9/2017	10:56:31	0.01
7/9/2017	10:57:31	0.022
7/9/2017	10:58:31	0.012
7/9/2017	10:59:31	0.009
7/9/2017	11:00:31	0.012
7/9/2017	11:01:31	0.01
7/9/2017	11:02:31	0.009
7/9/2017	11:03:31	0.009
7/9/2017	11:04:31	0.009
7/9/2017	11:05:31	0.008
7/9/2017	11:06:31	0.008
7/9/2017	11:07:31	0.007
7/9/2017	11:08:31	0.008
7/9/2017	11:09:31	0.008
7/9/2017	11:10:31	0.008
7/9/2017	11:11:31	0.009
7/9/2017	11:12:31	0.009
7/9/2017	11:13:31	0.008
7/9/2017	11:14:31	0.008
7/9/2017	11:15:31	0.009
7/9/2017	11:16:31	0.008
7/9/2017	11:17:31	0.008
7/9/2017	11:18:31	0.019
7/9/2017	11:19:31	0.008
7/9/2017	11:20:31	0.008
7/9/2017	11:21:31	0.007
7/9/2017	11:22:31	0.008
7/9/2017	11:23:31	0.008
7/9/2017	11:24:31	0.007
7/9/2017	11:25:31	0.008
7/9/2017	11:26:31	0.007
7/9/2017	11:27:31	0.007
7/9/2017	11:28:31	0.007
7/9/2017	11:29:31	0.007
7/9/2017	11:30:31	0.007
7/9/2017	11:31:31	0.007
7/9/2017	11:32:31	0.008
7/9/2017	11:33:31	0.008
7/9/2017	11:34:31	0.008
7/9/2017	11:35:31	0.008
7/9/2017	11:36:31	0.007
7/9/2017	11:37:31	0.007
7/9/2017	11:38:31	0.007
7/9/2017	11:39:31	0.007
7/9/2017	11:40:31	0.007
7/9/2017	11:41:31	0.007
7/9/2017	11:42:31	0.008
7/9/2017	11:43:31	0.008
7/9/2017	11:44:31	0.008
7/9/2017	11:45:31	0.007

7/9/2017	11:46:31	0.007
7/9/2017	11:47:31	0.007
7/9/2017	11:48:31	0.007
7/9/2017	11:49:31	0.008
7/9/2017	11:50:31	0.007
7/9/2017	11:51:31	0.008
7/9/2017	11:52:31	0.007
7/9/2017	11:53:31	0.008
7/9/2017	11:54:31	0.007
7/9/2017	11:55:31	0.009
7/9/2017	11:56:31	0.008
7/9/2017	11:57:31	0.008
7/9/2017	11:58:31	0.008
7/9/2017	11:59:31	0.008
7/9/2017	12:00:31	0.025
7/9/2017	12:01:31	0.013
7/9/2017	12:02:31	0.008
7/9/2017	12:03:31	0.008
7/9/2017	12:04:31	0.007

# Upwind VOC CAMP Data



# Upwind VOC CAMP Data

National Grid - Non-Owned Former MGP Site - Rensselaer, New York

## PDI Summary Report

Location:	Upwind VOC			
Date of Monitoring:	1/14/2017			
MiniRAE 3000 (PGM7320)				
Data Points: 24		Sample Period: 900 sec		
Last Calibration Time: 1/13/2017 12:53:00 PM				
	Measurement Type:	Min(ppm)	Avg(ppm)	Max(ppm)
	High Alarm Levels:	100	100	100
	Low Alarm Levels:	50	50	50
Date	Time (hh:mm:ss)	Min(ppm)	Avg(ppm)	Max(ppm)
1/14/2017	10:29:12	0	0	0
1/14/2017	10:44:12	0	0.004	0.02
1/14/2017	10:59:12	0	0	0
1/14/2017	11:14:12	0	0	0
1/14/2017	11:29:12	0.003	0.088	0.186
1/14/2017	11:44:12	0	0.004	0.02
1/14/2017	11:59:12	0	0	0.007
1/14/2017	12:14:12	0	0	0
1/14/2017	12:29:12	0	0	0
1/14/2017	12:44:12	0	0.001	0.022
1/14/2017	12:59:12	0	0	0
1/14/2017	13:14:12	0	0.194	0.732
1/14/2017	13:29:12	0	0	0
1/14/2017	13:44:12	0	0	0
1/14/2017	13:59:12	0	0	0
1/14/2017	14:14:12	0	0	0
1/14/2017	14:29:12	0	0	0
1/14/2017	14:44:12	0	0	0
1/14/2017	14:59:12	0	0	0
1/14/2017	15:14:12	0	0.002	0.012
1/14/2017	15:29:12	0	0.003	0.03
1/14/2017	15:44:12	0	0.009	0.052
1/14/2017	15:59:12	0	0	0.001
1/14/2017	16:14:12	0	0	0.003

# Upwind VOC CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind VOC			
Date of Monitoring:	1/15/2017			
MiniRAE 3000 (PGM7320)				
Data Points: 38		Sample Period: 900 sec		
Last Calibration Time: 1/14/2017 4:22:00 PM				
	Measurement Type:	Min(ppm)	Avg(ppm)	Max(ppm)
	High Alarm Levels:	100	100	100
	Low Alarm Levels:	50	50	50
Date	Time (hh:mm:ss)	Min(ppm)	Avg(ppm)	Max(ppm)
1/15/2017	7:21:04	0	0	0
1/15/2017	7:36:04	0	0	0
1/15/2017	7:51:04	0	0	0
1/15/2017	8:06:04	0	0	0
1/15/2017	8:21:04	0	0.007	0.038
1/15/2017	8:36:04	0	0	0.002
1/15/2017	8:51:04	0	0	0
1/15/2017	9:06:04	0	0	0.022
1/15/2017	9:21:04	0	0.006	0.054
1/15/2017	9:36:04	0	0.021	0.069
1/15/2017	9:51:04	0.033	0.038	0.045
1/15/2017	10:06:04	0.008	0.009	0.011
1/15/2017	10:21:04	0.048	0.095	0.271
1/15/2017	10:36:04	0.014	0.019	0.061
1/15/2017	10:51:04	0.007	0.01	0.016
1/15/2017	11:06:04	0.006	0.014	0.034
1/15/2017	11:21:04	0	0.007	0.019
1/15/2017	11:36:04	0.04	0.057	0.087
1/15/2017	11:51:04	0.015	0.027	0.05
1/15/2017	12:06:04	0.007	0.016	0.058
1/15/2017	12:21:04	0.009	0.014	0.023
1/15/2017	12:36:04	0.016	0.023	0.038
1/15/2017	12:51:04	0.015	0.024	0.046
1/15/2017	13:06:04	0.016	0.042	0.067
1/15/2017	13:21:04	0.013	0.022	0.041
1/15/2017	13:36:04	0.015	0.03	0.071
1/15/2017	13:51:04	0.016	0.027	0.039
1/15/2017	14:06:04	0.014	0.017	0.022
1/15/2017	14:21:04	0.013	0.022	0.046
1/15/2017	14:36:04	0.015	0.019	0.028
1/15/2017	14:51:04	0.019	0.028	0.058
1/15/2017	15:06:04	0.022	0.053	0.122
1/15/2017	15:21:04	0.012	0.014	0.017
1/15/2017	15:36:04	0.009	0.042	0.287
1/15/2017	15:51:04	0.052	0.152	0.375
1/15/2017	16:06:04	0.064	0.07	0.088
1/15/2017	16:21:04	0.044	0.055	0.079
1/15/2017	16:36:04	0.039	0.054	0.089

# Upwind VOC CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind VOC			
Date of Monitoring:	1/16/2017			
MiniRAE 3000 (PGM7320)				
Data Points: 38		Sample Period: 900 sec		
Last Calibration Time: 1/15/2017 4:48:00 PM				
	Measurement Type:	Min(ppm)	Avg(ppm)	Max(ppm)
	High Alarm Levels:	100	100	100
	Low Alarm Levels:	50	50	50
Date	Time (hh:mm:ss)	Min(ppm)	Avg(ppm)	Max(ppm)
1/16/2017	7:01:14	0	0	0
1/16/2017	7:16:14	0	0	0
1/16/2017	7:31:14	0	0	0
1/16/2017	7:46:14	0.006	0.008	0.01
1/16/2017	8:01:14	0.017	0.019	0.022
1/16/2017	8:16:14	0.022	0.028	0.039
1/16/2017	8:31:14	0.022	0.024	0.027
1/16/2017	8:46:14	0.027	0.032	0.038
1/16/2017	9:01:14	0.085	0.151	0.316
1/16/2017	9:16:14	0.1	0.104	0.113
1/16/2017	9:31:14	0.09	0.099	0.133
1/16/2017	9:46:14	0.105	0.157	0.297
1/16/2017	10:01:14	0.092	0.109	0.137
1/16/2017	10:16:14	0.046	0.054	0.068
1/16/2017	10:31:14	0.194	0.282	0.43
1/16/2017	10:46:14	0.101	0.125	0.166
1/16/2017	11:01:14	0.059	0.073	0.104
1/16/2017	11:16:14	0.084	0.096	0.115
1/16/2017	11:31:14	0.062	0.139	0.231
1/16/2017	11:46:14	0.071	0.087	0.105
1/16/2017	12:01:14	0.066	0.071	0.075
1/16/2017	12:16:14	0.06	0.062	0.067
1/16/2017	12:31:14	0.105	0.13	0.155
1/16/2017	12:46:14	0.142	0.161	0.206
1/16/2017	13:01:14	0.125	0.13	0.139
1/16/2017	13:16:14	0.261	0.423	0.515
1/16/2017	13:31:14	0.107	0.122	0.151
1/16/2017	13:46:14	0.142	0.182	0.3
1/16/2017	14:01:14	0.108	0.134	0.189
1/16/2017	14:16:14	0.084	0.092	0.106
1/16/2017	14:31:14	0.122	0.15	0.176
1/16/2017	14:46:14	0.081	0.084	0.088
1/16/2017	15:01:14	0.078	0.094	0.114
1/16/2017	15:16:14	0.054	0.059	0.067
1/16/2017	15:31:14	0.05	0.051	0.053
1/16/2017	15:46:14	0.056	0.058	0.065
1/16/2017	16:01:14	0.05	0.05	0.052
1/16/2017	16:16:14	0.049	0.05	0.053

# Upwind VOC CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind VOC			
Date of Monitoring:	2/19/2017			
MiniRAE 3000 (PGM7320)				
Data Points: 24		Sample Period: 900 sec		
Last Calibration Time: 2/9/2017 9:25:00 AM				
	Measurement Type:	Min(ppm)	Avg(ppm)	Max(ppm)
	High Alarm Levels:	100	100	100
	Low Alarm Levels:	50	50	50
Date	Time (hh:mm:ss)	Min(ppm)	Avg(ppm)	Max(ppm)
2/19/2017	9:55:35	0	0.013	0.026
2/19/2017	10:10:35	0.045	0.066	0.087
2/19/2017	10:25:35	0.012	0.029	0.046
2/19/2017	10:40:35	0.059	0.08	0.101
2/19/2017	10:55:35	0.096	0.111	0.126
2/19/2017	11:10:35	0.116	0.136	0.156
2/19/2017	11:25:35	0.151	0.17	0.189
2/19/2017	11:40:35	0.12	0.147	0.174
2/19/2017	11:55:35	0.121	0.136	0.151
2/19/2017	12:10:35	0.099	0.136	0.173
2/19/2017	12:25:35	0.099	0.136	0.173
2/19/2017	12:40:35	0.087	0.124	0.161
2/19/2017	12:55:35	0.13	0.15	0.17
2/19/2017	13:10:35	0.118	0.152	0.186
2/19/2017	13:25:35	0.117	0.153	0.189
2/19/2017	13:40:35	0.117	0.154	0.191
2/19/2017	13:55:35	0.118	0.158	0.198
2/19/2017	14:10:35	0.115	0.193	0.271
2/19/2017	14:25:35	0.144	0.157	0.17
2/19/2017	14:40:35	0.115	0.13	0.145
2/19/2017	14:55:35	0.113	0.122	0.131
2/19/2017	15:10:35	0.112	0.132	0.152
2/19/2017	15:25:35	0.109	0.126	0.143
2/19/2017	15:40:35	0.125	0.139	0.153



# Upwind VOC CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Upwind VOC			
Date of Monitoring:	2/20/2017			
MiniRAE 3000 (PGM7320)				
Data Points: 22		Sample Period: 900 sec		
Last Calibration Time: 2/9/2017 9:25:00 AM				
	Measurement Type:	Min(ppm)	Avg(ppm)	Max(ppm)
	High Alarm Levels:	100	100	100
	Low Alarm Levels:	50	50	50
Date	Time (hh:mm:ss)	Min(ppm)	Avg(ppm)	Max(ppm)
2/20/2017	7:45:08	0.003	0.062	0.121
2/20/2017	8:00:08	0.089	0.1	0.111
2/20/2017	8:15:08	0.107	0.119	0.131
2/20/2017	8:30:08	0.131	0.143	0.155
2/20/2017	8:45:08	0.133	0.153	0.173
2/20/2017	9:00:08	0.139	0.158	0.177
2/20/2017	9:15:08	0.144	0.164	0.184
2/20/2017	9:30:08	0.164	0.177	0.19
2/20/2017	9:45:08	0.162	0.18	0.198
2/20/2017	10:00:08	0.172	0.189	0.206
2/20/2017	10:15:08	N/A	N/A	N/A
2/20/2017	10:30:08	N/A	N/A	N/A
2/20/2017	10:45:08	N/A	N/A	N/A
2/20/2017	11:00:08	N/A	N/A	N/A
2/20/2017	11:15:08	N/A	N/A	N/A
2/20/2017	11:30:08	N/A	N/A	N/A
2/20/2017	11:45:08	N/A	N/A	N/A
2/20/2017	12:00:08	0.117	0.126	0.135
2/20/2017	12:15:08	0.15	0.16	0.17
2/20/2017	12:30:08	0.139	0.155	0.171
2/20/2017	12:45:08	0.162	0.173	0.184
2/20/2017	13:00:08	0.156	0.17	0.184

# Downwind Dust CAMP Data



# Downwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Downwind Dust	
Date of Monitoring:	11/10/2016	
DustTrak II Model 8530		
Log Interval (mm:ss):	15:00	
Number of points:	29	
Statistics	Average:	0.005
	Minimum:	0.001
	Maximum:	0.01
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
11/10/2016	9:31:29	0.002
11/10/2016	9:46:29	0.001
11/10/2016	10:01:29	0.001
11/10/2016	10:16:29	0.002
11/10/2016	10:31:29	0.002
11/10/2016	10:46:29	0.003
11/10/2016	11:01:29	0.01
11/10/2016	11:16:29	0.004
11/10/2016	11:31:29	0.003
11/10/2016	11:46:29	0.005
11/10/2016	12:01:29	0.006
11/10/2016	12:16:29	0.008
11/10/2016	12:31:29	0.005
11/10/2016	12:46:29	0.005
11/10/2016	13:01:29	0.004
11/10/2016	13:16:29	0.006
11/10/2016	13:31:29	0.005
11/10/2016	13:46:29	0.005
11/10/2016	14:01:29	0.006
11/10/2016	14:16:29	0.007
11/10/2016	14:31:29	0.007
11/10/2016	14:46:29	0.007
11/10/2016	15:01:29	0.005
11/10/2016	15:16:29	0.009
11/10/2016	15:31:29	0.007
11/10/2016	15:46:29	0.005
11/10/2016	16:01:29	0.004
11/10/2016	16:16:29	0.004
11/10/2016	16:31:29	0.005

# Downwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Downwind Dust	
Date of Monitoring:	11/11/2016	
DustTrak II Model 8530		
Log Interval (mm:ss):	15:00	
Number of points:	24	
Statistics	Average:	0.004
	Minimum:	0
	Maximum:	0.015
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
11/11/2016	7:29:23	0.015
11/11/2016	7:44:23	0.013
11/11/2016	7:59:23	0.012
11/11/2016	9:11:50	0.011
11/11/2016	9:26:50	0.004
11/11/2016	9:41:50	0
11/11/2016	9:56:50	0
11/11/2016	10:11:50	0
11/11/2016	10:26:50	0
11/11/2016	10:41:50	0
11/11/2016	10:56:50	0
11/11/2016	11:11:50	0.001
11/11/2016	11:26:50	0
11/11/2016	11:41:50	0
11/11/2016	11:56:50	0
11/11/2016	12:11:50	0
11/11/2016	12:26:50	0
11/11/2016	12:41:50	0
11/11/2016	12:56:50	0
11/11/2016	13:11:50	0
11/11/2016	13:26:50	0.002
11/11/2016	13:41:50	0
11/11/2016	13:56:50	0.001
11/11/2016	14:11:50	0.001

## Downwind Dust CAMP Data

### National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Downwind Dust	
Date of Monitoring:	1/14/2017	
DustTrak II Model 8530		
Log Interval (mm:ss):	15:00	
Number of points:	23	
Statistics	Average:	0.016
	Minimum:	0.01
	Maximum:	0.06
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
1/14/2017	10:17:13	0.021
1/14/2017	10:32:13	0.01
1/14/2017	10:47:13	0.012
1/14/2017	11:02:13	0.01
1/14/2017	11:17:13	0.01
1/14/2017	11:32:13	0.011
1/14/2017	11:47:13	0.012
1/14/2017	12:02:13	0.012
1/14/2017	12:17:13	0.012
1/14/2017	12:32:13	0.012
1/14/2017	12:47:13	0.017
1/14/2017	13:02:13	0.012
1/14/2017	13:17:13	0.012
1/14/2017	13:32:13	0.013
1/14/2017	13:47:13	0.013
1/14/2017	14:02:13	0.013
1/14/2017	14:17:13	0.013
1/14/2017	14:32:13	0.012
1/14/2017	14:47:13	0.012
1/14/2017	15:02:13	0.012
1/14/2017	15:17:13	0.025
1/14/2017	15:32:13	0.031
1/14/2017	15:47:13	0.06

# Downwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Downwind Dust	
Date of Monitoring:	1/15/2017	
DustTrak II Model 8530		
Log Interval (mm:ss):	15:00	
Number of points:	38	
Statistics	Average:	0.025
	Minimum:	0.014
	Maximum:	0.036
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
1/15/2017	7:13:01	0.036
1/15/2017	7:28:01	0.028
1/15/2017	7:43:01	0.027
1/15/2017	7:58:01	0.026
1/15/2017	8:13:01	0.026
1/15/2017	8:28:01	0.03
1/15/2017	8:43:01	0.026
1/15/2017	8:58:01	0.025
1/15/2017	9:13:01	0.025
1/15/2017	9:28:01	0.029
1/15/2017	9:43:01	0.023
1/15/2017	9:58:01	0.025
1/15/2017	10:13:01	0.024
1/15/2017	10:28:01	0.025
1/15/2017	10:43:01	0.022
1/15/2017	10:58:01	0.022
1/15/2017	11:13:01	0.025
1/15/2017	11:28:01	0.028
1/15/2017	11:43:01	0.029
1/15/2017	11:58:01	0.025
1/15/2017	12:13:01	0.024
1/15/2017	12:28:01	0.025
1/15/2017	12:43:01	0.024
1/15/2017	12:58:01	0.023
1/15/2017	13:13:01	0.03
1/15/2017	13:28:01	0.031
1/15/2017	13:43:01	0.028
1/15/2017	13:58:01	0.02
1/15/2017	14:13:01	0.021
1/15/2017	14:28:01	0.036
1/15/2017	14:43:01	0.019
1/15/2017	14:58:01	0.017
1/15/2017	15:13:01	0.019
1/15/2017	15:28:01	0.029
1/15/2017	15:43:01	0.016
1/15/2017	15:58:01	0.016
1/15/2017	16:13:01	0.015
1/15/2017	16:28:01	0.014

# Downwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Downwind Dust	
Date of Monitoring:	1/16/2017	
DustTrak II Model 8530		
Log Interval (mm:ss):	15:00	
Number of points:	37	
Statistics	Average:	0.029
	Minimum:	0.022
	Maximum:	0.07
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
1/16/2017	6:55:19	0.07
1/16/2017	7:10:19	0.032
1/16/2017	7:25:19	0.034
1/16/2017	7:40:19	0.039
1/16/2017	7:55:19	0.038
1/16/2017	8:10:19	0.036
1/16/2017	8:25:19	0.037
1/16/2017	8:40:19	0.037
1/16/2017	8:55:19	0.036
1/16/2017	9:10:19	0.033
1/16/2017	9:25:19	0.03
1/16/2017	9:40:19	0.029
1/16/2017	9:55:19	0.031
1/16/2017	10:10:19	0.028
1/16/2017	10:25:19	0.028
1/16/2017	10:40:19	0.029
1/16/2017	10:55:19	0.025
1/16/2017	11:10:19	0.025
1/16/2017	11:25:19	0.025
1/16/2017	11:40:19	0.025
1/16/2017	11:55:19	0.023
1/16/2017	12:10:19	0.025
1/16/2017	12:25:19	0.025
1/16/2017	12:40:19	0.024
1/16/2017	12:55:19	0.024
1/16/2017	13:10:19	0.024
1/16/2017	13:25:19	0.024
1/16/2017	13:40:19	0.023
1/16/2017	13:55:19	0.023
1/16/2017	14:10:19	0.023
1/16/2017	14:25:19	0.023
1/16/2017	14:40:19	0.023
1/16/2017	14:55:19	0.023
1/16/2017	15:10:19	0.022
1/16/2017	15:25:19	0.023
1/16/2017	15:40:19	0.023
1/16/2017	15:55:19	0.024

# Downwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Downwind Dust	
Date of Monitoring:	2/19/2017	
DustTrak II Model 8533		
Log Interval (mm:ss):	15:00	
Number of points:	20	
Statistics	Average:	0.02
	Minimum:	0.012
	Maximum:	0.042
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
2/19/2017	10:15:46	0.042
2/19/2017	10:30:46	0.033
2/19/2017	10:45:46	0.034
2/19/2017	11:00:46	0.035
2/19/2017	11:15:46	0.023
2/19/2017	11:30:46	0.012
2/19/2017	11:45:46	0.012
2/19/2017	12:00:46	0.012
2/19/2017	12:15:46	0.012
2/19/2017	12:30:46	0.012
2/19/2017	12:45:46	0.017
2/19/2017	13:00:46	0.012
2/19/2017	13:15:46	0.013
2/19/2017	13:30:46	0.013
2/19/2017	13:45:46	0.023
2/19/2017	14:00:46	0.033
2/19/2017	14:15:46	0.032
2/19/2017	14:30:46	0.013
2/19/2017	14:45:46	0.013
2/19/2017	15:00:46	0.012



# Downwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Downwind Dust	
Date of Monitoring:	2/20/2017	
DustTrak II Model 8533		
Log Interval (mm:ss):	15:00	
Number of points:	25	
Statistics	Average:	0.016
	Minimum:	0.011
	Maximum:	0.023
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
2/20/2017	8:03:40	0.011
2/20/2017	8:18:40	0.013
2/20/2017	8:33:40	0.012
2/20/2017	8:48:40	0.016
2/20/2017	9:03:40	0.02
2/20/2017	9:18:40	0.023
2/20/2017	9:33:40	0.021
2/20/2017	9:48:40	0.021
2/20/2017	10:03:40	0.021
2/20/2017	10:18:40	0.019
2/20/2017	10:33:40	0.017
2/20/2017	10:48:40	0.018
2/20/2017	11:03:40	0.018
2/20/2017	11:18:40	0.019
2/20/2017	11:33:40	0.015
2/20/2017	11:48:40	0.015
2/20/2017	12:03:40	0.015
2/20/2017	12:18:40	0.015
2/20/2017	12:33:40	0.014
2/20/2017	12:48:40	0.013
2/20/2017	13:03:40	0.015
2/20/2017	13:18:40	0.016
2/20/2017	13:33:40	0.011
2/20/2017	13:48:40	0.012
2/20/2017	14:03:40	0.011

# Downwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Downwind Dust	
Date of Monitoring:	7/8/2017	
DustTrak II Model 8533		
Log Interval (mm:ss):	15:00	
Number of points:	13	
Statistics	Average:	0.009
	Minimum:	0.003
	Maximum:	0.013
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
7/8/2017	11:50:24	0.012
7/8/2017	12:05:24	0.006
7/8/2017	12:20:24	0.006
7/8/2017	12:35:24	0.008
7/8/2017	12:50:24	0.003
7/8/2017	13:05:24	0.01
7/8/2017	13:20:24	0.012
7/8/2017	13:35:24	0.011
7/8/2017	13:50:24	0.011
7/8/2017	14:05:24	0.01
7/8/2017	14:20:24	0.01
7/8/2017	14:35:24	0.011
7/8/2017	14:50:24	0.013

# Downwind Dust CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Downwind Dust	
Date of Monitoring:	7/9/2017	
DustTrak II Model 8533		
Log Interval (mm:ss):	15:00	
Number of points:	14	
Statistics	Average:	0.018
	Minimum:	0.013
	Maximum:	0.024
Date	Time (hh:mm:ss)	Aerosol (mg/m <sup>3</sup> )
7/9/2017	7:17:42	0.022
7/9/2017	7:32:42	0.024
7/9/2017	7:47:42	0.024
7/9/2017	8:02:42	0.021
7/9/2017	8:17:42	0.02
7/9/2017	8:32:42	0.021
7/9/2017	8:47:42	0.019
7/9/2017	9:02:42	0.019
7/9/2017	10:20:58	0.018
7/9/2017	10:35:58	0.013
7/9/2017	10:50:58	0.014
7/9/2017	11:05:58	0.017
7/9/2017	11:20:58	0.015
7/9/2017	11:35:58	0.014

# Downwind VOC CAMP Data



# Downwind VOC CAMP Data

National Grid - Non-Owned Former MGP Site - Rensselaer, New York

## PDI Summary Report

Location:	Downwind VOC			
Date of Monitoring:	1/14/2017			
MiniRAE 3000 (PGM7320)				
Data Points: 24		Sample Period: 900 sec		
Last Calibration Time: 1/13/2017 12:46:00 PM				
	Measurement Type:	Min(ppm)	Avg(ppm)	Max(ppm)
	High Alarm Levels:	100	100	100
	Low Alarm Levels:	50	50	50
Date	Time (hh:mm:ss)	Min(ppm)	Avg(ppm)	Max(ppm)
1/14/2017	10:23:56	0	0	0
1/14/2017	10:38:56	0.063	0.103	0.19
1/14/2017	10:53:56	0.241	0.32	0.466
1/14/2017	11:08:56	0.375	0.392	0.417
1/14/2017	11:23:56	0.357	0.363	0.371
1/14/2017	11:38:56	0.369	0.378	0.388
1/14/2017	11:53:56	0.388	0.411	0.438
1/14/2017	12:08:56	0.397	0.401	0.406
1/14/2017	12:23:56	0.317	0.324	0.338
1/14/2017	12:38:56	0.239	0.244	0.253
1/14/2017	12:53:56	0.204	0.217	0.291
1/14/2017	13:08:56	0.202	0.216	0.233
1/14/2017	13:23:56	0.188	0.194	0.201
1/14/2017	13:38:56	0.199	0.207	0.215
1/14/2017	13:53:56	0.22	0.24	0.277
1/14/2017	14:08:56	0.248	0.255	0.263
1/14/2017	14:23:56	0.282	0.289	0.306
1/14/2017	14:38:56	0.251	0.255	0.262
1/14/2017	14:53:56	0.266	0.272	0.285
1/14/2017	15:08:56	0.288	0.295	0.302
1/14/2017	15:23:56	0.295	0.308	0.342
1/14/2017	15:38:56	0.37	0.53	0.789
1/14/2017	15:53:56	0.33	0.428	0.629
1/14/2017	16:08:56	0.341	0.348	0.356

# Downwind VOC CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Downwind VOC			
Date of Monitoring:	1/15/2017			
MiniRAE 3000 (PGM7320)				
Data Points: 38		Sample Period: 900 sec		
Last Calibration Time: 1/14/2017 4:19:00 PM				
	Measurement Type:	Min(ppm)	Avg(ppm)	Max(ppm)
	High Alarm Levels:	100	100	100
	Low Alarm Levels:	50	50	50
Date	Time (hh:mm:ss)	Min(ppm)	Avg(ppm)	Max(ppm)
1/15/2017	7:16:06	0.002	0.002	0.002
1/15/2017	7:31:06	0.002	0.002	0.002
1/15/2017	7:46:06	0.002	0.002	0.002
1/15/2017	8:01:06	0.002	0.002	0.002
1/15/2017	8:16:06	0.002	0.002	0.002
1/15/2017	8:31:06	0.002	0.002	0.002
1/15/2017	8:46:06	0.002	0.002	0.002
1/15/2017	9:01:06	0.002	0.002	0.002
1/15/2017	9:16:06	0.002	0.002	0.002
1/15/2017	9:31:06	0.002	0.006	0.062
1/15/2017	9:46:06	0.001	0.002	0.003
1/15/2017	10:01:06	0.005	0.007	0.009
1/15/2017	10:16:06	0.014	0.023	0.048
1/15/2017	10:31:06	0.02	0.028	0.034
1/15/2017	10:46:06	0.009	0.013	0.024
1/15/2017	11:01:06	0.018	0.039	0.068
1/15/2017	11:16:06	0.017	0.027	0.038
1/15/2017	11:31:06	0.021	0.024	0.034
1/15/2017	11:46:06	0.021	0.026	0.034
1/15/2017	12:01:06	0.023	0.027	0.031
1/15/2017	12:16:06	0.024	0.025	0.027
1/15/2017	12:31:06	0.038	0.042	0.047
1/15/2017	12:46:06	0.037	0.047	0.061
1/15/2017	13:01:06	0.031	0.034	0.04
1/15/2017	13:16:06	0.052	0.119	0.285
1/15/2017	13:31:06	0.044	0.05	0.058
1/15/2017	13:46:06	0.04	0.044	0.053
1/15/2017	14:01:06	0.041	0.041	0.045
1/15/2017	14:16:06	0.05	0.059	0.077
1/15/2017	14:31:06	0.047	0.062	0.084
1/15/2017	14:46:06	0.044	0.052	0.062
1/15/2017	15:01:06	0.043	0.048	0.061
1/15/2017	15:16:06	0.043	0.044	0.059
1/15/2017	15:31:06	0.045	0.072	0.433
1/15/2017	15:46:06	0.047	0.048	0.049
1/15/2017	16:01:06	0.049	0.05	0.052
1/15/2017	16:16:06	0.049	0.052	0.055
1/15/2017	16:31:06	0.053	0.054	0.056

# Downwind VOC CAMP Data

National Grid - Non-Owned Former MGP Site - Rensselaer, New York

## PDI Summary Report

Location:	Downwind VOC			
Date of Monitoring:	1/16/2017			
MiniRAE 3000 (PGM7320)				
Data Points: 38		Sample Period: 900 sec		
Last Calibration Time: 1/15/2017 4:47:00 PM				
	Measurement Type:	Min(ppm)	Avg(ppm)	Max(ppm)
	High Alarm Levels:	100	100	100
	Low Alarm Levels:	50	50	50
Date	Time (hh:mm:ss)	Min(ppm)	Avg(ppm)	Max(ppm)
1/16/2017	6:55:25	0	0	0
1/16/2017	7:10:25	0	0	0
1/16/2017	7:25:25	0	0	0
1/16/2017	7:40:25	0	0	0
1/16/2017	7:55:25	0	0	0
1/16/2017	8:10:25	0	0	0
1/16/2017	8:25:25	0	0	0
1/16/2017	8:40:25	0	0	0
1/16/2017	8:55:25	0.033	0.044	0.062
1/16/2017	9:10:25	0.046	0.048	0.05
1/16/2017	9:25:25	0.028	0.03	0.033
1/16/2017	9:40:25	0.013	0.014	0.016
1/16/2017	9:55:25	0.011	0.026	0.036
1/16/2017	10:10:25	0	0.003	0.009
1/16/2017	10:25:25	0.007	0.009	0.013
1/16/2017	10:40:25	0.013	0.015	0.017
1/16/2017	10:55:25	0.004	0.006	0.009
1/16/2017	11:10:25	0.002	0.003	0.005
1/16/2017	11:25:25	0.006	0.008	0.012
1/16/2017	11:40:25	0.009	0.009	0.011
1/16/2017	11:55:25	0.021	0.022	0.023
1/16/2017	12:10:25	0.019	0.019	0.022
1/16/2017	12:25:25	0.027	0.028	0.031
1/16/2017	12:40:25	0.031	0.033	0.034
1/16/2017	12:55:25	0.032	0.034	0.037
1/16/2017	13:10:25	0.032	0.036	0.041
1/16/2017	13:25:25	0.034	0.035	0.037
1/16/2017	13:40:25	0.041	0.042	0.047
1/16/2017	13:55:25	0.048	0.05	0.054
1/16/2017	14:10:25	0.044	0.046	0.048
1/16/2017	14:25:25	0.044	0.045	0.049
1/16/2017	14:40:25	0.049	0.052	0.057
1/16/2017	14:55:25	0.053	0.054	0.055
1/16/2017	15:10:25	0.059	0.061	0.062
1/16/2017	15:25:25	0.056	0.057	0.058
1/16/2017	15:40:25	0.056	0.057	0.058
1/16/2017	15:55:25	0.06	0.061	0.063
1/16/2017	16:10:25	0.063	0.064	0.065

# Downwind VOC CAMP Data

## National Grid - Non-Owned Former MGP Site - Rensselaer, New York PDI Summary Report

Location:	Downwind VOC			
Date of Monitoring:	2/19/2017			
MiniRAE 3000 (PGM7600)				
Data Points: 24		Sample Period: 900 sec		
Last Calibration Time: 2/17/2017 11:24:00 AM				
	Measurement Type:	Min(ppm)	Avg(ppm)	Max(ppm)
	High Alarm Levels:	100	100	100
	Low Alarm Levels:	50	50	50
Date	Time (hh:mm:ss)	Min(ppm)	Avg(ppm)	Max(ppm)
2/19/2017	9:51:54	0	0	0
2/19/2017	10:06:54	0	0	0
2/19/2017	10:21:54	0	0	0
2/19/2017	10:36:54	0	0	0
2/19/2017	10:51:54	0	0	0
2/19/2017	11:06:54	0	0	0
2/19/2017	11:21:54	0	0	0
2/19/2017	11:36:54	0	0	0
2/19/2017	11:51:54	0	0	0
2/19/2017	12:06:54	0	0	0
2/19/2017	12:21:54	0	0	0
2/19/2017	12:36:54	0	0	0
2/19/2017	12:51:54	0	0	0
2/19/2017	13:06:54	0	0	0
2/19/2017	13:21:54	0	0	0
2/19/2017	13:36:54	0	0	0
2/19/2017	13:51:54	0	0	0
2/19/2017	14:06:54	0	0	0
2/19/2017	14:21:54	0	0	0
2/19/2017	14:36:54	0	0	0
2/19/2017	14:51:54	0	0	0
2/19/2017	15:06:54	0	0	0
2/19/2017	15:21:54	0	0	0
2/19/2017	15:36:54	0	0	0



# Downwind VOC CAMP Data

National Grid - Non-Owned Former MGP Site - Rensselaer, New York

## PDI Summary Report

Location:	Downwind VOC			
Date of Monitoring:	2/20/2017			
MiniRAE 3000 (PGM7600)				
Data Points: 22		Sample Period: 900 sec		
Last Calibration Time: 2/17/2017 11:24:00 AM				
	Measurement Type:	Min(ppm)	Avg(ppm)	Max(ppm)
	High Alarm Levels:	100	100	100
	Low Alarm Levels:	50	50	50
Date	Time (hh:mm:ss)	Min(ppm)	Avg(ppm)	Max(ppm)
2/20/2017	7:43:36	0	0	0
2/20/2017	7:58:36	0	0	0
2/20/2017	8:13:36	0	0	0
2/20/2017	8:28:36	0	0	0
2/20/2017	8:43:36	0	0	0
2/20/2017	8:58:36	0	0	0
2/20/2017	9:13:36	0	0	0
2/20/2017	9:28:36	0	0	0
2/20/2017	9:43:36	0	0	0
2/20/2017	9:58:36	0	0	0
2/20/2017	10:13:36	0	0	0
2/20/2017	10:28:36	0	0	0
2/20/2017	10:43:36	0	0	0
2/20/2017	10:58:36	0	0	0
2/20/2017	11:13:36	0	0	0
2/20/2017	11:28:36	0	0	0
2/20/2017	11:43:36	0	0	0
2/20/2017	11:58:36	0	0	0
2/20/2017	12:13:36	0	0	0
2/20/2017	12:28:36	0	0	0
2/20/2017	12:43:36	0	0	0
2/20/2017	12:58:36	0	0	0

## Air Monitoring Documentation Form

PID Model: \_\_\_\_\_

Monitor Frequency: EVERY HOUR / WHEN ABLE

LEL/O<sub>2</sub> Model:

CIT Model: \_\_\_\_\_

Dust Mon. Model: \_\_\_\_\_

### Air Monitoring Results

[illegible]

PID	Photoionization Detector
LEL	Lower Explosive Limit
O2	Oxygen
CIT	Colorimetric Indicator Tube

ppm  
%  
mg/m3

Part per million  
Percent  
Miligram per cubic meter

# ATTACHMENT 2 - CORRESPONDENCE FROM OPRHP/THE OFFICE OF INDIAN NATIONS AFFAIRS



# OPRHP Response Letter





## Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO  
Governor

ROSE HARVEY  
Commissioner

November 03, 2016

Mr. David Rodriguez  
Arcadis of New York, Inc.  
6723 Towpath Road  
PO Box 66  
Syracuse, NY 13214

Re: DEC  
Rensselaer Manufactured Gas Plant Remediation  
City of Rensselaer, Rensselaer County  
13PR01012

Dear Mr. Rodriguez:

Thank you for requesting the comments of the Division for Historic Preservation of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the submitted materials in accordance with the New York State Historic Preservation Act of 1980 (section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8) and its implementing regulations (6NYCRR Part 617).

OPRHP has received additional documentation regarding the proposed remedial action at the above-referenced project area, based on the Voluntary Cleanup Program Decision Document (September 2015). Given the limits of the areas of ground disturbance described in the submitted materials, this office recommends that the planned actions will have **No Impact** on historic properties listed or eligible for listing on the State and National Registers of Historic Places. This recommendation pertains only to the actions described in the submitted materials. Should the project design change, we recommend further consultation with this office.

If you have any questions please don't hesitate to contact me.

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit  
Phone: 518-268-2175  
e-mail: [philip.perazio@parks.ny.gov](mailto:philip.perazio@parks.ny.gov)

via email only

cc: Charles Vandrei and David Witt, DEC  
James Morgan, National Grid

---

### Division for Historic Preservation

P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • [www.nysparks.com](http://www.nysparks.com)

# OINA Response Letter



## Rodriguez Alcocer, David

---

**From:** Witt, David E (DEC) <david.witt@dec.ny.gov>  
**Sent:** Friday, November 4, 2016 12:59 PM  
**To:** Rodriguez Alcocer, David  
**Cc:** Golubski, Jason  
**Subject:** RE: Project we discussed over the phone yesterday

Thanks for following up, David. And yes, please contact me in case the project design changes.

Have a good weekend.



### David E. Witt, Ph.D.

Indian Nations Affairs Coordinator, Office of Environmental Justice

#### New York State Department of Environmental Conservation

625 Broadway, Albany, NY 12233-1500

P: (518) 402-9512 | F: (518) 402-9018 | david.witt@dec.ny.gov

[www.dec.ny.gov](http://www.dec.ny.gov) |  | 

---

**From:** Rodriguez Alcocer, David [mailto:david.rodriquez@arcadis.com]  
**Sent:** Friday, November 04, 2016 12:57 PM  
**To:** Witt, David E (DEC) <david.witt@dec.ny.gov>  
**Cc:** Golubski, Jason <Jason.Golubski@arcadis.com>  
**Subject:** RE: Project we discussed over the phone yesterday

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David,

I want to thank you expediting the review of our submittal for the National Grid site located in Rensselaer, NY (Project Review # 13PR01012).

Based on our phone conversation on Thursday November 3, 2016, Native American consultation will not be required given the limits of the areas of ground disturbance described in the submitted materials. Arcadis will consult with your office should the project design changes.

Please respond to this email to confirm the above for my records.

Thank you in advance and have a nice weekend,

David

**David Rodriguez, PhD** | Staff Environmental Engineer | [david.rodriquez@arcadis.com](mailto:david.rodriquez@arcadis.com)  
**Arcadis of New York, Inc.** | 6723 Towpath Road, PO Box 66, Syracuse, NY | 13214 | USA  
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---

**From:** Witt, David E (DEC) [<mailto:david.witt@dec.ny.gov>]  
**Sent:** Wednesday, October 26, 2016 8:14 AM  
**To:** Rodriguez Alcocer, David <[david.rodriquez@arcadis.com](mailto:david.rodriquez@arcadis.com)>  
**Subject:** Project we discussed over the phone yesterday

David,

I checked CRIS and didn't notice any new projects, so I wanted to send you an email just to ensure you have the correct email. Alternatively, you can email them to me here. I believe I have a 30 mb limit on attachments.

Thanks.

**David E. Witt, Ph.D.**

Indian Nations Affairs Coordinator, Office of Environmental Justice

**New York State Department of Environmental Conservation**

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P: (518) 402-9512 | F: (518) 402-9018 | [david.witt@dec.ny.gov](mailto:david.witt@dec.ny.gov)

[www.dec.ny.gov](http://www.dec.ny.gov) |  | 

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# ATTACHMENT 3 - WELL DECOMMISSIONING LOGS



**FIGURE 3**  
**WELL DECOMMISSIONING RECORD**

Site Name: <b>NG Former MGP Site</b>	Well I.D.: <b>MW-102-05</b>
Site Location: <b>Rensselaer, New York</b>	Driller: <b>Layne Pech</b>
Drilling Co.: <b>Parratt-Wolff, Inc.</b>	Inspector:
	Date: <b>1/14/17</b>

DECOMMISSIONING DATA (Fill in all that apply)	WELL SCHEMATIC*																																																
<p><b><u>OVERDRILLING</u></b></p> <table style="width: 100%;"> <tr><td>Interval Drilled</td><td style="text-align: center;">NA</td></tr> <tr><td>Drilling Method(s)</td><td style="text-align: center;">NA</td></tr> <tr><td>Borehole Dia. (in.)</td><td style="text-align: center;">NA</td></tr> <tr><td>Temporary Casing Installed? (y/n)</td><td style="text-align: center;">N</td></tr> <tr><td>Depth temporary casing installed</td><td style="text-align: center;">NA</td></tr> <tr><td>Casing type/dia. (in.)</td><td style="text-align: center;">NA</td></tr> <tr><td>Method of installing</td><td style="text-align: center;">NA</td></tr> </table> <p><b><u>CASING PULLING</u></b></p> <table style="width: 100%;"> <tr><td>Method employed</td><td style="text-align: center;">Cut &amp; Pull</td></tr> <tr><td>Casing retrieved (feet)</td><td style="text-align: center;">5.0'</td></tr> <tr><td>Casing type/dia. (in)</td><td style="text-align: center;">PVC / 2"</td></tr> </table> <p><b><u>CASING PERFORATING</u></b></p> <table style="width: 100%;"> <tr><td>Equipment used</td><td style="text-align: center;">NA</td></tr> <tr><td>Number of perforations/foot</td><td style="text-align: center;">NA</td></tr> <tr><td>Size of perforations</td><td style="text-align: center;">NA</td></tr> <tr><td>Interval perforated</td><td style="text-align: center;">NA</td></tr> </table> <p><b><u>GROUTING</u></b></p> <table style="width: 100%;"> <tr><td>Interval grouted (FBLs)</td><td style="text-align: center;">0 - 20</td></tr> <tr><td># of batches prepared</td><td style="text-align: center;">1</td></tr> <tr><td colspan="2">For each batch record:</td></tr> <tr><td>Quantity of water used (gal.)</td><td style="text-align: center;">19.5</td></tr> <tr><td>Quantity of cement used (lbs.)</td><td style="text-align: center;">235</td></tr> <tr><td>Cement type</td><td style="text-align: center;">Portland</td></tr> <tr><td>Quantity of bentonite used (lbs.)</td><td style="text-align: center;">10</td></tr> <tr><td>Quantity of calcium chloride used (lbs.)</td><td style="text-align: center;">NA</td></tr> <tr><td>Volume of grout prepared (gal.)</td><td style="text-align: center;">25</td></tr> <tr><td>Volume of grout used (gal.)</td><td style="text-align: center;">5</td></tr> </table>	Interval Drilled	NA	Drilling Method(s)	NA	Borehole Dia. (in.)	NA	Temporary Casing Installed? (y/n)	N	Depth temporary casing installed	NA	Casing type/dia. (in.)	NA	Method of installing	NA	Method employed	Cut & Pull	Casing retrieved (feet)	5.0'	Casing type/dia. (in)	PVC / 2"	Equipment used	NA	Number of perforations/foot	NA	Size of perforations	NA	Interval perforated	NA	Interval grouted (FBLs)	0 - 20	# of batches prepared	1	For each batch record:		Quantity of water used (gal.)	19.5	Quantity of cement used (lbs.)	235	Cement type	Portland	Quantity of bentonite used (lbs.)	10	Quantity of calcium chloride used (lbs.)	NA	Volume of grout prepared (gal.)	25	Volume of grout used (gal.)	5	<p style="text-align: center;">Depth (feet)</p>
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Drilling Contractor

Department Representative

**FIGURE 3**  
**WELL DECOMMISSIONING RECORD**

Site Name: <b>NG Former MGP Site</b>	Well I.D.: <b>MW-103-05</b>
Site Location: <b>Rensselaer, New York</b>	Driller: <b>Layne Pech</b>
Drilling Co.: <b>Parratt-Wolff, Inc.</b>	Inspector:
	Date: <b>1/14/17</b>

DECOMMISSIONING DATA (Fill in all that apply)	WELL SCHEMATIC*																																																
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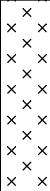

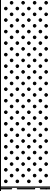




Drilling Contractor


Department Representative

**ATTACHMENT 4 - SOIL BORING/WELL  
CONSTRUCTION LOGS**



<b>Date Start/Finish:</b> 1/15-16/17 <b>Drilling Company:</b> Parratt-Wolfe <b>Driller's Name:</b> Glenn Lansing <b>Drilling Method:</b> HSA <b>Auger Size:</b> 4.25" (ID), 8.3" (OD) <b>Rig Type:</b> CME-55 <b>Sampling Method:</b> 2" SS Sampler/3" RC	<b>Northing:</b> 1387683.87 <b>Easting:</b> 695301.00 <b>Casing Elevation:</b> NA  <b>Borehole Depth:</b> 24.2 ft bgs <b>Surface Elevation:</b> NA  <b>Descriptions By:</b> Lacey Pitman	<b>Well/Boring ID:</b> B-134  <b>Client:</b> National Grid  <b>Location:</b> 89 Washington St, Rensselaer, NY
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0									
		NA	HC	NA	NA	NA	0.0		Asphalt surface	 Borehole backfilled with Bentonite to grade
									Brown, FILL, moist	
									Brown, CLAY, some f. Sand and Silt, trace brick (fragments), soft, loose, moist	
-5	-5	S-1	SS	1	1-1	1	0.0		Brown, Clayey f. SAND, trace Silt, loose, low plasticity, very loose to loose, moist	
		S-2	SS	1.5	1-2 2-3	4	0.0			
		S-3	SS	1.4	3-4 4-3	8	0.0		Brown, CLAY, trace Silt, soft, low plasticity, medium stiff, moist	
-10	-10								Greenish Gray, m.f. SAND, trace Silt, loose, wet	
		S-4	SS	0.4	3-3 5-5	8	0.0			
		S-5	SS	2	5-5 5-6	10	0.0		moist @ 12 ft	
									Brownish-orange, f. SAND, trace Silt and Clay, medium dense, moist	
-15	-15	S-6	SS	1	6-7 9-11	16	0.0		trace f. Gravel	

	<b>Remarks:</b> bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; HSA = Hollow Stem Auger; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5 ft, remaining depths were cleared by a HSA. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot.			<b>Water Level Data</b>		
				<b>Date</b>	<b>Depth</b>	<b>Elev.</b>
				1/15/17	*9.1	NA
				*Depth measured from bgs (ft)		
				Depth measured from top of casing		

Client: National Grid

Well/Boring ID: B-134

## Site Location:

Borehole Depth: 24.2 ft bgs

89 Washington St, Rensselaer, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
20	-20	S-7	SS	1.3	25-30 31-37	>50	0.0		Brownish-orange, Silty, clayey cmf SAND, little gravel, very dense, moist	Borehole backfilled with Bentonite to grade
		S-8	SS	0.9	38 50/4"	>50	0.0		trace f. Gravel	
		S-9	SS	1.3	25-35 50/4"	>50	0.0		Gray, Silty, Clayey cmf SAND, little gravel (subrounded, poorly sorted) (TILL), very dense, moist	
		S-10	SS	0.9	31- 50/4"	>50	0.0			
		S-11	SS	0.2	50/2"	>50	0.0		Dark gray, Shale (fragments), fissile	
									Split spoon and auger refusal at 24.2 ft bgs.	
25	-25									
30	-30									
35	-35									

## Remarks:

bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; HSA = Hollow Stem Auger; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5 ft, remaining depths were cleared by a HSA. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot.


## Water Level Data

Date	Depth	Elev.
1/15/17	*9.1	NA
*Depth measured from bgs (ft)		
Depth measured from top of casing		



<b>Date Start/Finish:</b> 1/14-17/17 <b>Drilling Company:</b> Parratt-Wolfe <b>Driller's Name:</b> Layne Pech <b>Drilling Method:</b> Hollow Stem Auger <b>Auger Size:</b> 4.25" (ID), 8.13" (OD) <b>Rig Type:</b> CME-55 <b>Sampling Method:</b> 2" SS Sampler	<b>Northing:</b> 1387622.69 <b>Easting:</b> 695365.21 <b>Casing Elevation:</b> 15.27 ft AMSL  <b>Borehole Depth:</b> 24.2 ft bgs <b>Surface Elevation:</b> 15.55 ft AMSL  <b>Descriptions By:</b> Molly Barker	<b>Well/Boring ID:</b> MW-118/B-135  <b>Client:</b> National Grid  <b>Location:</b> 89 Washington St, Rensselaer, NY
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0									
		NA	HC	NA	NA	NA			Asphalt	Steel Flush Mount (8" Diameter)
							1.5	x x x	Brown, FILL, weak cementation, soft, moist	2" Locking J-Plug
							3.6	x x x		Concrete Pad
							0.7	x x x	Red, BRICK (fragmented), some fill (brown), soft, dry	#2 Sand Drain
							2.9	x x x	Brown FILL, some Clay, trace Silt, very soft, moist	
-5	-5						4.2	x x x	wet @ 5 ft bgs	Grout
		S-1	SS	2.0	4-4 8-15	12	13		Brown, Sandy Silty Clay, stiff to soft, low plasticity, wet	2" Diameter Schedule 40 PVC Riser (0.5-12 ft bgs)
		S-2	SS	2.0	2-4 6-6	10	1.1			Medium Grade Chips (8-10 ft bgs)
-10	-10	S-3	SS	1.5	3-3 3-6	6	2.3		Iridescent sheen @ 11 ft bgs, medium stiff	
		S-4	SS	1.5	3-5 7-6	12	NA		Brown, CLAY, trace Silt, iridescent sheen, stiff, wet	#2 Sand (10-22 ft bgs)
-15	-15	S-5	SS	1.6	4-4 9-14	13	416		Brown, Sandy CLAY, some cmf. Gravel, stiff, iridescent sheen, wet	0.02" slot, 2" Diameter Schedule 40 PVC Screen (12-22 ft bgs)

 <b>ARCADIS</b>   Design & Consultancy for natural and built assets	<b>Remarks:</b> AMSL = Above Mean Sea Level; bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-6 ft. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot. Development of Well - Completed on 1/14/17; 30 gallons removed; tagged bottom of well: 23.52 ft bgs	<b>Water Level Data</b>		
		<b>Date</b>	<b>Depth</b>	<b>Elev.</b>
		1/15/17	*5.00	NA
		1/17/17	6.19	9.08
		*Depth measured from bgs (ft)		
		Depth measured from top of casing		

Client: National Grid

Well/Boring ID: MW-118/B-135

## Site Location:

89 Washington St, Rensselaer, NY

Borehole Depth: 24.2 ft bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
20	-20	S-6	SS	0.9	21-38 39-55	>50	697		Brown, Sandy CLAY, trace Sand and Silt, stiff to hard, iridescent sheen, strong tar-like odor, wet to moist	<p>0.02" slot, 2" Diameter Schedule 40 PVC Screen (12-22 ft bgs) #2 Sand (10-22 ft bgs) SUMP (22-24 ft bgs) Medium Grade Chips (22-24.2 ft bgs)</p>
		S-7	SS	1.5	17-50 55	>50	148		Brown, f. SAND and f. GRAVEL, trace Silt, very dense, iridescent sheen, strong tar-like odor, moist	
		S-8	SS	1.5	28-53 53	>50	216		Red to gray, Sandy CLAY, hard, iridescent sheen, wet to moist	
		S-9	SS	1.2	20-31 50/2"	>50	55		Black to gray, CLAY, hard, moist	
		S-10	SS	0.2	100/ 0.2 ft	>50	NA		Dark gray, f. CLAY, shale (fragments)	
25	-25								Refusal at 24.2 ft bgs. End of boring at 24.2 ft bgs.	
30	-30									
35	-35									

## Remarks:

AMSL = Above Mean Sea Level; bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-6 ft. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot. Development of Well - Completed on 1/14/17; 30 gallons removed; tagged bottom of well: 23.52 ft bgs

## Water Level Data

Date	Depth	Elev.
1/15/17	*5.00	NA
1/17/17	6.19	9.08
*Depth measured from bgs (ft)		
Depth measured from top of casing		






<b>Date Start/Finish:</b> 1/14-16/17 <b>Drilling Company:</b> Parratt-Wolfe <b>Driller's Name:</b> Layne Pach <b>Drilling Method:</b> HSA <b>Auger Size:</b> 4.25" (ID), 8.13" (OD) <b>Rig Type:</b> CME-55 <b>Sampling Method:</b> 2" SS Sampler/3" RC	<b>Northing:</b> 1387592.25 <b>Easting:</b> 695313.97 <b>Casing Elevation:</b> NA  <b>Borehole Depth:</b> 25.5 ft bgs <b>Surface Elevation:</b> NA  <b>Descriptions By:</b> Molly Barker	<b>Well/Boring ID:</b> B-136  <b>Client:</b> National Grid  <b>Location:</b> 89 Washington St, Rensselaer, NY
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0								Asphalt surface.	
								NA		
								1.9	Brown- Black, (FILL) Sandy SILT, soft, moist	
								3.5	Brown, CLAY, trace Silt, soft, low plasticity, moist	
		NA	HC	NA	NA	NA		14.1		
								18.9		
-5	-5	S-1	SS	0	WOH/18"	WOH	NA			
		S-2	SS	1.5	WOH/18"	WOH	47.5		Brown, Clayey f. SAND, trace Silt and Clay, very loose, iridescent sheen, strong tar-like odor, wet	
		S-3	SS	1.5	WOH-1 2-3	3	18.8		Brown, CLAY and SILT, trace f. Gravel (angular, poorly sorted), soft, iridescent sheen, strong tar-like odor, wet	
-10	-10								Some f. Gravel (angular, poorly sorted) @ 10 ft bgs	
		S-4	SS	1.5	4-6 10-17	16	205		Dark brown-gray, CLAY, some f. Gravel (angular, poorly sorted), trace Silt, very stiff, brownish-black oil-like NAPL, strong tar-like odor, wet	
		S-5	SS	1	42-50/3"	>50	34		Dark brown, mf. SAND and some f. Gravel (subrounded, poorly sorted), medium dense, brownish-black oil-like NAPL coating, strong tar-like odor, wet	
									Dark brown, mf. SAND and f. GRAVEL (subrounded, poorly sorted), medium dense, iridescent sheen, strong tar-like odor, wet	
-15	-15	S-6	SS	0.8	44-50/3"	>50	12		Dark Gray, Silty SAND (TILL), some gravel (angular), very dense, non-plastic to low plasticity, moist to dry (top ft of sample appears to be sluff from above).	


Borehole backfilled with Bentonite to grade

 <b>ARCADIS</b>	<b>Remarks:</b> bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; RC = Rock Core; SS = Split Spoon; HSA = Hollow Stem Auger; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5 ft, remaining depths were cleared by a HSA. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot.		<b>Water Level Data</b>		
			<b>Date</b>	<b>Depth</b>	<b>Elev.</b>
			1/16/17	*6.5	NA
			*Depth measured from bgs (ft)		
			Depth measured from top of casing		


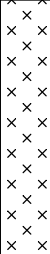



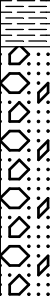


**Well/Boring ID: B-136**

**Borehole Depth:** 25.5 ft bgs


89 Washington St, Rensselaer, NY

 <div> <div>Design &amp; Consultancy for natural and built assets</div> </div>	<p><b>Remarks:</b></p> <p>bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; RC = Rock Core; SS = Split Spoon; HSA = Hollow Stem Auger; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5 ft, remaining depths were cleared by a HSA. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot.</p>	<p><b>Water Level Data</b></p> <table> <tr> <th>Date</th><th>Depth</th><th>Elev.</th></tr> <tr> <td>1/16/17</td><td>*6.5</td><td>NA</td></tr> <tr> <td colspan="3">*Depth measured from bgs (ft)</td></tr> <tr> <td colspan="3">Depth measured from top of casing</td></tr> </table>	Date	Depth	Elev.	1/16/17	*6.5	NA	*Depth measured from bgs (ft)			Depth measured from top of casing		
Date	Depth	Elev.												
1/16/17	*6.5	NA												
*Depth measured from bgs (ft)														
Depth measured from top of casing														

<b>Date Start/Finish:</b> 1/14-15/17 <b>Drilling Company:</b> Parratt-Wolfe <b>Driller's Name:</b> Layne Pach <b>Drilling Method:</b> HSA <b>Auger Size:</b> 4.25" (ID), 8.13" (OD) <b>Rig Type:</b> CME-55 <b>Sampling Method:</b> 2" SS Sampler/3" RC	<b>Northing:</b> 1387562.27 <b>Easting:</b> 695252.94 <b>Casing Elevation:</b> NA  <b>Borehole Depth:</b> 25.3 ft bgs <b>Surface Elevation:</b> NA  <b>Descriptions By:</b> Molly Barker	<b>Well/Boring ID:</b> B-137  <b>Client:</b> National Grid  <b>Location:</b> 89 Washington St, Rensselaer, NY
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0									
		NA	HC	NA	NA	NA			Asphalt surface.	
									Brown- black, FILL, soft, moist	
5	-5	S-1	SS	1.2	WOH/ 12"-2	2	NA		Dark-brown, CLAY, some f. SAND, soft, moist	
		S-2	SS	1.5	4-4 4	8	4.6		Dark-brown and white, Sandy Lean CLAY, little gravel (angular, poorly sorted), loose to very dense, moist	
		S-3	SS	1.3	3-19 50/.3 ft	>50	0.0		(pocket of f. Gravel @ 8 ft bgs)	
10	-10	S-4	SS	1.9	21-41 41-50/ .4 ft	82	0.0		Dark-gray, GRAVEL (angular, poorly sorted) and c. SAND (TILL), very dense, moist	
		S-5	SS	1.8	7-49 29-26	78	1.2			
15	-15	S-6	SS	1.9	11-16 15-16	31	0.0		Dark brown, Sandy Silty CLAY (TILL), few gravel (angular, poorly sorted), dense, moist	








Borehole backfilled with Bentonite to grade

	<b>Remarks:</b> bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; RC = Rock Core; SS = Split Spoon; HSA = Hollow Stem Auger; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5 ft, remaining depths were cleared by a HSA. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot.			<b>Water Level Data</b>		
				<b>Date</b>	<b>Depth</b>	<b>Elev.</b>
				NA	NA	NA
				*Depth measured from bgs (ft)		
				Depth measured from top of casing		

**Well/Boring ID: B-137**

**Borehole Depth:** 25.3 ft bgs

89 Washington St, Rensselaer, NY

DEPTH		ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction	
20	-20		S-7	SS	1.7	27-50/ 4 ft	>50	0.0		Dark brown to black, CLAY, some f. Gravel (angular, poorly sorted) and f. Sand, trace Silt (TILL), very dense, moist		Borehole backfilled with Bentonite to grade
												
										Dark gray, c. GRAVEL (angular), some f. Sand (TILL), very dense, moist		
		S-8	SS	1.8	28-50/ .4 ft	>50	0.0					
		S-9	SS	0.3	100/ 0.3 ft	>50	0.0			Dark gray, Shale (fragments), fissile, trace Clay and f. Gravel, very dense, moist		
25	-25									SHALE, weak, gray, fine-grained, no obvious bedding or structures, competent, intensely fractured (45-90 degrees). @ 23 ft and 25 ft bgs fracture zone RQD: 15"/38" = 39% Poor		
		RC-1	RC	3.2	~80 minutes (Run #1)	NA	NA					
30	-30									Split spoon and auger refusal at 20.3 ft bgs. End of boring at 25.3 ft bgs.		
35	-35											



## Remarks:

bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; RC = Rock Core; SS = Split Spoon; HSA = Hollow Stem Auger; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5 ft, remaining depths were cleared by a HSA. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot.

### Water Level Data


Date	Depth	Elev.
NA	NA	NA

\*Depth measured from bqs (ft)







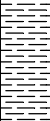


Depth measured from top of casing


<b>Date Start/Finish:</b> 7/8/17 <b>Drilling Company:</b> Parratt-Wolfe <b>Driller's Name:</b> Jolaan Price <b>Drilling Method:</b> HSA <b>Auger Size:</b> 4.25" (ID), 8.3" (OD) <b>Rig Type:</b> Ingersoll Rand (A300)- with geoprobe <b>Sampling Method:</b> 2" SS Sampler	<b>Northing:</b> 1387699.60 <b>Easting:</b> 695295.26 <b>Casing Elevation:</b> NA  <b>Borehole Depth:</b> 16 ft bgs <b>Surface Elevation:</b> NA  <b>Descriptions By:</b> Lacey Mikochik	<b>Well/Boring ID:</b> B-138  <b>Client:</b> National Grid  <b>Location:</b> 89 Washington St, Rensselaer, NY
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0									
									Asphalt surface	
								x x x x x x x x x x x x	Brown, Clayey SILT, trace f. Sand, low plasticity, moist	
		NA	HC	NA	NA	NA	0.0		Brown, CLAY, some f. Sand and Silt, moist	
-5	-5								Brown, Clayey f. SAND, trace Silt, low plasticity, moist	
		S-1	SS	2.0	NA	NA	19		Greenish Gray, m.f. SAND, trace Silt, loose, reddish-brown staining, slight tar-like odor, wet	Borehole backfilled with Bentonite to grade
-10	-10								Brownish-orange, f. SAND, trace Silt, Clay, and f. Gravel, medium dense, moist	
		S-2	SS	0.9	NA	NA	0.0		Black to dark Gray, Silty, Clayey m.f. SAND (TILL), little Gravel (subrounded), poorly sorted, very dense, moist	
		S-3	SS	1.0	NA	NA	0.0			
									Dark gray, Shale (fragments), fissile, very dense, dry	
-15	-15	S-4	SS	0.2	NA	NA	0.0		Auger refusal at 16 ft bgs. End of boring at 16 ft bgs.	

	<b>Remarks:</b> bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; HSA = Hollow Stem Auger; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-8.0 ft, remaining depths were cleared by a HSA. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot.			<b>Water Level Data</b>		
				<b>Date</b>	<b>Depth</b>	<b>Elev.</b>
				7/8/17	*8	NA
				*Depth measured from bgs (ft)		
				Depth measured from top of casing		

<b>Date Start/Finish:</b> 7/8/17 <b>Drilling Company:</b> Parratt-Wolfe <b>Driller's Name:</b> Jolaan Price <b>Drilling Method:</b> HSA <b>Auger Size:</b> 4.25" (ID), 8.3" (OD) <b>Rig Type:</b> Ingersoll Rand (A300)- with geoprobe <b>Sampling Method:</b> 2" SS Sampler	<b>Northing:</b> 1387613.44 <b>Easting:</b> 695275.81 <b>Casing Elevation:</b> NA  <b>Borehole Depth:</b> 18 ft bgs <b>Surface Elevation:</b> NA  <b>Descriptions By:</b> Lacey Mikochik	<b>Well/Boring ID:</b> B-139  <b>Client:</b> National Grid  <b>Location:</b> 89 Washington St, Rensselaer, NY
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0									
		NA	HC	NA	NA	NA	0.0		Asphalt surface	
									Brown to Black, Sandy SILT, some f. Sand and f.m. Gravel (subrounded), poorly sorted, low plasticity, moist	
									Brown, f. SAND and f.m. GRAVEL (subrounded), poorly sorted, loose, moist	
5	-5	S-1	SS	1.3	NA	NA	0.0		Some Clay, and slight tar-like odor @ 5 ft bgs.  Strong tar-like odor @ 7 ft bgs.	
		S-2	SS	0.7	NA	NA	5.0		Brown to greenish gray, Clayey SILT, little f. Gravel (subrounded), poorly sorted, hard, moist  Soft, reddish-brown staining, wet @ 9 ft bgs.	
10	-10	S-3	SS	1.5	NA	NA	20.3		Brown to greenish gray, CLAY (TILL), some f.m. Sand, trace f. gravel (subrounded), poorly sorted, hard, moist	
		S-4	SS	1.5	NA	NA	20.0			
		S-5	SS	2.0	NA	NA	0.0			
15	-15	S-6	SS	1.3	NA	NA	0.0		Dark gray, Shale (fragments), fissile, very dense, dry	

 <b>ARCADIS</b>   Design & Consultancy for natural and built assets	<b>Remarks:</b> bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; HSA = Hollow Stem Auger; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5.0 ft, remaining depths were cleared by a HSA. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot.		<b>Water Level Data</b>			
	<b>Date</b>	<b>Depth</b>	<b>Elev.</b>			
	7/8/17	*9	NA			
				*Depth measured from bgs (ft)		
				Depth measured from top of casing		

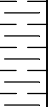


Client: National Grid

Well/Boring ID: B-139

## Site Location:

Borehole Depth: 18 ft bgs

89 Washington St, Rensselaer, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		S-7	SS	1.3	NA	NA	0.0		Dark gray, Shale (fragments), fissile, very dense, dry	
		S-8	SS	0.8	NA	NA	0.0		Auger refusal at 18 ft bgs.	 Borehole backfilled with Bentonite to grade
20	-20								End of boring at 18 ft bgs.	
25	-25									
30	-30									
35	-35									

## Remarks:

bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; HSA = Hollow Stem Auger; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5.0 ft, remaining depths were cleared by a HSA. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot.









## Water Level Data

Date	Depth	Elev.
7/8/17	*9	NA

\*Depth measured from bgs (ft)

Depth measured from top of casing



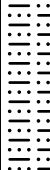








DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0									
		NA	HC	NA	NA	NA	0.0		Asphalt surface	
									Brown to Black, Sandy SILT, some f. Sand and f.m. Gravel (subrounded), poorly sorted, low plasticity, moist	
5	-5	S-1	SS	1.9	NA	NA	50.0		Brown to greenish gray, CLAY, trace f. Gravel (subrounded), well sorted, hard, moist	
		S-2	SS	2.0	NA	NA	25.0		Brown, f. SAND and f.m. GRAVEL (subrounded), poorly sorted, loose, reddish-brown staining, moderate tar-like odor, moist  No staining at 7.5 ft bgs.	
10	-10	S-3	SS	2.0	NA	NA	1.3		Brown, f. SAND and f.m. GRAVEL (subrounded), poorly sorted, loose, slight tar-like odor, wet  Strong tar-like odor @ 10.2 ft bgs.	
		S-4	SS	1.3	NA	NA	0.0		Brown to greenish gray, CLAY (TILL), some f.m. Sand, trace f. Gravel (subrounded), poorly sorted, hard, moist	
		S-5	SS	0.9	NA	NA	0.0			
15	-15	S-6	SS	0.1	NA	NA	0.0		Auger refusal at 15.1 ft bgs.	
									End of boring at 15.1 ft bgs.	

Project: B0036730.0000.00004      Template: boring\_HSA 2007 WL-boring      Page: 1 of 1  
Data File: B-140      Date: 8/8/2017      Created/Edited by: LMM



<b>Date Start/Finish:</b> 7/9/17 <b>Drilling Company:</b> Parratt-Wolfe <b>Driller's Name:</b> Jolaan Price <b>Drilling Method:</b> HSA <b>Auger Size:</b> 4.25" (ID), 8.3" (OD) <b>Rig Type:</b> Ingersoll Rand (A300)- with hammer <b>Sampling Method:</b> 2" SS Sampler	<b>Northing:</b> 1387573.81 <b>Easting:</b> 695351.75 <b>Casing Elevation:</b> NA  <b>Borehole Depth:</b> 12.7 ft bgs <b>Surface Elevation:</b> NA  <b>Descriptions By:</b> Lacey Mikochik	<b>Well/Boring ID:</b> B-141  <b>Client:</b> National Grid  <b>Location:</b> 89 Washington St, Rensselaer, NY
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0									
		NA	HC	NA	NA	NA	0.0		Asphalt surface	
									Red, BRICK (fragmented), brown Silty Clay (fill), dry to moist	
									Brown to Black, Sandy SILT, some f. Sand and f.m. Gravel (subrounded), poorly sorted, low plasticity, moist	
5	-5	S-1	SS	0.8	2-3	3	0.0		Brown, f. SAND and f.m. GRAVEL (subrounded), little Silt and Clay, poorly sorted, very loose, moist	
		S-2	SS	1.9	2-4 4-6	8	0.0		Loose, reddish-brown staining, strong tar-like odor, wet @ 7.0 ft bgs. No reddish-brown staining, slight tar-like odor, moist @7.5 ft bgs.	
		S-3	SS	1.6	2-7 15-20	22	20.0		Medium dense, reddish-brown staining, strong tar-like odor, @ 8.5 ft bgs. No reddish-brown staining, slight tar-like odor @ 9.0 ft bgs. No reddish-brown staining or tar-like odor @ 9.5 ft bgs. Very dense @ 10.0 ft bgs.	
10	-10	S-4	SS	1.0	6-24 26-30	50	0.0		Brown to greenish gray, CLAY (TILL), some f.m.Sand, trace f. Gravel (subrounded), poorly sorted, very hard, moist	
		S-5	SS	0.2	47- 50/0.2	>50	0.0		Split spoon and auger refusal at 12.7 ft bgs.	
									End of boring at 12.7 ft bgs.	
15	-15									

 <b>ARCADIS</b>	<b>Remarks:</b> bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; HSA = Hollow Stem Auger; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5.0 ft, remaining depths were cleared by a HSA. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot. Hammer Size = 140 pounds, 30" drop distance		<b>Water Level Data</b>		
			<b>Date</b>	<b>Depth</b>	<b>Elev.</b>
			7/9/17	*7	NA
			*Depth measured from bgs (ft)		
			Depth measured from top of casing		


<b>Date Start/Finish:</b> 7/9/17 <b>Drilling Company:</b> Parratt-Wolfe <b>Driller's Name:</b> Jolaan Price <b>Drilling Method:</b> HSA <b>Auger Size:</b> 4.25" (ID), 8.3" (OD) <b>Rig Type:</b> Ingersoll Rand (A300)- with hammer <b>Sampling Method:</b> 2" SS Sampler	<b>Northing:</b> 1387578.14 <b>Easting:</b> 695322.99 <b>Casing Elevation:</b> NA  <b>Borehole Depth:</b> 12.1 ft bgs <b>Surface Elevation:</b> NA  <b>Descriptions By:</b> Lacey Mikochik	<b>Well/Boring ID:</b> B-142  <b>Client:</b> National Grid  <b>Location:</b> 89 Washington St, Rensselaer, NY
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0								Asphalt surface	
		NA	HC	NA	NA	NA	0.0		Red, BRICK (fragmented), brown Silty Clay (fill), dry to moist  Brown to Black, Sandy SILT, some f. Sand and f.m. Gravel (subrounded), poorly sorted, low plasticity, moist	
-5	-5	S-1	SS	1.0	3-4	4	15.6		Brown to gray, CLAY, trace f. Gravel (subrounded), well sorted, soft, moist  Stiff @ 6 ft bgs.	
		S-2	SS	2.0	7-7 8-12	15	30.0			
-10	-10	S-3	SS	1.5	11-16 12-12	28	29.0		Brown, f. SAND and f.m. GRAVEL (subrounded), little Silt and Clay, poorly sorted, medium dense, reddish-brown staining, strong odor, moist  No reddish-brown staining, no strong tar-like odor, and wet @ 9.0 ft bgs.	
		S-4	SS	2.0	6-20 33-40	53	90.0		Very dense, reddish-brown staining, and strong tar-like odor @ 10.0 ft bgs.  Brown to greenish gray, CLAY (TILL), some f.m.Sand, trace f. Gravel (subrounded), poorly sorted, very hard, moist	
		S-5	SS	0.1	50/0.1	>50	0.0		Split spoon and auger refusal at 12.1 ft bgs. End of boring at 12.1 ft bgs.	
-15	-15									

	<b>Remarks:</b> bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; HSA = Hollow Stem Auger; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5.0 ft, remaining depths were cleared by a HSA. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot. Hammer Size = 140 pounds, 30" drop distance		<b>Water Level Data</b>		
			<b>Date</b>	<b>Depth</b>	<b>Elev.</b>
			7/9/17	*9	NA
			*Depth measured from bgs (ft)		
			Depth measured from top of casing		

<b>Date Start/Finish:</b> 1/15/17 <b>Drilling Company:</b> Parratt-Wolfe <b>Driller's Name:</b> Glenn Lansing <b>Drilling Method:</b> Hollow Stem Auger <b>Auger Size:</b> 4.25" (ID), 8.13" (OD) <b>Rig Type:</b> CME-55 <b>Sampling Method:</b> 2" SS Sampler	<b>Northing:</b> 1387687.98 <b>Easting:</b> 695313.65 <b>Casing Elevation:</b> 16.18 ft AMSL  <b>Borehole Depth:</b> 22.2 ft bgs <b>Surface Elevation:</b> 16.40 ft AMSL  <b>Descriptions By:</b> Lacey Pitman	<b>Well/Boring ID:</b> MW-116  <b>Client:</b> National Grid  <b>Location:</b> 89 Washington St, Rensselaer, NY
---	---	--

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0								Asphalt	Steel Flush Mount (8" Diameter)
									Black, Clayey SILT, trace f. Sand, soft, low plasticity, moist	2" Locking J-Plug
		NA	HC	NA	NA	NA	4.4		Light brown, CLAY, trace Silt and f. Sand, very stiff/hard, moist, medium plasticity	Concrete Pad
							7.7		Concrete slab	#2 Sand Drain
5	-5	S-1	SS	1	2-2	2	7.0		Brown, Clayey f. SAND, trace f. Gravel (subrounded, poorly sorted), trace Silt and Clay, very loose, moist	Grout
									Orangish red, BRICK fragments (subangular, poorly sorted)	2" Diameter Schedule 40 PVC Riser (0.2-10.2 ft bgs)
		S-2	SS	2	2-2 3-4	5	0		Brown, Clayey f. SAND, trace f. Gravel (subrounded, poorly sorted), Silt and Clay, loose, wet	Medium Grade Chips (6-8 ft bgs)
									Loose and moist @ 7 ft bgs	
		S-3	SS	1.5	3-3 4-4	7	0		Light brown, Clayey f. SAND, trace f. Gravel (subrounded, poorly sorted), and Silt, loose, medium plasticity, moist wet @ 10 ft bgs	
10	-10	S-4	SS	1.6	18-19 11-15	30	5.4		Grayish green, f. SAND and fm. GRAVEL (subrounded, poorly sorted), trace Silt and Clay, medium dense, moist	
		S-5	SS	0.8	10-11 12-12	23	5.0		Grayish green, c. SAND and m. GRAVEL (subrounded, poorly sorted), medium dense, redish-brown staining, slight tar-like odor, wet	
									Grayish green, f. SAND, trace Silt and Clay, loose, wet	
15	-15	S-6	SS	1.9	7-4 6-6	10	3 12 6.0		Grayish green, f. GRAVEL (subangular, poorly sorted), loose, redish-brown staining, slight tar-like odor, moist	
									Light brown, Clayey f. SAND, some Silt, loose, moist	#2 Sand (8-20.2 ft bgs)
										0.02" slot, 2" Diameter Schedule 40 PVC Screen (10.2-20.2 ft bgs)

 <b>ARCADIS</b>   Design & Consultancy for natural and built assets	<b>Remarks:</b> AMSL = Above Mean Sea Level; bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5 ft. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot. Well Development (1/17/17); 35 gallons removed; tagged bottom of well: 21.7 ft bgs	<b>Water Level Data</b>		
		<b>Date</b>	<b>Depth</b>	<b>Elev.</b>
		1/15/17	*6.00	NA
		1/17/17	8.19	7.99
		*Depth measured from bgs (ft)		
		Depth measured from top of casing		

Client: National Grid

Well/Boring ID: MW-116

## Site Location:

Borehole Depth: 22.2 ft bgs

89 Washington St, Rensselaer, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
		S-7	SS	2	5-6 7-6	13	0.0		Light brown, f. SAND and SILT, trace f. Gravel, medium dense, iridescent sheen, slight tar-like odor, wet	
		S-8	SS	1.3	29-48 50/4"	>50	0		Gray, f. SAND, some Silt and f. Gravel (subrounded, poorly sorted), medium dense, moist	
									Brown, f. SAND and f. GRAVEL (subrounded, poorly sorted) (TILL), very dense, moist	
20	-20	S-9	SS	0.6	47- 50/1"	>50	0		Gray, f. SAND and f. GRAVEL (subrounded, poorly sorted) (TILL), very dense, moist	
		S-10	SS	0.2	50/2"	NA	0		Gray, SHALE (fragmented), fissile, refusal	
									Split spoon and auger refusal at 22.2 ft bgs. End of boring at 22.2 ft bgs.	
25	-25									
30	-30									
35	-35									

## Remarks:

AMSL = Above Mean Sea Level; bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5 ft. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot. Well Development (1/17/17); 35 gallons removed; tagged bottom of well: 21.7 ft bgs


## Water Level Data

Date	Depth	Elev.
1/15/17	*6.00	NA
1/17/17	8.19	7.99
*Depth measured from bgs (ft)		
Depth measured from top of casing		



<b>Date Start/Finish:</b> 1/14/17 <b>Drilling Company:</b> Parratt-Wolfe <b>Driller's Name:</b> Glenn Lansing <b>Drilling Method:</b> Hollow Stem Auger <b>Auger Size:</b> 4.25" (ID), 8.13" (OD) <b>Rig Type:</b> CME-55 <b>Sampling Method:</b> 2" SS Sampler	<b>Northing:</b> 1387655.93 <b>Easting:</b> 695340.22 <b>Casing Elevation:</b> 15.22 ft AMSL  <b>Borehole Depth:</b> 22.7 ft bgs <b>Surface Elevation:</b> 15.52 ft AMSL  <b>Descriptions By:</b> Lacey Pitman	<b>Well/Boring ID:</b> MW-117  <b>Client:</b> National Grid  <b>Location:</b> 89 Washington St, Rensselaer, NY
---	---	--

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0									
		NA	HC	NA	NA	NA			Asphalt	Steel Flush Mount (8" Diameter)
							NA		Brown to black, Clayey SILT, trace f. Sand, soft, low plasticity, moist	2" Locking J-Plug
							3.7		Light brown, CLAY, trace Silt and f. Sand, very stiff/hard, medium plasticity, moist	Concrete Pad
							3.0			#2 Sand Drain
							3.0		Red brick (fragmented)	
5	-5	S-1	SS	1	2-2	2	3.4		Gray, CLAY, trace Silt and f. Sand, medium stiff, moist	Medium Grade Chips
		S-2	SS	2	2-2 4-5	6	39		NAPL Blebs and tar-like odor @ 7.2 ft bgs	2" Diameter Schedule 40 PVC Riser (0.7-10.7 ft bgs)
							40			Medium Grade Chips (7-9 ft bgs)
		S-3	SS	1.6	11-7 6-5	13	50		Light brown to gray, Clayey SILT, trace f. Sand and f. Gravel (subrounded, poorly sorted), stiff, NAPL blebs (quarter size and redish brown), strong tar-like odor, moist A seem of brownish-black oil-like NAPL @ 9.3-9.4 ft bgs	
10	-10	S-4	SS	0.1	4-5 6-6	11	20		Dark brownish gray, Clayey f. SAND, some Silt and Clay, medium dense, moderate plasticity, moist	
							54		Redish-brown to black staining @ 12 ft bgs	
		S-5	SS	1.7	7-5 6-7	11	90		Brownish-black oil-like NAPL and very strong tar-like odor @ 13.2-13.7 ft bgs	#2 Sand (9-21 ft bgs)
										0.02" slot, 2" Diameter Schedule 40 PVC Screen (10.7-20.7 ft bgs)
15	-15	S-6	SS	0.8	2-3 4-4	7	3		Gray, f. SAND and f. GRAVEL (subangular, poorly sorted), some Clay and Silt, loose, iridescent sheen, slight tar-like odor, moist	

 <b>ARCADIS</b>   Design & Consultancy for natural and built assets	<b>Remarks:</b>		<b>Water Level Data</b>		
	AMSL = Above Mean Sea Level; bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5 ft. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot. Development of Well - Completed on 1/16/17; 21 gallons removed; tagged bottom of well: 22.4 ft bgs		<b>Date</b>	<b>Depth</b>	<b>Elev.</b>
			1/14/17	*16.00	NA
			1/17/17	8.19	7.03
			*Depth measured from bgs (ft)		
			Depth measured from top of casing		

Client: National Grid

Well/Boring ID: MW-117

## Site Location:

Borehole Depth: 22.7 ft bgs

89 Washington St, Rensselaer, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
20	-20	S-7	SS	2	3-4 4-4	8	3		Dark Gray, cm. SAND, trace Silt and Clay, loose, iridescent sheen, wet	<p>0.02" slot, 2" Diameter Schedule 40 PVC Screen (10.7-20.7 ft bgs) #2 Sand (9-21 ft bgs) SUMP (20.7-22.7 ft bgs) Medium Grade Chips (21-22.7 ft bgs)</p>
									Dark Gray, CLAY, trace Silt and f. Sand, medium stiff, brownish-black oil-like NAPL, slight tar-like odor, wet	
		S-8	SS	2	8-10 8-8	18	2.5 4.5		Dark Gray, f. SAND, some Silt, trace Clay, medium dense, iridescent sheen, wet	
									Dark Gray, f. SAND, and Silt, trace f. Gravel, medium dense, brownish-black oil-like NAPL, wet	
		S-9	SS	1.5	20-25 35-37	60	5.0		Dark gray, fm. SAND, some mf. GRAVEL (subrounded, poorly sorted) (TILL), very dense, dry	
		S-10	SS	0.2	48- 50/2"	>50	1.0			
25	-25								Split spoon and auger refusal at 22.7 ft bgs. End of boring at 22.7 ft bgs.	
30	-30									
35	-35									

## Remarks:

AMSL = Above Mean Sea Level; bgs = below ground surface; ft = feet; " = inch; HC = Hand Clear; SS = Split Spoon; OD = Outer Diameter; ID = Inner Diameter; ppm = parts per million; NA = Not Applicable/Available; f = fine; m = medium; c = coarse; Vacuum truck used to HC 0-5 ft. Horizontal Datum NAD83 New York State Plane, East Zone, US Foot. Development of Well - Completed on 1/16/17; 21 gallons removed; tagged bottom of well: 22.4 ft bgs

## Water Level Data

Date	Depth	Elev.
1/14/17	*16.00	NA
1/17/17	8.19	7.03
*Depth measured from bgs (ft)		
Depth measured from top of casing		



# ATTACHMENT 5 - GEOTECHNICAL RESULTS

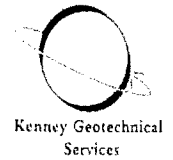


# **Kenney Geotechnical Engineering Services, PLLC**

**Office: 6901 Herman Road, Syracuse, NY 13209**

**Mail: P.O. Box 117 Warners, NY 13164**

**Phone: (315) 638-2706 Fax: (315) 638-1544**



**Project : National Grid Rensselaer**

**Client: Arcadis**

**Test: Natural Moisture Content**

**Standard: ASTM D2216**

Boring, Sample & Depth	Moisture Content As A Percent of Dry Weight
B-134,S-3, 12-14'	13.9
B-134, S-6, 16-18	8.0
B-134, S-9, 22-22.9	8.1
MMW-118/B-135, S-2,9-11	15.0
B-136, S-6,14-14.8	10.0
B-137, S-2, 6.5-8	22.6
B-137, S-6, 14-16	9.1



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**Project: National Grid Rensselaer**

**Client: Arcadis**

**SPECIFIC GRAVITY - Method B**

**ASTM D854**

Boring, Sample & Depth	Specific Gravity
B-134, S-9, 22-22.9	2.72
MMW-118/B-135, S-2,9-11	2.72
B-136, S-6,14-14.8	2.63
B-137, S-6, 14-16	2.72



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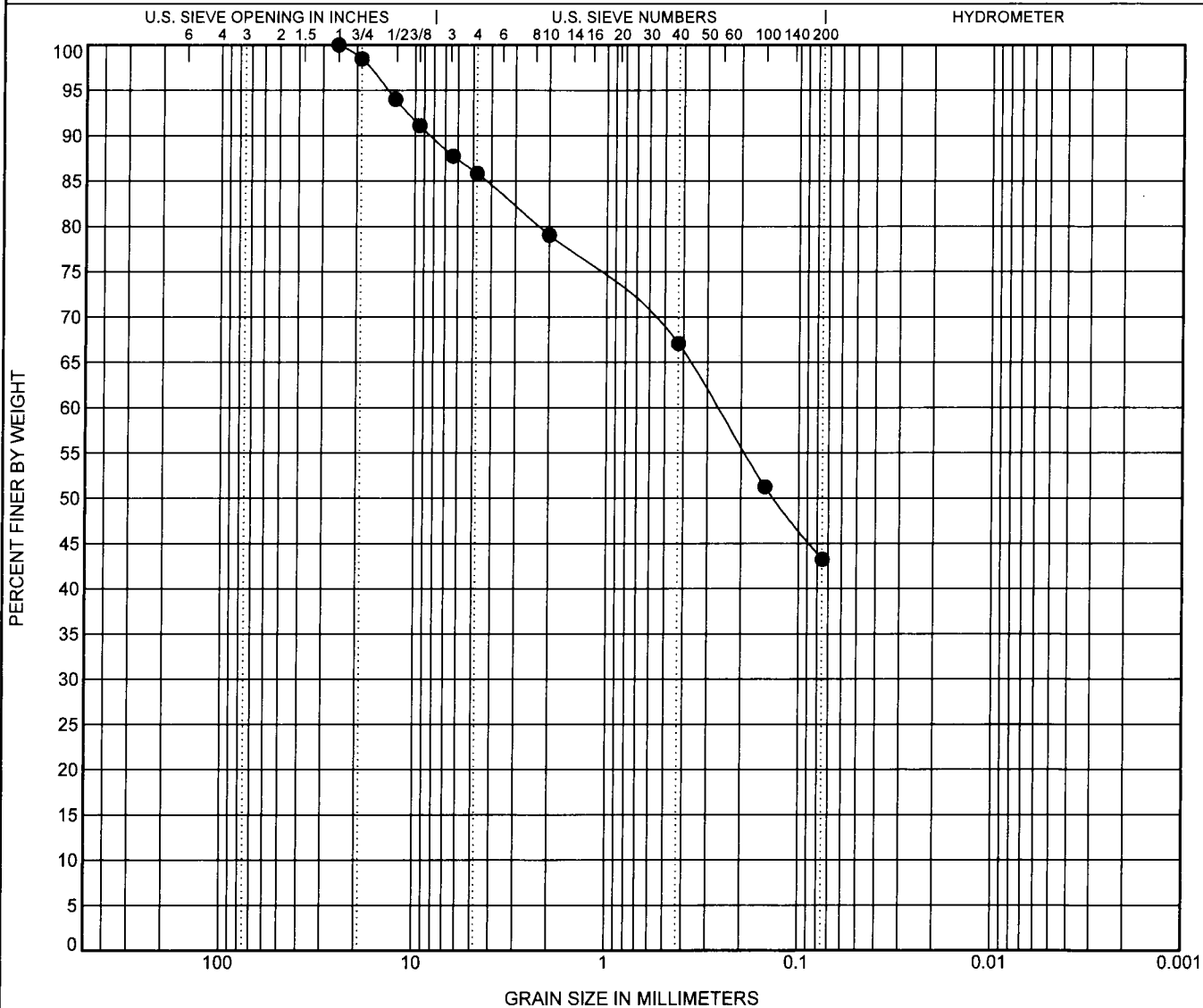
# GRAIN SIZE DISTRIBUTION

CLIENT ARCADIS

PROJECT NAME NATIONAL GRID RENSSELAER

PROJECT NUMBER 16-158

PROJECT LOCATION RENSSELAER, NY

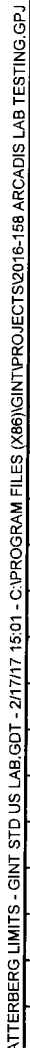


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					LL	PL	PI	Cc	Cu
● MMW-118/B-135 S-2 9-11 11.0	SILTY, CLAYEY SAND(SC-SM)					26	19	7		
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● MMW-118/B-135 S-2 9-11 11.0	25	0.267			14.2	42.6	43.2			

## ATTERBERG LIMITS' RESULTS

**PROJECT LOCATION** RENSSELAER, NY

[illegible]



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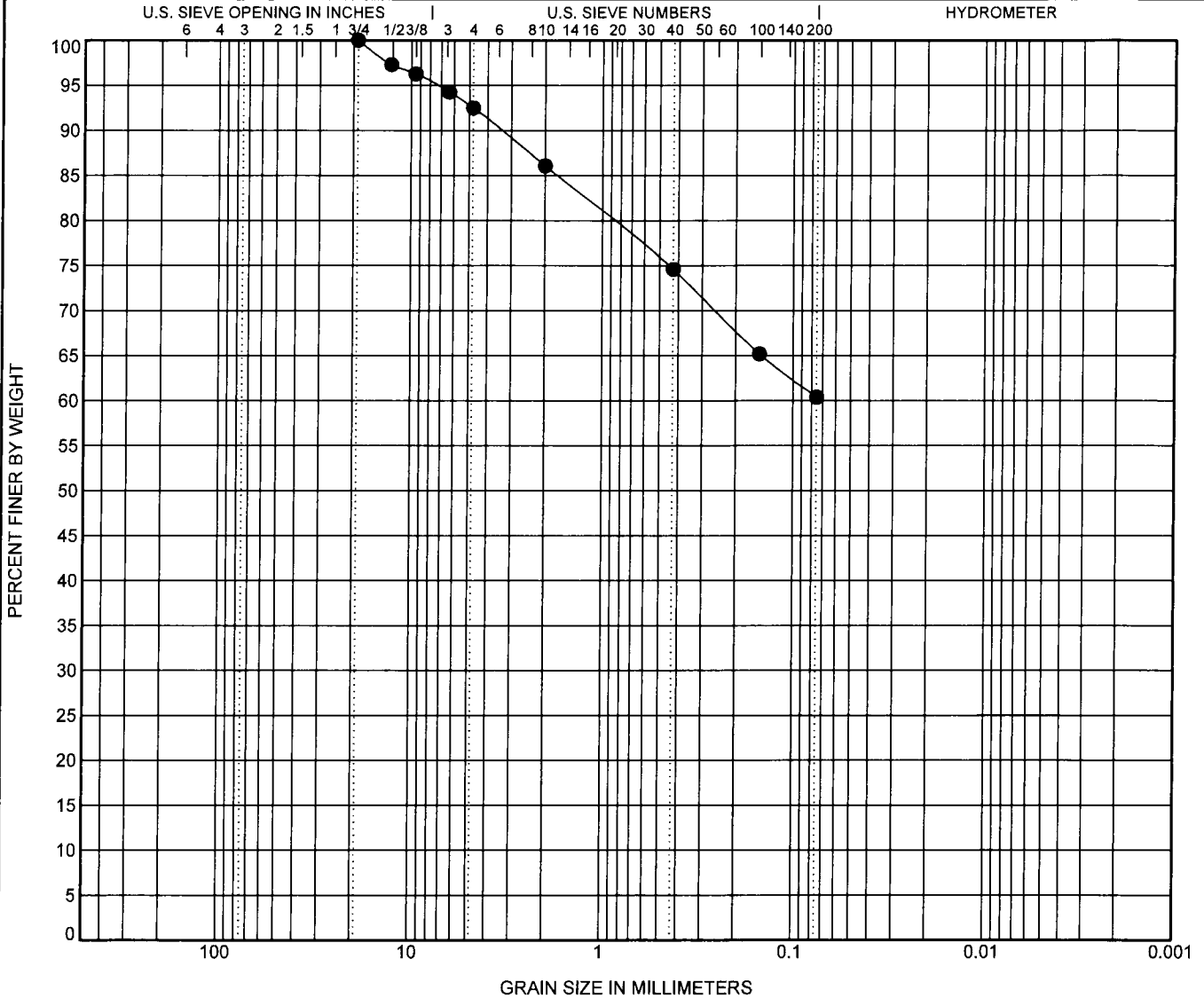
# GRAIN SIZE DISTRIBUTION

CLIENT ARCADIS

PROJECT NAME NATIONAL GRID RENSSELAER

PROJECT NUMBER 16-158

PROJECT LOCATION RENSSELAER, NY



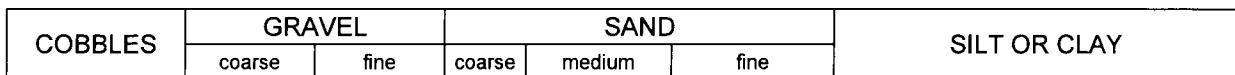
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification				LL	PL	PI	Cc	Cu
●	B-137 S-6 14-16	16.0								
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
●	B-137 S-6 14-16	16.0	19			7.5	32.1	60.4		

GRAIN SIZE - GINT STD US LAB.GDT - 2/17/17 15:04 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2016-158 ARCADIS LAB TESTING.GPJ



**PROJECT LOCATION** RENSSELAER, NY



## ATTERBERG LIMITS' RESULTS

**PROJECT LOCATION** RENSSELAER, NY

[illegible]



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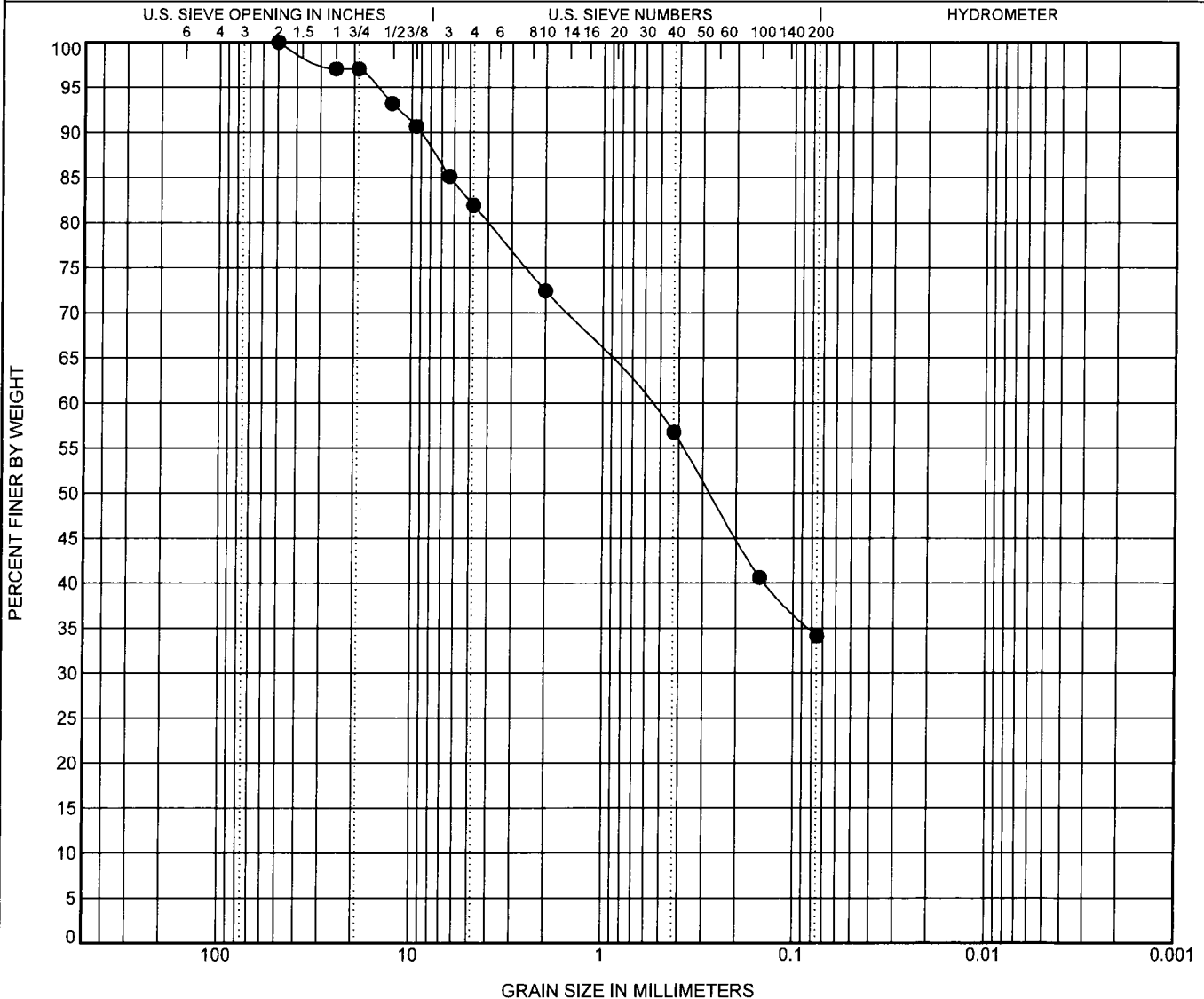
# GRAIN SIZE DISTRIBUTION

CLIENT ARCADIS

PROJECT NAME NATIONAL GRID RENSSELAER

PROJECT NUMBER 16-158

PROJECT LOCATION RENSSELAER, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification					LL	PL	PI	Cc	Cu
● B-134 S-6 16-18	18.0										
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● B-134 S-6 16-18	18.0	50	0.586			18.1	47.8	34.1			

GRAIN SIZE - GINT STD US LAB.GDT - 2/17/17 14:59 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2016-158 ARCADIS LAB TESTING.GPJ



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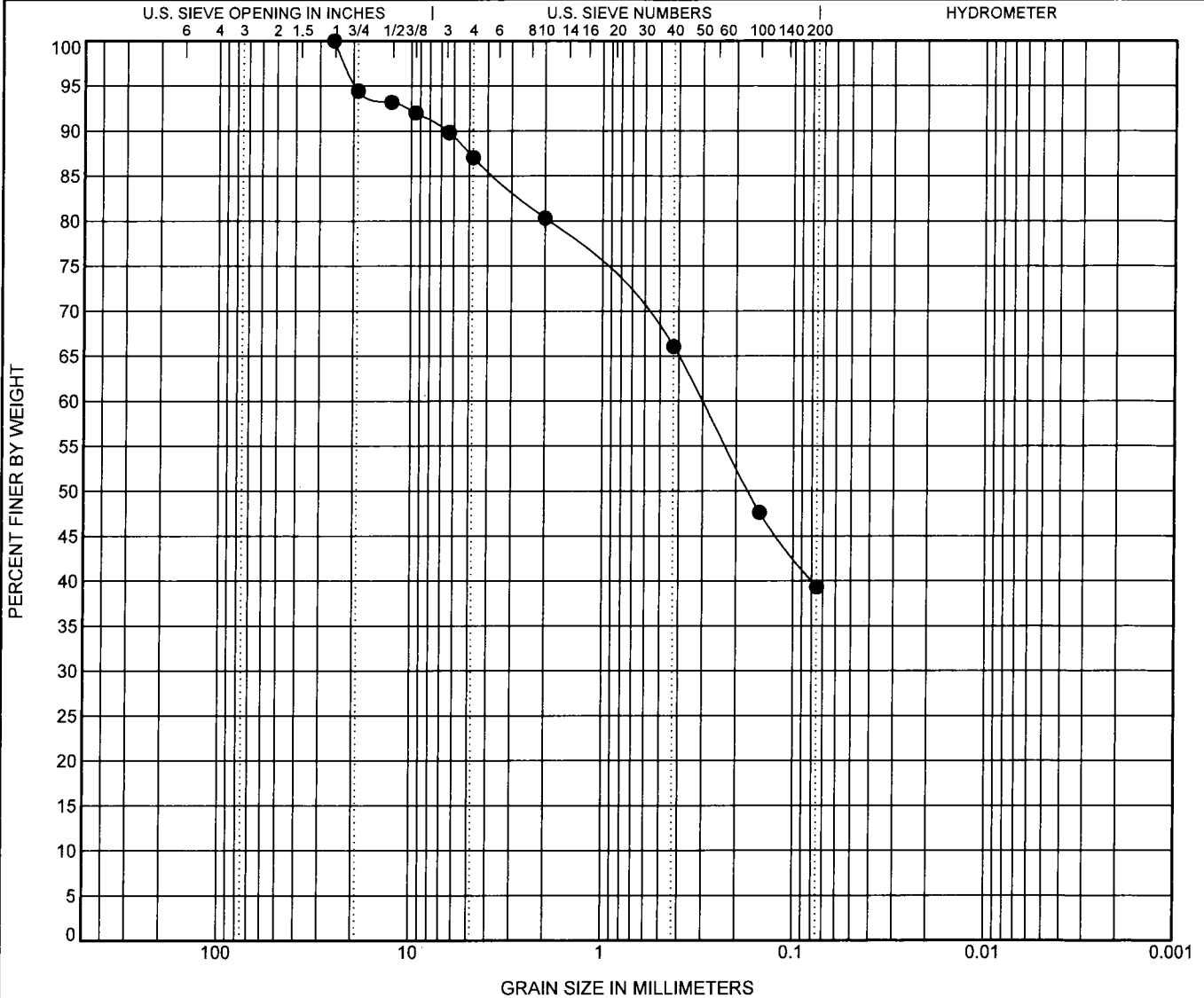
# GRAIN SIZE DISTRIBUTION

CLIENT ARCADIS

PROJECT NAME NATIONAL GRID RENSSELAER

PROJECT NUMBER 16-158

PROJECT LOCATION RENSSELAER, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification					LL	PL	PI	Cc	Cu
● B-134 S-3 12-14	14.0										
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● B-134 S-3 12-14	14.0	25.4	0.302			13.0	47.7	39.3			

GRAIN SIZE - GINT STD US LAB.GDT - 2/17/17 14:59 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2016-158 ARCADIS LAB TESTING.GPJ





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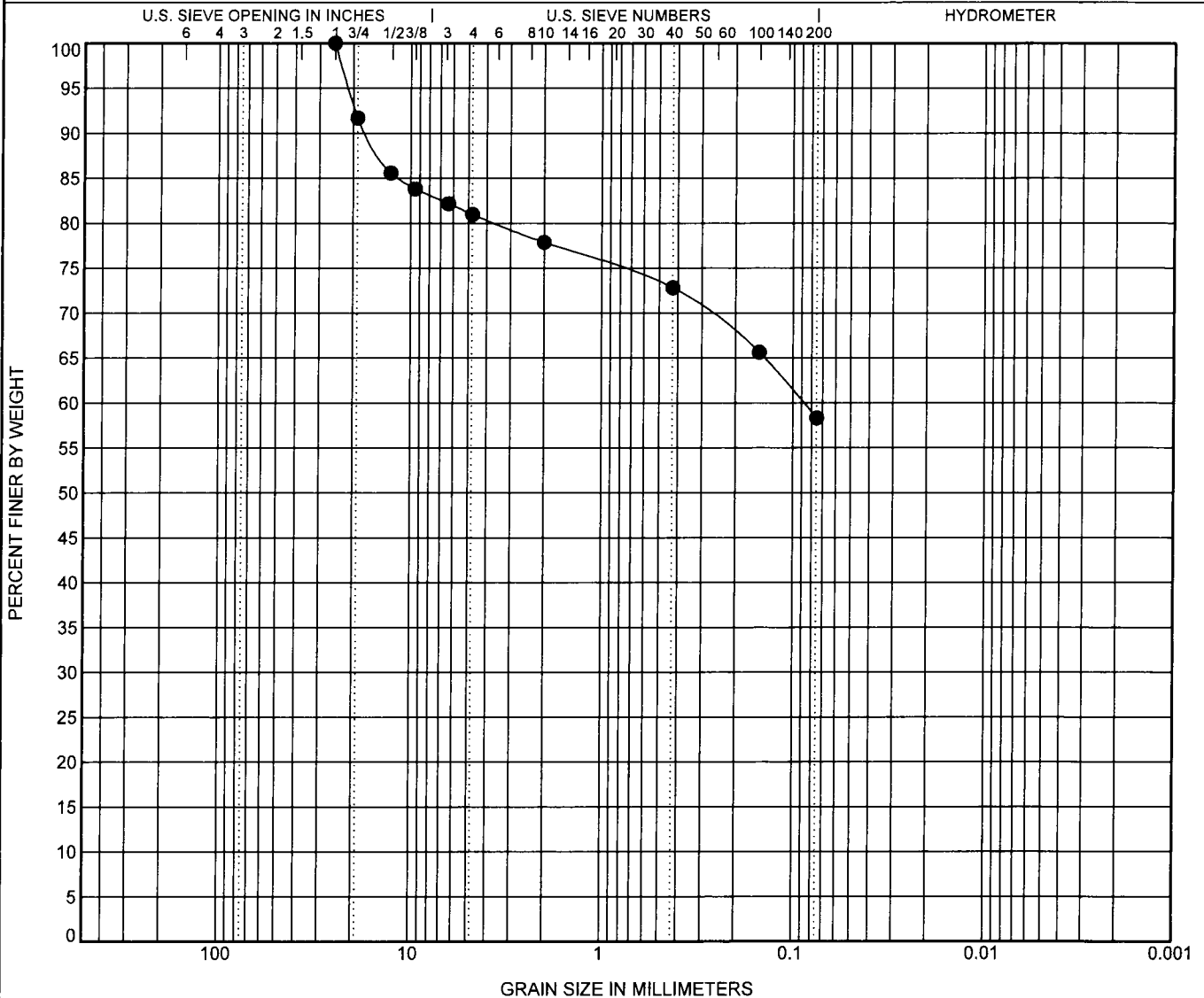
# GRAIN SIZE DISTRIBUTION

CLIENT ARCADIS

PROJECT NAME NATIONAL GRID RENSSELAER

PROJECT NUMBER 16-158

PROJECT LOCATION RENSSELAER, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification					LL	PL	PI	Cc	Cu	
●	B-137 S-2 6.5-8	8.0	SANDY LEAN CLAY with GRAVEL(CL)					35	24	11		
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay			
●	B-137 S-2 6.5-8	8.0	25	0.088		19.0	22.6	58.3				

GRAIN SIZE - GINT STD US LAB GDT - 2/17/17 15:03 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2016-158 ARCADIS LAB TESTING.GPJ

## ATTERBERG LIMITS' RESULTS

**PROJECT LOCATION** RENSSELAER, NY

[illegible]



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7246 State Fair Blvd  
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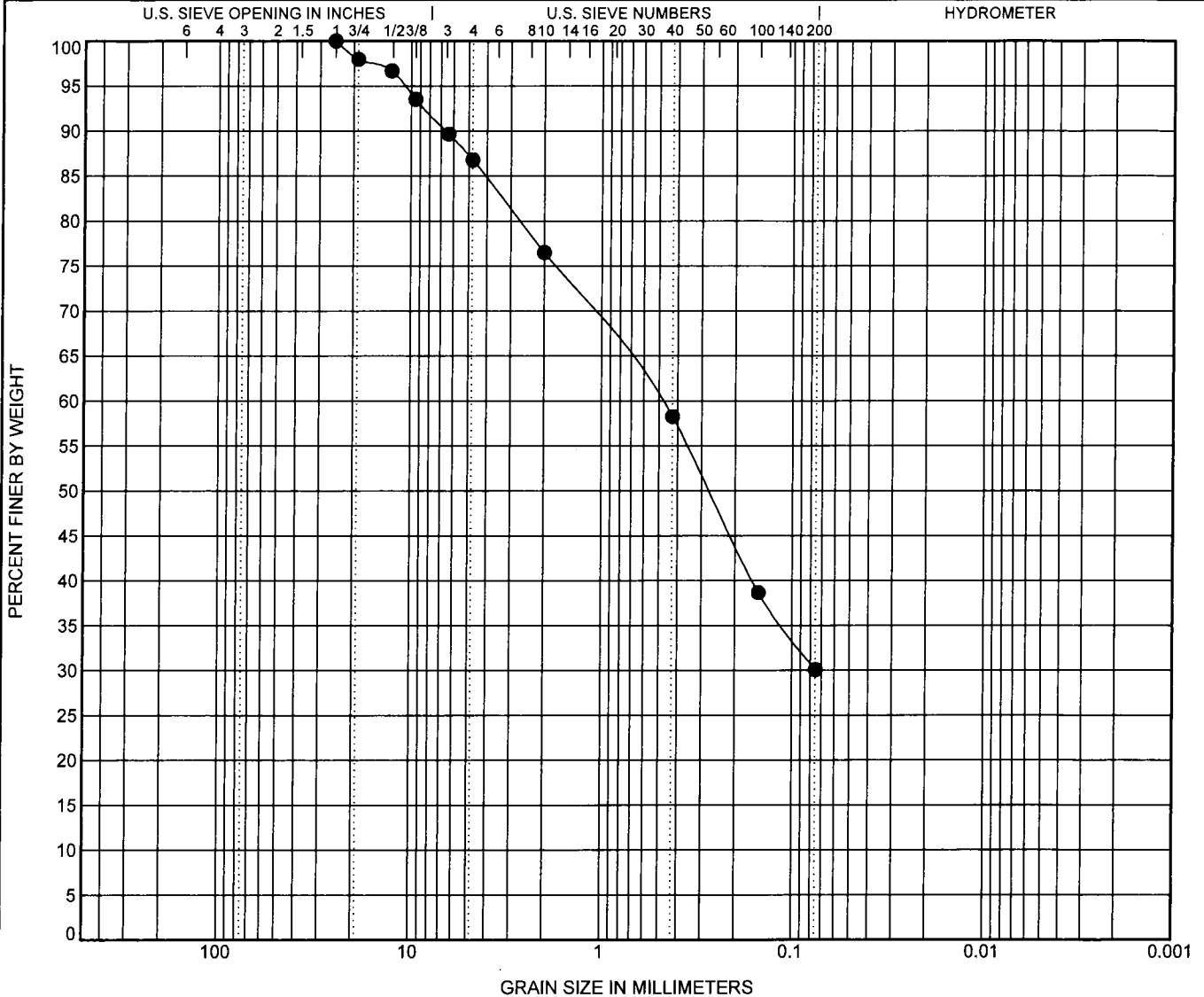
# GRAIN SIZE DISTRIBUTION

CLIENT **ARCADIS**

PROJECT NAME **NATIONAL GRID RENSSELAER**

PROJECT NUMBER **16-158**

PROJECT LOCATION **RENSSELAER, NY**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification					LL	PL	PI	Cc	Cu
● B-134 S-9 22- 22.9	22.9										
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● B-134 S-9 22- 22.9	22.9	25	0.493			13.2	56.7	30.1			

GRAIN SIZE - GINT STD US LAB GDT - 2/17/17 15:06 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2016-158 ARCADIS LAB TESTING.GPJ

ATTACHMENT 6 - TEST PIT LOGS

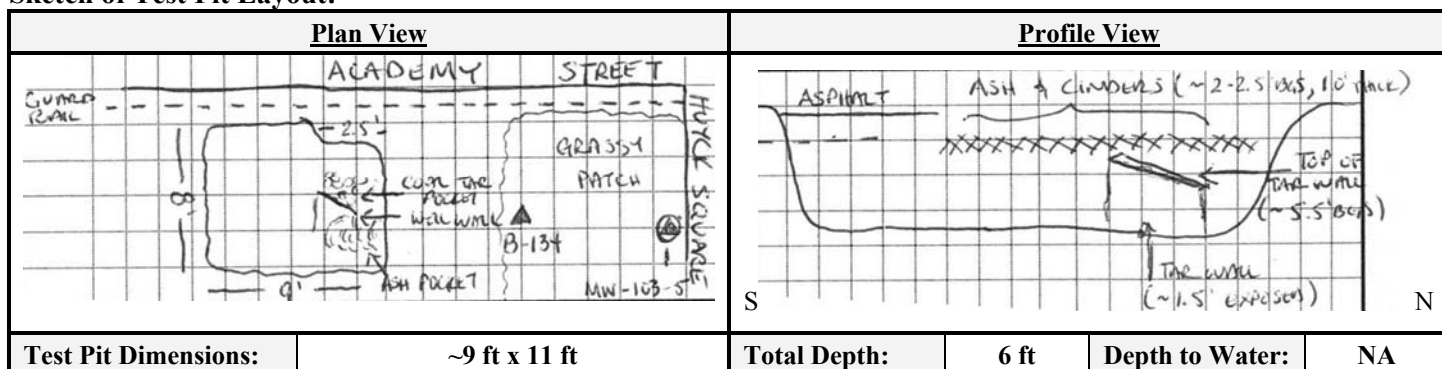


# Test Pit Log

Test Pit ID: TP-106

<b>Client:</b>	National Grid	<b>Date/Day:</b>	11/10/2016
<b>Project:</b>	Former Rensselaer MGP Site	<b>Weather:</b>	Sunny
<b>Location:</b>	Rensselaer, NY	<b>Temperature:</b>	40°F
<b>Project #:</b>	B0036730.0000	<b>Wind:</b>	Blowing to the South
<b>Logged By:</b>	J. LeMessurier	<b>Subcontractor:</b>	Parratt-Wolff
<b>Coordinates:</b>	NA	<b>Equipment:</b>	Takeuchi Mini Excavator

## Sketch of Test Pit Layout:



Depth Interval (feet)	PID Screening Result (ppm)	Description of Soil/Material
0-0.8	0.0	Asphalt
0.8-2.5	1.5	(Fill Material) Brown cmf SAND, little clay, trace ash and cinders, moist, loose, slight tar-like odor
2.5-4.0	15-20.0	(Fill Material) Gravelly CLAY, little cmf sand, trace debris (red brick, metal, plastic), pockets of viscous coal-tar throughout, moist
4.0-6.0	7.0	Brown CLAY, little silt, little very fine sand, moist, medium dense to soft, slight tar-like odor, medium plasticity.

## Notes:

- Sample taken at 3 feet bgs. (TP-106 3.0 feet) at 1330.
- Coal tar pocket, above uncovered tar well structure; 5.5 feet bgs and 1.0 feet wide (see profile view).
- bgs – below ground surface

## Photo Summary:

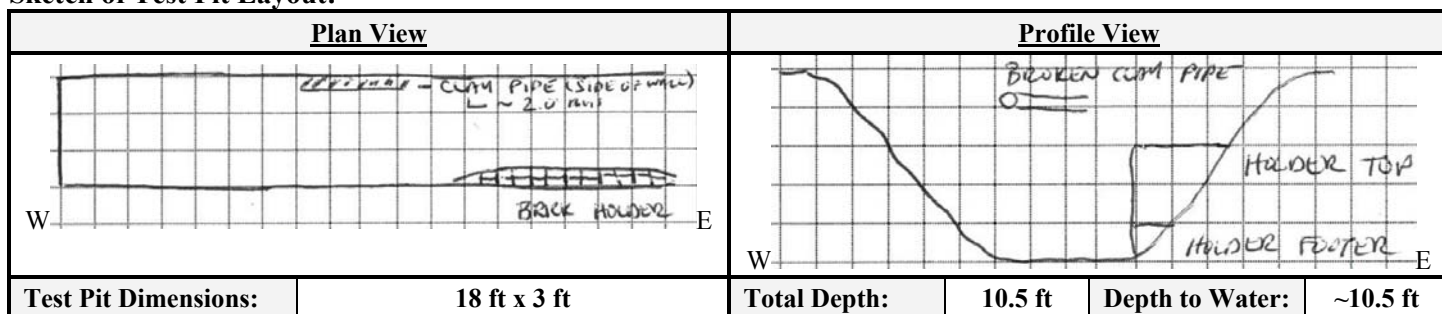
1	Looking at bottom of TP-106, facing North
2	Looking at bottom of TP-106, facing South

# Test Pit Log

**Test Pit ID: TP-107 (A)**

<b>Client:</b>	National Grid	<b>Date/Day:</b>	11/10/2016
<b>Project:</b>	Former Rensselaer MGP Site	<b>Weather:</b>	Overcast
<b>Location:</b>	Rensselaer, NY	<b>Temperature:</b>	40°F
<b>Project #:</b>	B0036730.0000	<b>Wind:</b>	Calm
<b>Logged By:</b>	J. LeMessurier	<b>Subcontractor:</b>	Parratt-Wolff
<b>Coordinates:</b>	NA	<b>Equipment:</b>	Takeuchi Mini Excavator

## Sketch of Test Pit Layout:



Depth Interval (feet)	PID Screening Result (ppm)	Description of Soil/Material
0-0.5	0.0	Asphalt
0.5-1.5	100.0	Clean Brown mf SAND, some cmf gravel, little debris (brick), trace cobble, loose, moist, no odor.
1.5-3.5	100.0	Same as above, grey staining, strong tar-like odor.
3.5-10.5	106.0	Grey-Green Sandy CLAY, little mf sand, trace cobble, rounded, odor smelled more of gasoline-like as compared to tar-like odor.

## Notes:

- 3.5 feet to 10.5 feet bgs color described due to staining.
- No samples were taken on the outside of the holder.
- bgs – below ground surface

## Photo Summary:

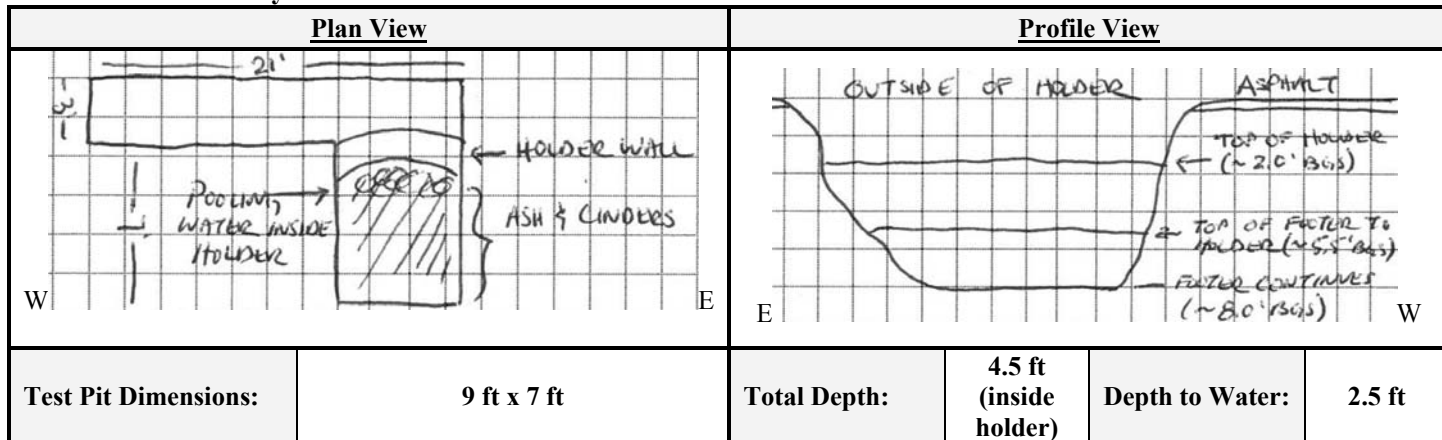
<b>3</b>	Looking at bottom of TP-107A, facing east
<b>4</b>	Brick holder wall exposed during TP-107A excavation, facing east
<b>5</b>	Clay pipe uncovered during TP-107A excavation, facing north

# Test Pit Log

**Test Pit ID: TP-107 (B)**

<b>Client:</b>	National Grid	<b>Date/Day:</b>	11/11/2016
<b>Project:</b>	Former Rensselaer MGP Site	<b>Weather:</b>	Overcast, Breezy
<b>Location:</b>	Rensselaer, NY	<b>Temperature:</b>	50°F
<b>Project #:</b>	B0036730.0000	<b>Wind:</b>	From the North 0-10 MPH
<b>Logged By:</b>	J. LeMessurier	<b>Subcontractor:</b>	Parratt-Wolff
<b>Coordinates:</b>	NA	<b>Equipment:</b>	Takeuchi Mini Excavator

## Sketch of Test Pit Layout:



Depth Interval (feet)	PID Screening Result (ppm)	Description of Soil/Material
0-0.5	0.0	Asphalt
0.5-4.0	5.5	(Fill Material) Red-Brown Ash and Cinders, little cobble, rounded, trace cmf sand, trace red brick, very loose, wet, slight tar-like odor.

## Notes:

- Inside of holder is holding water at a level approximately 1.5 feet below top of holder wall. Outside of holder has slight tar-like odor and staining present. Water present at approximate 10-10.5 feet below grade, which is most likely the surrounding water level.
- Integrity of holder appears to be competent based on visual observation and water holding inside holder wall at different level than outside of holder wall.
- Sample taken at 3.0 feet bgs (TP-107 3.0 feet)
- bgs – below ground surface

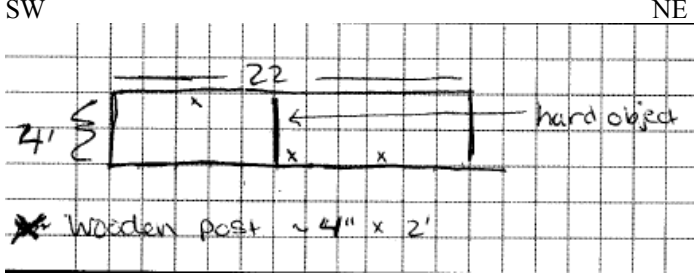
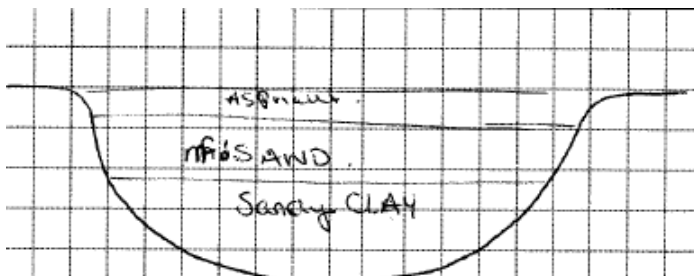
## Photo Summary:


# Test Pit Log

Test Pit ID: TP-109

<b>Client:</b>	National Grid	<b>Date/Day:</b>	1/16/2017
<b>Project:</b>	Former Rensselaer MGP Site	<b>Weather:</b>	Cloudy
<b>Location:</b>	Rensselaer, NY	<b>Temperature:</b>	30°F
<b>Project #:</b>	B0036730.0000	<b>Wind:</b>	---
<b>Logged By:</b>	L. Pitman	<b>Subcontractor:</b>	Parratt-Wolff
<b>Coordinates:</b>	NA	<b>Equipment:</b>	Takeuchi Mini Excavator

## Sketch of Test Pit Layout:

Plan View		Profile View	
			
<b>Test Pit Dimensions:</b>	22 ft x 4 ft	<b>Total Depth:</b>	10 ft
		<b>Depth to Water:</b>	NA

Depth Interval (feet)	PID Screening Result (ppm)	Description of Soil/Material
0-0.5	0.0	Asphalt
0.5-5.0	0.0	(Fill Material) Brown mf SAND, some cmf gravel, little brick, moist, no odor
5.0-9.0	100	Grey-Green cmf Sandy CLAY, trace silt, staining present throughout interval, tar-like odor
9.0-10.0	100+	SAA, saturated with NAPL, heavy staining, strong tar-like odor

## Notes:

- At 5 feet bgs, top of wooden posts. Posts appeared to go to termination depth of TP-109.
- 9.0-10.0 feet bgs, a pocket of NAPL saturated soil (1' x 1') on the southern portion of TP-109 adjacent to stone structure.
- Stone structure observed 5 feet below grade
- bgs – below ground surface

## Photo Summary:

6	Pocket of NAPL saturated soil and sheen on pooling groundwater at bottom of TP-109, facing south.
7	Pocket of NAPL saturated soil at bottom of TP-109. Concrete obstruction encountered during TP-109 excavation, facing west.



# Test Pit Log

**Test Pit ID: TP-110**

<b>Client:</b>	National Grid	<b>Date/Day:</b>	11/11/2016
<b>Project:</b>	Former Rensselaer MGP Site	<b>Weather:</b>	Overcast, Windy
<b>Location:</b>	Rensselaer, NY	<b>Temperature:</b>	50°F
<b>Project #:</b>	B0036730.0000	<b>Wind:</b>	From the North 10-20 MPH
<b>Logged By:</b>	J. LeMessurier	<b>Subcontractor:</b>	Parratt-Wolff
<b>Coordinates:</b>	NA	<b>Equipment:</b>	Takeuchi Mini Excavator

## Sketch of Test Pit Layout:

Plan View	Profile View
<b>Test Pit Dimensions:</b>	<b>22 ft x 4 ft</b>
<b>Total Depth:</b>	<b>5.5 ft</b>
<b>Depth to Water:</b>	<b>NA</b>

Depth Interval (feet)	PID Screening Result (ppm)	Description of Soil/Material
0-0.5	0.0	Asphalt
0.5-1.5	0.0	Brown cmf SAND, some cmf gravel, rounded to subrounded, trace silt, loose, moist, no odor.
1.5-4.0	106	Grey to dark grey, cmf SAND, some ash and cinders, little mf gravel, subrounded, trace red brick, moist to wet, loose, strong tar-like odor, staining throughout interval
4.0-5.0	95	Grey-green Sandy CLAY, little mf sand, soft, moist, moderate tar-like odor, piles (wood) encountered at 4 feet bgs.

## Notes:

- Concrete structure (written as holder wall on profile view) was located on the western edge of TP-110. 4 feet was exposed, appears to continue in the western direction.
- Structure appears to be made of concrete, as compared to the anticipated brick and mortar.
- Wood piles were exposed (3) at a depth of 4.0 feet bgs
- Samples collected 0.5-3.0 feet bgs (TP-110 0.0-3.0 at 1215) and 3.0-5.0 feet bgs (TP-110 3.0-5.0 at 1215).
- bgs – below ground surface

## Photo Summary:

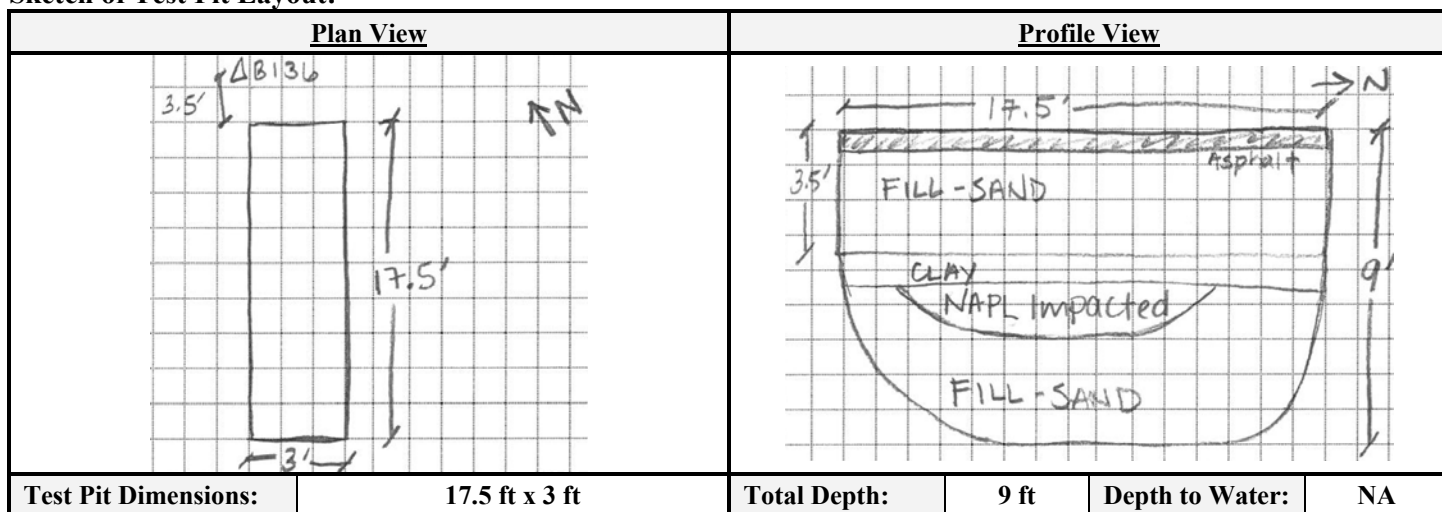
<b>8</b>	Water pooling in the east end of TP-110, facing north.
<b>9</b>	Staining in west wall of test pit, facing west.
<b>10</b>	Wood pile hole, facing west.

# Test Pit Log

Test Pit ID: TP-111

<b>Client:</b>	National Grid	<b>Date/Day:</b>	02/19/2017
<b>Project:</b>	Former Rensselaer MGP Site	<b>Weather:</b>	Sunny
<b>Location:</b>	Rensselaer, NY	<b>Temperature:</b>	40°F
<b>Project #:</b>	B0036730.0000	<b>Wind:</b>	Slight wind
<b>Logged By:</b>	K. Warren	<b>Subcontractor:</b>	Parratt-Wolff
<b>Coordinates:</b>	NA	<b>Equipment:</b>	Takeuchi Mini Excavator

## Sketch of Test Pit Layout:



Depth Interval (feet)	PID Screening Result (ppm)	Description of Soil/Material
0-0.5	0.0	Asphalt and Subbase Material
0.5-3.5	20	(Fill Material) Brown SAND, some silt/clay, few gravel, moist
3.5-6.0	120	Dark grey CLAY, some sand, strong tar-like odor, sheens, saturated with NAPL, moist, low to medium plasticity
6.0-9.0	200+	Dark brown SAND, some gravel, little silt/clay, strong tar-like odor, large NAPL pockets (4-8" in diameter), sheen, moist.

## Notes:

- Very little debris and brick observed during excavation.
- Pockets of NAPL saturated soil observed underlying clay unit from 4 feet to 6 feet below grade. Pockets range from 4" to 8" in diameter. Sheen and staining present surrounding NAPL saturated soil throughout the 3.5 feet to 8 feet below grade interval.
- bgs – below ground surface

## Photo Summary:

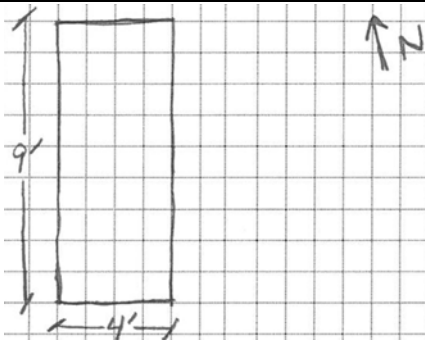
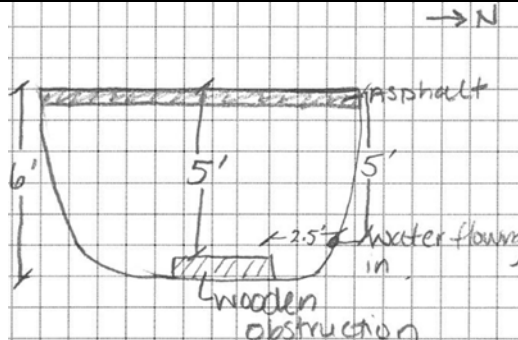
11	Water pooling with NAPL in bottom of the north portion of TP-111, facing north.
12	Stained soil from bottom of TP-111.

# Test Pit Log

Test Pit ID: TP-112

<b>Client:</b>	National Grid	<b>Date/Day:</b>	02/19/2017
<b>Project:</b>	Former Rensselaer MGP Site	<b>Weather:</b>	Sunny
<b>Location:</b>	Rensselaer, NY	<b>Temperature:</b>	50°F
<b>Project #:</b>	B0036730.0000	<b>Wind:</b>	Slight northern wind
<b>Logged By:</b>	K. Warren	<b>Subcontractor:</b>	Parratt-Wolff
<b>Coordinates:</b>	NA	<b>Equipment:</b>	Takeuchi Mini Excavator

## Sketch of Test Pit Layout:

Plan View		Profile View	
			
<b>Test Pit Dimensions:</b>	9 ft x 4 ft	<b>Total Depth:</b>	6 ft
		<b>Depth to Water:</b>	5 ft

Depth Interval (feet)	PID Screening Result (ppm)	Description of Soil/Material
0-0.5	0.0	Asphalt and Subbase Material
0.5-6.0	35	(Fill Material) Dark brown and dark grey Clayey SAND, some gravel, little debris (concrete pieces/brick), moist, faint tar-like odor, sheen, small blebs (0.5" to 2" in diameter). Wooden obstruction encountered at 5 feet below grade.

## Notes:

- Water flowing into TP-112 at northern excavation wall at 5 feet below grade.
- Excavator broke down during excavation of TP-112; hydraulic line in excavator disengaged. TP-112 terminated at 6 feet below grade when no holder wall or holder wall components were encountered.
- TP-112 left open during excavator repair, water filled TP-112 to 5 feet below grade. Sheen collected on top of water flowing into TP-112.
- Wooden obstruction encountered at 5 feet below grade, unable to uncover further due to excavator breakdown.
- bgs – below ground surface

## Photo Summary:

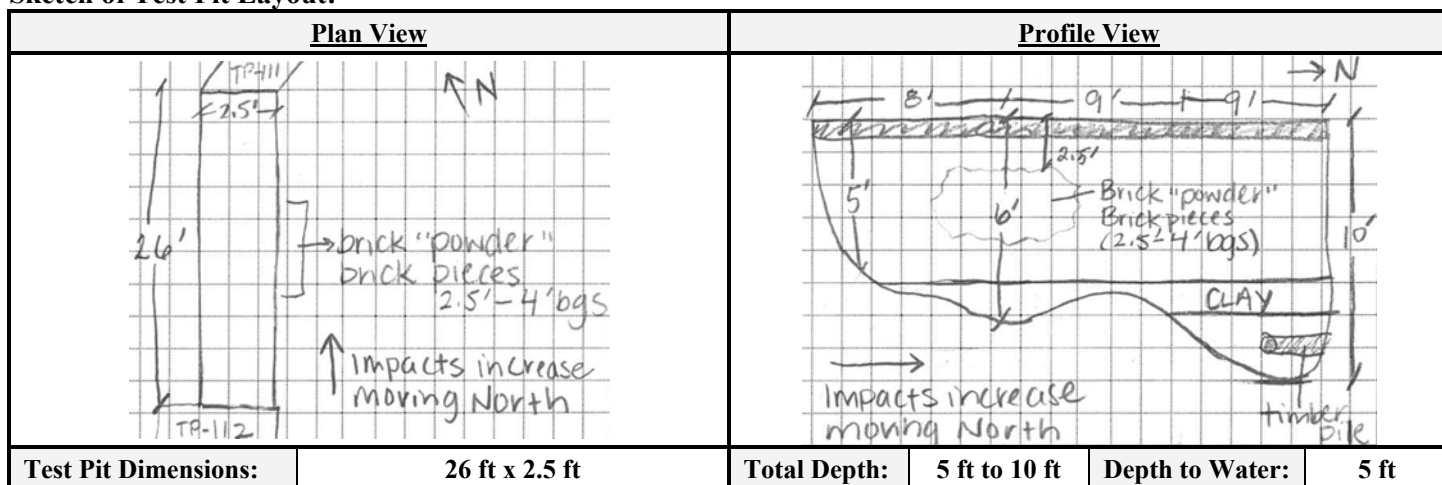
<b>13</b>	Sheen and staining on the east and west side walls of TP-112.
<b>14</b>	Water pooling with sheen at the bottom of the north end of TP-112, facing west.

# Test Pit Log

Test Pit ID: TP-113

<b>Client:</b>	National Grid	<b>Date/Day:</b>	02/20/2017
<b>Project:</b>	Former Rensselaer MGP Site	<b>Weather:</b>	Partly Cloudy
<b>Location:</b>	Rensselaer, NY	<b>Temperature:</b>	35°F
<b>Project #:</b>	B0036730.0000	<b>Wind:</b>	Slightly windy
<b>Logged By:</b>	K. Warren	<b>Subcontractor:</b>	Parratt-Wolff
<b>Coordinates:</b>	NA	<b>Equipment:</b>	Takeuchi Mini Excavator

## Sketch of Test Pit Layout:



Depth Interval (feet)	PID Screening Result (ppm)	Description of Soil/Material
0-0.5	0.0	Asphalt and Subbase Material
0.5-3.0	0-5	(Fill Material) Brown SAND, some gravel, little debris (brick/concrete pieces), little silt/clay, moist. Brick "powder" area encountered at 2.5 feet below grade in center of TP-113 (see plan view).
3.0-5.0	20-35	(Fill Material) Light brown SAND and CLAY, some gravel, little debris (brick/concrete pieces), moist, low plasticity.
5.0-10.0	45-200+	Brown and dark grey Clayey SAND, little gravel, wet, strong impacts including areas saturated in NAPL, sheen and blebs (0.5" to 2" in diameter) surrounding saturated soil, and strong tar-like and petroleum-like odors.

## Notes:

- North end of TP-113 is adjacent to TP-111. South end of TP is adjacent to TP-112. Total length of all 3 TPs is ~55 feet.
- Timber pile encountered in northern end of TP-113 at 9 feet below grade.
- Excavator at arm length limit at 10 feet bgs. Excavator bucket teeth scraping on something hard, assumed to be holder foundation.
- Impacts appear to increase moving north starting at encountered "brick powder" area (see plan view).
- bgs – below ground surface

## Photo Summary:

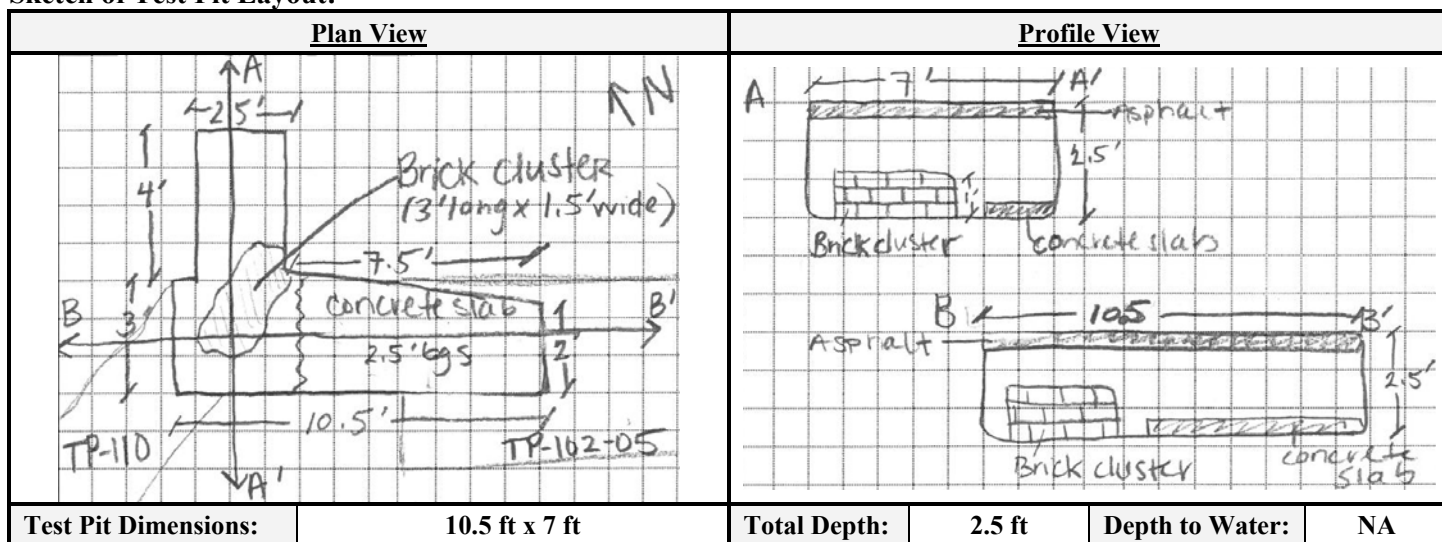
<b>15</b>	Stained soil and brick fill, facing east.
<b>16</b>	Stained soil, and sheen and NAPL from bottom of TP-113.
<b>17</b>	Stained soil and sheen from bottom and sides of TP-113, facing east.

# Test Pit Log

Test Pit ID: TP-114

<b>Client:</b>	National Grid	<b>Date/Day:</b>	02/20/2017
<b>Project:</b>	Former Rensselaer MGP Site	<b>Weather:</b>	Partly Cloudy
<b>Location:</b>	Rensselaer, NY	<b>Temperature:</b>	40°F
<b>Project #:</b>	B0036730.0000	<b>Wind:</b>	Slightly windy
<b>Logged By:</b>	K. Warren	<b>Subcontractor:</b>	Parratt-Wolff
<b>Coordinates:</b>	NA	<b>Equipment:</b>	Takeuchi Mini Excavator

## Sketch of Test Pit Layout:



Depth Interval (feet)	PID Screening Result (ppm)	Description of Soil/Material
0-0.5	0.0	Asphalt and Subbase Material
0.5-2.5	0.0	(Fill Material) Brown SAND, some gravel, little asphalt pieces (from previous test pit TP-102-05, excavated in 2005), moist. Holder wall component encountered on western side of TP-114, adjacent to TP-110.

## Notes:

- TP-114 connects previously excavated TPs (TP-102-05 and TP-110).
- Brick cluster (holder wall component) encountered in west side of TP-114, does not extend, only 2.5 feet long. Not fully indicative of holder wall original built location.
- bgs – below ground surface

## Photo Summary:

<b>18</b>	Brick cluster piece discovered in northern portion of TP-114, facing east.
<b>19</b>	Brick cluster piece discovered in northern portion of TP-114, facing east.

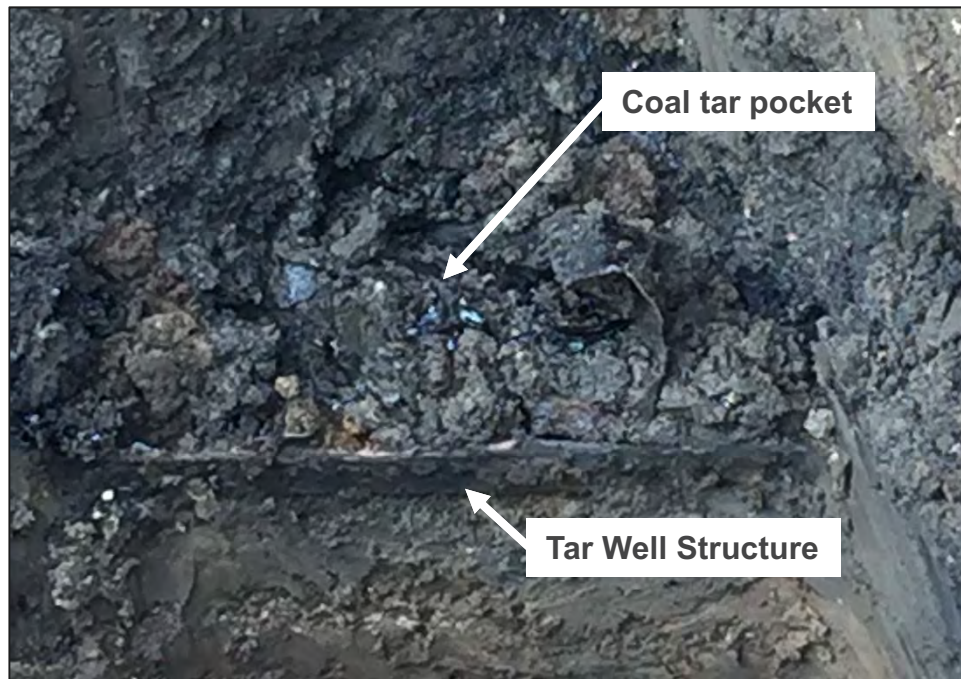
ATTACHMENT 7 - TEST PIT PHOTO LOG





## Project Photographs

Rensselaer Former MGP Site  
Rensselaer, NY



**Photo: 1**

**Date:**

2016.11.10

**Description:**

Looking at bottom of TP-106,  
facing North.

**Location:**

TP-106



**Photo: 2**

**Date:**

2016.11.10

**Description:**

Looking at bottom of TP-106,  
facing South.

**Location:**

TP-106



## Project Photographs

Rensselaer Former MGP Site  
Rensselaer, NY



**Photo: 3**

**Date:**

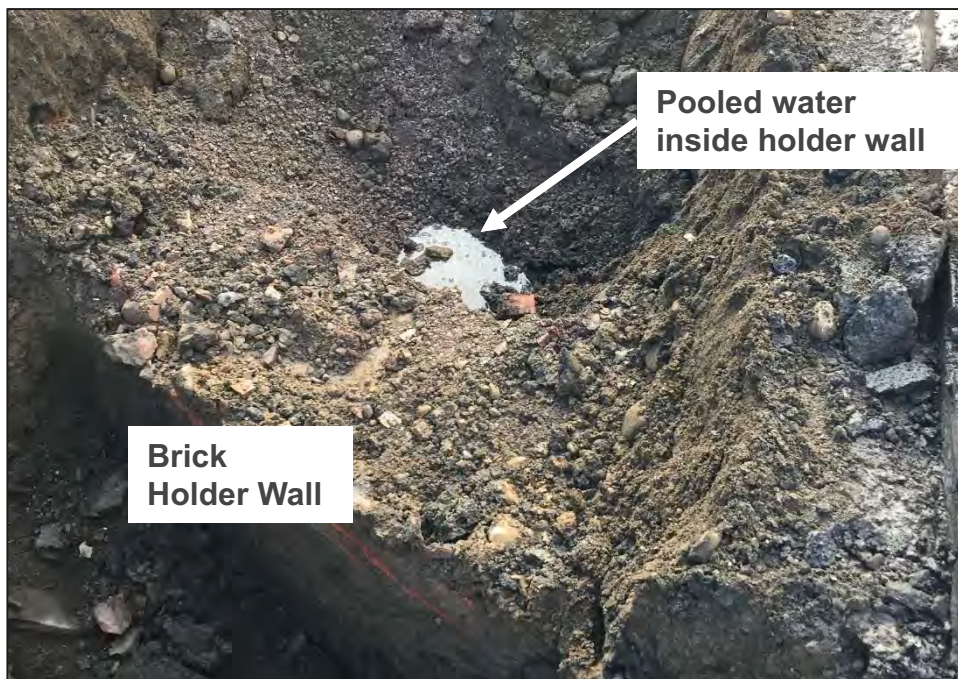
2016.11.10

**Description:**

Looking at bottom of TP-107A, facing east.

**Location:**

TP-107A



**Photo: 4**

**Date:**

2016.11.10

**Description:**

Brick Holder wall exposed during TP-107A excavation, facing east.

**Location:**

TP-107A



## Project Photographs

Rensselaer Former MGP Site  
Rensselaer, NY



**Photo: 5**

**Date:**

2016.11.10

**Description:**

Clay pipe uncovered during TP-107 excavation, facing north.

**Location:**

TP-107A



**Photo: 6**

**Date:**

2017.01.16

**Description:**

Pocket of NAPL saturated soil and sheen on pooling groundwater at bottom of TP-109, facing south.

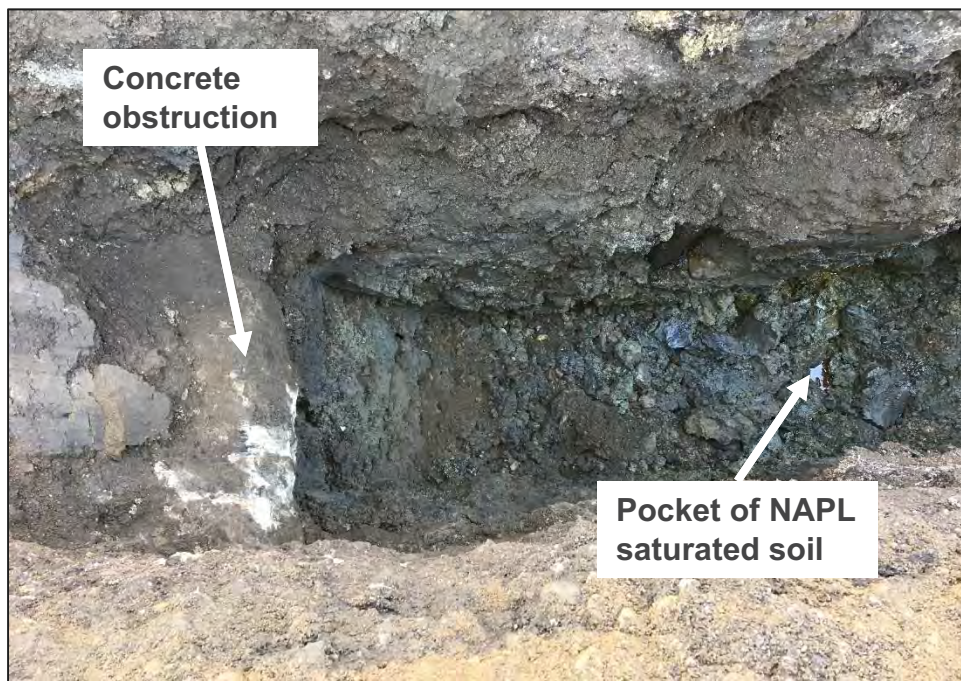
**Location:**

TP-109



## Project Photographs

Rensselaer Former MGP Site  
Rensselaer, NY



**Photo: 7**

**Date:**

2017.01.16

**Description:**

Pocket of NAPL saturated soil at bottom of TP-109. Concrete obstruction encountered during TP-109 excavation, facing west.

**Location:**

TP-109



**Photo: 8**

**Date:**

2016.11.11

**Description:**

Water pooling in the east end of TP-110, facing north.

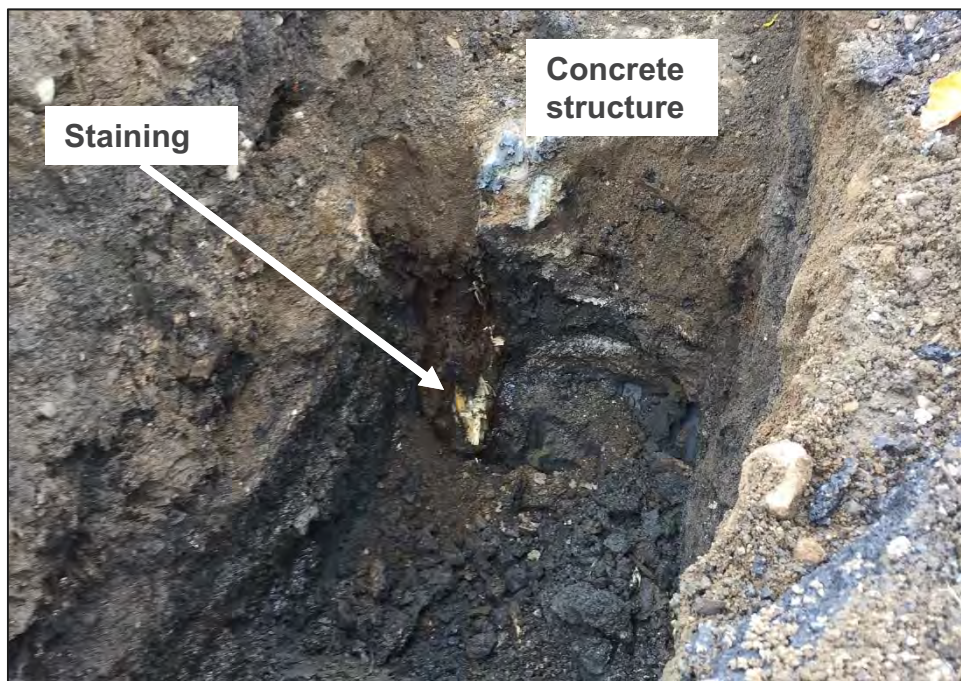
**Location:**

TP-110



## Project Photographs

Rensselaer Former MGP Site  
Rensselaer, NY



**Photo: 9**

**Date:**

2016.11.11

**Description:**

Staining in west wall of test pit, facing west.

**Location:**

TP-110



**Photo: 10**

**Date:**

2016.11.11

**Description:**

Wood pile hole at the bottom of TP-110, facing west.

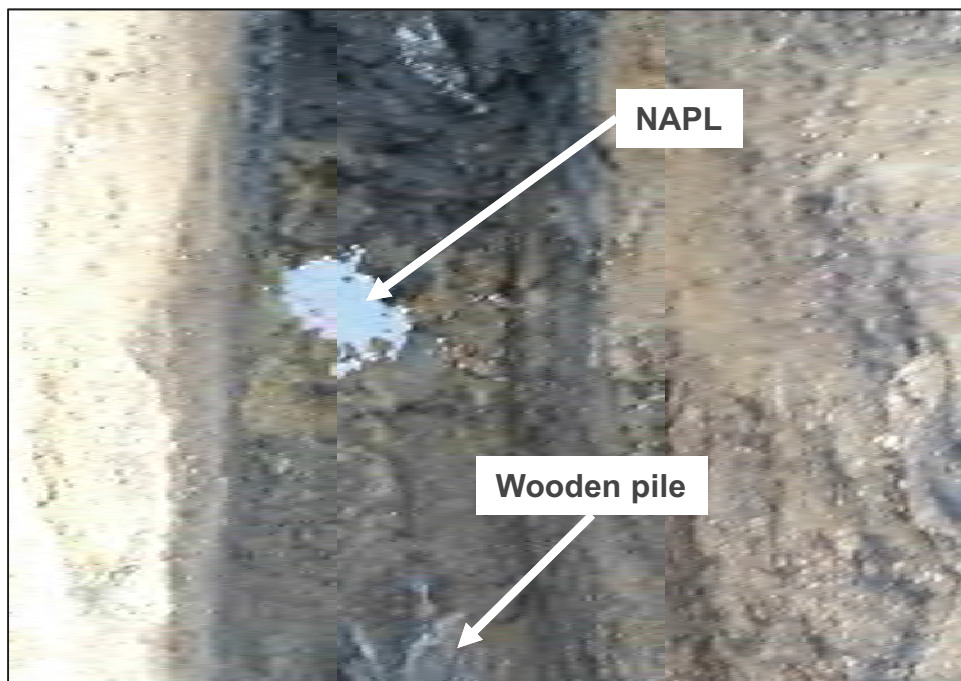
**Location:**

TP-110



## Project Photographs

Rensselaer Former MGP Site  
Rensselaer, NY



**Photo: 11**

**Date:**  
2017.02.19

**Description:**  
Water pooling with NAPL in  
bottom of the north portion  
of TP-111, facing north.

**Location:**  
TP-111



**Photo: 12**

**Date:**  
2017.02.19

**Description:**  
Stained soil from bottom of  
TP-111.

**Location:**  
TP-111

## Project Photographs

Rensselaer Former MGP Site  
Rensselaer, NY



**Photo: 13**

**Date:**  
2017.02.19

**Description:**  
Sheen and staining on the east and west side walls of TP-112.

**Location:**  
TP-112



**Photo: 14**

**Date:**  
2017.02.19

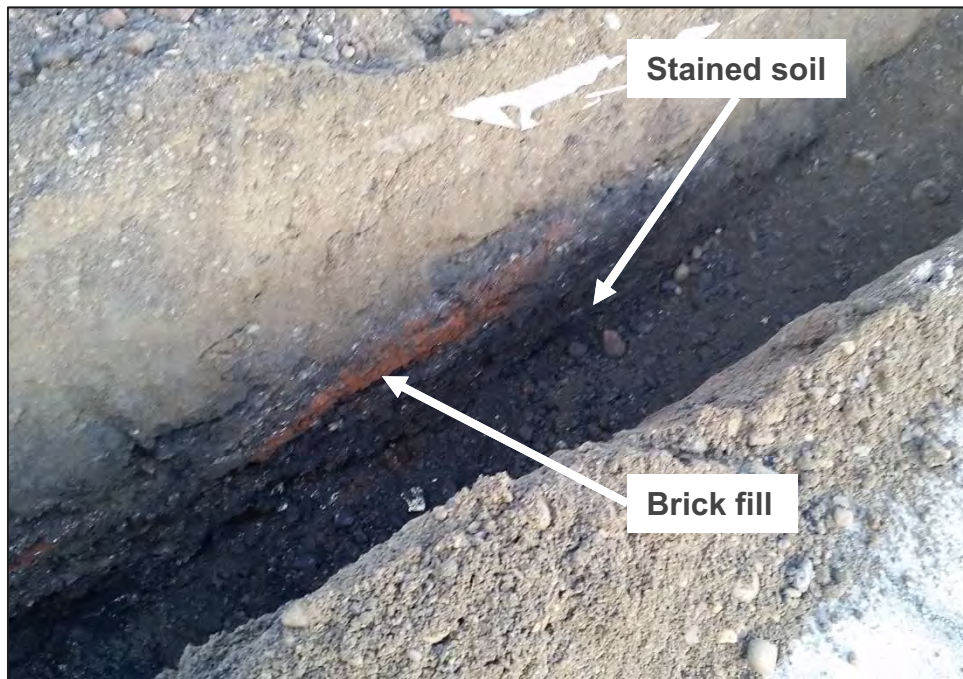
**Description:**  
Water pooling with sheen in bottom of TP-112, facing west.

**Location:**  
TP-112



## Project Photographs

Rensselaer Former MGP Site  
Rensselaer, NY



**Photo: 15**

**Date:**

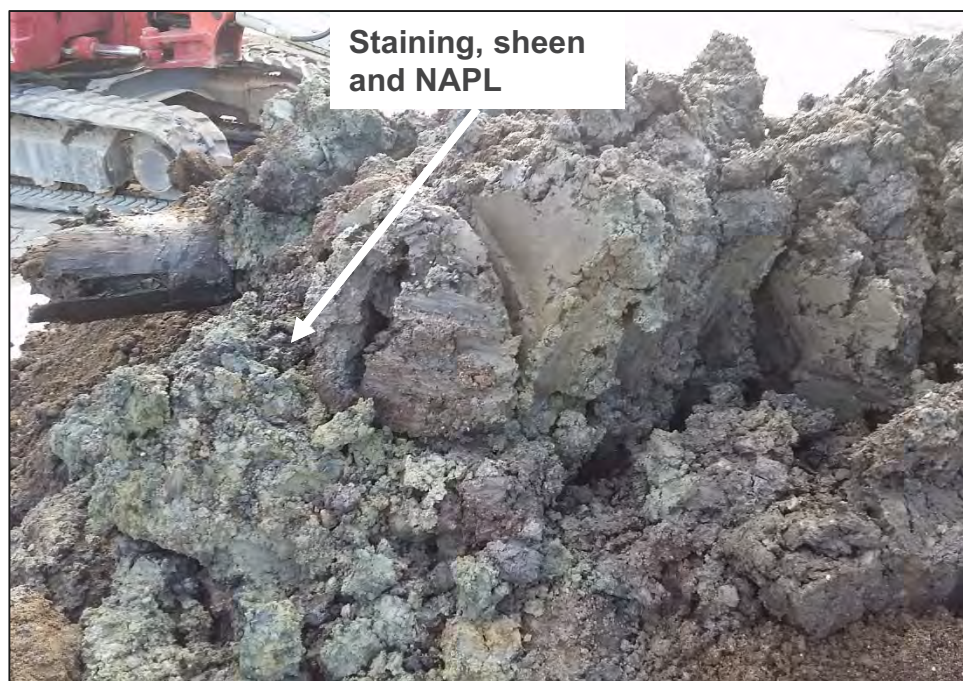
2017.02.20

**Description:**

Stained soil and brick fill, facing east.

**Location:**

TP-113



**Photo: 16**

**Date:**

2017.02.20

**Description:**

Stained soil, and sheen and NAPL from bottom of TP-113.

**Location:**

TP-113



## Project Photographs

Rensselaer Former MGP Site  
Rensselaer, NY



**Photo: 17**

**Date:**

2017.02.20

**Description:**

Stained soil and sheen from bottom and sides of TP-113, facing east.

**Location:**

TP-113



**Photo: 18**

**Date:**

2017.02.20

**Description:**

Brick cluster piece discovered in northern portion of TP-114, facing east.

**Location:**

TP-114

## Project Photographs

Rensselaer Former MGP Site  
Rensselaer, NY



**Photo: 19**

**Date:**

2017.02.20

**Description:**

Brick cluster piece discovered  
in northern portion of TP-114,  
facing east.

**Location:**

TP-114



# ATTACHMENT 8 - WASTE CHARACTERIZATION ANALYTICAL RESULTS



**Technical Report for****Arcadis**

National Grid, Washington Street, Rensselaer, NY

B0036730

SGS Accutest Job Number: MC48722

Sampling Dates: 11/10/16 - 11/11/16

**Report to:**Arcadis U.S.  
6723 Towpath Road, Box 66  
Syracuse, NY 13214-0066  
jason.golubski@arcadis.com

ATTN: Jason Golubski

Total number of pages in report: 175

Test results contained within this data package meet the requirements  
of the National Environmental Laboratory Accreditation Program  
and/or state specific certification programs as applicable.  
**H. (Brad) Madadian**  
Lab Director**Client Service contact: Jeremy Vienneau 508-481-6200**Certifications: MA (M-MA136, SW846 NELAC) CT (PH-0109) NH (250210) RI (00071) FL (E87579) NY (11791)  
NJ (MA926) PA (6801121) ND (R-188) CO (MA00136) MN (11546AA) NC (653) IL (002337) WI (399080220)  
DoD ELAP (L-A-B L2235)This report shall not be reproduced, except in its entirety, without the written approval of SGS Accutest.  
Test results relate only to samples analyzed.

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Sample Summary

Arcadis

National Grid, Washington Street, Rensselaer, NY  
Project No: B0036730

Job No: MC48722

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
MC48722-1	11/10/16	13:30 JDL	11/12/16	SO	Soil	TP-106(3.0')
MC48722-1A	11/10/16	13:30 JDL	11/12/16	SO	Soil	TP-106(3.0')
MC48722-2	11/11/16	08:30 JDL	11/12/16	SO	Soil	TP-107(3.0')
MC48722-2A	11/11/16	08:30 JDL	11/12/16	SO	Soil	TP-107(3.0')
MC48722-3	11/11/16	12:15 JDL	11/12/16	SO	Soil	TP-110(0-3.0')
MC48722-4	11/11/16	12:15 JDL	11/12/16	SO	Soil	TP-110(3.0-3.5')

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## Summary of Hits

**Job Number:** MC48722  
**Account:** Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY  
**Collected:** 11/10/16 thru 11/11/16

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>MC48722-1</b>	<b>TP-106(3.0')</b>					
Acetone		20.2 B	8.0	2.6	ug/kg	SW846 8260C
Benzene		12.1	0.80	0.30	ug/kg	SW846 8260C
Carbon disulfide <sup>a</sup>		18.7	4.0	0.33	ug/kg	SW846 8260C
Ethylbenzene		0.90 J	1.6	0.30	ug/kg	SW846 8260C
Toluene		3.2 JB	4.0	0.32	ug/kg	SW846 8260C
Xylene (total)		2.9	1.6	0.28	ug/kg	SW846 8260C
Acenaphthene		448	120	8.6	ug/kg	SW846 8270D
Acenaphthylene		918	120	9.9	ug/kg	SW846 8270D
Anthracene		1300	120	10	ug/kg	SW846 8270D
Benzo(a)anthracene		5260	120	12	ug/kg	SW846 8270D
Benzo(a)pyrene		5480	310	11	ug/kg	SW846 8270D
Benzo(b)fluoranthene		4980	120	14	ug/kg	SW846 8270D
Benzo(g,h,i)perylene		2460	120	12	ug/kg	SW846 8270D
Benzo(k)fluoranthene		3850	120	17	ug/kg	SW846 8270D
Carbazole		421	120	11	ug/kg	SW846 8270D
Chrysene		4620	120	9.7	ug/kg	SW846 8270D
Dibenzo(a,h)anthracene		866	120	10	ug/kg	SW846 8270D
Dibenzofuran		629	120	9.8	ug/kg	SW846 8270D
Fluoranthene		7470	120	11	ug/kg	SW846 8270D
Fluorene		642	120	14	ug/kg	SW846 8270D
Indeno(1,2,3-cd)pyrene		2910	310	35	ug/kg	SW846 8270D
2-Methylnaphthalene		461	120	15	ug/kg	SW846 8270D
Naphthalene		3200	120	11	ug/kg	SW846 8270D
Phenanthrene		3480	120	9.3	ug/kg	SW846 8270D
Pyrene		6750	120	12	ug/kg	SW846 8270D
TPH-GRO (VOA)		4.46 J	12	2.2	mg/kg	SW846 8015
TPH-DRO (Semi-VOA)		525	20	5.1	mg/kg	SW846-8015
Arsenic		7.0	1.0	0.20	mg/kg	SW846 6010C
Barium		103	5.0	0.077	mg/kg	SW846 6010C
Beryllium		0.88	0.40	0.015	mg/kg	SW846 6010C
Cadmium		0.19 B	0.40	0.031	mg/kg	SW846 6010C
Chromium		17.4	1.0	0.047	mg/kg	SW846 6010C
Lead		28.0	1.0	0.11	mg/kg	SW846 6010C
Mercury		0.057	0.041	0.0069	mg/kg	SW846 7471B
Nickel		26.3	4.0	0.057	mg/kg	SW846 6010C
Vanadium		26.7	1.0	0.040	mg/kg	SW846 6010C
Zinc		69.7	2.0	0.17	mg/kg	SW846 6010C
Cyanide		2.6	0.15	0.042	mg/kg	SW846 9012 M
Heat Content, BTU <sup>b</sup>		3260	100		BTU/lb	ASTM D240-92
Percent Sulfur <sup>b</sup>		0.17 B	0.21	0.054	%	ASTM D129-95

## Summary of Hits

**Job Number:** MC48722  
**Account:** Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY  
**Collected:** 11/10/16 thru 11/11/16

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### MC48722-1A TP-106(3.0')

Benzene	0.0586 J	0.10	0.027	mg/l	SW846 8260C
Arsenic	0.0044 B	0.010	0.0020	mg/l	SW846 6010C
Barium	0.65	0.50	0.00057	mg/l	SW846 6010C
Cadmium	0.0012 B	0.0040	0.00030	mg/l	SW846 6010C
Lead	0.0012 B	0.010	0.0011	mg/l	SW846 6010C

### MC48722-2 TP-107(3.0')

Acetone	15.3 B	8.2	2.7	ug/kg	SW846 8260C
Benzene	2.3	0.82	0.31	ug/kg	SW846 8260C
Carbon disulfide <sup>a</sup>	1.7 J	4.1	0.33	ug/kg	SW846 8260C
Toluene	0.73 JB	4.1	0.33	ug/kg	SW846 8260C
Acenaphthene	44.6 J	110	7.3	ug/kg	SW846 8270D
Acenaphthylene	435	110	8.5	ug/kg	SW846 8270D
Anthracene	674	110	8.6	ug/kg	SW846 8270D
Benzo(a)anthracene	2030	110	11	ug/kg	SW846 8270D
Benzo(a)pyrene	2270	270	9.1	ug/kg	SW846 8270D
Benzo(b)fluoranthene	1820	110	12	ug/kg	SW846 8270D
Benzo(g,h,i)perylene	1260	110	10	ug/kg	SW846 8270D
Benzo(k)fluoranthene	1810	110	15	ug/kg	SW846 8270D
Butyl benzyl phthalate	276	270	14	ug/kg	SW846 8270D
Carbazole	76.5 J	110	9.3	ug/kg	SW846 8270D
Chrysene	1780	110	8.3	ug/kg	SW846 8270D
Dibenzo(a,h)anthracene	370	110	8.8	ug/kg	SW846 8270D
Dibenzofuran	223	110	8.4	ug/kg	SW846 8270D
Di-n-butyl phthalate	23.4 J	270	11	ug/kg	SW846 8270D
Fluoranthene	2910	110	9.8	ug/kg	SW846 8270D
Fluorene	196	110	12	ug/kg	SW846 8270D
Indeno(1,2,3-cd)pyrene	1350	270	30	ug/kg	SW846 8270D
2-Methylnaphthalene	77.5 J	110	13	ug/kg	SW846 8270D
Naphthalene	151	110	9.1	ug/kg	SW846 8270D
Phenanthrene	1540	110	8.0	ug/kg	SW846 8270D
Pyrene	2780	110	10	ug/kg	SW846 8270D
TPH-GRO (VOA)	3.66 J	9.3	1.7	mg/kg	SW846 8015
TPH-DRO (Semi-VOA)	101	18	4.6	mg/kg	SW846-8015
Arsenic	8.6	0.91	0.18	mg/kg	SW846 6010C
Barium	92.7	4.6	0.070	mg/kg	SW846 6010C
Beryllium	0.63	0.37	0.014	mg/kg	SW846 6010C
Cadmium	0.22 B	0.37	0.028	mg/kg	SW846 6010C
Chromium	14.6	0.91	0.043	mg/kg	SW846 6010C
Lead	46.1	0.91	0.10	mg/kg	SW846 6010C
Mercury	0.21	0.034	0.0057	mg/kg	SW846 7471B
Nickel	20.6	3.7	0.052	mg/kg	SW846 6010C

## Summary of Hits

**Job Number:** MC48722  
**Account:** Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY  
**Collected:** 11/10/16 thru 11/11/16

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Thallium		0.11 B	0.91	0.10	mg/kg	SW846 6010C
Vanadium		22.1	0.91	0.037	mg/kg	SW846 6010C
Zinc		76.4	1.8	0.16	mg/kg	SW846 6010C
Cyanide		0.62	0.13	0.037	mg/kg	SW846 9012 M
Heat Content, BTU <sup>b</sup>		1800	100		BTU/lb	ASTM D240-92

### MC48722-2A TP-107(3.0')

Arsenic		0.0020 B	0.010	0.0020	mg/l	SW846 6010C
Barium		0.37 B	0.50	0.00057	mg/l	SW846 6010C
Cadmium		0.0012 B	0.0040	0.00030	mg/l	SW846 6010C
Chromium		0.0012 B	0.010	0.0011	mg/l	SW846 6010C
Lead		0.0039 B	0.010	0.0011	mg/l	SW846 6010C

### MC48722-3 TP-110(0-3.0')

Tetrachloroethene		0.0248 J	0.20	0.021	mg/l	SW846 8260C
Arsenic		0.0037 B	0.010	0.0020	mg/l	SW846 6010C
Barium		0.75	0.50	0.00057	mg/l	SW846 6010C
Cadmium		0.0013 B	0.0040	0.00030	mg/l	SW846 6010C
Lead		1.5	0.010	0.0011	mg/l	SW846 6010C

### MC48722-4 TP-110(3.0-3.5')

Ethylbenzene		1330	210	40	ug/kg	SW846 8260C
Toluene		77.0 J	530	42	ug/kg	SW846 8260C
Xylene (total)		1460	210	37	ug/kg	SW846 8260C
Acenaphthene		3270	120	8.3	ug/kg	SW846 8270D
Acenaphthylene		958	120	9.6	ug/kg	SW846 8270D
Anthracene		2200	120	9.8	ug/kg	SW846 8270D
Benzo(a)anthracene		2910	120	12	ug/kg	SW846 8270D
Benzo(a)pyrene		2900	300	10	ug/kg	SW846 8270D
Benzo(b)fluoranthene		1910	120	14	ug/kg	SW846 8270D
Benzo(g,h,i)perylene		1400	120	12	ug/kg	SW846 8270D
Benzo(k)fluoranthene		2070	120	17	ug/kg	SW846 8270D
Carbazole		220	120	11	ug/kg	SW846 8270D
Chrysene		2700	120	9.4	ug/kg	SW846 8270D
Dibenzo(a,h)anthracene		367	120	10	ug/kg	SW846 8270D
Dibenzofuran		316	120	9.5	ug/kg	SW846 8270D
Fluoranthene		5160	120	11	ug/kg	SW846 8270D
Fluorene		1720	120	13	ug/kg	SW846 8270D
Indeno(1,2,3-cd)pyrene		1410	300	34	ug/kg	SW846 8270D
2-Methylnaphthalene		4460	120	14	ug/kg	SW846 8270D
Naphthalene		7580	120	10	ug/kg	SW846 8270D
Phenanthrene		7470	120	9.1	ug/kg	SW846 8270D



## Summary of Hits

**Job Number:** MC48722  
**Account:** Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY  
**Collected:** 11/10/16 thru 11/11/16

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Pyrene		7400	120	12	ug/kg	SW846 8270D
TPH-GRO (VOA)		68.1	11	2.0	mg/kg	SW846 8015
TPH-DRO (Semi-VOA)		2200	20	4.9	mg/kg	SW846-8015
Arsenic		4.6	0.99	0.20	mg/kg	SW846 6010C
Barium		83.6	4.9	0.075	mg/kg	SW846 6010C
Beryllium		0.47	0.39	0.015	mg/kg	SW846 6010C
Cadmium		0.12 B	0.39	0.031	mg/kg	SW846 6010C
Chromium		13.1	0.99	0.046	mg/kg	SW846 6010C
Lead		34.9	0.99	0.11	mg/kg	SW846 6010C
Mercury		0.30	0.038	0.0064	mg/kg	SW846 7471B
Nickel		19.2	3.9	0.056	mg/kg	SW846 6010C
Vanadium		17.0	0.99	0.039	mg/kg	SW846 6010C
Zinc		61.7	2.0	0.17	mg/kg	SW846 6010C
Cyanide		1.1	0.14	0.039	mg/kg	SW846 9012 M
Heat Content, BTU <sup>b</sup>		1510	100		BTU/lb	ASTM D240-92
Percent Sulfur <sup>b</sup>		0.11 B	0.20	0.054	%	ASTM D129-95

(a) Continuing Calibration outside of acceptance criteria. Result may be biased low.

(b) Analysis performed at SGS Accutest, Dayton, NJ.

**Sample Results**

**Report of Analysis**

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M82033.D	1	11/21/16	KP	n/a	n/a	MSM2942
Run #2							

	Initial Weight	Final Volume
Run #1	8.09 g	5.0 ml
Run #2		

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	20.2	8.0	2.6	ug/kg	B
71-43-2	Benzene	12.1	0.80	0.30	ug/kg	
75-27-4	Bromodichloromethane	ND	1.6	0.34	ug/kg	
75-25-2	Bromoform	ND	1.6	0.38	ug/kg	
74-83-9	Bromomethane	ND	8.0	1.3	ug/kg	
78-93-3	2-Butanone (MEK)	ND	8.0	2.7	ug/kg	
75-15-0	Carbon disulfide <sup>a</sup>	18.7	4.0	0.33	ug/kg	
56-23-5	Carbon tetrachloride	ND	1.6	0.33	ug/kg	
108-90-7	Chlorobenzene	ND	1.6	0.76	ug/kg	
75-00-3	Chloroethane	ND	8.0	1.7	ug/kg	
67-66-3	Chloroform	ND	1.6	0.40	ug/kg	
74-87-3	Chloromethane	ND	4.0	0.60	ug/kg	
124-48-1	Dibromochloromethane	ND	4.0	0.86	ug/kg	
75-34-3	1,1-Dichloroethane	ND	1.6	0.32	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.6	0.30	ug/kg	
75-35-4	1,1-Dichloroethene <sup>b</sup>	ND	1.6	0.55	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	1.6	0.29	ug/kg	
156-60-5	trans-1,2-Dichloroethene <sup>b</sup>	ND	1.6	0.32	ug/kg	
78-87-5	1,2-Dichloropropane	ND	1.6	0.35	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.6	0.98	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.6	1.1	ug/kg	
100-41-4	Ethylbenzene	0.90	1.6	0.30	ug/kg	J
591-78-6	2-Hexanone	ND	4.0	0.54	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	4.0	0.52	ug/kg	
75-09-2	Methylene chloride	ND	1.6	0.34	ug/kg	
100-42-5	Styrene	ND	4.0	0.25	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.0	1.5	ug/kg	
127-18-4	Tetrachloroethene	ND	1.6	0.24	ug/kg	
108-88-3	Toluene	3.2	4.0	0.32	ug/kg	JB
71-55-6	1,1,1-Trichloroethane	ND	1.6	0.28	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.6	1.1	ug/kg	
79-01-6	Trichloroethene	ND	1.6	0.25	ug/kg	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	8.0	2.7	ug/kg	
1330-20-7	Xylene (total)	2.9	1.6	0.28	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	118%		65-141%
2037-26-5	Toluene-D8	103%		65-129%
460-00-4	4-Bromofluorobenzene	95%		63-137%

(a) Continuing Calibration outside of acceptance criteria. Result may be biased low.

(b) Continuing Calibration outside of acceptance criteria. Reporting Limit response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50715.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.8 g	1.0 ml
Run #2		

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	310	14	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	620	14	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	620	33	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	620	260	ug/kg	
51-28-5	2,4-Dinitrophenol <sup>a</sup>	ND	620	130	ug/kg	
534-52-1	4,6-Dinitro-o-cresol <sup>a</sup>	ND	620	62	ug/kg	
95-48-7	2-Methylphenol	ND	620	66	ug/kg	
	3&4-Methylphenol	ND	620	54	ug/kg	
88-75-5	2-Nitrophenol	ND	620	49	ug/kg	
100-02-7	4-Nitrophenol	ND	620	72	ug/kg	
87-86-5	Pentachlorophenol	ND	620	71	ug/kg	
108-95-2	Phenol	ND	310	14	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	620	19	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	620	11	ug/kg	
83-32-9	Acenaphthene	448	120	8.6	ug/kg	
208-96-8	Acenaphthylene	918	120	9.9	ug/kg	
120-12-7	Anthracene	1300	120	10	ug/kg	
56-55-3	Benzo(a)anthracene	5260	120	12	ug/kg	
50-32-8	Benzo(a)pyrene	5480	310	11	ug/kg	
205-99-2	Benzo(b)fluoranthene	4980	120	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	2460	120	12	ug/kg	
207-08-9	Benzo(k)fluoranthene	3850	120	17	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	310	13	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	310	16	ug/kg	
91-58-7	2-Chloronaphthalene	ND	310	12	ug/kg	
106-47-8	4-Chloroaniline	ND	620	14	ug/kg	
86-74-8	Carbazole	421	120	11	ug/kg	
218-01-9	Chrysene	4620	120	9.7	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	310	12	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	310	11	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	310	15	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	310	15	ug/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	1,2-Dichlorobenzene	ND	310	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	310	9.3	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	310	13	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	620	15	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	620	14	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	620	41	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	866	120	10	ug/kg	
132-64-9	Dibenzofuran	629	120	9.8	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	310	13	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	310	11	ug/kg	
84-66-2	Diethyl phthalate	ND	310	9.9	ug/kg	
131-11-3	Dimethyl phthalate	ND	310	9.9	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	310	12	ug/kg	
206-44-0	Fluoranthene	7470	120	11	ug/kg	
86-73-7	Fluorene	642	120	14	ug/kg	
118-74-1	Hexachlorobenzene	ND	310	16	ug/kg	
87-68-3	Hexachlorobutadiene	ND	310	12	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	620	15	ug/kg	
67-72-1	Hexachloroethane	ND	310	30	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	2910	310	35	ug/kg	
78-59-1	Isophorone	ND	310	22	ug/kg	
91-57-6	2-Methylnaphthalene	461	120	15	ug/kg	
88-74-4	2-Nitroaniline	ND	620	15	ug/kg	
99-09-2	3-Nitroaniline	ND	620	15	ug/kg	
100-01-6	4-Nitroaniline	ND	620	15	ug/kg	
91-20-3	Naphthalene	3200	120	11	ug/kg	
98-95-3	Nitrobenzene	ND	310	34	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	310	18	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	310	41	ug/kg	
85-01-8	Phenanthrene	3480	120	9.3	ug/kg	
129-00-0	Pyrene	6750	120	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	310	16	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	36%		25-109%
4165-62-2	Phenol-d5	50%		29-113%
118-79-6	2,4,6-Tribromophenol	81%		20-141%
4165-60-0	Nitrobenzene-d5	42%		27-115%
321-60-8	2-Fluorobiphenyl	70%		34-118%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	Terphenyl-d14	88%		42-139%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
RL = Reporting Limit      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8015		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	WX78128.D	1	11/17/16	AF	n/a	n/a	GWX3867
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.33 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	4.46	12	2.2	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	102%		64-127%		

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8082A SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK63163.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
Run #2							

Run #	Initial Weight	Final Volume
Run #1	15.2 g	10.0 ml
Run #2		

## PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	43	4.4	ug/kg	
11104-28-2	Aroclor 1221	ND	43	19	ug/kg	
11141-16-5	Aroclor 1232	ND	43	13	ug/kg	
53469-21-9	Aroclor 1242	ND	43	9.8	ug/kg	
12672-29-6	Aroclor 1248	ND	43	7.4	ug/kg	
11097-69-1	Aroclor 1254	ND	43	19	ug/kg	
11096-82-5	Aroclor 1260	ND	43	3.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	83%		25-145%
877-09-8	Tetrachloro-m-xylene	74%		25-145%
2051-24-3	Decachlorobiphenyl	76%		25-179%
2051-24-3	Decachlorobiphenyl	76%		25-179%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846-8015 SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IR3264.D	1	11/18/16	MD	11/16/16	OP49158	GIR226
Run #2							

	Initial Weight	Final Volume
Run #1	15.8 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (Semi-VOA)	525	20	5.1	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	91%		17-130%		

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: TP-106(3.0')

Lab Sample ID: MC48722-1

Matrix: SO - Soil

Date Sampled: 11/10/16

Date Received: 11/12/16

Percent Solids: 77.0

Project: National Grid, Washington Street, Rensselaer, NY

## Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony	ND	1.0	0.17	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Arsenic	7.0	1.0	0.20	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Barium	103	5.0	0.077	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Beryllium	0.88	0.40	0.015	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Cadmium	0.19 B	0.40	0.031	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Chromium	17.4	1.0	0.047	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Lead	28.0	1.0	0.11	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Mercury	0.057	0.041	0.0069	mg/kg	1	11/15/16	11/15/16 JM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>3</sup>
Nickel	26.3	4.0	0.057	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Selenium	ND	1.0	0.30	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Silver	ND	0.50	0.061	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Thallium	ND	1.0	0.11	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Vanadium	26.7	1.0	0.040	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Zinc	69.7	2.0	0.17	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>

(1) Instrument QC Batch: MA19626

(2) Instrument QC Batch: MA19629

(3) Prep QC Batch: MP27019

(4) Prep QC Batch: MP27020

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

B = Indicates a result &gt; = MDL but &lt; RL

## Report of Analysis

**Client Sample ID:** TP-106(3.0')**Lab Sample ID:** MC48722-1**Matrix:** SO - Soil**Project:** National Grid, Washington Street, Rensselaer, NY**Date Sampled:** 11/10/16**Date Received:** 11/12/16**Percent Solids:** 77.0**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Cyanide	2.6	0.15	0.042	mg/kg	1	11/23/16 20:54 CF	SW846	9012 M
Heat Content, BTU <sup>a</sup>	3260	100		BTU/lb	1	11/18/16 21:00 ANJ	ASTM	D240-92
Percent Sulfur <sup>a</sup>	0.17 B	0.21	0.054	%	1	11/18/16 21:00 ANJ	ASTM	D129-95
Solids, Percent	77			%	1	11/15/16	JM	SM 2540G-97 MOD

(a) Analysis performed at SGS Accutest, Dayton, NJ.

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
B = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')		
<b>Lab Sample ID:</b>	MC48722-1A	<b>Date Sampled:</b>	11/10/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8260C SW846 1311	<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N106527.D	100	11/23/16	AD	11/15/16	GP21107	MSN3919
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	0.0586	D018	0.50	0.10	0.027	mg/l	J
78-93-3	2-Butanone (MEK)	ND	D035	200	1.0	0.30	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.20	0.034	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.20	0.024	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.20	0.040	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.20	0.058	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.20	0.068	mg/l	
75-35-4	1,1-Dichloroethene	ND	D029	0.70	0.20	0.028	mg/l	
127-18-4	Tetrachloroethene	ND	D039	0.70	0.20	0.021	mg/l	
79-01-6	Trichloroethene	ND	D040	0.50	0.20	0.025	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.20	0.045	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		74-135%
2037-26-5	Toluene-D8	102%		83-116%
460-00-4	4-Bromofluorobenzene	102%		76-124%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6(g))  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')		
<b>Lab Sample ID:</b>	MC48722-1A	<b>Date Sampled:</b>	11/10/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8270D SW846 3510C	<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50881.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897
Run #2							

Run #	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2		

## ABN TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0.10	0.0032	mg/l	
	3&4-Methylphenol	ND	D024	200	0.10	0.0054	mg/l	
87-86-5	Pentachlorophenol <sup>a</sup>	ND	D037	100	0.10	0.0059	mg/l	
95-95-4	2,4,5-Trichlorophenol	ND	D041	400	0.10	0.0052	mg/l	
88-06-2	2,4,6-Trichlorophenol	ND	D042	2.0	0.10	0.0038	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.050	0.0035	mg/l	
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.10	0.012	mg/l	
118-74-1	Hexachlorobenzene	ND	D032	0.13	0.050	0.0041	mg/l	
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.050	0.0043	mg/l	
67-72-1	Hexachloroethane	ND	D034	3.0	0.050	0.0036	mg/l	
98-95-3	Nitrobenzene	ND	D036	2.0	0.050	0.0042	mg/l	
110-86-1	Pyridine	ND	D038	5.0	0.10	0.013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	48%		10-73%
4165-62-2	Phenol-d5	30%		10-58%
118-79-6	2,4,6-Tribromophenol	83%		15-125%
4165-60-0	Nitrobenzene-d5	73%		23-120%
321-60-8	2-Fluorobiphenyl	78%		31-102%
1718-51-0	Terphenyl-d14	94%		42-124%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
MCL = Maximum Contamination Level (40 CFR 261.6/96)      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')						
<b>Lab Sample ID:</b>	MC48722-1A					<b>Date Sampled:</b>	11/10/16
<b>Matrix:</b>	SO - Soil					<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8151 SW846 3510C SPLP					<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ98717.D	1	11/29/16	TA	11/16/16	OP49161	GYZ8038
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Herbicide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
94-75-7	2,4-D	ND	D016	10	0.010	0.0034	mg/l	
93-72-1	2,4,5-TP (Silvex)	ND	D017	1.0	0.010	0.0040	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	57%		30-150%
19719-28-9	2,4-DCAA	45%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')		
<b>Lab Sample ID:</b>	MC48722-1A	<b>Date Sampled:</b>	11/10/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8081B SW846 3510C SPLP	<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BE53426.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Pesticide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	D013	0.40	0.00050	0.000044	mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0050	0.0011	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.00050	0.00012	mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.00050	0.00011	mg/l	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.00050	0.000051	mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00050	0.00021	mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.025	0.0013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	50%		30-150%
877-09-8	Tetrachloro-m-xylene	53%		30-150%
2051-24-3	Decachlorobiphenyl	82%		30-150%
2051-24-3	Decachlorobiphenyl	75%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')		
<b>Lab Sample ID:</b>	MC48722-1A	<b>Date Sampled:</b>	11/10/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8082A SW846 3510C SPLP	<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK63184.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## PCB List

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND			0.0025	0.0016	mg/l	
11104-28-2	Aroclor 1221	ND			0.0025	0.0016	mg/l	
11141-16-5	Aroclor 1232	ND			0.0025	0.0018	mg/l	
53469-21-9	Aroclor 1242	ND			0.0025	0.0019	mg/l	
12672-29-6	Aroclor 1248	ND			0.0025	0.0012	mg/l	
11097-69-1	Aroclor 1254	ND			0.0025	0.0016	mg/l	
11096-82-5	Aroclor 1260	ND			0.0025	0.0019	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	85%		30-150%
877-09-8	Tetrachloro-m-xylene	72%		30-150%
2051-24-3	Decachlorobiphenyl	109%		30-150%
2051-24-3	Decachlorobiphenyl	112%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** TP-106(3.0')**Lab Sample ID:** MC48722-1A**Matrix:** SO - Soil**Date Sampled:** 11/10/16**Date Received:** 11/12/16**Percent Solids:** 77.0**Project:** National Grid, Washington Street, Rensselaer, NY**Metals Analysis, TCLP Leachate SW846 1311**

Analyte	Result	HW#	MCL	RL	MDL	Units	DF	Prep	Analyzed By	Method
Arsenic	0.0044 B	D004	5.0	0.010	0.0020	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Barium	0.65	D005	100	0.50	0.00057	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Cadmium	0.0012 B	D006	1.0	0.0040	0.00030	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Chromium	ND	D007	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Lead	0.0012 B	D008	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Mercury	ND	D009	0.20	0.00020	0.000034	mg/l	1	11/17/16	11/17/16	JM SW846 7470A <sup>2</sup>
Selenium	ND	D010	1.0	0.025	0.0034	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Silver	ND	D011	5.0	0.0050	0.0014	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>

(1) Instrument QC Batch: MA19631

(2) Instrument QC Batch: MA19634

(3) Prep QC Batch: MP27025

(4) Prep QC Batch: MP27030

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

MCL = Maximum Contamination Level (40 CFR 261.6(g))

B = Indicates a result &gt; = MDL but &lt; RL

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M82034.D	1	11/21/16	KP	n/a	n/a	MSM2942
Run #2							

	Initial Weight	Final Volume
Run #1	6.87 g	5.0 ml
Run #2		

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	15.3	8.2	2.7	ug/kg	B
71-43-2	Benzene	2.3	0.82	0.31	ug/kg	
75-27-4	Bromodichloromethane	ND	1.6	0.35	ug/kg	
75-25-2	Bromoform	ND	1.6	0.39	ug/kg	
74-83-9	Bromomethane	ND	8.2	1.3	ug/kg	
78-93-3	2-Butanone (MEK)	ND	8.2	2.8	ug/kg	
75-15-0	Carbon disulfide <sup>a</sup>	1.7	4.1	0.33	ug/kg	J
56-23-5	Carbon tetrachloride	ND	1.6	0.34	ug/kg	
108-90-7	Chlorobenzene	ND	1.6	0.77	ug/kg	
75-00-3	Chloroethane	ND	8.2	1.7	ug/kg	
67-66-3	Chloroform	ND	1.6	0.41	ug/kg	
74-87-3	Chloromethane	ND	4.1	0.61	ug/kg	
124-48-1	Dibromochloromethane	ND	4.1	0.88	ug/kg	
75-34-3	1,1-Dichloroethane	ND	1.6	0.33	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.6	0.30	ug/kg	
75-35-4	1,1-Dichloroethene <sup>b</sup>	ND	1.6	0.56	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	1.6	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene <sup>b</sup>	ND	1.6	0.33	ug/kg	
78-87-5	1,2-Dichloropropane	ND	1.6	0.36	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.6	1.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.6	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	1.6	0.31	ug/kg	
591-78-6	2-Hexanone	ND	4.1	0.55	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	4.1	0.54	ug/kg	
75-09-2	Methylene chloride	ND	1.6	0.34	ug/kg	
100-42-5	Styrene	ND	4.1	0.26	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.1	1.6	ug/kg	
127-18-4	Tetrachloroethene	ND	1.6	0.24	ug/kg	
108-88-3	Toluene	0.73	4.1	0.33	ug/kg	JB
71-55-6	1,1,1-Trichloroethane	ND	1.6	0.29	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.6	1.1	ug/kg	
79-01-6	Trichloroethene	ND	1.6	0.25	ug/kg	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	8.2	2.8	ug/kg	
1330-20-7	Xylene (total)	ND	1.6	0.29	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	115%		65-141%
2037-26-5	Toluene-D8	103%		65-129%
460-00-4	4-Bromofluorobenzene	104%		63-137%

(a) Continuing Calibration outside of acceptance criteria. Result may be biased low.

(b) Continuing Calibration outside of acceptance criteria. Reporting Limit response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50716.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
Run #2							

Run #	Initial Weight	Final Volume
Run #1	21.0 g	1.0 ml
Run #2		

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	270	12	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	540	12	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	540	29	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	540	220	ug/kg	
51-28-5	2,4-Dinitrophenol <sup>a</sup>	ND	540	110	ug/kg	
534-52-1	4,6-Dinitro-o-cresol <sup>a</sup>	ND	540	53	ug/kg	
95-48-7	2-Methylphenol	ND	540	57	ug/kg	
	3&4-Methylphenol	ND	540	47	ug/kg	
88-75-5	2-Nitrophenol	ND	540	42	ug/kg	
100-02-7	4-Nitrophenol	ND	540	62	ug/kg	
87-86-5	Pentachlorophenol	ND	540	61	ug/kg	
108-95-2	Phenol	ND	270	12	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	540	16	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	540	9.8	ug/kg	
83-32-9	Acenaphthene	44.6	110	7.3	ug/kg	J
208-96-8	Acenaphthylene	435	110	8.5	ug/kg	
120-12-7	Anthracene	674	110	8.6	ug/kg	
56-55-3	Benzo(a)anthracene	2030	110	11	ug/kg	
50-32-8	Benzo(a)pyrene	2270	270	9.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	1820	110	12	ug/kg	
191-24-2	Benzo(g,h,i)perylene	1260	110	10	ug/kg	
207-08-9	Benzo(k)fluoranthene	1810	110	15	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	270	11	ug/kg	
85-68-7	Butyl benzyl phthalate	276	270	14	ug/kg	
91-58-7	2-Chloronaphthalene	ND	270	11	ug/kg	
106-47-8	4-Chloroaniline	ND	540	12	ug/kg	
86-74-8	Carbazole	76.5	110	9.3	ug/kg	J
218-01-9	Chrysene	1780	110	8.3	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	270	10	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	270	9.7	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	270	13	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	270	13	ug/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	1,2-Dichlorobenzene	ND	270	9.1	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	270	8.0	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	270	11	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	540	13	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	540	12	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	540	35	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	370	110	8.8	ug/kg	
132-64-9	Dibenzofuran	223	110	8.4	ug/kg	
84-74-2	Di-n-butyl phthalate	23.4	270	11	ug/kg	J
117-84-0	Di-n-octyl phthalate	ND	270	9.1	ug/kg	
84-66-2	Diethyl phthalate	ND	270	8.5	ug/kg	
131-11-3	Dimethyl phthalate	ND	270	8.5	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	270	11	ug/kg	
206-44-0	Fluoranthene	2910	110	9.8	ug/kg	
86-73-7	Fluorene	196	110	12	ug/kg	
118-74-1	Hexachlorobenzene	ND	270	14	ug/kg	
87-68-3	Hexachlorobutadiene	ND	270	10	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	540	13	ug/kg	
67-72-1	Hexachloroethane	ND	270	25	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	1350	270	30	ug/kg	
78-59-1	Isophorone	ND	270	19	ug/kg	
91-57-6	2-Methylnaphthalene	77.5	110	13	ug/kg	J
88-74-4	2-Nitroaniline	ND	540	12	ug/kg	
99-09-2	3-Nitroaniline	ND	540	13	ug/kg	
100-01-6	4-Nitroaniline	ND	540	13	ug/kg	
91-20-3	Naphthalene	151	110	9.1	ug/kg	
98-95-3	Nitrobenzene	ND	270	30	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	270	15	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	270	36	ug/kg	
85-01-8	Phenanthrene	1540	110	8.0	ug/kg	
129-00-0	Pyrene	2780	110	10	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	270	14	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	57%		25-109%
4165-62-2	Phenol-d5	66%		29-113%
118-79-6	2,4,6-Tribromophenol	81%		20-141%
4165-60-0	Nitrobenzene-d5	59%		27-115%
321-60-8	2-Fluorobiphenyl	80%		34-118%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	Terphenyl-d14	87%		42-139%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8015		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	WX78127.D	1	11/17/16	AF	n/a	n/a	GWX3867
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.48 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	3.66	9.3	1.7	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	102%		64-127%		

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Sampled:</b> 11/11/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b> 11/12/16
<b>Method:</b>	SW846 8082A SW846 3546	<b>Percent Solids:</b> 88.9
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK63165.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
Run #2							

	Initial Weight	Final Volume
Run #1	15.3 g	10.0 ml
Run #2		

## PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	37	3.8	ug/kg	
11104-28-2	Aroclor 1221	ND	37	16	ug/kg	
11141-16-5	Aroclor 1232	ND	37	11	ug/kg	
53469-21-9	Aroclor 1242	ND	37	8.5	ug/kg	
12672-29-6	Aroclor 1248	ND	37	6.3	ug/kg	
11097-69-1	Aroclor 1254	ND	37	16	ug/kg	
11096-82-5	Aroclor 1260	ND	37	3.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	99%		25-145%
877-09-8	Tetrachloro-m-xylene	106%		25-145%
2051-24-3	Decachlorobiphenyl	91%		25-179%
2051-24-3	Decachlorobiphenyl	99%		25-179%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846-8015 SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IR3263.D	1	11/18/16	MD	11/16/16	OP49158	GIR226
Run #2							

	Initial Weight	Final Volume
Run #1	15.4 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (Semi-VOA)	101	18	4.6	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	70%		17-130%		

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: TP-107(3.0')

Lab Sample ID: MC48722-2

Matrix: SO - Soil

Date Sampled: 11/11/16

Date Received: 11/12/16

Percent Solids: 88.9

Project: National Grid, Washington Street, Rensselaer, NY

## Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony	ND	0.91	0.16	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Arsenic	8.6	0.91	0.18	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Barium	92.7	4.6	0.070	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Beryllium	0.63	0.37	0.014	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Cadmium	0.22 B	0.37	0.028	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Chromium	14.6	0.91	0.043	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Lead	46.1	0.91	0.10	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Mercury	0.21	0.034	0.0057	mg/kg	1	11/15/16	11/15/16 JM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>3</sup>
Nickel	20.6	3.7	0.052	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Selenium	ND	0.91	0.27	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Silver	ND	0.46	0.056	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Thallium	0.11 B	0.91	0.10	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Vanadium	22.1	0.91	0.037	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Zinc	76.4	1.8	0.16	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>

(1) Instrument QC Batch: MA19626

(2) Instrument QC Batch: MA19629

(3) Prep QC Batch: MP27019

(4) Prep QC Batch: MP27020

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

B = Indicates a result &gt; = MDL but &lt; RL

## Report of Analysis

**Client Sample ID:** TP-107(3.0')**Lab Sample ID:** MC48722-2**Matrix:** SO - Soil**Project:** National Grid, Washington Street, Rensselaer, NY**Date Sampled:** 11/11/16**Date Received:** 11/12/16**Percent Solids:** 88.9

## General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Cyanide	0.62	0.13	0.037	mg/kg	1	11/23/16 20:55 CF	SW846	9012 M
Heat Content, BTU <sup>a</sup>	1800	100		BTU/lb	1	11/18/16 21:00 ANJ	ASTM	D240-92
Percent Sulfur <sup>a</sup>	ND	0.17	0.054	%	1	11/18/16 21:00 ANJ	ASTM	D129-95
Solids, Percent	88.9			%	1	11/16/16	JM	SM 2540G-97 MOD

(a) Analysis performed at SGS Accutest, Dayton, NJ.

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
B = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')		
<b>Lab Sample ID:</b>	MC48722-2A	<b>Date Sampled:</b>	11/11/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8260C SW846 1311	<b>Percent Solids:</b>	88.9
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N106528.D	100	11/23/16	AD	11/15/16	GP21107	MSN3919
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	ND	D018	0.50	0.10	0.027	mg/l	
78-93-3	2-Butanone (MEK)	ND	D035	200	1.0	0.30	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.20	0.034	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.20	0.024	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.20	0.040	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.20	0.058	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.20	0.068	mg/l	
75-35-4	1,1-Dichloroethene	ND	D029	0.70	0.20	0.028	mg/l	
127-18-4	Tetrachloroethene	ND	D039	0.70	0.20	0.021	mg/l	
79-01-6	Trichloroethene	ND	D040	0.50	0.20	0.025	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.20	0.045	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		74-135%
2037-26-5	Toluene-D8	101%		83-116%
460-00-4	4-Bromofluorobenzene	101%		76-124%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6(g))  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2A	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8270D SW846 3510C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50882.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897
Run #2							

Run #	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2		

## ABN TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0.10	0.0032	mg/l	
	3&4-Methylphenol	ND	D024	200	0.10	0.0054	mg/l	
87-86-5	Pentachlorophenol <sup>a</sup>	ND	D037	100	0.10	0.0059	mg/l	
95-95-4	2,4,5-Trichlorophenol	ND	D041	400	0.10	0.0052	mg/l	
88-06-2	2,4,6-Trichlorophenol	ND	D042	2.0	0.10	0.0038	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.050	0.0035	mg/l	
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.10	0.012	mg/l	
118-74-1	Hexachlorobenzene	ND	D032	0.13	0.050	0.0041	mg/l	
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.050	0.0043	mg/l	
67-72-1	Hexachloroethane	ND	D034	3.0	0.050	0.0036	mg/l	
98-95-3	Nitrobenzene	ND	D036	2.0	0.050	0.0042	mg/l	
110-86-1	Pyridine	ND	D038	5.0	0.10	0.013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	48%		10-73%
4165-62-2	Phenol-d5	29%		10-58%
118-79-6	2,4,6-Tribromophenol	79%		15-125%
4165-60-0	Nitrobenzene-d5	74%		23-120%
321-60-8	2-Fluorobiphenyl	80%		31-102%
1718-51-0	Terphenyl-d14	94%		42-124%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
MCL = Maximum Contamination Level (40 CFR 261.6/96)      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')						
<b>Lab Sample ID:</b>	MC48722-2A					<b>Date Sampled:</b>	11/11/16
<b>Matrix:</b>	SO - Soil					<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8151 SW846 3510C SPLP					<b>Percent Solids:</b>	88.9
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ98718.D	1	11/29/16	TA	11/16/16	OP49161	GYZ8038
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Herbicide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
94-75-7	2,4-D	ND	D016	10	0.010	0.0034	mg/l	
93-72-1	2,4,5-TP (Silvex)	ND	D017	1.0	0.010	0.0040	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	60%		30-150%
19719-28-9	2,4-DCAA	47%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')		
<b>Lab Sample ID:</b>	MC48722-2A	<b>Date Sampled:</b>	11/11/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8081B SW846 3510C SPLP	<b>Percent Solids:</b>	88.9
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BE53427.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Pesticide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	D013	0.40	0.00050	0.000044	mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0050	0.0011	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.00050	0.00012	mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.00050	0.00011	mg/l	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.00050	0.000051	mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00050	0.00021	mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.025	0.0013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	47%		30-150%
877-09-8	Tetrachloro-m-xylene	61%		30-150%
2051-24-3	Decachlorobiphenyl	32%		30-150%
2051-24-3	Decachlorobiphenyl	65%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')		
<b>Lab Sample ID:</b>	MC48722-2A	<b>Date Sampled:</b>	11/11/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8082A SW846 3510C SPLP	<b>Percent Solids:</b>	88.9
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK63185.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## PCB List

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND			0.0025	0.0016	mg/l	
11104-28-2	Aroclor 1221	ND			0.0025	0.0016	mg/l	
11141-16-5	Aroclor 1232	ND			0.0025	0.0018	mg/l	
53469-21-9	Aroclor 1242	ND			0.0025	0.0019	mg/l	
12672-29-6	Aroclor 1248	ND			0.0025	0.0012	mg/l	
11097-69-1	Aroclor 1254	ND			0.0025	0.0016	mg/l	
11096-82-5	Aroclor 1260	ND			0.0025	0.0019	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	68%		30-150%
877-09-8	Tetrachloro-m-xylene	70%		30-150%
2051-24-3	Decachlorobiphenyl	92%		30-150%
2051-24-3	Decachlorobiphenyl	96%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** TP-107(3.0')**Lab Sample ID:** MC48722-2A**Matrix:** SO - Soil**Date Sampled:** 11/11/16**Date Received:** 11/12/16**Percent Solids:** 88.9**Project:** National Grid, Washington Street, Rensselaer, NY**Metals Analysis, TCLP Leachate SW846 1311**

Analyte	Result	HW#	MCL	RL	MDL	Units	DF	Prep	Analyzed By	Method
Arsenic	0.0020 B	D004	5.0	0.010	0.0020	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Barium	0.37 B	D005	100	0.50	0.00057	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Cadmium	0.0012 B	D006	1.0	0.0040	0.00030	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Chromium	0.0012 B	D007	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Lead	0.0039 B	D008	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Mercury	ND	D009	0.20	0.00020	0.000034	mg/l	1	11/17/16	11/17/16	JM SW846 7470A <sup>2</sup>
Selenium	ND	D010	1.0	0.025	0.0034	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Silver	ND	D011	5.0	0.0050	0.0014	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>

(1) Instrument QC Batch: MA19631

(2) Instrument QC Batch: MA19634

(3) Prep QC Batch: MP27025

(4) Prep QC Batch: MP27030

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

MCL = Maximum Contamination Level (40 CFR 261.6(g))

B = Indicates a result &gt; MDL but &lt; RL

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(0-3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-3	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260C SW846 1311		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N106529.D	100	11/23/16	AD	11/15/16	GP21107	MSN3919
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	ND	D018	0.50	0.10	0.027	mg/l	
78-93-3	2-Butanone (MEK)	ND	D035	200	1.0	0.30	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.20	0.034	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.20	0.024	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.20	0.040	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.20	0.058	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.20	0.068	mg/l	
75-35-4	1,1-Dichloroethene	ND	D029	0.70	0.20	0.028	mg/l	
127-18-4	Tetrachloroethene	0.0248	D039	0.70	0.20	0.021	mg/l	J
79-01-6	Trichloroethene	ND	D040	0.50	0.20	0.025	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.20	0.045	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		74-135%
2037-26-5	Toluene-D8	100%		83-116%
460-00-4	4-Bromofluorobenzene	102%		76-124%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261 6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(0-3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-3	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8270D SW846 3510C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50883.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897
Run #2							

Run #	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2		

## ABN TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0.10	0.0032	mg/l	
	3&4-Methylphenol	ND	D024	200	0.10	0.0054	mg/l	
87-86-5	Pentachlorophenol <sup>a</sup>	ND	D037	100	0.10	0.0059	mg/l	
95-95-4	2,4,5-Trichlorophenol	ND	D041	400	0.10	0.0052	mg/l	
88-06-2	2,4,6-Trichlorophenol	ND	D042	2.0	0.10	0.0038	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.050	0.0035	mg/l	
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.10	0.012	mg/l	
118-74-1	Hexachlorobenzene	ND	D032	0.13	0.050	0.0041	mg/l	
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.050	0.0043	mg/l	
67-72-1	Hexachloroethane	ND	D034	3.0	0.050	0.0036	mg/l	
98-95-3	Nitrobenzene	ND	D036	2.0	0.050	0.0042	mg/l	
110-86-1	Pyridine	ND	D038	5.0	0.10	0.013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	46%		10-73%
4165-62-2	Phenol-d5	29%		10-58%
118-79-6	2,4,6-Tribromophenol	79%		15-125%
4165-60-0	Nitrobenzene-d5	76%		23-120%
321-60-8	2-Fluorobiphenyl	82%		31-102%
1718-51-0	Terphenyl-d14	94%		42-124%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
MCL = Maximum Contamination Level (40 CFR 261.6/96)      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(0-3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-3	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8151 SW846 3510C SPLP		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ98719.D	1	11/29/16	TA	11/16/16	OP49161	GYZ8038
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Herbicide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
94-75-7	2,4-D	ND	D016	10	0.010	0.0034	mg/l	
93-72-1	2,4,5-TP (Silvex)	ND	D017	1.0	0.010	0.0040	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	59%		30-150%
19719-28-9	2,4-DCAA	48%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(0-3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-3	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8081B SW846 3510C SPLP		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BE53428.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688
Run #2							

Run #	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Pesticide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	D013	0.40	0.00050	0.000044	mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0050	0.0011	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.00050	0.00012	mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.00050	0.00011	mg/l	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.00050	0.000051	mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00050	0.00021	mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.025	0.0013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	68%		30-150%
877-09-8	Tetrachloro-m-xylene	70%		30-150%
2051-24-3	Decachlorobiphenyl	82%		30-150%
2051-24-3	Decachlorobiphenyl	76%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: TP-110(0-3.0')

Lab Sample ID: MC48722-3

Matrix: SO - Soil

Date Sampled: 11/11/16

Date Received: 11/12/16

Percent Solids: n/a

Project: National Grid, Washington Street, Rensselaer, NY

## Metals Analysis, TCLP Leachate SW846 1311

Analyte	Result	HW#	MCL	RL	MDL	Units	DF	Prep	Analyzed By	Method
Arsenic	0.0037 B	D004	5.0	0.010	0.0020	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Barium	0.75	D005	100	0.50	0.00057	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Cadmium	0.0013 B	D006	1.0	0.0040	0.00030	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Chromium	ND	D007	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Lead	1.5	D008	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Mercury	ND	D009	0.20	0.00020	0.000034	mg/l	1	11/17/16	11/17/16	JM SW846 7470A <sup>2</sup>
Selenium	ND	D010	1.0	0.025	0.0034	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Silver	ND	D011	5.0	0.0050	0.0014	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>

(1) Instrument QC Batch: MA19631

(2) Instrument QC Batch: MA19634

(3) Prep QC Batch: MP27025

(4) Prep QC Batch: MP27030

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

MCL = Maximum Contamination Level (40 CFR 261.6(g))

B = Indicates a result &gt; MDL but &lt; RL

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L101580.D	1	11/18/16	TB	n/a	n/a	MSL4385
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.64 g	10.0 ml	100 ul
Run #2			

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	1100	350	ug/kg	
71-43-2	Benzene	ND	110	40	ug/kg	
75-27-4	Bromodichloromethane	ND	210	45	ug/kg	
75-25-2	Bromoform	ND	210	50	ug/kg	
74-83-9	Bromomethane	ND	1100	170	ug/kg	
78-93-3	2-Butanone (MEK)	ND	1100	360	ug/kg	
75-15-0	Carbon disulfide	ND	530	43	ug/kg	
56-23-5	Carbon tetrachloride	ND	210	43	ug/kg	
108-90-7	Chlorobenzene	ND	210	100	ug/kg	
75-00-3	Chloroethane	ND	1100	220	ug/kg	
67-66-3	Chloroform	ND	210	53	ug/kg	
74-87-3	Chloromethane	ND	530	79	ug/kg	
124-48-1	Dibromochloromethane	ND	530	110	ug/kg	
75-34-3	1,1-Dichloroethane	ND	210	42	ug/kg	
107-06-2	1,2-Dichloroethane	ND	210	39	ug/kg	
75-35-4	1,1-Dichloroethene	ND	210	72	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	210	38	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	210	43	ug/kg	
78-87-5	1,2-Dichloropropane	ND	210	46	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	210	130	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	210	140	ug/kg	
100-41-4	Ethylbenzene	1330	210	40	ug/kg	
591-78-6	2-Hexanone	ND	530	71	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	530	69	ug/kg	
75-09-2	Methylene chloride	ND	210	44	ug/kg	
100-42-5	Styrene	ND	530	33	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	530	200	ug/kg	
127-18-4	Tetrachloroethene	ND	210	31	ug/kg	
108-88-3	Toluene	77.0	530	42	ug/kg	J
71-55-6	1,1,1-Trichloroethane	ND	210	37	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	210	150	ug/kg	
79-01-6	Trichloroethene	ND	210	33	ug/kg	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound



## Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1100	360	ug/kg	
1330-20-7	Xylene (total)	1460	210	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		65-141%
2037-26-5	Toluene-D8	100%		65-129%
460-00-4	4-Bromofluorobenzene	98%		63-137%

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50717.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.4 g	1.0 ml
Run #2		

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	300	14	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	610	14	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	610	33	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	610	250	ug/kg	
51-28-5	2,4-Dinitrophenol <sup>a</sup>	ND	610	130	ug/kg	
534-52-1	4,6-Dinitro-o-cresol <sup>a</sup>	ND	610	60	ug/kg	
95-48-7	2-Methylphenol	ND	610	65	ug/kg	
	3&4-Methylphenol	ND	610	53	ug/kg	
88-75-5	2-Nitrophenol	ND	610	47	ug/kg	
100-02-7	4-Nitrophenol	ND	610	70	ug/kg	
87-86-5	Pentachlorophenol	ND	610	69	ug/kg	
108-95-2	Phenol	ND	300	13	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	610	18	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	610	11	ug/kg	
83-32-9	Acenaphthene	3270	120	8.3	ug/kg	
208-96-8	Acenaphthylene	958	120	9.6	ug/kg	
120-12-7	Anthracene	2200	120	9.8	ug/kg	
56-55-3	Benzo(a)anthracene	2910	120	12	ug/kg	
50-32-8	Benzo(a)pyrene	2900	300	10	ug/kg	
205-99-2	Benzo(b)fluoranthene	1910	120	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	1400	120	12	ug/kg	
207-08-9	Benzo(k)fluoranthene	2070	120	17	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	300	13	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	300	16	ug/kg	
91-58-7	2-Chloronaphthalene	ND	300	12	ug/kg	
106-47-8	4-Chloroaniline	ND	610	14	ug/kg	
86-74-8	Carbazole	220	120	11	ug/kg	
218-01-9	Chrysene	2700	120	9.4	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	300	12	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	300	11	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	300	15	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	300	14	ug/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: TP-110(3.0-3.5')

Lab Sample ID: MC48722-4

Matrix: SO - Soil

Method: SW846 8270D SW846 3546

Project: National Grid, Washington Street, Rensselaer, NY

Date Sampled: 11/11/16

Date Received: 11/12/16

Percent Solids: 80.4

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	1,2-Dichlorobenzene	ND	300	10	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	300	9.0	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	300	12	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	610	15	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	610	14	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	610	40	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	367	120	10	ug/kg	
132-64-9	Dibenzofuran	316	120	9.5	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	300	13	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	300	10	ug/kg	
84-66-2	Diethyl phthalate	ND	300	9.7	ug/kg	
131-11-3	Dimethyl phthalate	ND	300	9.6	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	300	12	ug/kg	
206-44-0	Fluoranthene	5160	120	11	ug/kg	
86-73-7	Fluorene	1720	120	13	ug/kg	
118-74-1	Hexachlorobenzene	ND	300	16	ug/kg	
87-68-3	Hexachlorobutadiene	ND	300	12	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	610	14	ug/kg	
67-72-1	Hexachloroethane	ND	300	29	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	1410	300	34	ug/kg	
78-59-1	Isophorone	ND	300	22	ug/kg	
91-57-6	2-Methylnaphthalene	4460	120	14	ug/kg	
88-74-4	2-Nitroaniline	ND	610	14	ug/kg	
99-09-2	3-Nitroaniline	ND	610	14	ug/kg	
100-01-6	4-Nitroaniline	ND	610	14	ug/kg	
91-20-3	Naphthalene	7580	120	10	ug/kg	
98-95-3	Nitrobenzene	ND	300	34	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	300	17	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	300	40	ug/kg	
85-01-8	Phenanthrene	7470	120	9.1	ug/kg	
129-00-0	Pyrene	7400	120	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	300	15	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	60%		25-109%
4165-62-2	Phenol-d5	68%		29-113%
118-79-6	2,4,6-Tribromophenol	82%		20-141%
4165-60-0	Nitrobenzene-d5	66%		27-115%
321-60-8	2-Fluorobiphenyl	82%		34-118%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	Terphenyl-d14	89%		42-139%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
RL = Reporting Limit      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846 8015		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	WX78125.D	1	11/17/16	AF	n/a	n/a	GWX3867
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.64 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	68.1	11	2.0	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	107%		64-127%		

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846 8082A SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK63166.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
Run #2							

Run #	Initial Weight	Final Volume
Run #1	15.6 g	10.0 ml
Run #2		

## PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	40	4.1	ug/kg	
11104-28-2	Aroclor 1221	ND	40	17	ug/kg	
11141-16-5	Aroclor 1232	ND	40	12	ug/kg	
53469-21-9	Aroclor 1242	ND	40	9.2	ug/kg	
12672-29-6	Aroclor 1248	ND	40	6.9	ug/kg	
11097-69-1	Aroclor 1254	ND	40	17	ug/kg	
11096-82-5	Aroclor 1260	ND	40	3.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	101%		25-145%
877-09-8	Tetrachloro-m-xylene	74%		25-145%
2051-24-3	Decachlorobiphenyl	69%		25-179%
2051-24-3	Decachlorobiphenyl	68%		25-179%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846-8015 SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IR3257.D	1	11/18/16	MD	11/16/16	OP49158	GIR226
Run #2							

	Initial Weight	Final Volume
Run #1	15.9 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (Semi-VOA)	2200	20	4.9	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	91%		17-130%		

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: TP-110(3.0-3.5')

Lab Sample ID: MC48722-4

Matrix: SO - Soil

Date Sampled: 11/11/16

Date Received: 11/12/16

Percent Solids: 80.4

Project: National Grid, Washington Street, Rensselaer, NY

## Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analized By	Method	Prep Method
Antimony	ND	0.99	0.17	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Arsenic	4.6	0.99	0.20	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Barium	83.6	4.9	0.075	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Beryllium	0.47	0.39	0.015	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Cadmium	0.12 B	0.39	0.031	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Chromium	13.1	0.99	0.046	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Lead	34.9	0.99	0.11	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Mercury	0.30	0.038	0.0064	mg/kg	1	11/15/16	11/15/16 JM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>3</sup>
Nickel	19.2	3.9	0.056	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Selenium	ND	0.99	0.30	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Silver	ND	0.49	0.060	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Thallium	ND	0.99	0.11	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Vanadium	17.0	0.99	0.039	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Zinc	61.7	2.0	0.17	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>

(1) Instrument QC Batch: MA19626

(2) Instrument QC Batch: MA19629

(3) Prep QC Batch: MP27019

(4) Prep QC Batch: MP27020

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

B = Indicates a result &gt; = MDL but &lt; RL



## Report of Analysis

**Client Sample ID:** TP-110(3.0-3.5')**Lab Sample ID:** MC48722-4**Matrix:** SO - Soil**Project:** National Grid, Washington Street, Rensselaer, NY**Date Sampled:** 11/11/16**Date Received:** 11/12/16**Percent Solids:** 80.4

## General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Cyanide	1.1	0.14	0.039	mg/kg	1	11/23/16 20:56 CF	SW846	9012 M
Heat Content, BTU <sup>a</sup>	1510	100		BTU/lb	1	11/18/16 21:00 ANJ	ASTM	D240-92
Percent Sulfur <sup>a</sup>	0.11 B	0.20	0.054	%	1	11/18/16 21:00 ANJ	ASTM	D129-95
Solids, Percent	80.4			%	1	11/16/16	JM	SM 2540G-97 MOD

(a) Analysis performed at SGS Accutest, Dayton, NJ.

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
B = Indicates a result > = MDL but < RL



## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody

SGS Accutest of New England  
50 D'Angelo Drive, Building One Marlborough, MA 01752  
TEL: 508-481-6200 FAX: 508-481-7753  
[www.accutest.com](http://www.accutest.com)

		SGS Accutest of New England 50 D'Angelo Drive, Building One Marlborough, MA 01752 TEL: 508-481-8200 FAX: 508-481-7753 www.accutest.com		FED-EX Tracking # _____ Bottle Order Control # _____																																																																																						
Client / Reporting Information Company Name: <b>ARCADIS</b> Street Address: <b>60723 Tawpath Rd</b> City: <b>SYRACUSE</b> State: <b>NY</b> Zip: <b>13214</b> Project Contact: <b>DAVID RODRIGUEZ</b> (E-mail: <b>DRodriguez@arcadis.com</b> ) Phone #: <b>315 671 9619</b> Sampler(s) Name(s): <b>JOE LEMESSURIER</b> Phone #: <b>315 558 1904</b>		Project Information Project Name: <b>NATIONAL GRID - RENSSLAER</b> Street: <b>WASHINGTON ST</b> City: <b>RENSSELAER</b> Billing Information (If different from Report to) Company Name: _____ Street Address: _____ Client PO#: _____ City: _____ State: _____ Zip: _____ Project Manager: <b>JASON GOLUBSKI</b> Attention: _____ PO#: _____		Requested Analysis (see TEST CODE sheet) Matrix Codes DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OL - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinsate Blank TB - Trip Blank																																																																																						
Field ID / Point of Collection <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Field ID</th> <th>Point of Collection</th> <th>MEQ/Dir. #</th> <th>Date</th> <th>Time</th> <th>Sampled by</th> <th>18lit</th> <th># of bottles</th> <th>HCl</th> <th>NaOH</th> <th>HNO3</th> <th>H2SO4</th> <th>NONE</th> <th>DI Water</th> <th>MEOH</th> <th>ENCORE</th> <th>Isotone</th> </tr> </thead> <tbody> <tr> <td>-1</td> <td>TP-106 (3.0')</td> <td></td> <td>11/10/16</td> <td>1330</td> <td>JDL</td> <td></td> <td>50</td> <td></td> <td></td> <td></td> <td></td> <td>4</td> <td>1</td> <td>2</td> <td></td> <td></td> </tr> <tr> <td>-2</td> <td>TP-107 (3.0')</td> <td></td> <td>11/11/16</td> <td>0830</td> <td></td> <td></td> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td>4</td> <td>1</td> <td>2</td> <td></td> <td></td> </tr> <tr> <td>-3</td> <td>TP-110 (0-3.0')</td> <td></td> <td></td> <td>1215</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>-4</td> <td>TP-110 (3.0-3.5')</td> <td></td> <td></td> <td>1215</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td>1</td> <td>2</td> <td></td> <td></td> </tr> </tbody> </table>		Field ID	Point of Collection	MEQ/Dir. #	Date	Time	Sampled by	18lit	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Isotone	-1	TP-106 (3.0')		11/10/16	1330	JDL		50					4	1	2			-2	TP-107 (3.0')		11/11/16	0830			7					4	1	2			-3	TP-110 (0-3.0')			1215			3					3					-4	TP-110 (3.0-3.5')			1215			4					1	1	2			Number of preserved Bottles TOLP VOC TOLP SVOC, TOLP METALS + TO, PCB, PESTICIDE / HERBICIDE VOC SVOC, PCB, TOTAL METALS, TOLP % SOLUBLE, BTU		LAB USE ONLY <div style="text-align: right;">28 1066</div>	
Field ID	Point of Collection	MEQ/Dir. #	Date	Time	Sampled by	18lit	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Isotone																																																																										
-1	TP-106 (3.0')		11/10/16	1330	JDL		50					4	1	2																																																																												
-2	TP-107 (3.0')		11/11/16	0830			7					4	1	2																																																																												
-3	TP-110 (0-3.0')			1215			3					3																																																																														
-4	TP-110 (3.0-3.5')			1215			4					1	1	2																																																																												
Turnaround Time (Business days) <input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush TIA data available via Lablink		Approved By (SGS Accutest PM) / Date: _____ Commercial "A" = Results Only Commercial "B" = Results + QC Summary		Comments / Special Instructions INITIAL ASSESSMENT _____ LABEL VERIFICATION _____																																																																																						
Sample Custody must be documented below each time samples change possession, including courier delivery.																																																																																										
Relinquished by Sampler: Relinquished by: _____ Date Time: <b>11/16/16 1600</b>		Received By: Received By: _____ Date Time: _____		Relinquished By: Relinquished By: _____ Date Time: <b>11/16/16 1600</b>																																																																																						
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## MC48722: Chain of Custody

Page 1 of 2

## SGS Accutest Sample Receipt Summary

**Job Number:** MC48722

**Client:** ARCADIS

**Project:** NATIONAL GRID

**Date / Time Received:** 11/12/2016 10:20:00 AM

**Delivery Method:** FEDX

**Airbill #'s:** 784623131115

**Cooler Temps (Initial/Adjusted):** #1: (3.5/3.5):

### Cooler Security

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                            |                                     |                          |
|----------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Thermometer ID:         | IRGUN1;                             |                          |
| 3. Cooler media:           | Ice (Bag)                           |                          |
| 4. No. Coolers:            | 1                                   |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                                     |                                     |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Comments

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

MC48722: Chain of Custody

Page 2 of 2

## GC/MS Volatiles

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## QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries

## Method Blank Summary

Page 1 of 2

**Job Number:** MC48722**Account:** BBLNYS Arcadis**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSL4385-MB	L101570.D	1	11/18/16	TB	n/a	n/a	MSL4385

**The QC reported here applies to the following samples:****Method:** SW846 8260C

MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	500	160	ug/kg	
71-43-2	Benzene	ND	50	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	21	ug/kg	
75-25-2	Bromoform	ND	100	24	ug/kg	
74-83-9	Bromomethane	ND	500	80	ug/kg	
78-93-3	2-Butanone (MEK)	ND	500	170	ug/kg	
75-15-0	Carbon disulfide	ND	250	20	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	21	ug/kg	
108-90-7	Chlorobenzene	ND	100	47	ug/kg	
75-00-3	Chloroethane	ND	500	100	ug/kg	
67-66-3	Chloroform	ND	100	25	ug/kg	
74-87-3	Chloromethane	ND	250	38	ug/kg	
124-48-1	Dibromochloromethane	ND	250	54	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	20	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	18	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	34	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	18	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	20	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	22	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	100	61	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	66	ug/kg	
100-41-4	Ethylbenzene	ND	100	19	ug/kg	
591-78-6	2-Hexanone	ND	250	34	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	33	ug/kg	
75-09-2	Methylene chloride	ND	100	21	ug/kg	
100-42-5	Styrene	ND	250	16	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	95	ug/kg	
127-18-4	Tetrachloroethene	ND	100	15	ug/kg	
108-88-3	Toluene	ND	250	20	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	17	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	69	ug/kg	
79-01-6	Trichloroethene	ND	100	15	ug/kg	
75-01-4	Vinyl chloride	ND	500	170	ug/kg	
1330-20-7	Xylene (total)	ND	100	17	ug/kg	

Method Blank Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSL4385-MB	L101570.D	1	11/18/16	TB	n/a	n/a	MSL4385

The QC reported here applies to the following samples: Method: SW846 8260C

MC48722-4

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	108% 65-141%
2037-26-5	Toluene-D8	98% 65-129%
460-00-4	4-Bromofluorobenzene	104% 63-137%

## Method Blank Summary

Page 1 of 2

**Job Number:** MC48722**Account:** BBLNYS Arcadis**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2942-MB	M82027.D	1	11/21/16	KP	n/a	n/a	MSM2942

**The QC reported here applies to the following samples:****Method:** SW846 8260C

MC48722-1, MC48722-2

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	4.2	10	3.3	ug/kg	J
71-43-2	Benzene	ND	1.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.43	ug/kg	
75-25-2	Bromoform	ND	2.0	0.48	ug/kg	
74-83-9	Bromomethane	ND	10	1.6	ug/kg	
78-93-3	2-Butanone (MEK)	ND	10	3.4	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.41	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.41	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.94	ug/kg	
75-00-3	Chloroethane	ND	10	2.1	ug/kg	
67-66-3	Chloroform	ND	2.0	0.50	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.75	ug/kg	
124-48-1	Dibromochloromethane	ND	5.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.40	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.37	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.68	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.36	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.40	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.44	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	1.2	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	1.3	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.38	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.67	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.65	ug/kg	
75-09-2	Methylene chloride	ND	2.0	0.42	ug/kg	
100-42-5	Styrene	ND	5.0	0.31	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	1.9	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.30	ug/kg	
108-88-3	Toluene	0.68	5.0	0.40	ug/kg	J
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.35	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	1.4	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.31	ug/kg	
75-01-4	Vinyl chloride	ND	10	3.4	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.35	ug/kg	



Method Blank Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2942-MB	M82027.D	1	11/21/16	KP	n/a	n/a	MSM2942

The QC reported here applies to the following samples: Method: SW846 8260C  
MC48722-1, MC48722-2

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	114% 65-141%
2037-26-5	Toluene-D8	104% 65-129%
460-00-4	4-Bromofluorobenzene	97% 63-137%

## Method Blank Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN3919-MB	N106520.D	1	11/23/16	AD	n/a	n/a	MSN3919

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.39	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	1.3	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.73	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.31	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.32	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.57	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.74	ug/l	
127-18-4	Tetrachloroethene	0.37	1.0	0.26	ug/l	J
79-01-6	Trichloroethene	ND	1.0	0.70	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.72	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	101% 76-129%
2037-26-5	Toluene-D8	100% 83-114%
460-00-4	4-Bromofluorobenzene	101% 75-124%

# Leachate Blank Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GP21107-LB1	N106524.D	10	11/23/16	AD	11/15/16	GP21107	MSN3919

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.0	2.7	ug/l	
78-93-3	2-Butanone (MEK)	ND	100	30	ug/l	
56-23-5	Carbon tetrachloride	ND	10	3.4	ug/l	
108-90-7	Chlorobenzene	ND	10	2.4	ug/l	
67-66-3	Chloroform	ND	10	4.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	10	5.8	ug/l	
107-06-2	1,2-Dichloroethane	ND	10	6.8	ug/l	
75-35-4	1,1-Dichloroethene	ND	10	2.8	ug/l	
127-18-4	Tetrachloroethene	2.4	10	2.1	ug/l	J
79-01-6	Trichloroethene	ND	10	2.5	ug/l	
75-01-4	Vinyl chloride	ND	10	4.5	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	99% 74-135%
2037-26-5	Toluene-D8	102% 83-116%
460-00-4	4-Bromofluorobenzene	102% 76-124%

## Blank Spike Summary

Page 1 of 2

**Job Number:** MC48722**Account:** BBLNYS Arcadis**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSL4385-B5	L101567.D	1	11/18/16	TB	n/a	n/a	MSL4385

**The QC reported here applies to the following samples:****Method:** SW846 8260C

MC48722-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	2500	3690	148	24-179
71-43-2	Benzene	2500	2510	100	73-115
75-27-4	Bromodichloromethane	2500	2350	94	76-122
75-25-2	Bromoform	2500	2560	102	67-151
74-83-9	Bromomethane	2500	2200	88	52-139
78-93-3	2-Butanone (MEK)	2500	3500	140	32-151
75-15-0	Carbon disulfide	2500	2630	105	57-143
56-23-5	Carbon tetrachloride	2500	2230	89	73-129
108-90-7	Chlorobenzene	2500	2550	102	79-123
75-00-3	Chloroethane	2500	2490	100	51-159
67-66-3	Chloroform	2500	2460	98	72-122
74-87-3	Chloromethane	2500	1980	79	57-143
124-48-1	Dibromochloromethane	2500	2520	101	74-139
75-34-3	1,1-Dichloroethane	2500	2490	100	70-128
107-06-2	1,2-Dichloroethane	2500	2300	92	70-126
75-35-4	1,1-Dichloroethene	2500	2570	103	71-136
156-59-2	cis-1,2-Dichloroethene	2500	2830	113	78-128
156-60-5	trans-1,2-Dichloroethene	2500	2420	97	71-131
78-87-5	1,2-Dichloropropane	2500	2570	103	79-124
10061-01-5	cis-1,3-Dichloropropene	2500	2480	99	75-126
10061-02-6	trans-1,3-Dichloropropene	2500	2290	92	75-128
100-41-4	Ethylbenzene	2500	2620	105	76-122
591-78-6	2-Hexanone	2500	4170	167	26-169
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	2790	112	43-166
75-09-2	Methylene chloride	2500	2670	107	74-125
100-42-5	Styrene	2500	2710	108	79-124
79-34-5	1,1,2,2-Tetrachloroethane	2500	2700	108	66-134
127-18-4	Tetrachloroethene	2500	2480	99	76-125
108-88-3	Toluene	2500	2400	96	76-119
71-55-6	1,1,1-Trichloroethane	2500	2390	96	70-130
79-00-5	1,1,2-Trichloroethane	2500	2520	101	75-124
79-01-6	Trichloroethene	2500	2360	94	74-127
75-01-4	Vinyl chloride	2500	1900	76	33-166
1330-20-7	Xylene (total)	7500	8350	111	78-122

\* = Outside of Control Limits.

## Blank Spike Summary

Page 2 of 2

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSL4385-BS	L101567.D	1	11/18/16	TB	n/a	n/a	MSL4385

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-4

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	102%	65-141%
2037-26-5	Toluene-D8	98%	65-129%
460-00-4	4-Bromofluorobenzene	96%	63-137%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 2

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2942-BS	M82024.D	1	11/21/16	KP	n/a	n/a	MSM2942

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-1, MC48722-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	50	80.9	162	24-179
71-43-2	Benzene	50	50.9	102	73-115
75-27-4	Bromodichloromethane	50	49.8	100	76-122
75-25-2	Bromoform	50	45.3	91	67-151
74-83-9	Bromomethane	50	40.5	81	52-139
78-93-3	2-Butanone (MEK)	50	74.0	148	32-151
75-15-0	Carbon disulfide	50	59.0	118	57-143
56-23-5	Carbon tetrachloride	50	54.0	108	73-129
108-90-7	Chlorobenzene	50	45.3	91	79-123
75-00-3	Chloroethane	50	40.3	81	51-159
67-66-3	Chloroform	50	51.5	103	72-122
74-87-3	Chloromethane	50	54.1	108	57-143
124-48-1	Dibromochloromethane	50	44.8	90	74-139
75-34-3	1,1-Dichloroethane	50	51.4	103	70-128
107-06-2	1,2-Dichloroethane	50	51.4	103	70-126
75-35-4	1,1-Dichloroethene	50	52.9	106	71-136
156-59-2	cis-1,2-Dichloroethene	50	53.3	107	78-128
156-60-5	trans-1,2-Dichloroethene	50	47.8	96	71-131
78-87-5	1,2-Dichloropropane	50	50.0	100	79-124
10061-01-5	cis-1,3-Dichloropropene	50	48.5	97	75-126
10061-02-6	trans-1,3-Dichloropropene	50	49.0	98	75-128
100-41-4	Ethylbenzene	50	48.6	97	76-122
591-78-6	2-Hexanone	50	65.2	130	26-169
108-10-1	4-Methyl-2-pentanone (MIBK)	50	48.4	97	43-166
75-09-2	Methylene chloride	50	56.5	113	74-125
100-42-5	Styrene	50	47.0	94	79-124
79-34-5	1,1,2,2-Tetrachloroethane	50	45.4	91	66-134
127-18-4	Tetrachloroethene	50	48.0	96	76-125
108-88-3	Toluene	50	50.2	100	76-119
71-55-6	1,1,1-Trichloroethane	50	53.8	108	70-130
79-00-5	1,1,2-Trichloroethane	50	47.7	95	75-124
79-01-6	Trichloroethene	50	49.0	98	74-127
75-01-4	Vinyl chloride	50	43.9	88	33-166
1330-20-7	Xylene (total)	150	144	96	78-122

\* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2942-BS	M82024.D	1	11/21/16	KP	n/a	n/a	MSM2942

The QC reported here applies to the following samples: Method: SW846 8260C  
MC48722-1, MC48722-2

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	103%	65-141%
2037-26-5	Toluene-D8	102%	65-129%
460-00-4	4-Bromofluorobenzene	96%	63-137%

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN3919-BS	N106517.D	1	11/23/16	AD	n/a	n/a	MSN3919
MSN3919-BSD	N106518.D	1	11/23/16	AD	n/a	n/a	MSN3919

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	50	44.3	89	49.6	99	11	66-123/25
78-93-3	2-Butanone (MEK)	50	46.0	92	51.1	102	11	45-171/25
56-23-5	Carbon tetrachloride	50	46.1	92	51.5	103	11	54-151/25
108-90-7	Chlorobenzene	50	45.5	91	52.0	104	13	75-117/25
67-66-3	Chloroform	50	45.7	91	52.1	104	13	65-127/25
106-46-7	1,4-Dichlorobenzene	50	46.0	92	51.0	102	10	77-117/25
107-06-2	1,2-Dichloroethane	50	44.3	89	50.3	101	13	68-126/25
75-35-4	1,1-Dichloroethene	50	40.7	81	46.1	92	12	44-148/25
127-18-4	Tetrachloroethene	50	46.7	93	52.9	106	12	68-133/25
79-01-6	Trichloroethene	50	46.0	92	51.9	104	12	73-120/25
75-01-4	Vinyl chloride	50	43.5	87	44.3	89	2	49-154/25

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	101%	100%	76-129%
2037-26-5	Toluene-D8	101%	101%	83-114%
460-00-4	4-Bromofluorobenzene	99%	98%	75-124%

\* = Outside of Control Limits.



# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC48725-1MS	L101581.D	1	11/18/16	TB	n/a	n/a	MSL4385
MC48725-1MSD	L101582.D	1	11/18/16	TB	n/a	n/a	MSL4385
MC48725-1 <sup>a</sup>	L101571.D	1	11/18/16	TB	n/a	n/a	MSL4385

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-4

CAS No.	Compound	MC48725-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	3080	3100	101	3080	3660	119	17	10-200/30
71-43-2	Benzene	ND	3080	2990	97	3080	2950	96	1	38-135/30
75-27-4	Bromodichloromethane	ND	3080	3370	109	3080	2740	89	21	45-136/30
75-25-2	Bromoform	ND	3080	3450	112	3080	3060	99	12	42-150/30
74-83-9	Bromomethane	ND	3080	3690	120	3080	2750	89	29	20-159/30
78-93-3	2-Butanone (MEK)	ND	3080	3210	104	3080	3690	120	14	10-187/30
75-15-0	Carbon disulfide	ND	3080	2840	92	3080	2960	96	4	29-157/30
56-23-5	Carbon tetrachloride	ND	3080	3550	115	3080	2640	86	29	42-148/30
108-90-7	Chlorobenzene	ND	3080	2960	96	3080	3060	99	3	33-148/30
75-00-3	Chloroethane	ND	3080	3060	99	3080	3080	100	1	32-162/30
67-66-3	Chloroform	ND	3080	3130	102	3080	2780	90	12	46-136/30
74-87-3	Chloromethane	ND	3080	4470	145	3080	2360	77	62* <sup>b</sup>	33-152/30
124-48-1	Dibromochloromethane	ND	3080	3140	102	3080	2990	97	5	46-147/30
75-34-3	1,1-Dichloroethane	ND	3080	2910	94	3080	2810	91	3	49-134/30
107-06-2	1,2-Dichloroethane	ND	3080	3400	110	3080	2580	84	27	46-135/30
75-35-4	1,1-Dichloroethene	ND	3080	2870	93	3080	2930	95	2	46-148/30
156-59-2	cis-1,2-Dichloroethene	ND	3080	3110	101	3080	3270	106	5	46-144/30
156-60-5	trans-1,2-Dichloroethene	ND	3080	2670	87	3080	2800	91	5	44-145/30
78-87-5	1,2-Dichloropropane	ND	3080	3010	98	3080	2960	96	2	48-138/30
10061-01-5	cis-1,3-Dichloropropene	ND	3080	3270	106	3080	2920	95	11	34-149/30
10061-02-6	trans-1,3-Dichloropropene	ND	3080	3130	102	3080	2630	85	17	28-151/30
100-41-4	Ethylbenzene	ND	3080	3190	103	3080	3130	102	2	32-150/30
591-78-6	2-Hexanone	ND	3080	3510	114	3080	3960	128	12	10-184/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	3080	3550	115	3080	3160	102	12	35-164/30
75-09-2	Methylene chloride	ND	3080	2860	93	3080	3030	98	6	48-140/30
100-42-5	Styrene	ND	3080	3260	106	3080	3290	107	1	17-160/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	3080	2210	72	3080	3150	102	35* <sup>b</sup>	30-157/30
127-18-4	Tetrachloroethene	ND	3080	2950	96	3080	2940	95	0	40-146/30
108-88-3	Toluene	ND	3080	3080	100	3080	2900	94	6	33-145/30
71-55-6	1,1,1-Trichloroethane	ND	3080	3400	110	3080	2750	89	21	41-147/30
79-00-5	1,1,2-Trichloroethane	ND	3080	3050	99	3080	3020	98	1	40-148/30
79-01-6	Trichloroethene	ND	3080	3160	102	3080	2860	93	10	36-155/30
75-01-4	Vinyl chloride	ND	3080	3390	110	3080	2260	73	40* <sup>b</sup>	11-183/30
1330-20-7	Xylene (total)	ND	9250	10000	108	9250	10200	110	2	33-150/30

\* = Outside of Control Limits.

## Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC48725-1MS	L101581.D	1	11/18/16	TB	n/a	n/a	MSL4385
MC48725-1MSD	L101582.D	1	11/18/16	TB	n/a	n/a	MSL4385
MC48725-1 <sup>a</sup>	L101571.D	1	11/18/16	TB	n/a	n/a	MSL4385

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-4

CAS No.	Surrogate Recoveries	MS	MSD	MC48725-1	Limits
1868-53-7	Dibromofluoromethane	101%	97%	112%	65-141%
2037-26-5	Toluene-D8	102%	99%	101%	65-129%
460-00-4	4-Bromofluorobenzene	70%	100%	99%	63-137%

(a) Analytical results based on analysis of intact sample. Sample results may be biased low due to sample not being preserved according to 5035-L/5035A-L specifications.

(b) High RPD due to possible matrix interference and/or sample non-homogeneity.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC48777-1MS	M82046.D	1	11/21/16	KP	n/a	n/a	MSM2942
MC48777-1MSD	M82047.D	1	11/21/16	KP	n/a	n/a	MSM2942
MC48777-1	M82031.D	1	11/21/16	KP	n/a	n/a	MSM2942

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-1, MC48722-2

CAS No.	Compound	MC48777-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	51.6	38.6	75	49.5	41.3	83	7	10-200/30
71-43-2	Benzene	ND	51.6	50.2	97	49.5	48.1	97	4	38-135/30
75-27-4	Bromodichloromethane	ND	51.6	48.8	95	49.5	46.8	95	4	45-136/30
75-25-2	Bromoform	ND	51.6	43.9	85	49.5	41.7	84	5	42-150/30
74-83-9	Bromomethane	ND	51.6	39.6	77	49.5	39.2	79	1	20-159/30
78-93-3	2-Butanone (MEK)	ND	51.6	33.4	65	49.5	41.9	85	23	10-187/30
75-15-0	Carbon disulfide	ND	51.6	57.9	112	49.5	53.0	107	9	29-157/30
56-23-5	Carbon tetrachloride	ND	51.6	55.0	107	49.5	51.2	103	7	42-148/30
108-90-7	Chlorobenzene	ND	51.6	42.0	81	49.5	40.6	82	3	33-148/30
75-00-3	Chloroethane	ND	51.6	42.9	83	49.5	39.5	80	8	32-162/30
67-66-3	Chloroform	ND	51.6	52.0	101	49.5	48.6	98	7	46-136/30
74-87-3	Chloromethane	ND	51.6	54.8	106	49.5	50.2	101	9	33-152/30
124-48-1	Dibromochloromethane	ND	51.6	42.7	83	49.5	41.3	83	3	46-147/30
75-34-3	1,1-Dichloroethane	ND	51.6	51.1	99	49.5	48.1	97	6	49-134/30
107-06-2	1,2-Dichloroethane	ND	51.6	51.7	100	49.5	49.0	99	5	46-135/30
75-35-4	1,1-Dichloroethene	ND	51.6	52.0	101	49.5	49.2	99	6	46-148/30
156-59-2	cis-1,2-Dichloroethene	ND	51.6	51.9	101	49.5	49.0	99	6	46-144/30
156-60-5	trans-1,2-Dichloroethene	ND	51.6	46.9	91	49.5	44.3	89	6	44-145/30
78-87-5	1,2-Dichloropropane	ND	51.6	49.5	96	49.5	46.8	95	6	48-138/30
10061-01-5	cis-1,3-Dichloropropene	ND	51.6	44.6	86	49.5	43.6	88	2	34-149/30
10061-02-6	trans-1,3-Dichloropropene	ND	51.6	45.9	89	49.5	44.1	89	4	28-151/30
100-41-4	Ethylbenzene	ND	51.6	44.4	86	49.5	42.7	86	4	32-150/30
591-78-6	2-Hexanone	ND	51.6	36.0	70	49.5	36.5	74	1	10-184/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	51.6	45.9	89	49.5	44.0	89	4	35-164/30
75-09-2	Methylene chloride	ND	51.6	59.8	116	49.5	54.4	110	9	48-140/30
100-42-5	Styrene	ND	51.6	41.4	80	49.5	40.1	81	3	17-160/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	51.6	44.9	87	49.5	43.3	87	4	30-157/30
127-18-4	Tetrachloroethene	ND	51.6	42.4	82	49.5	41.0	83	3	40-146/30
108-88-3	Toluene	0.98	51.6	48.0	91	49.5	46.1	91	4	33-145/30
71-55-6	1,1,1-Trichloroethane	ND	51.6	54.7	106	49.5	51.2	103	7	41-147/30
79-00-5	1,1,2-Trichloroethane	ND	51.6	47.6	92	49.5	45.3	91	5	40-148/30
79-01-6	Trichloroethene	ND	51.6	47.0	91	49.5	45.4	92	3	36-155/30
75-01-4	Vinyl chloride	ND	51.6	43.9	85	49.5	41.4	84	6	11-183/30
1330-20-7	Xylene (total)	ND	155	125	81	149	121	81	3	33-150/30

\* = Outside of Control Limits.

## Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC48777-1MS	M82046.D	1	11/21/16	KP	n/a	n/a	MSM2942
MC48777-1MSD	M82047.D	1	11/21/16	KP	n/a	n/a	MSM2942
MC48777-1	M82031.D	1	11/21/16	KP	n/a	n/a	MSM2942

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-1, MC48722-2

CAS No.	Surrogate Recoveries	MS	MSD	MC48777-1	Limits
1868-53-7	Dibromofluoromethane	105%	102%	118%	65-141%
2037-26-5	Toluene-D8	105%	103%	105%	65-129%
460-00-4	4-Bromofluorobenzene	94%	97%	97%	63-137%

\* = Outside of Control Limits.

# Leachate Spike Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GP21107-LS1	N106538.D	1	11/23/16	AD	11/15/16	GP21107	MSN3919
MC48722-1A	N106527.D	100	11/23/16	AD	11/15/16	GP21107	MSN3919

**The QC reported here applies to the following samples:**

**Method:** SW846 8260C

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48722-1ASpike		LS ug/l	LS %	Limits
		ug/l	Q ug/l			
71-43-2	Benzene	58.6	J 50	45.3	-27* a	63-125
78-93-3	2-Butanone (MEK)	ND	50	47.7	95	10-158
56-23-5	Carbon tetrachloride	ND	50	42.2	84	48-153
108-90-7	Chlorobenzene	ND	50	45.0	90	68-117
67-66-3	Chloroform	ND	50	47.2	94	57-137
106-46-7	1,4-Dichlorobenzene	ND	50	44.3	89	66-114
107-06-2	1,2-Dichloroethane	ND	50	46.8	94	48-146
75-35-4	1,1-Dichloroethene	ND	50	40.6	81	47-150
127-18-4	Tetrachloroethene	ND	50	42.2	84	71-117
79-01-6	Trichloroethene	ND	50	44.1	88	67-121
75-01-4	Vinyl chloride	ND	50	49.0	98	49-151

CAS No.	Surrogate Recoveries	LS MC48722-1ALimits		
1868-53-7	Dibromofluoromethane	102%	101%	74-135%
2037-26-5	Toluene-D8	101%	102%	83-116%
460-00-4	4-Bromofluorobenzene	100%	102%	76-124%

(a) Outside control limits due to possible matrix interference. Refer to Blank Spike.

\* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Method: SW846 8260C	Matrix: LEACHATE
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
MC48722-3	N106529.D	100	100	102
MC48722-1A	N106527.D	101	102	102
MC48722-2A	N106528.D	101	101	101
GP21107-LB1	N106524.D	99	102	102
GP21107-LS1	N106538.D	102	101	100
MSN3919-BS	N106517.D	101	101	99
MSN3919-BSD	N106518.D	100	101	98
MSN3919-MB	N106520.D	101	100	101

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	74-135%
S2 = Toluene-D8	83-116%
S3 = 4-Bromofluorobenzene	76-124%

5.7.1  
5

**Volatile Surrogate Recovery Summary**

**Job Number:** MC48722  
**Account:** BBLNYS Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY

<b>Method:</b> SW846 8260C	<b>Matrix:</b> SO
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**Samples and QC shown here apply to the above method**

Lab Sample ID	Lab File ID	S1	S2	S3
MC48722-1	M82033.D	118	103	95
MC48722-2	M82034.D	115	103	104
MC48722-4	L101580.D	107	100	98
MC48725-1MS	L101581.D	101	102	70
MC48725-1MSD	L101582.D	97	99	100
MC48777-1MS	M82046.D	105	105	94
MC48777-1MSD	M82047.D	102	103	97
MSL4385-BS	L101567.D	102	98	96
MSL4385-MB	L101570.D	108	98	104
MSM2942-BS	M82024.D	103	102	96
MSM2942-MB	M82027.D	114	104	97

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	65-141%
S2 = Toluene-D8	65-129%
S3 = 4-Bromofluorobenzene	63-137%

5.7.2  
5



## GC/MS Semi-volatiles

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries





## Method Blank Summary

Page 1 of 3

**Job Number:** MC48722**Account:** BBLNYS Arcadis**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MB	R50705.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

**The QC reported here applies to the following samples:****Method:** SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	240	11	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	480	11	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	480	26	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	480	200	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	480	100	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	480	47	ug/kg	
95-48-7	2-Methylphenol	ND	480	51	ug/kg	
	3&4-Methylphenol	ND	480	42	ug/kg	
88-75-5	2-Nitrophenol	ND	480	37	ug/kg	
100-02-7	4-Nitrophenol	ND	480	55	ug/kg	
87-86-5	Pentachlorophenol	ND	480	54	ug/kg	
108-95-2	Phenol	ND	240	10	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	480	14	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	480	8.7	ug/kg	
83-32-9	Acenaphthene	ND	95	6.5	ug/kg	
208-96-8	Acenaphthylene	ND	95	7.5	ug/kg	
120-12-7	Anthracene	ND	95	7.7	ug/kg	
56-55-3	Benzo(a)anthracene	ND	95	9.4	ug/kg	
50-32-8	Benzo(a)pyrene	ND	240	8.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	95	11	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	95	9.2	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	95	13	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	240	9.9	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	240	12	ug/kg	
91-58-7	2-Chloronaphthalene	ND	240	9.5	ug/kg	
106-47-8	4-Chloroaniline	ND	480	11	ug/kg	
86-74-8	Carbazole	ND	95	8.2	ug/kg	
218-01-9	Chrysene	ND	95	7.4	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	240	9.3	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	240	8.6	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	240	12	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	240	11	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	240	8.1	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	240	7.1	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	240	9.6	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	480	12	ug/kg	

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**Job Number:** MC48722**Account:** BBLNYS Arcadis**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MB	R50705.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

**The QC reported here applies to the following samples:****Method:** SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	480	11	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	480	31	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	95	7.8	ug/kg	
132-64-9	Dibenzofuran	ND	95	7.4	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	240	10	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	240	8.1	ug/kg	
84-66-2	Diethyl phthalate	ND	240	7.6	ug/kg	
131-11-3	Dimethyl phthalate	ND	240	7.5	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	240	9.5	ug/kg	
206-44-0	Fluoranthene	ND	95	8.7	ug/kg	
86-73-7	Fluorene	ND	95	11	ug/kg	
118-74-1	Hexachlorobenzene	ND	240	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	240	9.2	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	480	11	ug/kg	
67-72-1	Hexachloroethane	ND	240	23	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	240	26	ug/kg	
78-59-1	Isophorone	ND	240	17	ug/kg	
91-57-6	2-Methylnaphthalene	ND	95	11	ug/kg	
88-74-4	2-Nitroaniline	ND	480	11	ug/kg	
99-09-2	3-Nitroaniline	ND	480	11	ug/kg	
100-01-6	4-Nitroaniline	ND	480	11	ug/kg	
91-20-3	Naphthalene	ND	95	8.1	ug/kg	
98-95-3	Nitrobenzene	ND	240	26	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	240	13	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	240	32	ug/kg	
85-01-8	Phenanthrene	ND	95	7.1	ug/kg	
129-00-0	Pyrene	ND	95	9.2	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	240	12	ug/kg	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	30% 25-109%
4165-62-2	Phenol-d5	34% 29-113%
118-79-6	2,4,6-Tribromophenol	57% 20-141%
4165-60-0	Nitrobenzene-d5	29% 27-115%

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MB	R50705.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Surrogate Recoveries	Limits
321-60-8	2-Fluorobiphenyl	43% 34-118%
1718-51-0	Terphenyl-d14	81% 42-139%

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-MB1	R50878.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	41% 10-73%
4165-62-2	Phenol-d5	25% 10-58%
118-79-6	2,4,6-Tribromophenol	76% 15-125%
4165-60-0	Nitrobenzene-d5	65% 23-120%
321-60-8	2-Fluorobiphenyl	69% 31-102%
1718-51-0	Terphenyl-d14	101% 42-124%

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-MB	W30954.D	1	11/11/16	MR	11/10/16	OP49119	MSW1256

The QC reported here applies to the following samples:

Method: SW846 8270D

OP49119-MS, OP49119-MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	38%	10-73%
4165-62-2	Phenol-d5	24%	10-58%
118-79-6	2,4,6-Tribromophenol	88%	15-125%
4165-60-0	Nitrobenzene-d5	62%	23-120%
321-60-8	2-Fluorobiphenyl	67%	31-102%
1718-51-0	Terphenyl-d14	85%	42-124%

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-MB2	R50865.D	1	11/23/16	MR	11/22/16	OP49119	MSR1896

The QC reported here applies to the following samples:

Method: SW846 8270D

OP49119-LS2, OP49119-LS3

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	32% 10-73%
4165-62-2	Phenol-d5	22% 10-58%
118-79-6	2,4,6-Tribromophenol	70% 15-125%
4165-60-0	Nitrobenzene-d5	52% 23-120%
321-60-8	2-Fluorobiphenyl	57% 31-102%
1718-51-0	Terphenyl-d14	93% 42-124%

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LB1	R50878A.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	41% 10-73%
4165-62-2	Phenol-d5	25% 10-58%
118-79-6	2,4,6-Tribromophenol	76% 15-125%
4165-60-0	Nitrobenzene-d5	65% 23-120%
321-60-8	2-Fluorobiphenyl	69% 31-102%
1718-51-0	Terphenyl-d14	101% 42-124%

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LB	W30954A.D	1	11/11/16	MR	11/10/16	OP49119	MSW1256

The QC reported here applies to the following samples:

Method: SW846 8270D

OP49119-MS, OP49119-MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	38% 10-73%
4165-62-2	Phenol-d5	24% 10-58%
118-79-6	2,4,6-Tribromophenol	88% 15-125%
4165-60-0	Nitrobenzene-d5	62% 23-120%
321-60-8	2-Fluorobiphenyl	67% 31-102%
1718-51-0	Terphenyl-d14	85% 42-124%



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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LB2	R50865A.D	1	11/23/16	MR	11/22/16	OP49119	MSR1896

The QC reported here applies to the following samples:

Method: SW846 8270D

OP49119-LS2, OP49119-LS3

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	32% 10-73%
4165-62-2	Phenol-d5	22% 10-58%
118-79-6	2,4,6-Tribromophenol	70% 15-125%
4165-60-0	Nitrobenzene-d5	52% 23-120%
321-60-8	2-Fluorobiphenyl	57% 31-102%
1718-51-0	Terphenyl-d14	93% 42-124%

## Blank Spike Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-BS1	R50879.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
95-48-7	2-Methylphenol	500	365	73	20-112
	3&4-Methylphenol	1000	650	65	19-102
87-86-5	Pentachlorophenol	500	351	70	28-117
95-95-4	2,4,5-Trichlorophenol	500	532	106	56-112
88-06-2	2,4,6-Trichlorophenol	500	525	105	54-112
106-46-7	1,4-Dichlorobenzene	500	405	81	30-90
121-14-2	2,4-Dinitrotoluene	500	535	107	62-121
118-74-1	Hexachlorobenzene	500	522	104	49-128
87-68-3	Hexachlorobutadiene	500	406	81	22-96
67-72-1	Hexachloroethane	500	368	74	22-86
98-95-3	Nitrobenzene	500	425	85	50-117
110-86-1	Pyridine	500	178	36	10-86

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	50%	10-73%
4165-62-2	Phenol-d5	32%	10-58%
118-79-6	2,4,6-Tribromophenol	90%	15-125%
4165-60-0	Nitrobenzene-d5	78%	23-120%
321-60-8	2-Fluorobiphenyl	87%	31-102%
1718-51-0	Terphenyl-d14	94%	42-124%

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-BS	R50706.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-BSD	R50714.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
95-57-8	2-Chlorophenol	2400	1580	66	2200	89	33* a	39-104/30
59-50-7	4-Chloro-3-methyl phenol	2400	1640	68	2150	87	27	51-110/30
120-83-2	2,4-Dichlorophenol	2400	1660	69	2240	90	30	47-109/30
105-67-9	2,4-Dimethylphenol	2400	1630	68	2200	89	30	43-105/30
51-28-5	2,4-Dinitrophenol	2400	610	25	703	28	14	10-130/30
534-52-1	4,6-Dinitro-o-cresol	2400	1190	50	941	38	23	16-140/30
95-48-7	2-Methylphenol	2400	1590	66	2220	90	33* a	40-105/30
	3&4-Methylphenol	4800	3130	65	4300	87	31* a	39-113/30
88-75-5	2-Nitrophenol	2400	1520	63	2030	82	29	41-112/30
100-02-7	4-Nitrophenol	2400	1750	73	2450	99	33* a	28-134/30
87-86-5	Pentachlorophenol	2400	1410	59	1910	77	30	22-123/30
108-95-2	Phenol	2400	1550	65	2060	83	28	40-107/30
95-95-4	2,4,5-Trichlorophenol	2400	1930	80	2450	99	24	54-115/30
88-06-2	2,4,6-Trichlorophenol	2400	1890	79	2440	99	25	51-110/30
83-32-9	Acenaphthene	2400	1800	75	2300	93	24	49-108/30
208-96-8	Acenaphthylene	2400	1660	69	2150	87	26	37-102/30
120-12-7	Anthracene	2400	1690	70	2230	90	28	54-111/30
56-55-3	Benzo(a)anthracene	2400	1760	73	2380	96	30	56-117/30
50-32-8	Benzo(a)pyrene	2400	1730	72	2320	94	29	57-117/30
205-99-2	Benzo(b)fluoranthene	2400	1750	73	2280	92	26	55-122/30
191-24-2	Benzo(g,h,i)perylene	2400	1660	69	2210	89	28	52-123/30
207-08-9	Benzo(k)fluoranthene	2400	1760	73	2370	96	30	54-117/30
101-55-3	4-Bromophenyl phenyl ether	2400	2070	86	2670	108	25	54-118/30
85-68-7	Butyl benzyl phthalate	2400	1990	83	2800	113	34* a	54-121/30
91-58-7	2-Chloronaphthalene	2400	1840	77	2400	97	26	46-114/30
106-47-8	4-Chloroaniline	2400	1320	55	666	27	66* a	12-88/30
86-74-8	Carbazole	2400	1730	72	2300	93	28	56-116/30
218-01-9	Chrysene	2400	1720	72	2290	92	28	56-114/30
111-91-1	bis(2-Chloroethoxy)methane	2400	1540	64	2090	84	30	41-106/30
111-44-4	bis(2-Chloroethyl)ether	2400	1690	70	2310	93	31* a	28-113/30
108-60-1	bis(2-Chloroisopropyl)ether	2400	1790	75	2480	100	32* a	30-132/30
7005-72-3	4-Chlorophenyl phenyl ether	2400	2100	87	2730	110	26	54-114/30
95-50-1	1,2-Dichlorobenzene	2400	1750	73	2330	94	28	34-100/30
541-73-1	1,3-Dichlorobenzene	2400	1740	72	2360	95	30	35-99/30
106-46-7	1,4-Dichlorobenzene	2400	1690	70	2270	92	29	35-98/30
121-14-2	2,4-Dinitrotoluene	2400	1920	80	2480	100	25	50-121/30

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-BS	R50706.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-BSD	R50714.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
606-20-2	2,6-Dinitrotoluene	2400	1830	76	2360	95	25	52-115/30
91-94-1	3,3'-Dichlorobenzidine	2400	1260	52	1420	57	12	17-120/30
53-70-3	Dibenzo(a,h)anthracene	2400	1650	69	2210	89	29	54-121/30
132-64-9	Dibenzofuran	2400	1830	76	2370	96	26	52-109/30
84-74-2	Di-n-butyl phthalate	2400	1940	81	2640	107	31* a	55-113/30
117-84-0	Di-n-octyl phthalate	2400	1850	77	2470	100	29	53-126/30
84-66-2	Diethyl phthalate	2400	2080	87	2730	110	27	54-111/30
131-11-3	Dimethyl phthalate	2400	2060	86	2690	109	27	53-111/30
117-81-7	bis(2-Ethylhexyl)phthalate	2400	1870	78	2590	105	32* a	55-125/30
206-44-0	Fluoranthene	2400	1790	75	2350	95	27	55-116/30
86-73-7	Fluorene	2400	1950	81	2520	102	26	52-111/30
118-74-1	Hexachlorobenzene	2400	1880	78	2440	99	26	52-117/30
87-68-3	Hexachlorobutadiene	2400	1700	71	2310	93	30	36-108/30
77-47-4	Hexachlorocyclopentadiene	2400	1240	52	1290	52	4	10-99/30
67-72-1	Hexachloroethane	2400	1580	66	2120	86	29	33-100/30
193-39-5	Indeno(1,2,3-cd)pyrene	2400	1630	68	2200	89	30	55-120/30
78-59-1	Isophorone	2400	1660	69	2200	89	28	37-101/30
91-57-6	2-Methylnaphthalene	2400	1640	68	2200	89	29	38-114/30
88-74-4	2-Nitroaniline	2400	1780	74	2330	94	27	55-120/30
99-09-2	3-Nitroaniline	2400	1600	67	1270	51	23	31-103/30
100-01-6	4-Nitroaniline	2400	1650	69	1900	77	14	50-112/30
91-20-3	Naphthalene	2400	2050	85	2960	120	36* a	27-128/30
98-95-3	Nitrobenzene	2400	1590	66	2150	87	30	33-108/30
621-64-7	N-Nitroso-di-n-propylamine	2400	1750	73	2400	97	31* a	37-112/30
86-30-6	N-Nitrosodiphenylamine	2400	1710	71	2300	93	29	47-114/30
85-01-8	Phenanthrene	2400	1780	74	2340	94	27	54-112/30
129-00-0	Pyrene	2400	1860	77	2540	103	31* a	54-118/30
120-82-1	1,2,4-Trichlorobenzene	2400	1780	74	2430	98	31* a	38-105/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
367-12-4	2-Fluorophenol	63%	81%	25-109%
4165-62-2	Phenol-d5	66%	82%	29-113%
118-79-6	2,4,6-Tribromophenol	74%	88%	20-141%
4165-60-0	Nitrobenzene-d5	63%	79%	27-115%

\* = Outside of Control Limits.

## Blank Spike/Blank Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-BS	R50706.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-BSD	R50714.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
321-60-8	2-Fluorobiphenyl	74%	88%	34-118%
1718-51-0	Terphenyl-d14	80%	96%	42-139%

(a) Outside control limits. Individual spike recoveries within acceptance limits.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-MS	W30956.D	1	11/11/16	MR	11/10/16	OP49119	MSW1256
OP49119-MSD	W30957.D	1	11/11/16	MR	11/10/16	OP49119	MSW1256
MC48658-1	W30958.D	1	11/11/16	MR	11/10/16	OP49119	MSW1256

**The QC reported here applies to the following samples:**

**Method:** SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48658-1 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
95-48-7	2-Methylphenol	ND	500	314	63	500	299	60	5	30-130/20
	3&4-Methylphenol	ND	1000	582	58	1000	552	55	5	30-130/20
87-86-5	Pentachlorophenol	ND	500	367	73	500	362	72	1	30-130/20
95-95-4	2,4,5-Trichlorophenol	ND	500	469	94	500	454	91	3	30-130/20
88-06-2	2,4,6-Trichlorophenol	ND	500	463	93	500	436	87	6	30-130/20
106-46-7	1,4-Dichlorobenzene	ND	500	315	63	500	266	53	17	40-140/20
121-14-2	2,4-Dinitrotoluene	ND	500	471	94	500	472	94	0	40-140/20
118-74-1	Hexachlorobenzene	ND	500	491	98	500	482	96	2	40-140/20
87-68-3	Hexachlorobutadiene	ND	500	318	64	500	264	53	19	40-140/20
67-72-1	Hexachloroethane	ND	500	281	56	500	243	49	15	40-140/20
98-95-3	Nitrobenzene	ND	500	373	75	500	336	67	10	40-140/20
110-86-1	Pyridine	ND	500	184	37	500	186	37	1	10-86/20

CAS No.	Surrogate Recoveries	MS	MSD	MC48658-1	Limits
367-12-4	2-Fluorophenol	43%	41%	41%	10-73%
4165-62-2	Phenol-d5	27%	26%	26%	10-58%
118-79-6	2,4,6-Tribromophenol	100%	99%	93%	15-125%
4165-60-0	Nitrobenzene-d5	72%	66%	67%	23-120%
321-60-8	2-Fluorobiphenyl	75%	67%	70%	31-102%
1718-51-0	Terphenyl-d14	88%	89%	85%	42-124%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MS	R50710.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-MSD	R50712.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
MC48723-45	R50713.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	MC48723-45 Spike ug/kg	Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
95-57-8	2-Chlorophenol	ND		3170	1870	59	3040	1510	50	27-112/30
59-50-7	4-Chloro-3-methyl phenol	ND		3170	2380	75	3040	2240	74	30-130/30
120-83-2	2,4-Dichlorophenol	ND		3170	2400	76	3040	2090	69	36-119/30
105-67-9	2,4-Dimethylphenol	ND		3170	2050	65	3040	1790	59	28-118/30
51-28-5	2,4-Dinitrophenol	ND		3170	550	17	3040	481	16	10-149/30
534-52-1	4,6-Dinitro-o-cresol	ND		3170	823	26	3040	489	16	51* a 10-150/30
95-48-7	2-Methylphenol	ND		3170	2040	64	3040	1710	56	18 23-119/30
	3&4-Methylphenol	ND		6330	4120	65	6070	3590	59	14 24-124/30
88-75-5	2-Nitrophenol	ND		3170	1950	62	3040	1470	48	28 23-126/30
100-02-7	4-Nitrophenol	ND		3170	2600	82	3040	2440	80	6 18-141/30
87-86-5	Pentachlorophenol	ND		3170	2010	63	3040	1870	62	7 10-145/30
108-95-2	Phenol	ND		3170	1900	60	3040	1600	53	17 25-119/30
95-95-4	2,4,5-Trichlorophenol	ND		3170	2820	89	3040	2610	86	8 34-128/30
88-06-2	2,4,6-Trichlorophenol	ND		3170	2750	87	3040	2500	82	10 32-124/30
83-32-9	Acenaphthene	ND		3170	2530	80	3040	2340	77	8 27-133/30
208-96-8	Acenaphthylene	ND		3170	2350	74	3040	2180	72	8 25-111/30
120-12-7	Anthracene	ND		3170	2520	80	3040	2430	80	4 25-138/30
56-55-3	Benzo(a)anthracene	ND		3170	2690	85	3040	2590	85	4 23-147/30
50-32-8	Benzo(a)pyrene	ND		3170	2640	83	3040	2540	84	4 24-144/30
205-99-2	Benzo(b)fluoranthene	ND		3170	2600	82	3040	2510	83	4 25-149/30
191-24-2	Benzo(g,h,i)perylene	ND		3170	2710	86	3040	2390	79	13 18-150/30
207-08-9	Benzo(k)fluoranthene	ND		3170	2640	83	3040	2560	84	3 18-143/30
101-55-3	4-Bromophenyl phenyl ether	ND		3170	3040	96	3040	2910	96	4 42-128/30
85-68-7	Butyl benzyl phthalate	ND		3170	3110	98	3040	2960	97	5 39-132/30
91-58-7	2-Chloronaphthalene	ND		3170	2530	80	3040	2300	76	10 39-121/30
106-47-8	4-Chloroaniline	ND		3170	1640	52	3040	1320	43	22 10-105/30
86-74-8	Carbazole	ND		3170	2580	81	3040	2480	82	4 32-134/30
218-01-9	Chrysene	ND		3170	2600	82	3040	2520	83	3 23-145/30
111-91-1	bis(2-Chloroethoxy)methane	ND		3170	2040	64	3040	1750	58	15 32-114/30
111-44-4	bis(2-Chloroethyl)ether	ND		3170	1680	53	3040	1410	46	17 25-111/30
108-60-1	bis(2-Chloroisopropyl)ether	ND		3170	1910	60	3040	1570	52	20 24-136/30
7005-72-3	4-Chlorophenyl phenyl ether	ND		3170	3070	97	3040	2930	96	5 42-123/30
95-50-1	1,2-Dichlorobenzene	ND		3170	1480	47	3040	1310	43	12 25-105/30
541-73-1	1,3-Dichlorobenzene	ND		3170	1390	44	3040	1280	42	8 26-103/30
106-46-7	1,4-Dichlorobenzene	ND		3170	1370	43	3040	1270	42	8 25-104/30
121-14-2	2,4-Dinitrotoluene	ND		3170	2850	90	3040	2600	86	9 34-129/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MS	R50710.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-MSD	R50712.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
MC48723-45	R50713.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	MC48723-45 Spike ug/kg	Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
606-20-2	2,6-Dinitrotoluene	ND		3170	2710	86	3040	2500	82	39-124/30
91-94-1	3,3'-Dichlorobenzidine	ND		3170	1380	44	3040	1320	43	10-139/30
53-70-3	Dibenzo(a,h)anthracene	ND		3170	2630	83	3040	2430	80	35-134/30
132-64-9	Dibenzofuran	ND		3170	2600	82	3040	2450	81	30-131/30
84-74-2	Di-n-butyl phthalate	ND		3170	2970	94	3040	2850	94	41-123/30
117-84-0	Di-n-octyl phthalate	ND		3170	2790	88	3040	2630	87	33-142/30
84-66-2	Diethyl phthalate	ND		3170	3100	98	3040	2960	97	42-119/30
131-11-3	Dimethyl phthalate	ND		3170	3020	95	3040	2910	96	38-122/30
117-81-7	bis(2-Ethylhexyl)phthalate	ND		3170	2890	91	3040	2780	92	35-141/30
206-44-0	Fluoranthene	ND		3170	2700	85	3040	2570	85	17-151/30
86-73-7	Fluorene	ND		3170	2790	88	3040	2640	87	34-128/30
118-74-1	Hexachlorobenzene	ND		3170	2810	89	3040	2650	87	40-125/30
87-68-3	Hexachlorobutadiene	ND		3170	1820	57	3040	1490	49	20 30-113/30
77-47-4	Hexachlorocyclopentadiene	ND		3170	1330	42	3040	798	26	50* a 10-103/30
67-72-1	Hexachloroethane	ND		3170	1320	42	3040	1110	37	17 10-125/30
193-39-5	Indeno(1,2,3-cd)pyrene	ND		3170	2600	82	3040	2390	79	8 22-147/30
78-59-1	Isophorone	ND		3170	2140	68	3040	1890	62	12 29-109/30
91-57-6	2-Methylnaphthalene	35.5	J	3170	2160	67	3040	1910	62	12 26-127/30
88-74-4	2-Nitroaniline	ND		3170	2610	82	3040	2470	81	6 40-128/30
99-09-2	3-Nitroaniline	ND		3170	2310	73	3040	2110	69	9 21-116/30
100-01-6	4-Nitroaniline	ND		3170	2350	74	3040	2280	75	3 21-125/30
91-20-3	Naphthalene	ND		3170	2570	81	3040	2290	75	12 18-135/30
98-95-3	Nitrobenzene	ND		3170	1820	57	3040	1560	51	15 29-110/30
621-64-7	N-Nitroso-di-n-propylamine	ND		3170	2150	68	3040	1800	59	18 22-128/30
86-30-6	N-Nitrosodiphenylamine	ND		3170	2520	80	3040	2470	81	2 22-142/30
85-01-8	Phenanthrene	22.3	J	3170	2660	83	3040	2560	84	4 21-141/30
129-00-0	Pyrene	ND		3170	2820	89	3040	2690	89	5 22-148/30
120-82-1	1,2,4-Trichlorobenzene	ND		3170	2010	63	3040	1690	56	17 30-113/30

CAS No.	Surrogate Recoveries	MS	MSD	MC48723-45 Limits
367-12-4	2-Fluorophenol	51%	43%	42% 25-109%
4165-62-2	Phenol-d5	62%	54%	54% 29-113%
118-79-6	2,4,6-Tribromophenol	83%	81%	71% 20-141%
4165-60-0	Nitrobenzene-d5	56%	48%	46% 27-115%

\* = Outside of Control Limits.



## Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MS	R50710.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-MSD	R50712.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
MC48723-45	R50713.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

**The QC reported here applies to the following samples:**

**Method:** SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Surrogate Recoveries	MS	MSD	MC48723-45 Limits	
321-60-8	2-Fluorobiphenyl	78%	73%	73%	34-118%
1718-51-0	Terphenyl-d14	92%	91%	95%	42-139%

(a) Outside control limits. Individual spike recoveries within acceptance limits.

\* = Outside of Control Limits.

# Leachate Spike Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LS1	R50880.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897
MC48722-2A	R50882.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48722-2ASpike ug/l	Q	ug/l	LS ug/l	LS %	Limits
95-48-7	2-Methylphenol	ND		500	354	71	30-130
	3&4-Methylphenol	ND		1000	634	63	30-130
87-86-5	Pentachlorophenol	ND		500	338	68	30-130
95-95-4	2,4,5-Trichlorophenol	ND		500	525	105	30-130
88-06-2	2,4,6-Trichlorophenol	ND		500	509	102	30-130
106-46-7	1,4-Dichlorobenzene	ND		500	398	80	40-140
121-14-2	2,4-Dinitrotoluene	ND		500	523	105	40-140
118-74-1	Hexachlorobenzene	ND		500	517	103	40-140
87-68-3	Hexachlorobutadiene	ND		500	405	81	40-140
67-72-1	Hexachloroethane	ND		500	360	72	40-140
98-95-3	Nitrobenzene	ND		500	431	86	40-140
110-86-1	Pyridine	ND		500	226	45	10-86

CAS No.	Surrogate Recoveries	LS	MC48722-2ALimits
367-12-4	2-Fluorophenol	52%	48% 10-73%
4165-62-2	Phenol-d5	34%	29% 10-58%
118-79-6	2,4,6-Tribromophenol	91%	79% 15-125%
4165-60-0	Nitrobenzene-d5	80%	74% 23-120%
321-60-8	2-Fluorobiphenyl	87%	80% 31-102%
1718-51-0	Terphenyl-d14	93%	94% 42-124%

\* = Outside of Control Limits.

# Leachate Spike Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LS2	R50867.D	1	11/23/16	MR	11/22/16	OP49119	MSR1896
MC48791-2	R50869.D	1	11/23/16	MR	11/22/16	OP49119	MSR1896

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48791-2 ug/l	Spike Q	LS ug/l	LS %	Limits
95-48-7	2-Methylphenol	ND	500	380	76	30-130
	3&4-Methylphenol	ND	1000	681	68	30-130
87-86-5	Pentachlorophenol	ND	500	420	84	30-130
95-95-4	2,4,5-Trichlorophenol	ND	500	507	101	30-130
88-06-2	2,4,6-Trichlorophenol	ND	500	488	98	30-130
106-46-7	1,4-Dichlorobenzene	ND	500	466	93	40-140
121-14-2	2,4-Dinitrotoluene	ND	500	504	101	40-140
118-74-1	Hexachlorobenzene	ND	500	496	99	40-140
87-68-3	Hexachlorobutadiene	ND	500	448	90	40-140
67-72-1	Hexachloroethane	ND	500	217	43	40-140
98-95-3	Nitrobenzene	ND	500	427	85	40-140
110-86-1	Pyridine	ND	500	206	41	10-86

CAS No.	Surrogate Recoveries	LS	MC48791-2	Limits
367-12-4	2-Fluorophenol	52%	41%	10-73%
4165-62-2	Phenol-d5	37%	26%	10-58%
118-79-6	2,4,6-Tribromophenol	90%	83%	15-125%
4165-60-0	Nitrobenzene-d5	77%	63%	23-120%
321-60-8	2-Fluorobiphenyl	83%	69%	31-102%
1718-51-0	Terphenyl-d14	92%	91%	42-124%

\* = Outside of Control Limits.

# Leachate Spike Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LS3	R50897.D	1	11/28/16	MR	11/22/16	OP49119	MSR1898
MC48853-7	R50898.D	1	11/28/16	MR	11/22/16	OP49119	MSR1898

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48853-7 ug/l	Spike Q	LS ug/l	LS %	Limits
95-48-7	2-Methylphenol	ND	500	388	78	30-130
	3&4-Methylphenol	ND	1000	692	69	30-130
87-86-5	Pentachlorophenol	ND	500	367	73	30-130
95-95-4	2,4,5-Trichlorophenol	ND	500	522	104	30-130
88-06-2	2,4,6-Trichlorophenol	ND	500	499	100	30-130
106-46-7	1,4-Dichlorobenzene	ND	500	341	68	40-140
121-14-2	2,4-Dinitrotoluene	ND	500	567	113	40-140
118-74-1	Hexachlorobenzene	ND	500	502	100	40-140
87-68-3	Hexachlorobutadiene	ND	500	340	68	40-140
67-72-1	Hexachloroethane	ND	500	308	62	40-140
98-95-3	Nitrobenzene	ND	500	431	86	40-140
110-86-1	Pyridine	ND	500	167	33	10-86

CAS No.	Surrogate Recoveries	LS	MC48853-7	Limits
367-12-4	2-Fluorophenol	47%	47%	10-73%
4165-62-2	Phenol-d5	33%	30%	10-58%
118-79-6	2,4,6-Tribromophenol	81%	76%	15-125%
4165-60-0	Nitrobenzene-d5	75%	71%	23-120%
321-60-8	2-Fluorobiphenyl	70%	71%	31-102%
1718-51-0	Terphenyl-d14	88%	81%	42-124%

\* = Outside of Control Limits.

# Semivolatile Surrogate Recovery Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

**Method:** SW846 8270D

**Matrix:** LEACHATE

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
MC48722-3	R50883.D	46	29	79	76	82	94
MC48722-1A	R50881.D	48	30	83	73	78	94
MC48722-2A	R50882.D	48	29	79	74	80	94
OP49119-BS1	R50879.D	50	32	90	78	87	94
OP49119-LB1	R50878A.D	41	25	76	65	69	101
OP49119-LS1	R50880.D	52	34	91	80	87	93
OP49119-LS2	R50867.D	52	37	90	77	83	92
OP49119-LS3	R50897.D	47	33	81	75	70	88
OP49119-MB1	R50878.D	41	25	76	65	69	101
OP49119-MS	W30956.D	43	27	100	72	75	88
OP49119-MSD	W30957.D	41	26	99	66	67	89
OP49119-LB	W30954A.D	38	24	88	62	67	85
OP49119-LB2	R50865A.D	32	22	70	52	57	93
OP49119-MB	W30954.D	38	24	88	62	67	85
OP49119-MB2	R50865.D	32	22	70	52	57	93

## Surrogate Compounds

## Recovery Limits

<b>S1</b> = 2-Fluorophenol	10-73%
<b>S2</b> = Phenol-d5	10-58%
<b>S3</b> = 2,4,6-Tribromophenol	15-125%
<b>S4</b> = Nitrobenzene-d5	23-120%
<b>S5</b> = 2-Fluorobiphenyl	31-102%
<b>S6</b> = Terphenyl-d14	42-124%

6.7.1

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Semivolatile Surrogate Recovery Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Method: SW846 8270D	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
MC48722-1	R50715.D	36	50	81	42	70	88
MC48722-2	R50716.D	57	66	81	59	80	87
MC48722-4	R50717.D	60	68	82	66	82	89
OP49144-BS	R50706.D	63	66	74	63	74	80
OP49144-BSD	R50714.D	81	82	88	79	88	96
OP49144-MB	R50705.D	30	34	57	29	43	81
OP49144-MS	R50710.D	51	62	83	56	78	92
OP49144-MSD	R50712.D	43	54	81	48	73	91

Surrogate Compounds	Recovery Limits
S1 = 2-Fluorophenol	25-109%
S2 = Phenol-d5	29-113%
S3 = 2,4,6-Tribromophenol	20-141%
S4 = Nitrobenzene-d5	27-115%
S5 = 2-Fluorobiphenyl	34-118%
S6 = Terphenyl-d14	42-139%



## GC Volatiles

## QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries

Method Blank Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GWX3867-MB	WX78122.D	1	11/17/16	AF	n/a	n/a	GWX3867

The QC reported here applies to the following samples: Method: SW846 8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	ND	5.0	0.94	mg/kg	

CAS No.	Surrogate Recoveries	Limits
	2,3,4-Trifluorotoluene	106% 64-127%



Blank Spike/Blank Spike Duplicate Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GWX3867-BSP	WX78123.D	1	11/17/16	AF	n/a	n/a	GWX3867
GWX3867-BSD	WX78124.D	1	11/17/16	AF	n/a	n/a	GWX3867

The QC reported here applies to the following samples: Method: SW846 8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	BSD mg/kg	BSD %	RPD	Limits Rec/RPD
	TPH-GRO (VOA)	50	55.1	110	53.4	107	3	80-120/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
	2,3,4-Trifluorotoluene	106%	106%	64-127%

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC48722-1MS	WX78129.D	1	11/17/16	AF	n/a	n/a	GWX3867
MC48722-1MSD	WX78130.D	1	11/17/16	AF	n/a	n/a	GWX3867
MC48722-1	WX78128.D	1	11/17/16	AF	n/a	n/a	GWX3867

The QC reported here applies to the following samples: Method: SW846 8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	MC48722-1 mg/kg	Spike Q	mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (VOA)	4.46	J	118	130	107	118	132	109	2	54-130/20

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-1	Limits
	2,3,4-Trifluorotoluene	105%	106%	102%	64-127%

\* = Outside of Control Limits.

**Volatile Surrogate Recovery Summary**

**Job Number:** MC48722  
**Account:** BBLNYS Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY

<b>Method:</b> SW846 8015	<b>Matrix:</b> SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>
MC48722-1	WX78128.D	102
MC48722-2	WX78127.D	102
MC48722-4	WX78125.D	107
GWX3867-BSD	WX78124.D	106
GWX3867-BSP	WX78123.D	106
GWX3867-MB	WX78122.D	106
MC48722-1MS	WX78129.D	105
MC48722-1MSD	WX78130.D	106

Surrogate Compounds	Recovery Limits
S1 = 2,3,4-Trifluorotoluene	64-127%

(a) Recovery from GC signal #1

## GC Semi-volatiles

## QC Data Summaries



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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries

Method Blank Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49161-MB	YZ98708.D	1	11/28/16	TA	11/16/16	OP49161	GYZ8038

The QC reported here applies to the following samples: Method: SW846 8151

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	10	3.4	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	10	4.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
19719-28-9	2,4-DCAA	75% 30-150%
19719-28-9	2,4-DCAA	68% 30-150%

## Method Blank Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49159-MB	BE53422.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688

The QC reported here applies to the following samples:

Method: SW846 8081B

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	0.50	0.044	ug/l	
12789-03-6	Chlordane	ND	5.0	1.1	ug/l	
72-20-8	Endrin	ND	0.50	0.12	ug/l	
76-44-8	Heptachlor	ND	0.50	0.11	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.50	0.051	ug/l	
72-43-5	Methoxychlor	ND	0.50	0.21	ug/l	
8001-35-2	Toxaphene	ND	25	1.3	ug/l	

CAS No.	Surrogate Recoveries	Limits
877-09-8	Tetrachloro-m-xylene	62% 30-150%
877-09-8	Tetrachloro-m-xylene	73% 30-150%
2051-24-3	Decachlorobiphenyl	90% 30-150%
2051-24-3	Decachlorobiphenyl	80% 30-150%

8.1.2

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## Method Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49147-MB	BK63151.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	25	2.5	ug/kg	
11104-28-2	Aroclor 1221	ND	25	11	ug/kg	
11141-16-5	Aroclor 1232	ND	25	7.6	ug/kg	
53469-21-9	Aroclor 1242	ND	25	5.7	ug/kg	
12672-29-6	Aroclor 1248	ND	25	4.3	ug/kg	
11097-69-1	Aroclor 1254	ND	25	11	ug/kg	
11096-82-5	Aroclor 1260	ND	25	2.3	ug/kg	

CAS No.	Surrogate Recoveries	Limits
877-09-8	Tetrachloro-m-xylene	85% 25-145%
877-09-8	Tetrachloro-m-xylene	87% 25-145%
2051-24-3	Decachlorobiphenyl	86% 25-179%
2051-24-3	Decachlorobiphenyl	87% 25-179%

8.1.3

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## Method Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49160-MB	BK63180.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	2.5	1.6	ug/l	
11104-28-2	Aroclor 1221	ND	2.5	1.6	ug/l	
11141-16-5	Aroclor 1232	ND	2.5	1.8	ug/l	
53469-21-9	Aroclor 1242	ND	2.5	1.9	ug/l	
12672-29-6	Aroclor 1248	ND	2.5	1.2	ug/l	
11097-69-1	Aroclor 1254	ND	2.5	1.6	ug/l	
11096-82-5	Aroclor 1260	ND	2.5	1.9	ug/l	

CAS No.	Surrogate Recoveries	Limits
877-09-8	Tetrachloro-m-xylene	86% 30-150%
877-09-8	Tetrachloro-m-xylene	89% 30-150%
2051-24-3	Decachlorobiphenyl	94% 30-150%
2051-24-3	Decachlorobiphenyl	97% 30-150%

8.1.4

8



Method Blank Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49158-MB	IR3252.D	1	11/18/16	MD	11/16/16	OP49158	GIR226

The QC reported here applies to the following samples: Method: SW846-8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (Semi-VOA)	ND	16	4.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	79% 17-130%

8.1.5  
8

# Leachate Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49161-LB	YZ98708A.D	1	11/28/16	TA	11/16/16	OP49161	GYZ8038

The QC reported here applies to the following samples:

Method: SW846 8151

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	10	3.4	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	10	4.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
19719-28-9	2,4-DCAA	75% 30-150%
19719-28-9	2,4-DCAA	68% 30-150%

8.2.1

8

## Leachate Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49159-LB	BE53422A.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688

The QC reported here applies to the following samples:

Method: SW846 8081B

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	0.50	0.044	ug/l	
12789-03-6	Chlordane	ND	5.0	1.1	ug/l	
72-20-8	Endrin	ND	0.50	0.12	ug/l	
76-44-8	Heptachlor	ND	0.50	0.11	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.50	0.051	ug/l	
72-43-5	Methoxychlor	ND	0.50	0.21	ug/l	
8001-35-2	Toxaphene	ND	25	1.3	ug/l	

CAS No.	Surrogate Recoveries	Limits
877-09-8	Tetrachloro-m-xylene	62% 30-150%
877-09-8	Tetrachloro-m-xylene	73% 30-150%
2051-24-3	Decachlorobiphenyl	90% 30-150%
2051-24-3	Decachlorobiphenyl	80% 30-150%

8.2.2

8

# Leachate Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49160-LB	BK63180A.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	2.5	1.6	ug/l	
11104-28-2	Aroclor 1221	ND	2.5	1.6	ug/l	
11141-16-5	Aroclor 1232	ND	2.5	1.8	ug/l	
53469-21-9	Aroclor 1242	ND	2.5	1.9	ug/l	
12672-29-6	Aroclor 1248	ND	2.5	1.2	ug/l	
11097-69-1	Aroclor 1254	ND	2.5	1.6	ug/l	
11096-82-5	Aroclor 1260	ND	2.5	1.9	ug/l	

CAS No.	Surrogate Recoveries	Limits
877-09-8	Tetrachloro-m-xylene	86% 30-150%
877-09-8	Tetrachloro-m-xylene	89% 30-150%
2051-24-3	Decachlorobiphenyl	94% 30-150%
2051-24-3	Decachlorobiphenyl	97% 30-150%

8.2.3

8

## Blank Spike Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49161-BS	YZ98709.D	1	11/28/16	TA	11/16/16	OP49161	GYZ8038

The QC reported here applies to the following samples:

Method: SW846 8151

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
94-75-7	2,4-D	40	43.2	108	40-140
93-72-1	2,4,5-TP (Silvex)	40	40.9	102	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
19719-28-9	2,4-DCAA	101%	30-150%
19719-28-9	2,4-DCAA	96%	30-150%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49159-BS	BE53423.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688

**The QC reported here applies to the following samples:**

**Method:** SW846 8081B

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
58-89-9	gamma-BHC (Lindane)	5	4.4	88	40-140
72-20-8	Endrin	5	5.2	104	40-140
76-44-8	Heptachlor	5	4.5	90	40-140
1024-57-3	Heptachlor epoxide	5	4.6	92	40-140
72-43-5	Methoxychlor	5	5.5	110	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
877-09-8	Tetrachloro-m-xylene	75%	30-150%
877-09-8	Tetrachloro-m-xylene	69%	30-150%
2051-24-3	Decachlorobiphenyl	82%	30-150%
2051-24-3	Decachlorobiphenyl	70%	30-150%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49160-BS	BK63181.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1A, MC48722-2A

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
12674-11-2	Aroclor 1016	20	21.1	106	40-140
11104-28-2	Aroclor 1221		ND		40-140
11141-16-5	Aroclor 1232		ND		40-140
53469-21-9	Aroclor 1242		ND		40-140
12672-29-6	Aroclor 1248		ND		40-140
11097-69-1	Aroclor 1254		ND		40-140
11096-82-5	Aroclor 1260	20	22.5	113	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
877-09-8	Tetrachloro-m-xylene	86%	30-150%
877-09-8	Tetrachloro-m-xylene	86%	30-150%
2051-24-3	Decachlorobiphenyl	95%	30-150%
2051-24-3	Decachlorobiphenyl	99%	30-150%

\* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49158-BS	IR3253.D	1	11/18/16	MD	11/16/16	OP49158	GIR226

The QC reported here applies to the following samples: Method: SW846-8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (Semi-VOA)	160	141	88	29-125

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	82%	17-130%

\* = Outside of Control Limits.



## Blank Spike/Blank Spike Duplicate Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49147-BS	BK63152.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
OP49147-BSD	BK63164.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
12674-11-2	Aroclor 1016	262	263	100	290	113	10	47-144/30
11104-28-2	Aroclor 1221		ND		ND		nc	40-140/30
11141-16-5	Aroclor 1232		ND		ND		nc	40-140/30
53469-21-9	Aroclor 1242		ND		ND		nc	40-140/30
12672-29-6	Aroclor 1248		ND		ND		nc	40-140/30
11097-69-1	Aroclor 1254		ND		ND		nc	40-140/30
11096-82-5	Aroclor 1260	262	262	100	269	105	3	45-156/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
877-09-8	Tetrachloro-m-xylene	94%	104%	25-145%
877-09-8	Tetrachloro-m-xylene	95%	113%	25-145%
2051-24-3	Decachlorobiphenyl	90%	92%	25-179%
2051-24-3	Decachlorobiphenyl	95%	100%	25-179%

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49161-MS	YZ98710.D	1	11/28/16	TA	11/16/16	OP49161	GYZ8038
OP49161-MSD	YZ98713.D	1	11/28/16	TA	11/16/16	OP49161	GYZ8038
MC48722-2A	YZ98718.D	1	11/29/16	TA	11/16/16	OP49161	GYZ8038

The QC reported here applies to the following samples: Method: SW846 8151

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48722-2ASpike ug/l	Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
94-75-7	2,4-D	ND	40	44.3	111	40	42.2	106	5	30-150/30
93-72-1	2,4,5-TP (Silvex)	ND	40	42.4	106	40	40.2	101	5	30-150/30

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-2ALimits
19719-28-9	2,4-DCAA	101%	100%	60% 30-150%
19719-28-9	2,4-DCAA	96%	95%	47% 30-150%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49159-MS	BE53424.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688
OP49159-MSD	BE53425.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688
MC48722-2A	BE53427.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688

The QC reported here applies to the following samples:

Method: SW846 8081B

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48722-2ASpike ug/l	Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
58-89-9	gamma-BHC (Lindane)	ND	5	4.7	94	5	3.8	76	21	30-150/30
72-20-8	Endrin	ND	5	5.6	112	5	4.8	96	15	30-150/30
76-44-8	Heptachlor	ND	5	4.9	98	5	4.1	82	18	30-150/30
1024-57-3	Heptachlor epoxide	ND	5	5.0	100	5	4.1	82	20	30-150/30
72-43-5	Methoxychlor	ND	5	6.0	120	5	5.3	106	12	30-150/30

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-2ALimits	
877-09-8	Tetrachloro-m-xylene	75%	57%	47%	30-150%
877-09-8	Tetrachloro-m-xylene	70%	56%	61%	30-150%
2051-24-3	Decachlorobiphenyl	85%	76%	32%	30-150%
2051-24-3	Decachlorobiphenyl	72%	67%	65%	30-150%

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49147-MS	BK63153.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
OP49147-MSD	BK63154.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
MC48722-1	BK63163.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996

The QC reported here applies to the following samples: Method: SW846 8082A

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	MC48722-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
12674-11-2	Aroclor 1016	ND	333	311	93	344	286	83	8	24-164/50
11104-28-2	Aroclor 1221	ND		ND			ND		nc	40-140/50
11141-16-5	Aroclor 1232	ND		ND			ND		nc	40-140/50
53469-21-9	Aroclor 1242	ND		ND			ND		nc	40-140/50
12672-29-6	Aroclor 1248	ND		ND			ND		nc	40-140/50
11097-69-1	Aroclor 1254	ND		ND			ND		nc	40-140/50
11096-82-5	Aroclor 1260	ND	333	329	99	344	295	86	11	19-177/50

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-1	Limits
877-09-8	Tetrachloro-m-xylene	145%	84%	83%	25-145%
877-09-8	Tetrachloro-m-xylene	97%	73%	74%	25-145%
2051-24-3	Decachlorobiphenyl	83%	78%	76%	25-179%
2051-24-3	Decachlorobiphenyl	75%	80%	76%	25-179%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49160-MS	BK63182.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997
OP49160-MSD	BK63183.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997
MC48722-2A	BK63185.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1A, MC48722-2A

CAS No.	Compound	MC48722-2ASpike ug/l	Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
12674-11-2	Aroclor 1016	ND	20	20.5	103	20	21.4	107	4	40-140/50
11104-28-2	Aroclor 1221	ND		ND			ND		nc	40-140/50
11141-16-5	Aroclor 1232	ND		ND			ND		nc	40-140/50
53469-21-9	Aroclor 1242	ND		ND			ND		nc	40-140/50
12672-29-6	Aroclor 1248	ND		ND			ND		nc	40-140/50
11097-69-1	Aroclor 1254	ND		ND			ND		nc	40-140/50
11096-82-5	Aroclor 1260	ND	20	22.3	112	20	23.3	117	4	40-140/50

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-2ALimits
877-09-8	Tetrachloro-m-xylene	83%	80%	68%
877-09-8	Tetrachloro-m-xylene	84%	80%	70%
2051-24-3	Decachlorobiphenyl	105%	102%	92%
2051-24-3	Decachlorobiphenyl	110%	107%	96%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49158-MS	IR3258.D	1	11/18/16	MD	11/16/16	OP49158	GIR226
OP49158-MSD	IR3261.D	1	11/18/16	MD	11/16/16	OP49158	GIR226
MC48722-4	IR3257.D	1	11/18/16	MD	11/16/16	OP49158	GIR226

The QC reported here applies to the following samples:

Method: SW846-8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	MC48722-4 mg/kg	Spike mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (Semi-VOA)	2200	195	4280	1069* <sup>a</sup>	203	2720	256* <sup>a</sup>	45	10-139/50

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-4	Limits
84-15-1	o-Terphenyl	124%	131%* <sup>b</sup>	91%	17-130%

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Outside control limits due to possible matrix interference.

\* = Outside of Control Limits.

Semivolatile Surrogate Recovery Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Method: SW846 8151	Matrix: LEACHATE
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC48722-3	YZ98719.D	59	48
MC48722-1A	YZ98717.D	57	45
MC48722-2A	YZ98718.D	60	47
OP49161-BS	YZ98709.D	101	96
OP49161-LB	YZ98708A.D	75	68
OP49161-MB	YZ98708.D	75	68
OP49161-MS	YZ98710.D	101	96
OP49161-MSD	YZ98713.D	100	95

Surrogate Compounds	Recovery Limits
S1 = 2,4-DCAA	30-150%

(a) Recovery from GC signal #2  
(b) Recovery from GC signal #1

8.6.1  
8

# Semivolatile Surrogate Recovery Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

**Method:** SW846 8081B

**Matrix:** LEACHATE

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>	S2 <sup>a</sup>	S2 <sup>b</sup>
MC48722-3	BE53428.D	68	70	82	76
MC48722-1A	BE53426.D	50	53	82	75
MC48722-2A	BE53427.D	47	61	32	65
OP49159-BS	BE53423.D	75	69	82	70
OP49159-LB	BE53422A.D	62	73	90	80
OP49159-MB	BE53422.D	62	73	90	80
OP49159-MS	BE53424.D	75	70	85	72
OP49159-MSD	BE53425.D	57	56	76	67

## Surrogate Compounds

## Recovery Limits

**S1** = Tetrachloro-m-xylene

30-150%

**S2** = Decachlorobiphenyl

30-150%

(a) Recovery from GC signal #1

(b) Recovery from GC signal #2

8.6.2

8



Semivolatile Surrogate Recovery Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Method: SW846 8082A	Matrix: LEACHATE
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>	S2 <sup>a</sup>	S2 <sup>b</sup>
MC48722-1A	BK63184.D	85	72	109	112
MC48722-2A	BK63185.D	68	70	92	96
OP49160-BS	BK63181.D	86	86	95	99
OP49160-LB	BK63180A.D	86	89	94	97
OP49160-MB	BK63180.D	86	89	94	97
OP49160-MS	BK63182.D	83	84	105	110
OP49160-MSD	BK63183.D	80	80	102	107

Surrogate Compounds	Recovery Limits
S1 = Tetrachloro-m-xylene	30-150%
S2 = Decachlorobiphenyl	30-150%

(a) Recovery from GC signal #1  
(b) Recovery from GC signal #2

8.6.3  
8

# Semivolatile Surrogate Recovery Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

**Method:** SW846 8082A

**Matrix:** SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>	S2 <sup>a</sup>	S2 <sup>b</sup>
MC48722-1	BK63163.D	83	74	76	76
MC48722-2	BK63165.D	99	106	91	99
MC48722-4	BK63166.D	101	74	69	68
OP49147-BS	BK63152.D	94	95	90	95
OP49147-BSD	BK63164.D	104	113	92	100
OP49147-MB	BK63151.D	85	87	86	87
OP49147-MS	BK63153.D	145	97	83	75
OP49147-MSD	BK63154.D	84	73	78	80

## Surrogate Compounds

## Recovery Limits

**S1** = Tetrachloro-m-xylene

25-145%

**S2** = Decachlorobiphenyl

25-179%

(a) Recovery from GC signal #1

(b) Recovery from GC signal #2

8.6.4

8

Semivolatile Surrogate Recovery Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Method: SW846-8015	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>
MC48722-1	IR3264.D	91
MC48722-2	IR3263.D	70
MC48722-4	IR3257.D	91
OP49158-BS	IR3253.D	82
OP49158-MB	IR3252.D	79
OP49158-MS	IR3258.D	124
OP49158-MSD	IR3261.D	131* <sup>b</sup>

Surrogate Compounds	Recovery Limits
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S1 = o-Terphenyl                      17-130%

(a) Recovery from GC signal #1  
(b) Outside control limits due to possible matrix interference.

8.6.5  
8

## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27019  
Matrix Type: SOLID

Methods: SW846 7471B  
Units: mg/kg

Prep Date: 11/15/16

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.033	.0011	.0057	0.0070	<0.033

Associated samples MP27019: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27019  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48716-3 Original MS	Spikelot HGRWS1	% Rec	QC Limits
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Mercury 0.030 0.53 0.496 100.8 80-120

Associated samples MP27019: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27019  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48716-3 Original MSD	Spikelot HGRWS1	% Rec	MSD RPD	QC Limit
Mercury	0.030	0.53	0.489	102.3	0.0 20

Associated samples MP27019: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27019  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/15/16 11/15/16

Metal	BSP Result	Spikelot HGRWS1	% Rec	QC Limits	BSD Result	Spikelot HGRWS1	% Rec	BSD RPD	QC Limit
Mercury	0.50	0.5	100.0	80-120	0.48	0.5	96.0	4.1	20

Associated samples MP27019: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27019  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/15/16

Metal	LCS Result	Spikelot HGLCS86	% Rec	QC Limits
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Mercury	19.6	20.2	97.0	71-129
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Associated samples MP27019: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 11/15/16

Metal	RL	IDL	MDL	MB raw	final
Aluminum	20	1.1	1.2		
Antimony	1.0	.13	.17	0.12	<1.0
Arsenic	1.0	.15	.2	-0.070	<1.0
Barium	5.0	.019	.076	0.040	<5.0
Beryllium	0.40	.016	.015	0.0	<0.40
Bismuth	5.0	.095	.15		
Boron	10	.97	.13		
Cadmium	0.40	.019	.031	-0.010	<0.40
Calcium	500	.76	.86		
Chromium	1.0	.039	.047	0.080	<1.0
Cobalt	5.0	.021	.031		
Copper	2.5	.055	.1		
Gold	5.0	.091	.11		
Iron	10	.19	.44		
Lead	1.0	.11	.11	0.030	<1.0
Lithium	50	.13	.18		
Magnesium	500	2.5	4		
Manganese	1.5	.011	.047		
Molybdenum	10	.017	.51		
Nickel	4.0	.033	.057	-0.010	<4.0
Palladium	5.0	.19	.14		
Platinum	5.0	.31	.54		
Potassium	500	2.7	3.4		
Selenium	1.0	.18	.3	0.13	<1.0
Silicon	10	.63	.51		
Silver	0.50	.027	.061	-0.010	<0.50
Sodium	500	.51	1.2		
Sulfur	5.0	.22	.31		
Strontium	1.0	.0079	.022		
Thallium	1.0	.13	.11	-0.080	<1.0
Tin	10	.08	.078		
Titanium	5.0	.032	.054		
Tungsten	10	.33	.93		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 11/15/16

Metal	RL	IDL	MDL	MB raw	final
Vanadium	1.0	.037	.04	-0.010	<1.0
Zinc	2.0	.12	.17	0.22	<2.0
Zirconium	5.0	.032	.17		

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48731-1 Original MS		Spikelot MPICP7	% Rec	QC Limits
Aluminum					
Antimony	0.26	19.9	44.9	43.7 (a)	75-125
Arsenic	2.6	43.4	44.9	90.9	75-125
Barium	33.9	198	180	91.4	75-125
Beryllium	0.26	40.6	44.9	89.9	75-125
Bismuth					
Boron					
Cadmium	0.082	42.5	44.9	94.5	75-125
Calcium					
Chromium	12.5	52.2	44.9	88.4	75-125
Cobalt					
Copper					
Gold					
Iron					
Lead	19.4	107	89.8	97.6	75-125
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel	7.6	49.7	44.9	93.8	75-125
Palladium					
Platinum					
Potassium					
Selenium	0.0	40.4	44.9	90.0	75-125
Silicon					
Silver	0.082	15.2	18	84.2	75-125
Sodium					
Sulfur					
Strontium					
Thallium	0.0	42.0	44.9	93.6	75-125
Tin					
Titanium					
Tungsten					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48731-1 Original MS		Spikelot MPICP7	% Rec	QC Limits
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Vanadium 22.5 63.7 44.9 91.8 75-125

Zinc 28.2 79.0 44.9 113.2 75-125

Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity. Post spike within acceptable range.

9.2.2

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48731-1 Original	MSD	Spikelot MPICP7	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	0.26	20.3	44.9	44.6 (a)	2.0	20
Arsenic	2.6	43.6	44.9	91.3	0.5	20
Barium	33.9	193	180	88.6	2.6	20
Beryllium	0.26	40.9	44.9	90.5	0.7	20
Bismuth						
Boron						
Cadmium	0.082	42.8	44.9	95.2	0.7	20
Calcium						
Chromium	12.5	50.8	44.9	85.3	2.7	20
Cobalt						
Copper						
Gold						
Iron						
Lead	19.4	105	89.8	95.3	1.9	20
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	7.6	49.4	44.9	93.1	0.6	20
Palladium						
Platinum						
Potassium						
Selenium	0.0	40.7	44.9	90.7	0.7	20
Silicon						
Silver	0.082	15.2	18	84.2	0.0	20
Sodium						
Sulfur						
Strontium						
Thallium	0.0	42.4	44.9	94.4	0.9	20
Tin						
Titanium						
Tungsten						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48731-1		Spikelot		MSD	QC
	Original	MSD	MPICP7	% Rec	RPD	Limit

Vanadium	22.5	62.0	44.9	88.0	2.7	20
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Zinc	28.2	68.3	44.9	89.3	14.5	20
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Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike duplicate recovery indicates possible matrix interference and/or sample nonhomogeneity.

9.2.2

9

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722

Account: BBLNYS - Arcadis

Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020

Methods: SW846 6010C

Matrix Type: SOLID

Units: mg/kg

Prep Date:

11/15/16

11/15/16

Metal	BSP Result	Spikelot MPICP7	% Rec	QC Limits	BSD Result	Spikelot MPICP7	% Rec	BSD RPD	QC Limit
Aluminum									
Antimony	47.8	50	95.6	80-120	48.3	50	96.6	1.0	20
Arsenic	48.1	50	96.2	80-120	48.4	50	96.8	0.6	20
Barium	188	200	94.0	80-120	186	200	93.0	1.1	20
Beryllium	46.6	50	93.2	80-120	46.3	50	92.6	0.6	20
Bismuth									
Boron									
Cadmium	49.3	50	98.6	80-120	49.6	50	99.2	0.6	20
Calcium									
Chromium	46.0	50	92.0	80-120	45.9	50	91.8	0.2	20
Cobalt									
Copper									
Gold									
Iron									
Lead	95.5	100	95.5	80-120	96.3	100	96.3	0.8	20
Lithium									
Magnesium									
Manganese									
Molybdenum									
Nickel	47.3	50	94.6	80-120	47.5	50	95.0	0.4	20
Palladium									
Platinum									
Potassium									
Selenium	47.2	50	94.4	80-120	47.5	50	95.0	0.6	20
Silicon									
Silver	17.4	20	87.0	80-120	17.2	20	86.0	1.2	20
Sodium									
Sulfur									
Strontium									
Thallium	48.4	50	96.8	80-120	48.6	50	97.2	0.4	20
Tin									
Titanium									
Tungsten									



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16 11/15/16

Metal	BSP Result	Spikelot MPICP7	% Rec	QC Limits	BSD Result	Spikelot MPICP7	% Rec	BSD RPD	QC Limit
Vanadium	47.0	50	94.0	80-120	46.3	50	92.6	1.5	20
Zinc	47.1	50	94.2	80-120	47.4	50	94.8	0.6	20

Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

9.2.3

9

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722

Account: BBLNYS - Arcadis

Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020

Methods: SW846 6010C

Matrix Type: SOLID

Units: mg/kg

Prep Date: 11/15/16

Metal	LCS Result	Spikelot MPLCS86	% Rec	QC Limits
Aluminum				
Antimony	52.3	86.5	60.5	1-199
Arsenic	91.7	97.5	94.1	78-122
Barium	290	306	94.8	83-117
Beryllium	90.8	100	90.8	83-118
Bismuth				
Boron				
Cadmium	73.2	76.6	95.6	82-118
Calcium				
Chromium	93.0	103	90.3	80-121
Cobalt				
Copper				
Gold				
Iron				
Lead	89.9	96.7	93.0	82-118
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	141	153	92.2	82-118
Palladium				
Platinum				
Potassium				
Selenium	150	161	93.2	78-123
Silicon				
Silver	43.6	49.3	88.4	75-125
Sodium				
Sulfur				
Strontium				
Thallium	114	119	95.8	79-121
Tin				
Titanium				
Tungsten				

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16

Metal	LCS Result	Spikelot MPLCS86	% Rec	QC Limits
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Vanadium 95.2 102 93.3 78-123

Zinc 203 229 88.6 82-118

Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

9.2.3

9

SERIAL DILUTION RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 11/15/16

Metal	MC48731-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony	2.90	0.00	100.0(a)	0-10
Arsenic	28.8	24.0	16.7 (a)	0-10
Barium	372	391	5.1	0-10
Beryllium	2.80	2.60	7.1	0-10
Bismuth				
Boron				
Cadmium	0.900	0.00	100.0(a)	0-10
Calcium				
Chromium	137	143	4.5	0-10
Cobalt				
Copper				
Gold				
Iron				
Lead	213	215	0.7	0-10
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	83.1	82.6	0.6	0-10
Palladium				
Platinum				
Potassium				
Selenium	0.00	0.00	NC	0-10
Silicon				
Silver	0.900	0.00	100.0(a)	0-10
Sodium				
Sulfur				
Strontium				
Thallium	0.00	0.00	NC	0-10
Tin				
Titanium				
Tungsten				

# SERIAL DILUTION RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 11/15/16

Metal	MC48731-1 Original	SDL 1:5	%DIF	QC Limits
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Vanadium 247 260 5.1 0-10

Zinc 310 333 7.6 0-10

Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

9.2.4

9

POST DIGESTATE SPIKE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: ug/l

Prep Date:

11/15/16

Metal	Sample ml	Final ml	MC48731-1 Raw	PS Corr.**	PS ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum										
Antimony	10	10.1	2.9	2.871287	21.8	.1	2	19.80198	95.6	80-120
Arsenic										
Barium										
Beryllium										
Bismuth										
Boron										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Gold										
Iron										
Lead										
Lithium										
Magnesium										
Manganese										
Molybdenum										
Nickel										
Palladium										
Platinum										
Potassium										
Selenium										
Silicon										
Silver										
Sodium										
Sulfur										
Strontium										
Thallium										
Tin										
Titanium										
Tungsten										

POST DIGESTATE SPIKE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020                      Methods: SW846 6010C  
 Matrix Type: SOLID                      Units: ug/l

Prep Date: 11/15/16

Metal	Sample ml	Final ml	MC48731-1 Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
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Vanadium

Zinc

Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (\*\*) Corr. sample result = Raw \* (sample volume / final volume)  
 (anr) Analyte not requested

9.2.5  
9

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
Matrix Type: LEACHATE

Methods: SW846 6010C  
Units: mg/l

Prep Date: 11/16/16

Metal	RL	IDL	MDL	MB raw	final
Aluminum	0.20	.011	.025		
Antimony	0.0060	.0013	.0012		
Arsenic	0.010	.0015	.002	-0.00020	<0.010
Barium	0.50	.00019	.00057	0.00010	<0.50
Beryllium	0.0040	.00016	.00034		
Bismuth	0.050	.00095	.0018		
Boron	0.10	.0097	.0023		
Cadmium	0.0040	.00019	.0003	0.0	<0.0040
Calcium	5.0	.0076	.018		
Chromium	0.010	.00039	.0011	0.00010	<0.010
Cobalt	0.050	.00021	.00041		
Copper	0.025	.00055	.0042		
Gold	0.050	.00091	.0013		
Iron	0.10	.0019	.016		
Lead	0.010	.0011	.0011	0.00010	<0.010
Lithium	0.50	.0013	.0018		
Magnesium	5.0	.025	.056		
Manganese	0.015	.00011	.00041		
Molybdenum	0.10	.00017	.016		
Nickel	0.040	.00033	.00035		
Palladium	0.050	.0019	.0014		
Platinum	0.050	.0031	.0047		
Potassium	5.0	.027	.078		
Selenium	0.025	.0018	.0034	0.00080	<0.025
Silicon	0.10	.0063	.03		
Silver	0.0050	.00027	.0014	0.00010	<0.0050
Sodium	5.0	.0051	.035		
Sulfur	0.050	.0022	.0033		
Strontium	0.010	.000079	.00017		
Thallium	0.0050	.0013	.0018		
Tin	0.10	.0008	.0022		
Titanium	0.050	.00032	.00099		
Tungsten	0.10	.0033	.023		



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
Matrix Type: LEACHATE

Methods: SW846 6010C  
Units: mg/l

Prep Date: 11/16/16

Metal	RL	IDL	MDL	MB raw	final
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Vanadium 0.010 .00037 .0004

Zinc 0.10 .0012 .001

Zirconium 0.050 .00032 .0026

Associated samples MP27025: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: mg/l

Prep Date: 11/16/16

Metal	MC48722-1A Original MS		Spikelot MPICP7	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	0.0044	0.54	0.50	107.1	75-125
Barium	0.65	2.6	2.0	97.5	75-125
Beryllium					
Bismuth					
Boron					
Cadmium	0.0012	0.54	0.50	107.8	75-125
Calcium					
Chromium	0.00060	0.47	0.50	93.9	75-125
Cobalt					
Copper					
Gold					
Iron					
Lead	0.0012	1.0	1.0	99.9	75-125
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Palladium					
Platinum					
Potassium					
Selenium	0.0	0.55	0.50	110.0	75-125
Silicon					
Silver	0.00090	0.21	0.20	104.6	75-125
Sodium					
Sulfur					
Strontium					
Thallium					
Tin					
Titanium					
Tungsten					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: mg/l

Prep Date: 11/16/16

Metal	MC48722-1A Original MS	Spikelot MPICP7	% Rec	QC Limits
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Vanadium

Zinc

Zirconium

Associated samples MP27025: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

9.3.2

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: mg/l

Prep Date: 11/16/16

Metal	MC48722-1A Original MSD		Spikelot MPICP7	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	0.0044	0.55	0.50	109.1	1.8	20
Barium	0.65	2.6	2.0	97.5	0.0	20
Beryllium						
Bismuth						
Boron						
Cadmium	0.0012	0.55	0.50	109.8	1.8	20
Calcium						
Chromium	0.00060	0.47	0.50	93.9	0.0	20
Cobalt						
Copper						
Gold						
Iron						
Lead	0.0012	1.0	1.0	99.9	0.0	20
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Palladium						
Platinum						
Potassium						
Selenium	0.0	0.56	0.50	112.0	1.8	20
Silicon						
Silver	0.00090	0.21	0.20	104.6	0.0	20
Sodium						
Sulfur						
Strontium						
Thallium						
Tin						
Titanium						
Tungsten						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: mg/l

Prep Date: 11/16/16

Metal	MC48722-1A Original MSD	Spikelot MPICP7	% Rec	MSD RPD	QC Limit
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Vanadium

Zinc

Zirconium

Associated samples MP27025: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

9.3.2

9

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722

Account: BBLNYS - Arcadis

Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
Matrix Type: LEACHATEMethods: SW846 6010C  
Units: mg/l

Prep Date:

11/16/16

11/16/16

Metal	BSP Result	Spikelot MPICP7	% Rec	QC Limits	BSD Result	Spikelot MPICP7	% Rec	BSD RPD	QC Limit
Aluminum									
Antimony									
Arsenic	0.53	0.50	106.0	80-120	0.52	0.50	104.0	1.9	20
Barium	1.9	2.0	95.0	80-120	1.9	2.0	95.0	0.0	20
Beryllium									
Bismuth									
Boron									
Cadmium	0.52	0.50	104.0	80-120	0.51	0.50	102.0	1.9	20
Calcium									
Chromium	0.48	0.50	96.0	80-120	0.48	0.50	96.0	0.0	20
Cobalt									
Copper									
Gold									
Iron									
Lead	1.0	1.0	100.0	80-120	0.99	1.0	99.0	1.0	20
Lithium									
Magnesium									
Manganese									
Molybdenum									
Nickel									
Palladium									
Platinum									
Potassium									
Selenium	0.54	0.50	108.0	80-120	0.53	0.50	106.0	1.9	20
Silicon									
Silver	0.20	0.20	100.0	80-120	0.20	0.20	100.0	0.0	20
Sodium									
Sulfur									
Strontium									
Thallium									
Tin									
Titanium									
Tungsten									

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: mg/l

Prep Date: 11/16/16 11/16/16

Metal	BSP Result	Spikelot MPICP7	% Rec	QC Limits	BSD Result	Spikelot MPICP7	% Rec	BSD RPD	QC Limit
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Vanadium

Zinc

Zirconium

Associated samples MP27025: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

9.3.3

9

# SERIAL DILUTION RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 11/16/16

Metal	MC48722-1A Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	4.40	9.40	113.6(a)	0-10
Barium	649	663	2.1	0-10
Beryllium				
Bismuth				
Boron				
Cadmium	1.20	2.00	66.7 (a)	0-10
Calcium				
Chromium	0.600	0.00	100.0(a)	0-10
Cobalt				
Copper				
Gold				
Iron				
Lead	1.20	0.00	100.0(a)	0-10
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Palladium				
Platinum				
Potassium				
Selenium	0.00	0.00	NC	0-10
Silicon				
Silver	0.900	0.00	100.0(a)	0-10
Sodium				
Sulfur				
Strontium				
Thallium				
Tin				
Titanium				
Tungsten				



# SERIAL DILUTION RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 11/16/16

Metal	MC48722-1A Original SDL 1:5	%DIF	QC Limits
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Vanadium

Zinc

Zirconium

Associated samples MP27025: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

9.3.4

9

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27030  
Matrix Type: LEACHATE

Methods: SW846 7470A  
Units: mg/l

Prep Date: 11/17/16

Metal	RL	IDL	MDL	MB	
				raw	final

Mercury	0.00020	.0000068	.000034	-0.00010	<0.00020
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Associated samples MP27030: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27030  
 Matrix Type: LEACHATE

Methods: SW846 7470A  
 Units: mg/l

Prep Date: 11/17/16

Metal	MC48751-1A Original MS	Spikelot HGRWS1	% Rec	QC Limits
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Mercury	0.0	0.0029	0.0030	96.7	75-125
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Associated samples MP27030: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27030 Methods: SW846 7470A  
 Matrix Type: LEACHATE Units: mg/l

Prep Date: 11/17/16

Metal	MC48751-1A		SpikeLot		MSD	QC
	Original	MSD	HGRWS1	% Rec		
Mercury	0.0	0.0028	0.0030	93.3	3.5	

Associated samples MP27030: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27030  
 Matrix Type: LEACHATE

Methods: SW846 7470A  
 Units: mg/l

Prep Date: 11/17/16

Metal	MC48722-1A		SpikeLot		QC
	Original	LS	HGRWS1	% Rec	Limits

Mercury	0.0	0.0029	0.0030	96.7	75-125
---------	-----	--------	--------	------	--------

Associated samples MP27030: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

11/17/16

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

## General Chemistry

### QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Cyanide	GP21141/GN55417	0.12	0.0	mg/kg	0.6	0.630	105.0	90-110%
Cyanide	GP21141/GN55417			mg/kg	4.8	4.78	99.6	90-110%

Associated Samples:  
Batch GP21141: MC48722-1, MC48722-2, MC48722-4  
(\*) Outside of QC limits

10.1  
10



DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Cyanide	GP21141/GN55417	MC48722-1	mg/kg	2.6	2.4	8.0	0-20%
Solids, Percent	GN55333	MC48476-24	%	85.6	88	2.8	0-5%
Solids, Percent	GN55337	MC48745-7	%	90.2	92.2	2.2	0-5%

Associated Samples:

Batch GN55333: MC48722-1

Batch GN55337: MC48722-2, MC48722-4

Batch GP21141: MC48722-1, MC48722-2, MC48722-4

(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Cyanide	GP21141/GN55417	MC48722-1	mg/kg	2.6	1.47	4.8	149.9(a)	75-125%

Associated Samples:

Batch GP21141: MC48722-1, MC48722-2, MC48722-4

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity. Refer to spike blank.

## Misc. Forms

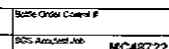
### Custody Documents and Other Forms

(SGS Accutest New Jersey)

---

Includes the following where applicable:

- Chain of Custody



## 11.1

## SGS Accutest Sample Receipt Summary

Job Number: MC48722

Client: \_\_\_\_\_

Project: \_\_\_\_\_

Date / Time Received: 11/15/2016 9:45:00 AM

Delivery Method: \_\_\_\_\_

Airbill #'s: \_\_\_\_\_

Cooler Temps (Raw Measured) °C: Cooler 1: (2.1);

Cooler Temps (Corrected) °C: Cooler 1: (3.5);

### Cooler Security

Y or N

1. Custody Seals Present: ☒ ☐
2. Custody Seals Intact: ☒ ☐

Y or N

3. COC Present: ☒ ☐
4. Smp'l Dates/Time OK ☒ ☐

### Cooler Temperature

Y or N

1. Temp criteria achieved: ☒ ☐
2. Cooler temp verification: IR Gun
3. Cooler media: Ice (Bag)
4. No. Coolers: 1

### Quality Control Preservation

Y or N

N/A

1. Trip Blank present / cooler: ☐ ☒ ☐
2. Trip Blank listed on COC: ☐ ☒ ☐
3. Samples preserved properly: ☒ ☐ ☐
4. VOCs headspace free: ☐ ☐ ☒

### Sample Integrity - Documentation

Y or N

1. Sample labels present on bottles: ☒ ☐
2. Container labeling complete: ☒ ☐
3. Sample container label / COC agree: ☒ ☐

### Sample Integrity - Condition

Y or N

1. Sample recvd within HT: ☒ ☐
2. All containers accounted for: ☒ ☐
3. Condition of sample: Intact

### Sample Integrity - Instructions

Y or N

N/A

1. Analysis requested is clear: ☒ ☐
2. Bottles received for unspecified tests: ☐ ☒
3. Sufficient volume recvd for analysis: ☒ ☐
4. Compositing instructions clear: ☐ ☐ ☒
5. Filtering instructions clear: ☐ ☐ ☒

Comments

MC48722: Chain of Custody

Page 2 of 2

## General Chemistry

### QC Data Summaries

(SGS Accutest New Jersey)

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: MC48722  
Account: ALNE - SGS Accutest New England  
Project: BBLNYS: National Grid, Washington Street, Rensselaer, NY

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Percent Sulfur	GN55368	0.10	0.0	%	xxxxxxx	0.60	90.6	80-120%
Percent Sulfur	GP1330/GN54926	0.10	0.0	%	.667	0.73	109.0	80-120%

Associated Samples:  
Batch GP1330: MC48722-1, MC48722-2, MC48722-4  
Batch GN55368: MC48722-1, MC48722-4  
(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: MC48722  
Account: ALNE - SGS Accutest New England  
Project: BBLNYS: National Grid, Washington Street, Rensselaer, NY

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Heat Content, BTU	GP1329/GN54841	LA26575-1	BTU/lb	6360	6200	2.5	0-45%
Percent Sulfur	GP1330/GN54926	TC941111-1	%	8.6	8.5	1.2	0-41%

Associated Samples:  
Batch GP1329: MC48722-1, MC48722-2, MC48722-4  
Batch GP1330: MC48722-1, MC48722-2, MC48722-4  
(\*) Outside of QC limits



### Technical Report for

Arcadis

National Grid, Washington Street, Rensselaer, NY

B0036730

SGS Accutest Job Number: MC48722

Sampling Dates: 11/10/16 - 11/11/16

Report to:

Arcadis U.S.  
6723 Towpath Road, Box 66  
Syracuse, NY 13214-0066  
jason.golubski@arcadis.com

ATTN: Jason Golubski

Total number of pages in report: **175**



Test results contained within this data package meet the requirements  
of the National Environmental Laboratory Accreditation Program  
and/or state specific certification programs as applicable.

*H. (Brad) Madadian*  
H. (Brad) Madadian  
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

Certifications: MA (M-MA136,SW846 NELAC) CT (PH-0109) NH (250210) RI (00071) FL (E87579) NY (11791)  
NJ (MA926) PA (6801121) ND (R-188) CO (MA00136) MN (11546AA) NC (653) IL (002337) WI (399080220)  
DoD ELAP (L-A-B L2235)

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Test results relate only to samples analyzed.

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Sample Summary

Arcadis

Job No: MC48722

National Grid, Washington Street, Rensselaer, NY  
Project No: B0036730

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
MC48722-1	11/10/16	13:30 JDL	11/12/16	SO	Soil	TP-106(3.0')
MC48722-1A	11/10/16	13:30 JDL	11/12/16	SO	Soil	TP-106(3.0')
MC48722-2	11/11/16	08:30 JDL	11/12/16	SO	Soil	TP-107(3.0')
MC48722-2A	11/11/16	08:30 JDL	11/12/16	SO	Soil	TP-107(3.0')
MC48722-3	11/11/16	12:15 JDL	11/12/16	SO	Soil	TP-110(0-3.0')
MC48722-4	11/11/16	12:15 JDL	11/12/16	SO	Soil	TP-110(3.0-3.5')

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## Summary of Hits

**Job Number:** MC48722  
**Account:** Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY  
**Collected:** 11/10/16 thru 11/11/16

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>MC48722-1</b>	<b>TP-106(3.0')</b>					
Acetone		20.2 B	8.0	2.6	ug/kg	SW846 8260C
Benzene		12.1	0.80	0.30	ug/kg	SW846 8260C
Carbon disulfide <sup>a</sup>		18.7	4.0	0.33	ug/kg	SW846 8260C
Ethylbenzene		0.90 J	1.6	0.30	ug/kg	SW846 8260C
Toluene		3.2 JB	4.0	0.32	ug/kg	SW846 8260C
Xylene (total)		2.9	1.6	0.28	ug/kg	SW846 8260C
Acenaphthene		448	120	8.6	ug/kg	SW846 8270D
Acenaphthylene		918	120	9.9	ug/kg	SW846 8270D
Anthracene		1300	120	10	ug/kg	SW846 8270D
Benzo(a)anthracene		5260	120	12	ug/kg	SW846 8270D
Benzo(a)pyrene		5480	310	11	ug/kg	SW846 8270D
Benzo(b)fluoranthene		4980	120	14	ug/kg	SW846 8270D
Benzo(g,h,i)perylene		2460	120	12	ug/kg	SW846 8270D
Benzo(k)fluoranthene		3850	120	17	ug/kg	SW846 8270D
Carbazole		421	120	11	ug/kg	SW846 8270D
Chrysene		4620	120	9.7	ug/kg	SW846 8270D
Dibenzo(a,h)anthracene		866	120	10	ug/kg	SW846 8270D
Dibenzofuran		629	120	9.8	ug/kg	SW846 8270D
Fluoranthene		7470	120	11	ug/kg	SW846 8270D
Fluorene		642	120	14	ug/kg	SW846 8270D
Indeno(1,2,3-cd)pyrene		2910	310	35	ug/kg	SW846 8270D
2-Methylnaphthalene		461	120	15	ug/kg	SW846 8270D
Naphthalene		3200	120	11	ug/kg	SW846 8270D
Phenanthrene		3480	120	9.3	ug/kg	SW846 8270D
Pyrene		6750	120	12	ug/kg	SW846 8270D
TPH-GRO (VOA)		4.46 J	12	2.2	mg/kg	SW846 8015
TPH-DRO (Semi-VOA)		525	20	5.1	mg/kg	SW846-8015
Arsenic		7.0	1.0	0.20	mg/kg	SW846 6010C
Barium		103	5.0	0.077	mg/kg	SW846 6010C
Beryllium		0.88	0.40	0.015	mg/kg	SW846 6010C
Cadmium		0.19 B	0.40	0.031	mg/kg	SW846 6010C
Chromium		17.4	1.0	0.047	mg/kg	SW846 6010C
Lead		28.0	1.0	0.11	mg/kg	SW846 6010C
Mercury		0.057	0.041	0.0069	mg/kg	SW846 7471B
Nickel		26.3	4.0	0.057	mg/kg	SW846 6010C
Vanadium		26.7	1.0	0.040	mg/kg	SW846 6010C
Zinc		69.7	2.0	0.17	mg/kg	SW846 6010C
Cyanide		2.6	0.15	0.042	mg/kg	SW846 9012 M
Heat Content, BTU <sup>b</sup>		3260	100		BTU/lb	ASTM D240-92
Percent Sulfur <sup>b</sup>		0.17 B	0.21	0.054	%	ASTM D129-95

## Summary of Hits

**Job Number:** MC48722  
**Account:** Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY  
**Collected:** 11/10/16 thru 11/11/16

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### MC48722-1A TP-106(3.0')

Benzene	0.0586 J	0.10	0.027	mg/l	SW846 8260C
Arsenic	0.0044 B	0.010	0.0020	mg/l	SW846 6010C
Barium	0.65	0.50	0.00057	mg/l	SW846 6010C
Cadmium	0.0012 B	0.0040	0.00030	mg/l	SW846 6010C
Lead	0.0012 B	0.010	0.0011	mg/l	SW846 6010C

### MC48722-2 TP-107(3.0')

Acetone	15.3 B	8.2	2.7	ug/kg	SW846 8260C
Benzene	2.3	0.82	0.31	ug/kg	SW846 8260C
Carbon disulfide <sup>a</sup>	1.7 J	4.1	0.33	ug/kg	SW846 8260C
Toluene	0.73 JB	4.1	0.33	ug/kg	SW846 8260C
Acenaphthene	44.6 J	110	7.3	ug/kg	SW846 8270D
Acenaphthylene	435	110	8.5	ug/kg	SW846 8270D
Anthracene	674	110	8.6	ug/kg	SW846 8270D
Benzo(a)anthracene	2030	110	11	ug/kg	SW846 8270D
Benzo(a)pyrene	2270	270	9.1	ug/kg	SW846 8270D
Benzo(b)fluoranthene	1820	110	12	ug/kg	SW846 8270D
Benzo(g,h,i)perylene	1260	110	10	ug/kg	SW846 8270D
Benzo(k)fluoranthene	1810	110	15	ug/kg	SW846 8270D
Butyl benzyl phthalate	276	270	14	ug/kg	SW846 8270D
Carbazole	76.5 J	110	9.3	ug/kg	SW846 8270D
Chrysene	1780	110	8.3	ug/kg	SW846 8270D
Dibenzo(a,h)anthracene	370	110	8.8	ug/kg	SW846 8270D
Dibenzofuran	223	110	8.4	ug/kg	SW846 8270D
Di-n-butyl phthalate	23.4 J	270	11	ug/kg	SW846 8270D
Fluoranthene	2910	110	9.8	ug/kg	SW846 8270D
Fluorene	196	110	12	ug/kg	SW846 8270D
Indeno(1,2,3-cd)pyrene	1350	270	30	ug/kg	SW846 8270D
2-Methylnaphthalene	77.5 J	110	13	ug/kg	SW846 8270D
Naphthalene	151	110	9.1	ug/kg	SW846 8270D
Phenanthrene	1540	110	8.0	ug/kg	SW846 8270D
Pyrene	2780	110	10	ug/kg	SW846 8270D
TPH-GRO (VOA)	3.66 J	9.3	1.7	mg/kg	SW846 8015
TPH-DRO (Semi-VOA)	101	18	4.6	mg/kg	SW846-8015
Arsenic	8.6	0.91	0.18	mg/kg	SW846 6010C
Barium	92.7	4.6	0.070	mg/kg	SW846 6010C
Beryllium	0.63	0.37	0.014	mg/kg	SW846 6010C
Cadmium	0.22 B	0.37	0.028	mg/kg	SW846 6010C
Chromium	14.6	0.91	0.043	mg/kg	SW846 6010C
Lead	46.1	0.91	0.10	mg/kg	SW846 6010C
Mercury	0.21	0.034	0.0057	mg/kg	SW846 7471B
Nickel	20.6	3.7	0.052	mg/kg	SW846 6010C

## Summary of Hits

**Job Number:** MC48722  
**Account:** Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY  
**Collected:** 11/10/16 thru 11/11/16

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Thallium		0.11 B	0.91	0.10	mg/kg	SW846 6010C
Vanadium		22.1	0.91	0.037	mg/kg	SW846 6010C
Zinc		76.4	1.8	0.16	mg/kg	SW846 6010C
Cyanide		0.62	0.13	0.037	mg/kg	SW846 9012 M
Heat Content, BTU <sup>b</sup>		1800	100		BTU/lb	ASTM D240-92

### MC48722-2A TP-107(3.0')

Arsenic		0.0020 B	0.010	0.0020	mg/l	SW846 6010C
Barium		0.37 B	0.50	0.00057	mg/l	SW846 6010C
Cadmium		0.0012 B	0.0040	0.00030	mg/l	SW846 6010C
Chromium		0.0012 B	0.010	0.0011	mg/l	SW846 6010C
Lead		0.0039 B	0.010	0.0011	mg/l	SW846 6010C

### MC48722-3 TP-110(0-3.0')

Tetrachloroethene		0.0248 J	0.20	0.021	mg/l	SW846 8260C
Arsenic		0.0037 B	0.010	0.0020	mg/l	SW846 6010C
Barium		0.75	0.50	0.00057	mg/l	SW846 6010C
Cadmium		0.0013 B	0.0040	0.00030	mg/l	SW846 6010C
Lead		1.5	0.010	0.0011	mg/l	SW846 6010C

### MC48722-4 TP-110(3.0-3.5')

Ethylbenzene		1330	210	40	ug/kg	SW846 8260C
Toluene		77.0 J	530	42	ug/kg	SW846 8260C
Xylene (total)		1460	210	37	ug/kg	SW846 8260C
Acenaphthene		3270	120	8.3	ug/kg	SW846 8270D
Acenaphthylene		958	120	9.6	ug/kg	SW846 8270D
Anthracene		2200	120	9.8	ug/kg	SW846 8270D
Benzo(a)anthracene		2910	120	12	ug/kg	SW846 8270D
Benzo(a)pyrene		2900	300	10	ug/kg	SW846 8270D
Benzo(b)fluoranthene		1910	120	14	ug/kg	SW846 8270D
Benzo(g,h,i)perylene		1400	120	12	ug/kg	SW846 8270D
Benzo(k)fluoranthene		2070	120	17	ug/kg	SW846 8270D
Carbazole		220	120	11	ug/kg	SW846 8270D
Chrysene		2700	120	9.4	ug/kg	SW846 8270D
Dibenzo(a,h)anthracene		367	120	10	ug/kg	SW846 8270D
Dibenzofuran		316	120	9.5	ug/kg	SW846 8270D
Fluoranthene		5160	120	11	ug/kg	SW846 8270D
Fluorene		1720	120	13	ug/kg	SW846 8270D
Indeno(1,2,3-cd)pyrene		1410	300	34	ug/kg	SW846 8270D
2-Methylnaphthalene		4460	120	14	ug/kg	SW846 8270D
Naphthalene		7580	120	10	ug/kg	SW846 8270D
Phenanthrene		7470	120	9.1	ug/kg	SW846 8270D

## Summary of Hits

**Job Number:** MC48722  
**Account:** Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY  
**Collected:** 11/10/16 thru 11/11/16

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Pyrene		7400	120	12	ug/kg	SW846 8270D
TPH-GRO (VOA)		68.1	11	2.0	mg/kg	SW846 8015
TPH-DRO (Semi-VOA)		2200	20	4.9	mg/kg	SW846-8015
Arsenic		4.6	0.99	0.20	mg/kg	SW846 6010C
Barium		83.6	4.9	0.075	mg/kg	SW846 6010C
Beryllium		0.47	0.39	0.015	mg/kg	SW846 6010C
Cadmium		0.12 B	0.39	0.031	mg/kg	SW846 6010C
Chromium		13.1	0.99	0.046	mg/kg	SW846 6010C
Lead		34.9	0.99	0.11	mg/kg	SW846 6010C
Mercury		0.30	0.038	0.0064	mg/kg	SW846 7471B
Nickel		19.2	3.9	0.056	mg/kg	SW846 6010C
Vanadium		17.0	0.99	0.039	mg/kg	SW846 6010C
Zinc		61.7	2.0	0.17	mg/kg	SW846 6010C
Cyanide		1.1	0.14	0.039	mg/kg	SW846 9012 M
Heat Content, BTU <sup>b</sup>		1510	100		BTU/lb	ASTM D240-92
Percent Sulfur <sup>b</sup>		0.11 B	0.20	0.054	%	ASTM D129-95

(a) Continuing Calibration outside of acceptance criteria. Result may be biased low.

(b) Analysis performed at SGS Accutest, Dayton, NJ.



**Sample Results**

**Report of Analysis**

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M82033.D	1	11/21/16	KP	n/a	n/a	MSM2942
Run #2							

	Initial Weight	Final Volume
Run #1	8.09 g	5.0 ml
Run #2		

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	20.2	8.0	2.6	ug/kg	B
71-43-2	Benzene	12.1	0.80	0.30	ug/kg	
75-27-4	Bromodichloromethane	ND	1.6	0.34	ug/kg	
75-25-2	Bromoform	ND	1.6	0.38	ug/kg	
74-83-9	Bromomethane	ND	8.0	1.3	ug/kg	
78-93-3	2-Butanone (MEK)	ND	8.0	2.7	ug/kg	
75-15-0	Carbon disulfide <sup>a</sup>	18.7	4.0	0.33	ug/kg	
56-23-5	Carbon tetrachloride	ND	1.6	0.33	ug/kg	
108-90-7	Chlorobenzene	ND	1.6	0.76	ug/kg	
75-00-3	Chloroethane	ND	8.0	1.7	ug/kg	
67-66-3	Chloroform	ND	1.6	0.40	ug/kg	
74-87-3	Chloromethane	ND	4.0	0.60	ug/kg	
124-48-1	Dibromochloromethane	ND	4.0	0.86	ug/kg	
75-34-3	1,1-Dichloroethane	ND	1.6	0.32	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.6	0.30	ug/kg	
75-35-4	1,1-Dichloroethene <sup>b</sup>	ND	1.6	0.55	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	1.6	0.29	ug/kg	
156-60-5	trans-1,2-Dichloroethene <sup>b</sup>	ND	1.6	0.32	ug/kg	
78-87-5	1,2-Dichloropropane	ND	1.6	0.35	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.6	0.98	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.6	1.1	ug/kg	
100-41-4	Ethylbenzene	0.90	1.6	0.30	ug/kg	J
591-78-6	2-Hexanone	ND	4.0	0.54	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	4.0	0.52	ug/kg	
75-09-2	Methylene chloride	ND	1.6	0.34	ug/kg	
100-42-5	Styrene	ND	4.0	0.25	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.0	1.5	ug/kg	
127-18-4	Tetrachloroethene	ND	1.6	0.24	ug/kg	
108-88-3	Toluene	3.2	4.0	0.32	ug/kg	JB
71-55-6	1,1,1-Trichloroethane	ND	1.6	0.28	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.6	1.1	ug/kg	
79-01-6	Trichloroethene	ND	1.6	0.25	ug/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	8.0	2.7	ug/kg	
1330-20-7	Xylene (total)	2.9	1.6	0.28	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	118%		65-141%
2037-26-5	Toluene-D8	103%		65-129%
460-00-4	4-Bromofluorobenzene	95%		63-137%

(a) Continuing Calibration outside of acceptance criteria. Result may be biased low.

(b) Continuing Calibration outside of acceptance criteria. Reporting Limit response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50715.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.8 g	1.0 ml
Run #2		

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	310	14	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	620	14	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	620	33	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	620	260	ug/kg	
51-28-5	2,4-Dinitrophenol <sup>a</sup>	ND	620	130	ug/kg	
534-52-1	4,6-Dinitro-o-cresol <sup>a</sup>	ND	620	62	ug/kg	
95-48-7	2-Methylphenol	ND	620	66	ug/kg	
	3&4-Methylphenol	ND	620	54	ug/kg	
88-75-5	2-Nitrophenol	ND	620	49	ug/kg	
100-02-7	4-Nitrophenol	ND	620	72	ug/kg	
87-86-5	Pentachlorophenol	ND	620	71	ug/kg	
108-95-2	Phenol	ND	310	14	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	620	19	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	620	11	ug/kg	
83-32-9	Acenaphthene	448	120	8.6	ug/kg	
208-96-8	Acenaphthylene	918	120	9.9	ug/kg	
120-12-7	Anthracene	1300	120	10	ug/kg	
56-55-3	Benzo(a)anthracene	5260	120	12	ug/kg	
50-32-8	Benzo(a)pyrene	5480	310	11	ug/kg	
205-99-2	Benzo(b)fluoranthene	4980	120	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	2460	120	12	ug/kg	
207-08-9	Benzo(k)fluoranthene	3850	120	17	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	310	13	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	310	16	ug/kg	
91-58-7	2-Chloronaphthalene	ND	310	12	ug/kg	
106-47-8	4-Chloroaniline	ND	620	14	ug/kg	
86-74-8	Carbazole	421	120	11	ug/kg	
218-01-9	Chrysene	4620	120	9.7	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	310	12	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	310	11	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	310	15	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	310	15	ug/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	1,2-Dichlorobenzene	ND	310	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	310	9.3	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	310	13	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	620	15	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	620	14	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	620	41	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	866	120	10	ug/kg	
132-64-9	Dibenzofuran	629	120	9.8	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	310	13	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	310	11	ug/kg	
84-66-2	Diethyl phthalate	ND	310	9.9	ug/kg	
131-11-3	Dimethyl phthalate	ND	310	9.9	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	310	12	ug/kg	
206-44-0	Fluoranthene	7470	120	11	ug/kg	
86-73-7	Fluorene	642	120	14	ug/kg	
118-74-1	Hexachlorobenzene	ND	310	16	ug/kg	
87-68-3	Hexachlorobutadiene	ND	310	12	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	620	15	ug/kg	
67-72-1	Hexachloroethane	ND	310	30	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	2910	310	35	ug/kg	
78-59-1	Isophorone	ND	310	22	ug/kg	
91-57-6	2-Methylnaphthalene	461	120	15	ug/kg	
88-74-4	2-Nitroaniline	ND	620	15	ug/kg	
99-09-2	3-Nitroaniline	ND	620	15	ug/kg	
100-01-6	4-Nitroaniline	ND	620	15	ug/kg	
91-20-3	Naphthalene	3200	120	11	ug/kg	
98-95-3	Nitrobenzene	ND	310	34	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	310	18	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	310	41	ug/kg	
85-01-8	Phenanthrene	3480	120	9.3	ug/kg	
129-00-0	Pyrene	6750	120	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	310	16	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	36%		25-109%
4165-62-2	Phenol-d5	50%		29-113%
118-79-6	2,4,6-Tribromophenol	81%		20-141%
4165-60-0	Nitrobenzene-d5	42%		27-115%
321-60-8	2-Fluorobiphenyl	70%		34-118%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	Terphenyl-d14	88%		42-139%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
RL = Reporting Limit      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

Report of Analysis

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<b>Client Sample ID:</b>	TP-106(3.0')						
<b>Lab Sample ID:</b>	MC48722-1					<b>Date Sampled:</b>	11/10/16
<b>Matrix:</b>	SO - Soil					<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8015					<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	WX78128.D	1	11/17/16	AF	n/a	n/a	GWX3867
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.33 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	4.46	12	2.2	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	102%		64-127%		

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')		
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Sampled:</b>	11/10/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8082A SW846 3546	<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK63163.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
Run #2							

	Initial Weight	Final Volume
Run #1	15.2 g	10.0 ml
Run #2		

## PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	43	4.4	ug/kg	
11104-28-2	Aroclor 1221	ND	43	19	ug/kg	
11141-16-5	Aroclor 1232	ND	43	13	ug/kg	
53469-21-9	Aroclor 1242	ND	43	9.8	ug/kg	
12672-29-6	Aroclor 1248	ND	43	7.4	ug/kg	
11097-69-1	Aroclor 1254	ND	43	19	ug/kg	
11096-82-5	Aroclor 1260	ND	43	3.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	83%		25-145%
877-09-8	Tetrachloro-m-xylene	74%		25-145%
2051-24-3	Decachlorobiphenyl	76%		25-179%
2051-24-3	Decachlorobiphenyl	76%		25-179%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846-8015 SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IR3264.D	1	11/18/16	MD	11/16/16	OP49158	GIR226
Run #2							

	Initial Weight	Final Volume
Run #1	15.8 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (Semi-VOA)	525	20	5.1	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	91%		17-130%		

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: TP-106(3.0')

Lab Sample ID: MC48722-1

Matrix: SO - Soil

Date Sampled: 11/10/16

Date Received: 11/12/16

Percent Solids: 77.0

Project: National Grid, Washington Street, Rensselaer, NY

## Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony	ND	1.0	0.17	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Arsenic	7.0	1.0	0.20	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Barium	103	5.0	0.077	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Beryllium	0.88	0.40	0.015	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Cadmium	0.19 B	0.40	0.031	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Chromium	17.4	1.0	0.047	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Lead	28.0	1.0	0.11	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Mercury	0.057	0.041	0.0069	mg/kg	1	11/15/16	11/15/16 JM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>3</sup>
Nickel	26.3	4.0	0.057	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Selenium	ND	1.0	0.30	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Silver	ND	0.50	0.061	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Thallium	ND	1.0	0.11	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Vanadium	26.7	1.0	0.040	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Zinc	69.7	2.0	0.17	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>

(1) Instrument QC Batch: MA19626

(2) Instrument QC Batch: MA19629

(3) Prep QC Batch: MP27019

(4) Prep QC Batch: MP27020

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

B = Indicates a result &gt; = MDL but &lt; RL

Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Cyanide	2.6	0.15	0.042	mg/kg	1	11/23/16 20:54 CF	SW846	9012 M
Heat Content, BTU <sup>a</sup>	3260	100		BTU/lb	1	11/18/16 21:00 ANJ	ASTM	D240-92
Percent Sulfur <sup>a</sup>	0.17 B	0.21	0.054	%	1	11/18/16 21:00 ANJ	ASTM	D129-95
Solids, Percent	77			%	1	11/15/16	JM	SM 2540G-97 MOD

(a) Analysis performed at SGS Accutest, Dayton, NJ.

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
B = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')		
<b>Lab Sample ID:</b>	MC48722-1A	<b>Date Sampled:</b>	11/10/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8260C SW846 1311	<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N106527.D	100	11/23/16	AD	11/15/16	GP21107	MSN3919
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	0.0586	D018	0.50	0.10	0.027	mg/l	J
78-93-3	2-Butanone (MEK)	ND	D035	200	1.0	0.30	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.20	0.034	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.20	0.024	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.20	0.040	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.20	0.058	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.20	0.068	mg/l	
75-35-4	1,1-Dichloroethene	ND	D029	0.70	0.20	0.028	mg/l	
127-18-4	Tetrachloroethene	ND	D039	0.70	0.20	0.021	mg/l	
79-01-6	Trichloroethene	ND	D040	0.50	0.20	0.025	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.20	0.045	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		74-135%
2037-26-5	Toluene-D8	102%		83-116%
460-00-4	4-Bromofluorobenzene	102%		76-124%

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

MCL = Maximum Contamination Level (40 CFR 261.6(g))

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')	<b>Date Sampled:</b>	11/10/16
<b>Lab Sample ID:</b>	MC48722-1A	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	77.0
<b>Method:</b>	SW846 8270D SW846 3510C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50881.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897
Run #2							

Run #	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2		

## ABN TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0.10	0.0032	mg/l	
	3&4-Methylphenol	ND	D024	200	0.10	0.0054	mg/l	
87-86-5	Pentachlorophenol <sup>a</sup>	ND	D037	100	0.10	0.0059	mg/l	
95-95-4	2,4,5-Trichlorophenol	ND	D041	400	0.10	0.0052	mg/l	
88-06-2	2,4,6-Trichlorophenol	ND	D042	2.0	0.10	0.0038	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.050	0.0035	mg/l	
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.10	0.012	mg/l	
118-74-1	Hexachlorobenzene	ND	D032	0.13	0.050	0.0041	mg/l	
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.050	0.0043	mg/l	
67-72-1	Hexachloroethane	ND	D034	3.0	0.050	0.0036	mg/l	
98-95-3	Nitrobenzene	ND	D036	2.0	0.050	0.0042	mg/l	
110-86-1	Pyridine	ND	D038	5.0	0.10	0.013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	48%		10-73%
4165-62-2	Phenol-d5	30%		10-58%
118-79-6	2,4,6-Tribromophenol	83%		15-125%
4165-60-0	Nitrobenzene-d5	73%		23-120%
321-60-8	2-Fluorobiphenyl	78%		31-102%
1718-51-0	Terphenyl-d14	94%		42-124%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
MCL = Maximum Contamination Level (40 CFR 261.6/96)      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')						
<b>Lab Sample ID:</b>	MC48722-1A					<b>Date Sampled:</b>	11/10/16
<b>Matrix:</b>	SO - Soil					<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8151 SW846 3510C SPLP					<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ98717.D	1	11/29/16	TA	11/16/16	OP49161	GYZ8038
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Herbicide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
94-75-7	2,4-D	ND	D016	10	0.010	0.0034	mg/l	
93-72-1	2,4,5-TP (Silvex)	ND	D017	1.0	0.010	0.0040	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	57%		30-150%
19719-28-9	2,4-DCAA	45%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')		
<b>Lab Sample ID:</b>	MC48722-1A	<b>Date Sampled:</b>	11/10/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8081B SW846 3510C SPLP	<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BE53426.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Pesticide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	D013	0.40	0.00050	0.000044	mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0050	0.0011	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.00050	0.00012	mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.00050	0.00011	mg/l	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.00050	0.000051	mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00050	0.00021	mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.025	0.0013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	50%		30-150%
877-09-8	Tetrachloro-m-xylene	53%		30-150%
2051-24-3	Decachlorobiphenyl	82%		30-150%
2051-24-3	Decachlorobiphenyl	75%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-106(3.0')						
<b>Lab Sample ID:</b>	MC48722-1A					<b>Date Sampled:</b>	11/10/16
<b>Matrix:</b>	SO - Soil					<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8082A SW846 3510C SPLP					<b>Percent Solids:</b>	77.0
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK63184.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## PCB List

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND			0.0025	0.0016	mg/l	
11104-28-2	Aroclor 1221	ND			0.0025	0.0016	mg/l	
11141-16-5	Aroclor 1232	ND			0.0025	0.0018	mg/l	
53469-21-9	Aroclor 1242	ND			0.0025	0.0019	mg/l	
12672-29-6	Aroclor 1248	ND			0.0025	0.0012	mg/l	
11097-69-1	Aroclor 1254	ND			0.0025	0.0016	mg/l	
11096-82-5	Aroclor 1260	ND			0.0025	0.0019	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	85%		30-150%
877-09-8	Tetrachloro-m-xylene	72%		30-150%
2051-24-3	Decachlorobiphenyl	109%		30-150%
2051-24-3	Decachlorobiphenyl	112%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



## Report of Analysis

**Client Sample ID:** TP-106(3.0')**Lab Sample ID:** MC48722-1A**Matrix:** SO - Soil**Date Sampled:** 11/10/16**Date Received:** 11/12/16**Percent Solids:** 77.0**Project:** National Grid, Washington Street, Rensselaer, NY**Metals Analysis, TCLP Leachate SW846 1311**

Analyte	Result	HW#	MCL	RL	MDL	Units	DF	Prep	Analyzed By	Method
Arsenic	0.0044 B	D004	5.0	0.010	0.0020	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Barium	0.65	D005	100	0.50	0.00057	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Cadmium	0.0012 B	D006	1.0	0.0040	0.00030	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Chromium	ND	D007	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Lead	0.0012 B	D008	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Mercury	ND	D009	0.20	0.00020	0.000034	mg/l	1	11/17/16	11/17/16	JM SW846 7470A <sup>2</sup>
Selenium	ND	D010	1.0	0.025	0.0034	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Silver	ND	D011	5.0	0.0050	0.0014	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>

(1) Instrument QC Batch: MA19631

(2) Instrument QC Batch: MA19634

(3) Prep QC Batch: MP27025

(4) Prep QC Batch: MP27030

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

MCL = Maximum Contamination Level (40 CFR 261.6(g))

B = Indicates a result &gt; = MDL but &lt; RL

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M82034.D	1	11/21/16	KP	n/a	n/a	MSM2942
Run #2							

	Initial Weight	Final Volume
Run #1	6.87 g	5.0 ml
Run #2		

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	15.3	8.2	2.7	ug/kg	B
71-43-2	Benzene	2.3	0.82	0.31	ug/kg	
75-27-4	Bromodichloromethane	ND	1.6	0.35	ug/kg	
75-25-2	Bromoform	ND	1.6	0.39	ug/kg	
74-83-9	Bromomethane	ND	8.2	1.3	ug/kg	
78-93-3	2-Butanone (MEK)	ND	8.2	2.8	ug/kg	
75-15-0	Carbon disulfide <sup>a</sup>	1.7	4.1	0.33	ug/kg	J
56-23-5	Carbon tetrachloride	ND	1.6	0.34	ug/kg	
108-90-7	Chlorobenzene	ND	1.6	0.77	ug/kg	
75-00-3	Chloroethane	ND	8.2	1.7	ug/kg	
67-66-3	Chloroform	ND	1.6	0.41	ug/kg	
74-87-3	Chloromethane	ND	4.1	0.61	ug/kg	
124-48-1	Dibromochloromethane	ND	4.1	0.88	ug/kg	
75-34-3	1,1-Dichloroethane	ND	1.6	0.33	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.6	0.30	ug/kg	
75-35-4	1,1-Dichloroethene <sup>b</sup>	ND	1.6	0.56	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	1.6	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene <sup>b</sup>	ND	1.6	0.33	ug/kg	
78-87-5	1,2-Dichloropropane	ND	1.6	0.36	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.6	1.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.6	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	1.6	0.31	ug/kg	
591-78-6	2-Hexanone	ND	4.1	0.55	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	4.1	0.54	ug/kg	
75-09-2	Methylene chloride	ND	1.6	0.34	ug/kg	
100-42-5	Styrene	ND	4.1	0.26	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.1	1.6	ug/kg	
127-18-4	Tetrachloroethene	ND	1.6	0.24	ug/kg	
108-88-3	Toluene	0.73	4.1	0.33	ug/kg	JB
71-55-6	1,1,1-Trichloroethane	ND	1.6	0.29	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.6	1.1	ug/kg	
79-01-6	Trichloroethene	ND	1.6	0.25	ug/kg	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	8.2	2.8	ug/kg	
1330-20-7	Xylene (total)	ND	1.6	0.29	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	115%		65-141%
2037-26-5	Toluene-D8	103%		65-129%
460-00-4	4-Bromofluorobenzene	104%		63-137%

(a) Continuing Calibration outside of acceptance criteria. Result may be biased low.

(b) Continuing Calibration outside of acceptance criteria. Reporting Limit response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50716.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
Run #2							

Run #	Initial Weight	Final Volume
Run #1	21.0 g	1.0 ml
Run #2		

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	270	12	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	540	12	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	540	29	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	540	220	ug/kg	
51-28-5	2,4-Dinitrophenol <sup>a</sup>	ND	540	110	ug/kg	
534-52-1	4,6-Dinitro-o-cresol <sup>a</sup>	ND	540	53	ug/kg	
95-48-7	2-Methylphenol	ND	540	57	ug/kg	
	3&4-Methylphenol	ND	540	47	ug/kg	
88-75-5	2-Nitrophenol	ND	540	42	ug/kg	
100-02-7	4-Nitrophenol	ND	540	62	ug/kg	
87-86-5	Pentachlorophenol	ND	540	61	ug/kg	
108-95-2	Phenol	ND	270	12	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	540	16	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	540	9.8	ug/kg	
83-32-9	Acenaphthene	44.6	110	7.3	ug/kg	J
208-96-8	Acenaphthylene	435	110	8.5	ug/kg	
120-12-7	Anthracene	674	110	8.6	ug/kg	
56-55-3	Benzo(a)anthracene	2030	110	11	ug/kg	
50-32-8	Benzo(a)pyrene	2270	270	9.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	1820	110	12	ug/kg	
191-24-2	Benzo(g,h,i)perylene	1260	110	10	ug/kg	
207-08-9	Benzo(k)fluoranthene	1810	110	15	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	270	11	ug/kg	
85-68-7	Butyl benzyl phthalate	276	270	14	ug/kg	
91-58-7	2-Chloronaphthalene	ND	270	11	ug/kg	
106-47-8	4-Chloroaniline	ND	540	12	ug/kg	
86-74-8	Carbazole	76.5	110	9.3	ug/kg	J
218-01-9	Chrysene	1780	110	8.3	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	270	10	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	270	9.7	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	270	13	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	270	13	ug/kg	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	1,2-Dichlorobenzene	ND	270	9.1	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	270	8.0	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	270	11	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	540	13	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	540	12	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	540	35	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	370	110	8.8	ug/kg	
132-64-9	Dibenzofuran	223	110	8.4	ug/kg	
84-74-2	Di-n-butyl phthalate	23.4	270	11	ug/kg	J
117-84-0	Di-n-octyl phthalate	ND	270	9.1	ug/kg	
84-66-2	Diethyl phthalate	ND	270	8.5	ug/kg	
131-11-3	Dimethyl phthalate	ND	270	8.5	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	270	11	ug/kg	
206-44-0	Fluoranthene	2910	110	9.8	ug/kg	
86-73-7	Fluorene	196	110	12	ug/kg	
118-74-1	Hexachlorobenzene	ND	270	14	ug/kg	
87-68-3	Hexachlorobutadiene	ND	270	10	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	540	13	ug/kg	
67-72-1	Hexachloroethane	ND	270	25	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	1350	270	30	ug/kg	
78-59-1	Isophorone	ND	270	19	ug/kg	
91-57-6	2-Methylnaphthalene	77.5	110	13	ug/kg	J
88-74-4	2-Nitroaniline	ND	540	12	ug/kg	
99-09-2	3-Nitroaniline	ND	540	13	ug/kg	
100-01-6	4-Nitroaniline	ND	540	13	ug/kg	
91-20-3	Naphthalene	151	110	9.1	ug/kg	
98-95-3	Nitrobenzene	ND	270	30	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	270	15	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	270	36	ug/kg	
85-01-8	Phenanthrene	1540	110	8.0	ug/kg	
129-00-0	Pyrene	2780	110	10	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	270	14	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	57%		25-109%
4165-62-2	Phenol-d5	66%		29-113%
118-79-6	2,4,6-Tribromophenol	81%		20-141%
4165-60-0	Nitrobenzene-d5	59%		27-115%
321-60-8	2-Fluorobiphenyl	80%		34-118%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	Terphenyl-d14	87%		42-139%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8015		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	WX78127.D	1	11/17/16	AF	n/a	n/a	GWX3867
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.48 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	3.66	9.3	1.7	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	102%		64-127%		

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8082A SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK63165.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
Run #2							

Run #	Initial Weight	Final Volume
Run #1	15.3 g	10.0 ml
Run #2		

## PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	37	3.8	ug/kg	
11104-28-2	Aroclor 1221	ND	37	16	ug/kg	
11141-16-5	Aroclor 1232	ND	37	11	ug/kg	
53469-21-9	Aroclor 1242	ND	37	8.5	ug/kg	
12672-29-6	Aroclor 1248	ND	37	6.3	ug/kg	
11097-69-1	Aroclor 1254	ND	37	16	ug/kg	
11096-82-5	Aroclor 1260	ND	37	3.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	99%		25-145%
877-09-8	Tetrachloro-m-xylene	106%		25-145%
2051-24-3	Decachlorobiphenyl	91%		25-179%
2051-24-3	Decachlorobiphenyl	99%		25-179%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846-8015 SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IR3263.D	1	11/18/16	MD	11/16/16	OP49158	GIR226
Run #2							

	Initial Weight	Final Volume
Run #1	15.4 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (Semi-VOA)	101	18	4.6	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	70%		17-130%		

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: TP-107(3.0')

Lab Sample ID: MC48722-2

Matrix: SO - Soil

Date Sampled: 11/11/16

Date Received: 11/12/16

Percent Solids: 88.9

Project: National Grid, Washington Street, Rensselaer, NY

## Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony	ND	0.91	0.16	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Arsenic	8.6	0.91	0.18	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Barium	92.7	4.6	0.070	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Beryllium	0.63	0.37	0.014	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Cadmium	0.22 B	0.37	0.028	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Chromium	14.6	0.91	0.043	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Lead	46.1	0.91	0.10	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Mercury	0.21	0.034	0.0057	mg/kg	1	11/15/16	11/15/16 JM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>3</sup>
Nickel	20.6	3.7	0.052	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Selenium	ND	0.91	0.27	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Silver	ND	0.46	0.056	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Thallium	0.11 B	0.91	0.10	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Vanadium	22.1	0.91	0.037	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Zinc	76.4	1.8	0.16	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>

(1) Instrument QC Batch: MA19626

(2) Instrument QC Batch: MA19629

(3) Prep QC Batch: MP27019

(4) Prep QC Batch: MP27020

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

B = Indicates a result &gt; = MDL but &lt; RL

## Report of Analysis

**Client Sample ID:** TP-107(3.0')**Lab Sample ID:** MC48722-2**Matrix:** SO - Soil**Project:** National Grid, Washington Street, Rensselaer, NY**Date Sampled:** 11/11/16**Date Received:** 11/12/16**Percent Solids:** 88.9

## General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Cyanide	0.62	0.13	0.037	mg/kg	1	11/23/16 20:55 CF	SW846	9012 M
Heat Content, BTU <sup>a</sup>	1800	100		BTU/lb	1	11/18/16 21:00 ANJ	ASTM	D240-92
Percent Sulfur <sup>a</sup>	ND	0.17	0.054	%	1	11/18/16 21:00 ANJ	ASTM	D129-95
Solids, Percent	88.9			%	1	11/16/16	JM	SM 2540G-97 MOD

(a) Analysis performed at SGS Accutest, Dayton, NJ.

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
B = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')		
<b>Lab Sample ID:</b>	MC48722-2A	<b>Date Sampled:</b>	11/11/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8260C SW846 1311	<b>Percent Solids:</b>	88.9
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N106528.D	100	11/23/16	AD	11/15/16	GP21107	MSN3919
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	ND	D018	0.50	0.10	0.027	mg/l	
78-93-3	2-Butanone (MEK)	ND	D035	200	1.0	0.30	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.20	0.034	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.20	0.024	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.20	0.040	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.20	0.058	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.20	0.068	mg/l	
75-35-4	1,1-Dichloroethene	ND	D029	0.70	0.20	0.028	mg/l	
127-18-4	Tetrachloroethene	ND	D039	0.70	0.20	0.021	mg/l	
79-01-6	Trichloroethene	ND	D040	0.50	0.20	0.025	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.20	0.045	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		74-135%
2037-26-5	Toluene-D8	101%		83-116%
460-00-4	4-Bromofluorobenzene	101%		76-124%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6(g))  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')		
<b>Lab Sample ID:</b>	MC48722-2A	<b>Date Sampled:</b>	11/11/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8270D SW846 3510C	<b>Percent Solids:</b>	88.9
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50882.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2		

## ABN TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0.10	0.0032	mg/l	
	3&4-Methylphenol	ND	D024	200	0.10	0.0054	mg/l	
87-86-5	Pentachlorophenol <sup>a</sup>	ND	D037	100	0.10	0.0059	mg/l	
95-95-4	2,4,5-Trichlorophenol	ND	D041	400	0.10	0.0052	mg/l	
88-06-2	2,4,6-Trichlorophenol	ND	D042	2.0	0.10	0.0038	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.050	0.0035	mg/l	
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.10	0.012	mg/l	
118-74-1	Hexachlorobenzene	ND	D032	0.13	0.050	0.0041	mg/l	
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.050	0.0043	mg/l	
67-72-1	Hexachloroethane	ND	D034	3.0	0.050	0.0036	mg/l	
98-95-3	Nitrobenzene	ND	D036	2.0	0.050	0.0042	mg/l	
110-86-1	Pyridine	ND	D038	5.0	0.10	0.013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	48%		10-73%
4165-62-2	Phenol-d5	29%		10-58%
118-79-6	2,4,6-Tribromophenol	79%		15-125%
4165-60-0	Nitrobenzene-d5	74%		23-120%
321-60-8	2-Fluorobiphenyl	80%		31-102%
1718-51-0	Terphenyl-d14	94%		42-124%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
MCL = Maximum Contamination Level (40 CFR 261.6/96)      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-2A	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	88.9
<b>Method:</b>	SW846 8151 SW846 3510C SPLP		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ98718.D	1	11/29/16	TA	11/16/16	OP49161	GYZ8038
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Herbicide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
94-75-7	2,4-D	ND	D016	10	0.010	0.0034	mg/l	
93-72-1	2,4,5-TP (Silvex)	ND	D017	1.0	0.010	0.0040	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	60%		30-150%
19719-28-9	2,4-DCAA	47%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')		
<b>Lab Sample ID:</b>	MC48722-2A	<b>Date Sampled:</b>	11/11/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8081B SW846 3510C SPLP	<b>Percent Solids:</b>	88.9
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BE53427.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688
Run #2							

Run #	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Pesticide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	D013	0.40	0.00050	0.000044	mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0050	0.0011	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.00050	0.00012	mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.00050	0.00011	mg/l	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.00050	0.000051	mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00050	0.00021	mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.025	0.0013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	47%		30-150%
877-09-8	Tetrachloro-m-xylene	61%		30-150%
2051-24-3	Decachlorobiphenyl	32%		30-150%
2051-24-3	Decachlorobiphenyl	65%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-107(3.0')		
<b>Lab Sample ID:</b>	MC48722-2A	<b>Date Sampled:</b>	11/11/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846 8082A SW846 3510C SPLP	<b>Percent Solids:</b>	88.9
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK63185.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## PCB List

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND			0.0025	0.0016	mg/l	
11104-28-2	Aroclor 1221	ND			0.0025	0.0016	mg/l	
11141-16-5	Aroclor 1232	ND			0.0025	0.0018	mg/l	
53469-21-9	Aroclor 1242	ND			0.0025	0.0019	mg/l	
12672-29-6	Aroclor 1248	ND			0.0025	0.0012	mg/l	
11097-69-1	Aroclor 1254	ND			0.0025	0.0016	mg/l	
11096-82-5	Aroclor 1260	ND			0.0025	0.0019	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	68%		30-150%
877-09-8	Tetrachloro-m-xylene	70%		30-150%
2051-24-3	Decachlorobiphenyl	92%		30-150%
2051-24-3	Decachlorobiphenyl	96%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6(g))  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



## Report of Analysis

**Client Sample ID:** TP-107(3.0')**Lab Sample ID:** MC48722-2A**Matrix:** SO - Soil**Date Sampled:** 11/11/16**Date Received:** 11/12/16**Percent Solids:** 88.9**Project:** National Grid, Washington Street, Rensselaer, NY**Metals Analysis, TCLP Leachate SW846 1311**

Analyte	Result	HW#	MCL	RL	MDL	Units	DF	Prep	Analyzed By	Method
Arsenic	0.0020 B	D004	5.0	0.010	0.0020	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Barium	0.37 B	D005	100	0.50	0.00057	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Cadmium	0.0012 B	D006	1.0	0.0040	0.00030	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Chromium	0.0012 B	D007	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Lead	0.0039 B	D008	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Mercury	ND	D009	0.20	0.00020	0.000034	mg/l	1	11/17/16	11/17/16	JM SW846 7470A <sup>2</sup>
Selenium	ND	D010	1.0	0.025	0.0034	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Silver	ND	D011	5.0	0.0050	0.0014	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>

(1) Instrument QC Batch: MA19631

(2) Instrument QC Batch: MA19634

(3) Prep QC Batch: MP27025

(4) Prep QC Batch: MP27030

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

MCL = Maximum Contamination Level (40 CFR 261.6(g))

B = Indicates a result &gt; = MDL but &lt; RL

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(0-3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-3	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260C SW846 1311		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N106529.D	100	11/23/16	AD	11/15/16	GP21107	MSN3919
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	ND	D018	0.50	0.10	0.027	mg/l	
78-93-3	2-Butanone (MEK)	ND	D035	200	1.0	0.30	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.20	0.034	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.20	0.024	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.20	0.040	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.20	0.058	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.20	0.068	mg/l	
75-35-4	1,1-Dichloroethene	ND	D029	0.70	0.20	0.028	mg/l	
127-18-4	Tetrachloroethene	0.0248	D039	0.70	0.20	0.021	mg/l	J
79-01-6	Trichloroethene	ND	D040	0.50	0.20	0.025	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.20	0.045	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		74-135%
2037-26-5	Toluene-D8	100%		83-116%
460-00-4	4-Bromofluorobenzene	102%		76-124%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(0-3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-3	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8270D SW846 3510C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50883.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897
Run #2							

Run #	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2		

## ABN TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0.10	0.0032	mg/l	
	3&4-Methylphenol	ND	D024	200	0.10	0.0054	mg/l	
87-86-5	Pentachlorophenol <sup>a</sup>	ND	D037	100	0.10	0.0059	mg/l	
95-95-4	2,4,5-Trichlorophenol	ND	D041	400	0.10	0.0052	mg/l	
88-06-2	2,4,6-Trichlorophenol	ND	D042	2.0	0.10	0.0038	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.050	0.0035	mg/l	
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.10	0.012	mg/l	
118-74-1	Hexachlorobenzene	ND	D032	0.13	0.050	0.0041	mg/l	
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.050	0.0043	mg/l	
67-72-1	Hexachloroethane	ND	D034	3.0	0.050	0.0036	mg/l	
98-95-3	Nitrobenzene	ND	D036	2.0	0.050	0.0042	mg/l	
110-86-1	Pyridine	ND	D038	5.0	0.10	0.013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	46%		10-73%
4165-62-2	Phenol-d5	29%		10-58%
118-79-6	2,4,6-Tribromophenol	79%		15-125%
4165-60-0	Nitrobenzene-d5	76%		23-120%
321-60-8	2-Fluorobiphenyl	82%		31-102%
1718-51-0	Terphenyl-d14	94%		42-124%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
MCL = Maximum Contamination Level (40 CFR 261.6/96)      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(0-3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-3	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8151 SW846 3510C SPLP		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ98719.D	1	11/29/16	TA	11/16/16	OP49161	GYZ8038
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Herbicide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
94-75-7	2,4-D	ND	D016	10	0.010	0.0034	mg/l	
93-72-1	2,4,5-TP (Silvex)	ND	D017	1.0	0.010	0.0040	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	59%		30-150%
19719-28-9	2,4-DCAA	48%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(0-3.0')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-3	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8081B SW846 3510C SPLP		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BE53428.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688
Run #2							

Run #	Initial Volume	Final Volume
Run #1	100 ml	5.0 ml
Run #2		

## Pesticide TCLP Leachate

## TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	D013	0.40	0.00050	0.000044	mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0050	0.0011	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.00050	0.00012	mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.00050	0.00011	mg/l	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.00050	0.000051	mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00050	0.00021	mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.025	0.0013	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	68%		30-150%
877-09-8	Tetrachloro-m-xylene	70%		30-150%
2051-24-3	Decachlorobiphenyl	82%		30-150%
2051-24-3	Decachlorobiphenyl	76%		30-150%

ND = Not detected      MDL = Method Detection Limit  
MCL = Maximum Contamination Level (40 CFR 261.6/96)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** TP-110(0-3.0')**Lab Sample ID:** MC48722-3**Matrix:** SO - Soil**Date Sampled:** 11/11/16**Date Received:** 11/12/16**Percent Solids:** n/a**Project:** National Grid, Washington Street, Rensselaer, NY**Metals Analysis, TCLP Leachate SW846 1311**

Analyte	Result	HW#	MCL	RL	MDL	Units	DF	Prep	Analyzed By	Method
Arsenic	0.0037 B	D004	5.0	0.010	0.0020	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Barium	0.75	D005	100	0.50	0.00057	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Cadmium	0.0013 B	D006	1.0	0.0040	0.00030	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Chromium	ND	D007	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Lead	1.5	D008	5.0	0.010	0.0011	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Mercury	ND	D009	0.20	0.00020	0.000034	mg/l	1	11/17/16	11/17/16	JM SW846 7470A <sup>2</sup>
Selenium	ND	D010	1.0	0.025	0.0034	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>
Silver	ND	D011	5.0	0.0050	0.0014	mg/l	1	11/16/16	11/16/16	EAL SW846 6010C <sup>1</sup>

(1) Instrument QC Batch: MA19631

(2) Instrument QC Batch: MA19634

(3) Prep QC Batch: MP27025

(4) Prep QC Batch: MP27030

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

MCL = Maximum Contamination Level (40 CFR 261.6(g))

B = Indicates a result &gt; = MDL but &lt; RL

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L101580.D	1	11/18/16	TB	n/a	n/a	MSL4385
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.64 g	10.0 ml	100 ul
Run #2			

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	1100	350	ug/kg	
71-43-2	Benzene	ND	110	40	ug/kg	
75-27-4	Bromodichloromethane	ND	210	45	ug/kg	
75-25-2	Bromoform	ND	210	50	ug/kg	
74-83-9	Bromomethane	ND	1100	170	ug/kg	
78-93-3	2-Butanone (MEK)	ND	1100	360	ug/kg	
75-15-0	Carbon disulfide	ND	530	43	ug/kg	
56-23-5	Carbon tetrachloride	ND	210	43	ug/kg	
108-90-7	Chlorobenzene	ND	210	100	ug/kg	
75-00-3	Chloroethane	ND	1100	220	ug/kg	
67-66-3	Chloroform	ND	210	53	ug/kg	
74-87-3	Chloromethane	ND	530	79	ug/kg	
124-48-1	Dibromochloromethane	ND	530	110	ug/kg	
75-34-3	1,1-Dichloroethane	ND	210	42	ug/kg	
107-06-2	1,2-Dichloroethane	ND	210	39	ug/kg	
75-35-4	1,1-Dichloroethene	ND	210	72	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	210	38	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	210	43	ug/kg	
78-87-5	1,2-Dichloropropane	ND	210	46	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	210	130	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	210	140	ug/kg	
100-41-4	Ethylbenzene	1330	210	40	ug/kg	
591-78-6	2-Hexanone	ND	530	71	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	530	69	ug/kg	
75-09-2	Methylene chloride	ND	210	44	ug/kg	
100-42-5	Styrene	ND	530	33	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	530	200	ug/kg	
127-18-4	Tetrachloroethene	ND	210	31	ug/kg	
108-88-3	Toluene	77.0	530	42	ug/kg	J
71-55-6	1,1,1-Trichloroethane	ND	210	37	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	210	150	ug/kg	
79-01-6	Trichloroethene	ND	210	33	ug/kg	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846 8260C		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

## VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1100	360	ug/kg	
1330-20-7	Xylene (total)	1460	210	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		65-141%
2037-26-5	Toluene-D8	100%		65-129%
460-00-4	4-Bromofluorobenzene	98%		63-137%

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



## Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R50717.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.4 g	1.0 ml
Run #2		

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	300	14	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	610	14	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	610	33	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	610	250	ug/kg	
51-28-5	2,4-Dinitrophenol <sup>a</sup>	ND	610	130	ug/kg	
534-52-1	4,6-Dinitro-o-cresol <sup>a</sup>	ND	610	60	ug/kg	
95-48-7	2-Methylphenol	ND	610	65	ug/kg	
	3&4-Methylphenol	ND	610	53	ug/kg	
88-75-5	2-Nitrophenol	ND	610	47	ug/kg	
100-02-7	4-Nitrophenol	ND	610	70	ug/kg	
87-86-5	Pentachlorophenol	ND	610	69	ug/kg	
108-95-2	Phenol	ND	300	13	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	610	18	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	610	11	ug/kg	
83-32-9	Acenaphthene	3270	120	8.3	ug/kg	
208-96-8	Acenaphthylene	958	120	9.6	ug/kg	
120-12-7	Anthracene	2200	120	9.8	ug/kg	
56-55-3	Benzo(a)anthracene	2910	120	12	ug/kg	
50-32-8	Benzo(a)pyrene	2900	300	10	ug/kg	
205-99-2	Benzo(b)fluoranthene	1910	120	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	1400	120	12	ug/kg	
207-08-9	Benzo(k)fluoranthene	2070	120	17	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	300	13	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	300	16	ug/kg	
91-58-7	2-Chloronaphthalene	ND	300	12	ug/kg	
106-47-8	4-Chloroaniline	ND	610	14	ug/kg	
86-74-8	Carbazole	220	120	11	ug/kg	
218-01-9	Chrysene	2700	120	9.4	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	300	12	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	300	11	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	300	15	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	300	14	ug/kg	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: TP-110(3.0-3.5')

Lab Sample ID: MC48722-4

Date Sampled: 11/11/16

Matrix: SO - Soil

Date Received: 11/12/16

Method: SW846 8270D SW846 3546

Percent Solids: 80.4

Project: National Grid, Washington Street, Rensselaer, NY

## ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	1,2-Dichlorobenzene	ND	300	10	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	300	9.0	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	300	12	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	610	15	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	610	14	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	610	40	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	367	120	10	ug/kg	
132-64-9	Dibenzofuran	316	120	9.5	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	300	13	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	300	10	ug/kg	
84-66-2	Diethyl phthalate	ND	300	9.7	ug/kg	
131-11-3	Dimethyl phthalate	ND	300	9.6	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	300	12	ug/kg	
206-44-0	Fluoranthene	5160	120	11	ug/kg	
86-73-7	Fluorene	1720	120	13	ug/kg	
118-74-1	Hexachlorobenzene	ND	300	16	ug/kg	
87-68-3	Hexachlorobutadiene	ND	300	12	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	610	14	ug/kg	
67-72-1	Hexachloroethane	ND	300	29	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	1410	300	34	ug/kg	
78-59-1	Isophorone	ND	300	22	ug/kg	
91-57-6	2-Methylnaphthalene	4460	120	14	ug/kg	
88-74-4	2-Nitroaniline	ND	610	14	ug/kg	
99-09-2	3-Nitroaniline	ND	610	14	ug/kg	
100-01-6	4-Nitroaniline	ND	610	14	ug/kg	
91-20-3	Naphthalene	7580	120	10	ug/kg	
98-95-3	Nitrobenzene	ND	300	34	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	300	17	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	300	40	ug/kg	
85-01-8	Phenanthrene	7470	120	9.1	ug/kg	
129-00-0	Pyrene	7400	120	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	300	15	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	60%		25-109%
4165-62-2	Phenol-d5	68%		29-113%
118-79-6	2,4,6-Tribromophenol	82%		20-141%
4165-60-0	Nitrobenzene-d5	66%		27-115%
321-60-8	2-Fluorobiphenyl	82%		34-118%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846 8270D SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	Terphenyl-d14	89%		42-139%

(a) Continuing Calibration outside of acceptance criteria. Reporting Limit Response verified by low-level standard.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
RL = Reporting Limit      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')			<b>Date Sampled:</b>	11/11/16		
<b>Lab Sample ID:</b>	MC48722-4			<b>Date Received:</b>	11/12/16		
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	80.4		
<b>Method:</b>	SW846 8015						
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	WX78125.D	1	11/17/16	AF	n/a	n/a	GWX3867
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.64 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	68.1	11	2.0	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	107%		64-127%		

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')	<b>Date Sampled:</b>	11/11/16
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Received:</b>	11/12/16
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.4
<b>Method:</b>	SW846 8082A SW846 3546		
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK63166.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
Run #2							

	Initial Weight	Final Volume
Run #1	15.6 g	10.0 ml
Run #2		

## PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	40	4.1	ug/kg	
11104-28-2	Aroclor 1221	ND	40	17	ug/kg	
11141-16-5	Aroclor 1232	ND	40	12	ug/kg	
53469-21-9	Aroclor 1242	ND	40	9.2	ug/kg	
12672-29-6	Aroclor 1248	ND	40	6.9	ug/kg	
11097-69-1	Aroclor 1254	ND	40	17	ug/kg	
11096-82-5	Aroclor 1260	ND	40	3.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	101%		25-145%
877-09-8	Tetrachloro-m-xylene	74%		25-145%
2051-24-3	Decachlorobiphenyl	69%		25-179%
2051-24-3	Decachlorobiphenyl	68%		25-179%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	TP-110(3.0-3.5')		
<b>Lab Sample ID:</b>	MC48722-4	<b>Date Sampled:</b>	11/11/16
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/12/16
<b>Method:</b>	SW846-8015 SW846 3546	<b>Percent Solids:</b>	80.4
<b>Project:</b>	National Grid, Washington Street, Rensselaer, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IR3257.D	1	11/18/16	MD	11/16/16	OP49158	GIR226
Run #2							

	Initial Weight	Final Volume
Run #1	15.9 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (Semi-VOA)	2200	20	4.9	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	91%		17-130%		

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: TP-110(3.0-3.5')

Lab Sample ID: MC48722-4

Matrix: SO - Soil

Date Sampled: 11/11/16

Date Received: 11/12/16

Percent Solids: 80.4

Project: National Grid, Washington Street, Rensselaer, NY

## Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Antimony	ND	0.99	0.17	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Arsenic	4.6	0.99	0.20	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Barium	83.6	4.9	0.075	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Beryllium	0.47	0.39	0.015	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Cadmium	0.12 B	0.39	0.031	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Chromium	13.1	0.99	0.046	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Lead	34.9	0.99	0.11	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Mercury	0.30	0.038	0.0064	mg/kg	1	11/15/16	11/15/16 JM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>3</sup>
Nickel	19.2	3.9	0.056	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Selenium	ND	0.99	0.30	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Silver	ND	0.49	0.060	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Thallium	ND	0.99	0.11	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Vanadium	17.0	0.99	0.039	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Zinc	61.7	2.0	0.17	mg/kg	1	11/15/16	11/15/16 EAL	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>

(1) Instrument QC Batch: MA19626

(2) Instrument QC Batch: MA19629

(3) Prep QC Batch: MP27019

(4) Prep QC Batch: MP27020

RL = Reporting Limit

MDL = Method Detection Limit

ND = Not detected

B = Indicates a result &gt; = MDL but &lt; RL

## Report of Analysis

**Client Sample ID:** TP-110(3.0-3.5')**Lab Sample ID:** MC48722-4**Matrix:** SO - Soil**Project:** National Grid, Washington Street, Rensselaer, NY**Date Sampled:** 11/11/16**Date Received:** 11/12/16**Percent Solids:** 80.4

## General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Cyanide	1.1	0.14	0.039	mg/kg	1	11/23/16 20:56 CF	SW846	9012 M
Heat Content, BTU <sup>a</sup>	1510	100		BTU/lb	1	11/18/16 21:00 ANJ	ASTM	D240-92
Percent Sulfur <sup>a</sup>	0.11 B	0.20	0.054	%	1	11/18/16 21:00 ANJ	ASTM	D129-95
Solids, Percent	80.4			%	1	11/16/16	JM	SM 2540G-97 MOD

(a) Analysis performed at SGS Accutest, Dayton, NJ.

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
B = Indicates a result > = MDL but < RL



## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody

SGS Accutest of New England  
50 D'Angelo Drive, Building One Marlborough, MA 01752  
TEL: 508-481-6200 FAX: 508-481-7753  
[www.accutest.com](http://www.accutest.com)

Client / Reporting Information		Project Information										Requested Analysis ( see TEST CODE sheet)										Matrix Codes								
Company Name <b>ARCADIS</b>		Project Name <b>NATIONAL GRID - RENSSELAER</b>										TOLP VOC TOLP SVOC, TOLP METALS + HA, PCB, PESTICIDE / HERBICIDE VOC SVOC, PCB, TOTAL METALS, T-G TO SOLUBLE, DTU																		
Street Address <b>60723 Tawpath Rd</b>		Street: <b>WASHINGTON ST</b>																												
City State Zip <b>SYRACUSE NY 13214</b>		Billing Information ( If different from Report to ) Company Name _____ Street Address _____ City _____ State _____ Zip _____																												
Project Contact <b>DAVID RODRIGUEZ</b> E-mail: <b>davidr@arcadis.com</b> Phone #: <b>315 671 9619</b> Fax # _____		Project# <b>B0036730</b> Client PO# _____ Attention: _____ PO# _____																												
Sampler(s) Name(s) <b>JON LEMESSURIER</b> Phone # <b>315 558 1904</b>		Project Manager <b>JASON GOLUBSKI</b>																												
Field ID / Point of Collection		Collection										Number of preserved Bottles										LAB USE ONLY								
		MEDIAID / vial #	Date	Time	Sampled by:	L/gal/v	# of bottles	HCl	NaOH	HNO3	H2SO4	HCN	D/Water	NEOH	ENDORE	Brine/line														
-1	TP-106 (3.0')		11/10/10	1330	JDL	50	7					4	1	2	X	X	X	X												
-2	TP-107 (3.0')		11/11/10	0830	I	I	7					4	1	2	X	X	X	X												
-3	TP-110 (0-3.0')		I	1215	I	I	3					3			X	X														
-4	TP-110 (3.0-3.5')		I	1215	I	I	4					1	1	2			X	X												
Data Deliverable Information											Comments / Special Instructions																			
<input checked="" type="checkbox"/> Turnaround Time ( Business days ) <input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY <small>Emergency &amp; Rush T/A data available VIA Lablink</small>											Approved By (SGS Accutest PM): / Date: _____ <div style="margin-top: 10px;"> <input type="checkbox"/> Commercial "A" ( Level 1 )      <input type="checkbox"/> NYASP Category A  <input checked="" type="checkbox"/> Commercial "B" ( Level 2 )      <input type="checkbox"/> NYASP Category B  <input type="checkbox"/> FULLT1 ( Level 3+4 )      <input type="checkbox"/> State Forms  <input type="checkbox"/> CT RCP                                  <input type="checkbox"/> EDD Format  <input type="checkbox"/> MA MCP                                <input type="checkbox"/> Other _____         </div> <p style="font-size: small; margin-top: 5px;">Commercial "A" = Results Only Commercial "B" = Results + QC Summary</p>										INITIAL ASSESSMENT _____  LABEL VERIFICATION _____									
Sample Custody must be documented below each time samples change possession, including courier delivery.																														
Relinquished By Sampler:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:		Received By:		Relinquished By:		Date Time:		Received By:												
		11/10/10 1600		1						11/21/10 1000		2																		
Relinquished By:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:		Received By:		Relinquished By:		Date Time:		Received By:												
5				5				5				5		5				5												
										Custody Seal #																				
										Intact Preserved where applicable <input type="checkbox"/> Intact <input type="checkbox"/> Not intact																				
										On Ice Cooler Temp. <input type="checkbox"/> On Ice <input type="checkbox"/> Cooler Temp. 35°F																				

## MC48722: Chain of Custody

Page 1 of 2

## SGS Accutest Sample Receipt Summary

**Job Number:** MC48722

**Client:** ARCADIS

**Project:** NATIONAL GRID

**Date / Time Received:** 11/12/2016 10:20:00 AM

**Delivery Method:** FEDX

**Airbill #'s:** 784623131115

**Cooler Temps (Initial/Adjusted):** #1: (3.5/3.5);

### Cooler Security

**Y or N**

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

**Y or N**

- |                            |                                     |                          |
|----------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Thermometer ID:         | IRGUN1;                             |                          |
| 3. Cooler media:           | Ice (Bag)                           |                          |
| 4. No. Coolers:            | 1                                   |                          |

### Quality Control Preservation

**Y or N**
**N/A**

- |                                 |                                     |                                     |                                     |
|---------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Comments

### Sample Integrity - Documentation

**Y or N**

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

**Y or N**

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

**Y or N N/A**

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

MC48722: Chain of Custody

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## GC/MS Volatiles

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## QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries

## Method Blank Summary

Page 1 of 2

**Job Number:** MC48722**Account:** BBLNYS Arcadis**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSL4385-MB	L101570.D	1	11/18/16	TB	n/a	n/a	MSL4385

**The QC reported here applies to the following samples:****Method:** SW846 8260C

MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	500	160	ug/kg	
71-43-2	Benzene	ND	50	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	21	ug/kg	
75-25-2	Bromoform	ND	100	24	ug/kg	
74-83-9	Bromomethane	ND	500	80	ug/kg	
78-93-3	2-Butanone (MEK)	ND	500	170	ug/kg	
75-15-0	Carbon disulfide	ND	250	20	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	21	ug/kg	
108-90-7	Chlorobenzene	ND	100	47	ug/kg	
75-00-3	Chloroethane	ND	500	100	ug/kg	
67-66-3	Chloroform	ND	100	25	ug/kg	
74-87-3	Chloromethane	ND	250	38	ug/kg	
124-48-1	Dibromochloromethane	ND	250	54	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	20	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	18	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	34	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	18	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	20	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	22	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	100	61	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	66	ug/kg	
100-41-4	Ethylbenzene	ND	100	19	ug/kg	
591-78-6	2-Hexanone	ND	250	34	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	33	ug/kg	
75-09-2	Methylene chloride	ND	100	21	ug/kg	
100-42-5	Styrene	ND	250	16	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	95	ug/kg	
127-18-4	Tetrachloroethene	ND	100	15	ug/kg	
108-88-3	Toluene	ND	250	20	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	17	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	69	ug/kg	
79-01-6	Trichloroethene	ND	100	15	ug/kg	
75-01-4	Vinyl chloride	ND	500	170	ug/kg	
1330-20-7	Xylene (total)	ND	100	17	ug/kg	

Method Blank Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSL4385-MB	L101570.D	1	11/18/16	TB	n/a	n/a	MSL4385

The QC reported here applies to the following samples: Method: SW846 8260C

MC48722-4

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	108% 65-141%
2037-26-5	Toluene-D8	98% 65-129%
460-00-4	4-Bromofluorobenzene	104% 63-137%

## Method Blank Summary

Page 1 of 2

**Job Number:** MC48722**Account:** BBLNYS Arcadis**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2942-MB	M82027.D	1	11/21/16	KP	n/a	n/a	MSM2942

**The QC reported here applies to the following samples:****Method:** SW846 8260C

MC48722-1, MC48722-2

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	4.2	10	3.3	ug/kg	J
71-43-2	Benzene	ND	1.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.43	ug/kg	
75-25-2	Bromoform	ND	2.0	0.48	ug/kg	
74-83-9	Bromomethane	ND	10	1.6	ug/kg	
78-93-3	2-Butanone (MEK)	ND	10	3.4	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.41	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.41	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.94	ug/kg	
75-00-3	Chloroethane	ND	10	2.1	ug/kg	
67-66-3	Chloroform	ND	2.0	0.50	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.75	ug/kg	
124-48-1	Dibromochloromethane	ND	5.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.40	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.37	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.68	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.36	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.40	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.44	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	1.2	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	1.3	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.38	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.67	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.65	ug/kg	
75-09-2	Methylene chloride	ND	2.0	0.42	ug/kg	
100-42-5	Styrene	ND	5.0	0.31	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	1.9	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.30	ug/kg	
108-88-3	Toluene	0.68	5.0	0.40	ug/kg	J
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.35	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	1.4	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.31	ug/kg	
75-01-4	Vinyl chloride	ND	10	3.4	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.35	ug/kg	

## Method Blank Summary

Page 2 of 2

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2942-MB	M82027.D	1	11/21/16	KP	n/a	n/a	MSM2942

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-1, MC48722-2

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	114% 65-141%
2037-26-5	Toluene-D8	104% 65-129%
460-00-4	4-Bromofluorobenzene	97% 63-137%



## Method Blank Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN3919-MB	N106520.D	1	11/23/16	AD	n/a	n/a	MSN3919

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.39	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	1.3	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.73	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.31	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.32	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.57	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.74	ug/l	
127-18-4	Tetrachloroethene	0.37	1.0	0.26	ug/l	J
79-01-6	Trichloroethene	ND	1.0	0.70	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.72	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	101% 76-129%
2037-26-5	Toluene-D8	100% 83-114%
460-00-4	4-Bromofluorobenzene	101% 75-124%

# Leachate Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GP21107-LB1	N106524.D	10	11/23/16	AD	11/15/16	GP21107	MSN3919

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.0	2.7	ug/l	
78-93-3	2-Butanone (MEK)	ND	100	30	ug/l	
56-23-5	Carbon tetrachloride	ND	10	3.4	ug/l	
108-90-7	Chlorobenzene	ND	10	2.4	ug/l	
67-66-3	Chloroform	ND	10	4.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	10	5.8	ug/l	
107-06-2	1,2-Dichloroethane	ND	10	6.8	ug/l	
75-35-4	1,1-Dichloroethene	ND	10	2.8	ug/l	
127-18-4	Tetrachloroethene	2.4	10	2.1	ug/l	J
79-01-6	Trichloroethene	ND	10	2.5	ug/l	
75-01-4	Vinyl chloride	ND	10	4.5	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	99% 74-135%
2037-26-5	Toluene-D8	102% 83-116%
460-00-4	4-Bromofluorobenzene	102% 76-124%

## Blank Spike Summary

Page 1 of 2

**Job Number:** MC48722**Account:** BBLNYS Arcadis**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSL4385-BS	L101567.D	1	11/18/16	TB	n/a	n/a	MSL4385

**The QC reported here applies to the following samples:****Method:** SW846 8260C

MC48722-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	2500	3690	148	24-179
71-43-2	Benzene	2500	2510	100	73-115
75-27-4	Bromodichloromethane	2500	2350	94	76-122
75-25-2	Bromoform	2500	2560	102	67-151
74-83-9	Bromomethane	2500	2200	88	52-139
78-93-3	2-Butanone (MEK)	2500	3500	140	32-151
75-15-0	Carbon disulfide	2500	2630	105	57-143
56-23-5	Carbon tetrachloride	2500	2230	89	73-129
108-90-7	Chlorobenzene	2500	2550	102	79-123
75-00-3	Chloroethane	2500	2490	100	51-159
67-66-3	Chloroform	2500	2460	98	72-122
74-87-3	Chloromethane	2500	1980	79	57-143
124-48-1	Dibromochloromethane	2500	2520	101	74-139
75-34-3	1,1-Dichloroethane	2500	2490	100	70-128
107-06-2	1,2-Dichloroethane	2500	2300	92	70-126
75-35-4	1,1-Dichloroethene	2500	2570	103	71-136
156-59-2	cis-1,2-Dichloroethene	2500	2830	113	78-128
156-60-5	trans-1,2-Dichloroethene	2500	2420	97	71-131
78-87-5	1,2-Dichloropropane	2500	2570	103	79-124
10061-01-5	cis-1,3-Dichloropropene	2500	2480	99	75-126
10061-02-6	trans-1,3-Dichloropropene	2500	2290	92	75-128
100-41-4	Ethylbenzene	2500	2620	105	76-122
591-78-6	2-Hexanone	2500	4170	167	26-169
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	2790	112	43-166
75-09-2	Methylene chloride	2500	2670	107	74-125
100-42-5	Styrene	2500	2710	108	79-124
79-34-5	1,1,2,2-Tetrachloroethane	2500	2700	108	66-134
127-18-4	Tetrachloroethene	2500	2480	99	76-125
108-88-3	Toluene	2500	2400	96	76-119
71-55-6	1,1,1-Trichloroethane	2500	2390	96	70-130
79-00-5	1,1,2-Trichloroethane	2500	2520	101	75-124
79-01-6	Trichloroethene	2500	2360	94	74-127
75-01-4	Vinyl chloride	2500	1900	76	33-166
1330-20-7	Xylene (total)	7500	8350	111	78-122

\* = Outside of Control Limits.

## Blank Spike Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSL4385-BS	L101567.D	1	11/18/16	TB	n/a	n/a	MSL4385

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-4

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	102%	65-141%
2037-26-5	Toluene-D8	98%	65-129%
460-00-4	4-Bromofluorobenzene	96%	63-137%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 2

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2942-BS	M82024.D	1	11/21/16	KP	n/a	n/a	MSM2942

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-1, MC48722-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	50	80.9	162	24-179
71-43-2	Benzene	50	50.9	102	73-115
75-27-4	Bromodichloromethane	50	49.8	100	76-122
75-25-2	Bromoform	50	45.3	91	67-151
74-83-9	Bromomethane	50	40.5	81	52-139
78-93-3	2-Butanone (MEK)	50	74.0	148	32-151
75-15-0	Carbon disulfide	50	59.0	118	57-143
56-23-5	Carbon tetrachloride	50	54.0	108	73-129
108-90-7	Chlorobenzene	50	45.3	91	79-123
75-00-3	Chloroethane	50	40.3	81	51-159
67-66-3	Chloroform	50	51.5	103	72-122
74-87-3	Chloromethane	50	54.1	108	57-143
124-48-1	Dibromochloromethane	50	44.8	90	74-139
75-34-3	1,1-Dichloroethane	50	51.4	103	70-128
107-06-2	1,2-Dichloroethane	50	51.4	103	70-126
75-35-4	1,1-Dichloroethene	50	52.9	106	71-136
156-59-2	cis-1,2-Dichloroethene	50	53.3	107	78-128
156-60-5	trans-1,2-Dichloroethene	50	47.8	96	71-131
78-87-5	1,2-Dichloropropane	50	50.0	100	79-124
10061-01-5	cis-1,3-Dichloropropene	50	48.5	97	75-126
10061-02-6	trans-1,3-Dichloropropene	50	49.0	98	75-128
100-41-4	Ethylbenzene	50	48.6	97	76-122
591-78-6	2-Hexanone	50	65.2	130	26-169
108-10-1	4-Methyl-2-pentanone (MIBK)	50	48.4	97	43-166
75-09-2	Methylene chloride	50	56.5	113	74-125
100-42-5	Styrene	50	47.0	94	79-124
79-34-5	1,1,2,2-Tetrachloroethane	50	45.4	91	66-134
127-18-4	Tetrachloroethene	50	48.0	96	76-125
108-88-3	Toluene	50	50.2	100	76-119
71-55-6	1,1,1-Trichloroethane	50	53.8	108	70-130
79-00-5	1,1,2-Trichloroethane	50	47.7	95	75-124
79-01-6	Trichloroethene	50	49.0	98	74-127
75-01-4	Vinyl chloride	50	43.9	88	33-166
1330-20-7	Xylene (total)	150	144	96	78-122

\* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2942-BS	M82024.D	1	11/21/16	KP	n/a	n/a	MSM2942

The QC reported here applies to the following samples: Method: SW846 8260C  
MC48722-1, MC48722-2

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	103%	65-141%
2037-26-5	Toluene-D8	102%	65-129%
460-00-4	4-Bromofluorobenzene	96%	63-137%

\* = Outside of Control Limits.

## Blank Spike/Blank Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN3919-BS	N106517.D	1	11/23/16	AD	n/a	n/a	MSN3919
MSN3919-BSD	N106518.D	1	11/23/16	AD	n/a	n/a	MSN3919

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	50	44.3	89	49.6	99	11	66-123/25
78-93-3	2-Butanone (MEK)	50	46.0	92	51.1	102	11	45-171/25
56-23-5	Carbon tetrachloride	50	46.1	92	51.5	103	11	54-151/25
108-90-7	Chlorobenzene	50	45.5	91	52.0	104	13	75-117/25
67-66-3	Chloroform	50	45.7	91	52.1	104	13	65-127/25
106-46-7	1,4-Dichlorobenzene	50	46.0	92	51.0	102	10	77-117/25
107-06-2	1,2-Dichloroethane	50	44.3	89	50.3	101	13	68-126/25
75-35-4	1,1-Dichloroethene	50	40.7	81	46.1	92	12	44-148/25
127-18-4	Tetrachloroethene	50	46.7	93	52.9	106	12	68-133/25
79-01-6	Trichloroethene	50	46.0	92	51.9	104	12	73-120/25
75-01-4	Vinyl chloride	50	43.5	87	44.3	89	2	49-154/25

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	101%	100%	76-129%
2037-26-5	Toluene-D8	101%	101%	83-114%
460-00-4	4-Bromofluorobenzene	99%	98%	75-124%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC48725-1MS	L101581.D	1	11/18/16	TB	n/a	n/a	MSL4385
MC48725-1MSD	L101582.D	1	11/18/16	TB	n/a	n/a	MSL4385
MC48725-1 <sup>a</sup>	L101571.D	1	11/18/16	TB	n/a	n/a	MSL4385

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-4

CAS No.	Compound	MC48725-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	3080	3100	101	3080	3660	119	17	10-200/30
71-43-2	Benzene	ND	3080	2990	97	3080	2950	96	1	38-135/30
75-27-4	Bromodichloromethane	ND	3080	3370	109	3080	2740	89	21	45-136/30
75-25-2	Bromoform	ND	3080	3450	112	3080	3060	99	12	42-150/30
74-83-9	Bromomethane	ND	3080	3690	120	3080	2750	89	29	20-159/30
78-93-3	2-Butanone (MEK)	ND	3080	3210	104	3080	3690	120	14	10-187/30
75-15-0	Carbon disulfide	ND	3080	2840	92	3080	2960	96	4	29-157/30
56-23-5	Carbon tetrachloride	ND	3080	3550	115	3080	2640	86	29	42-148/30
108-90-7	Chlorobenzene	ND	3080	2960	96	3080	3060	99	3	33-148/30
75-00-3	Chloroethane	ND	3080	3060	99	3080	3080	100	1	32-162/30
67-66-3	Chloroform	ND	3080	3130	102	3080	2780	90	12	46-136/30
74-87-3	Chloromethane	ND	3080	4470	145	3080	2360	77	62* <sup>b</sup>	33-152/30
124-48-1	Dibromochloromethane	ND	3080	3140	102	3080	2990	97	5	46-147/30
75-34-3	1,1-Dichloroethane	ND	3080	2910	94	3080	2810	91	3	49-134/30
107-06-2	1,2-Dichloroethane	ND	3080	3400	110	3080	2580	84	27	46-135/30
75-35-4	1,1-Dichloroethene	ND	3080	2870	93	3080	2930	95	2	46-148/30
156-59-2	cis-1,2-Dichloroethene	ND	3080	3110	101	3080	3270	106	5	46-144/30
156-60-5	trans-1,2-Dichloroethene	ND	3080	2670	87	3080	2800	91	5	44-145/30
78-87-5	1,2-Dichloropropane	ND	3080	3010	98	3080	2960	96	2	48-138/30
10061-01-5	cis-1,3-Dichloropropene	ND	3080	3270	106	3080	2920	95	11	34-149/30
10061-02-6	trans-1,3-Dichloropropene	ND	3080	3130	102	3080	2630	85	17	28-151/30
100-41-4	Ethylbenzene	ND	3080	3190	103	3080	3130	102	2	32-150/30
591-78-6	2-Hexanone	ND	3080	3510	114	3080	3960	128	12	10-184/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	3080	3550	115	3080	3160	102	12	35-164/30
75-09-2	Methylene chloride	ND	3080	2860	93	3080	3030	98	6	48-140/30
100-42-5	Styrene	ND	3080	3260	106	3080	3290	107	1	17-160/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	3080	2210	72	3080	3150	102	35* <sup>b</sup>	30-157/30
127-18-4	Tetrachloroethene	ND	3080	2950	96	3080	2940	95	0	40-146/30
108-88-3	Toluene	ND	3080	3080	100	3080	2900	94	6	33-145/30
71-55-6	1,1,1-Trichloroethane	ND	3080	3400	110	3080	2750	89	21	41-147/30
79-00-5	1,1,2-Trichloroethane	ND	3080	3050	99	3080	3020	98	1	40-148/30
79-01-6	Trichloroethene	ND	3080	3160	102	3080	2860	93	10	36-155/30
75-01-4	Vinyl chloride	ND	3080	3390	110	3080	2260	73	40* <sup>b</sup>	11-183/30
1330-20-7	Xylene (total)	ND	9250	10000	108	9250	10200	110	2	33-150/30

\* = Outside of Control Limits.



## Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC48725-1MS	L101581.D	1	11/18/16	TB	n/a	n/a	MSL4385
MC48725-1MSD	L101582.D	1	11/18/16	TB	n/a	n/a	MSL4385
MC48725-1 <sup>a</sup>	L101571.D	1	11/18/16	TB	n/a	n/a	MSL4385

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-4

CAS No.	Surrogate Recoveries	MS	MSD	MC48725-1	Limits
1868-53-7	Dibromofluoromethane	101%	97%	112%	65-141%
2037-26-5	Toluene-D8	102%	99%	101%	65-129%
460-00-4	4-Bromofluorobenzene	70%	100%	99%	63-137%

(a) Analytical results based on analysis of intact sample. Sample results may be biased low due to sample not being preserved according to 5035-L/5035A-L specifications.

(b) High RPD due to possible matrix interference and/or sample non-homogeneity.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC48777-1MS	M82046.D	1	11/21/16	KP	n/a	n/a	MSM2942
MC48777-1MSD	M82047.D	1	11/21/16	KP	n/a	n/a	MSM2942
MC48777-1	M82031.D	1	11/21/16	KP	n/a	n/a	MSM2942

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-1, MC48722-2

CAS No.	Compound	MC48777-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	51.6	38.6	75	49.5	41.3	83	7	10-200/30
71-43-2	Benzene	ND	51.6	50.2	97	49.5	48.1	97	4	38-135/30
75-27-4	Bromodichloromethane	ND	51.6	48.8	95	49.5	46.8	95	4	45-136/30
75-25-2	Bromoform	ND	51.6	43.9	85	49.5	41.7	84	5	42-150/30
74-83-9	Bromomethane	ND	51.6	39.6	77	49.5	39.2	79	1	20-159/30
78-93-3	2-Butanone (MEK)	ND	51.6	33.4	65	49.5	41.9	85	23	10-187/30
75-15-0	Carbon disulfide	ND	51.6	57.9	112	49.5	53.0	107	9	29-157/30
56-23-5	Carbon tetrachloride	ND	51.6	55.0	107	49.5	51.2	103	7	42-148/30
108-90-7	Chlorobenzene	ND	51.6	42.0	81	49.5	40.6	82	3	33-148/30
75-00-3	Chloroethane	ND	51.6	42.9	83	49.5	39.5	80	8	32-162/30
67-66-3	Chloroform	ND	51.6	52.0	101	49.5	48.6	98	7	46-136/30
74-87-3	Chloromethane	ND	51.6	54.8	106	49.5	50.2	101	9	33-152/30
124-48-1	Dibromochloromethane	ND	51.6	42.7	83	49.5	41.3	83	3	46-147/30
75-34-3	1,1-Dichloroethane	ND	51.6	51.1	99	49.5	48.1	97	6	49-134/30
107-06-2	1,2-Dichloroethane	ND	51.6	51.7	100	49.5	49.0	99	5	46-135/30
75-35-4	1,1-Dichloroethene	ND	51.6	52.0	101	49.5	49.2	99	6	46-148/30
156-59-2	cis-1,2-Dichloroethene	ND	51.6	51.9	101	49.5	49.0	99	6	46-144/30
156-60-5	trans-1,2-Dichloroethene	ND	51.6	46.9	91	49.5	44.3	89	6	44-145/30
78-87-5	1,2-Dichloropropane	ND	51.6	49.5	96	49.5	46.8	95	6	48-138/30
10061-01-5	cis-1,3-Dichloropropene	ND	51.6	44.6	86	49.5	43.6	88	2	34-149/30
10061-02-6	trans-1,3-Dichloropropene	ND	51.6	45.9	89	49.5	44.1	89	4	28-151/30
100-41-4	Ethylbenzene	ND	51.6	44.4	86	49.5	42.7	86	4	32-150/30
591-78-6	2-Hexanone	ND	51.6	36.0	70	49.5	36.5	74	1	10-184/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	51.6	45.9	89	49.5	44.0	89	4	35-164/30
75-09-2	Methylene chloride	ND	51.6	59.8	116	49.5	54.4	110	9	48-140/30
100-42-5	Styrene	ND	51.6	41.4	80	49.5	40.1	81	3	17-160/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	51.6	44.9	87	49.5	43.3	87	4	30-157/30
127-18-4	Tetrachloroethene	ND	51.6	42.4	82	49.5	41.0	83	3	40-146/30
108-88-3	Toluene	0.98	51.6	48.0	91	49.5	46.1	91	4	33-145/30
71-55-6	1,1,1-Trichloroethane	ND	51.6	54.7	106	49.5	51.2	103	7	41-147/30
79-00-5	1,1,2-Trichloroethane	ND	51.6	47.6	92	49.5	45.3	91	5	40-148/30
79-01-6	Trichloroethene	ND	51.6	47.0	91	49.5	45.4	92	3	36-155/30
75-01-4	Vinyl chloride	ND	51.6	43.9	85	49.5	41.4	84	6	11-183/30
1330-20-7	Xylene (total)	ND	155	125	81	149	121	81	3	33-150/30

\* = Outside of Control Limits.

## Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC48777-1MS	M82046.D	1	11/21/16	KP	n/a	n/a	MSM2942
MC48777-1MSD	M82047.D	1	11/21/16	KP	n/a	n/a	MSM2942
MC48777-1	M82031.D	1	11/21/16	KP	n/a	n/a	MSM2942

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-1, MC48722-2

CAS No.	Surrogate Recoveries	MS	MSD	MC48777-1	Limits
1868-53-7	Dibromofluoromethane	105%	102%	118%	65-141%
2037-26-5	Toluene-D8	105%	103%	105%	65-129%
460-00-4	4-Bromofluorobenzene	94%	97%	97%	63-137%

\* = Outside of Control Limits.

# Leachate Spike Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GP21107-LS1	N106538.D	1	11/23/16	AD	11/15/16	GP21107	MSN3919
MC48722-1A	N106527.D	100	11/23/16	AD	11/15/16	GP21107	MSN3919

The QC reported here applies to the following samples:

Method: SW846 8260C

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48722-1ASpike		LS	LS	Limits
		ug/l	Q ug/l		%	
71-43-2	Benzene	58.6	J 50	45.3	-27* a	63-125
78-93-3	2-Butanone (MEK)	ND	50	47.7	95	10-158
56-23-5	Carbon tetrachloride	ND	50	42.2	84	48-153
108-90-7	Chlorobenzene	ND	50	45.0	90	68-117
67-66-3	Chloroform	ND	50	47.2	94	57-137
106-46-7	1,4-Dichlorobenzene	ND	50	44.3	89	66-114
107-06-2	1,2-Dichloroethane	ND	50	46.8	94	48-146
75-35-4	1,1-Dichloroethene	ND	50	40.6	81	47-150
127-18-4	Tetrachloroethene	ND	50	42.2	84	71-117
79-01-6	Trichloroethene	ND	50	44.1	88	67-121
75-01-4	Vinyl chloride	ND	50	49.0	98	49-151

CAS No.	Surrogate Recoveries	LS MC48722-1ALimits		
1868-53-7	Dibromofluoromethane	102%	101%	74-135%
2037-26-5	Toluene-D8	101%	102%	83-116%
460-00-4	4-Bromofluorobenzene	100%	102%	76-124%

(a) Outside control limits due to possible matrix interference. Refer to Blank Spike.

\* = Outside of Control Limits.

**Volatile Surrogate Recovery Summary**

**Job Number:** MC48722  
**Account:** BBLNYS Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY

<b>Method:</b> SW846 8260C	<b>Matrix:</b> LEACHATE
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
MC48722-3	N106529.D	100	100	102
MC48722-1A	N106527.D	101	102	102
MC48722-2A	N106528.D	101	101	101
GP21107-LB1	N106524.D	99	102	102
GP21107-LS1	N106538.D	102	101	100
MSN3919-BS	N106517.D	101	101	99
MSN3919-BSD	N106518.D	100	101	98
MSN3919-MB	N106520.D	101	100	101

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	74-135%
S2 = Toluene-D8	83-116%
S3 = 4-Bromofluorobenzene	76-124%

5.7.1  
 5

**Volatile Surrogate Recovery Summary**

**Job Number:** MC48722  
**Account:** BBLNYS Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY

<b>Method:</b> SW846 8260C	<b>Matrix:</b> SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
MC48722-1	M82033.D	118	103	95
MC48722-2	M82034.D	115	103	104
MC48722-4	L101580.D	107	100	98
MC48725-1MS	L101581.D	101	102	70
MC48725-1MSD	L101582.D	97	99	100
MC48777-1MS	M82046.D	105	105	94
MC48777-1MSD	M82047.D	102	103	97
MSL4385-BS	L101567.D	102	98	96
MSL4385-MB	L101570.D	108	98	104
MSM2942-BS	M82024.D	103	102	96
MSM2942-MB	M82027.D	114	104	97

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	65-141%
S2 = Toluene-D8	65-129%
S3 = 4-Bromofluorobenzene	63-137%

5.7.2  
 5

## GC/MS Semi-volatiles

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries

## Method Blank Summary

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**Job Number:** MC48722**Account:** BBLNYS Arcadis**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MB	R50705.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

**The QC reported here applies to the following samples:****Method:** SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	240	11	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	480	11	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	480	26	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	480	200	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	480	100	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	480	47	ug/kg	
95-48-7	2-Methylphenol	ND	480	51	ug/kg	
	3&4-Methylphenol	ND	480	42	ug/kg	
88-75-5	2-Nitrophenol	ND	480	37	ug/kg	
100-02-7	4-Nitrophenol	ND	480	55	ug/kg	
87-86-5	Pentachlorophenol	ND	480	54	ug/kg	
108-95-2	Phenol	ND	240	10	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	480	14	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	480	8.7	ug/kg	
83-32-9	Acenaphthene	ND	95	6.5	ug/kg	
208-96-8	Acenaphthylene	ND	95	7.5	ug/kg	
120-12-7	Anthracene	ND	95	7.7	ug/kg	
56-55-3	Benzo(a)anthracene	ND	95	9.4	ug/kg	
50-32-8	Benzo(a)pyrene	ND	240	8.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	95	11	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	95	9.2	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	95	13	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	240	9.9	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	240	12	ug/kg	
91-58-7	2-Chloronaphthalene	ND	240	9.5	ug/kg	
106-47-8	4-Chloroaniline	ND	480	11	ug/kg	
86-74-8	Carbazole	ND	95	8.2	ug/kg	
218-01-9	Chrysene	ND	95	7.4	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	240	9.3	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	240	8.6	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	240	12	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	240	11	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	240	8.1	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	240	7.1	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	240	9.6	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	480	12	ug/kg	



## Method Blank Summary

Page 2 of 3

**Job Number:** MC48722**Account:** BBLNYS Arcadis**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MB	R50705.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

**The QC reported here applies to the following samples:****Method:** SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	480	11	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	480	31	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	95	7.8	ug/kg	
132-64-9	Dibenzofuran	ND	95	7.4	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	240	10	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	240	8.1	ug/kg	
84-66-2	Diethyl phthalate	ND	240	7.6	ug/kg	
131-11-3	Dimethyl phthalate	ND	240	7.5	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	240	9.5	ug/kg	
206-44-0	Fluoranthene	ND	95	8.7	ug/kg	
86-73-7	Fluorene	ND	95	11	ug/kg	
118-74-1	Hexachlorobenzene	ND	240	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	240	9.2	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	480	11	ug/kg	
67-72-1	Hexachloroethane	ND	240	23	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	240	26	ug/kg	
78-59-1	Isophorone	ND	240	17	ug/kg	
91-57-6	2-Methylnaphthalene	ND	95	11	ug/kg	
88-74-4	2-Nitroaniline	ND	480	11	ug/kg	
99-09-2	3-Nitroaniline	ND	480	11	ug/kg	
100-01-6	4-Nitroaniline	ND	480	11	ug/kg	
91-20-3	Naphthalene	ND	95	8.1	ug/kg	
98-95-3	Nitrobenzene	ND	240	26	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	240	13	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	240	32	ug/kg	
85-01-8	Phenanthrene	ND	95	7.1	ug/kg	
129-00-0	Pyrene	ND	95	9.2	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	240	12	ug/kg	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	30% 25-109%
4165-62-2	Phenol-d5	34% 29-113%
118-79-6	2,4,6-Tribromophenol	57% 20-141%
4165-60-0	Nitrobenzene-d5	29% 27-115%

## Method Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MB	R50705.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Surrogate Recoveries	Limits
321-60-8	2-Fluorobiphenyl	43% 34-118%
1718-51-0	Terphenyl-d14	81% 42-139%

## Method Blank Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-MB1	R50878.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	41% 10-73%
4165-62-2	Phenol-d5	25% 10-58%
118-79-6	2,4,6-Tribromophenol	76% 15-125%
4165-60-0	Nitrobenzene-d5	65% 23-120%
321-60-8	2-Fluorobiphenyl	69% 31-102%
1718-51-0	Terphenyl-d14	101% 42-124%

## Method Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-MB	W30954.D	1	11/11/16	MR	11/10/16	OP49119	MSW1256

The QC reported here applies to the following samples:

Method: SW846 8270D

OP49119-MS, OP49119-MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	38% 10-73%
4165-62-2	Phenol-d5	24% 10-58%
118-79-6	2,4,6-Tribromophenol	88% 15-125%
4165-60-0	Nitrobenzene-d5	62% 23-120%
321-60-8	2-Fluorobiphenyl	67% 31-102%
1718-51-0	Terphenyl-d14	85% 42-124%

## Method Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-MB2	R50865.D	1	11/23/16	MR	11/22/16	OP49119	MSR1896

The QC reported here applies to the following samples:

Method: SW846 8270D

OP49119-LS2, OP49119-LS3

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	32% 10-73%
4165-62-2	Phenol-d5	22% 10-58%
118-79-6	2,4,6-Tribromophenol	70% 15-125%
4165-60-0	Nitrobenzene-d5	52% 23-120%
321-60-8	2-Fluorobiphenyl	57% 31-102%
1718-51-0	Terphenyl-d14	93% 42-124%

## Leachate Blank Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LB1	R50878A.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	41% 10-73%
4165-62-2	Phenol-d5	25% 10-58%
118-79-6	2,4,6-Tribromophenol	76% 15-125%
4165-60-0	Nitrobenzene-d5	65% 23-120%
321-60-8	2-Fluorobiphenyl	69% 31-102%
1718-51-0	Terphenyl-d14	101% 42-124%

# Leachate Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LB	W30954A.D	1	11/11/16	MR	11/10/16	OP49119	MSW1256

The QC reported here applies to the following samples:

Method: SW846 8270D

OP49119-MS, OP49119-MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	38% 10-73%
4165-62-2	Phenol-d5	24% 10-58%
118-79-6	2,4,6-Tribromophenol	88% 15-125%
4165-60-0	Nitrobenzene-d5	62% 23-120%
321-60-8	2-Fluorobiphenyl	67% 31-102%
1718-51-0	Terphenyl-d14	85% 42-124%

# Leachate Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LB2	R50865A.D	1	11/23/16	MR	11/22/16	OP49119	MSR1896

The QC reported here applies to the following samples:

Method: SW846 8270D

OP49119-LS2, OP49119-LS3

CAS No.	Compound	Result	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	100	3.2	ug/l	
	3&4-Methylphenol	ND	100	5.4	ug/l	
87-86-5	Pentachlorophenol	ND	100	5.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	100	5.2	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	100	3.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	3.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	100	12	ug/l	
118-74-1	Hexachlorobenzene	ND	50	4.1	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	4.3	ug/l	
67-72-1	Hexachloroethane	ND	50	3.6	ug/l	
98-95-3	Nitrobenzene	ND	50	4.2	ug/l	
110-86-1	Pyridine	ND	100	13	ug/l	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	32% 10-73%
4165-62-2	Phenol-d5	22% 10-58%
118-79-6	2,4,6-Tribromophenol	70% 15-125%
4165-60-0	Nitrobenzene-d5	52% 23-120%
321-60-8	2-Fluorobiphenyl	57% 31-102%
1718-51-0	Terphenyl-d14	93% 42-124%



## Blank Spike Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-BS1	R50879.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
95-48-7	2-Methylphenol	500	365	73	20-112
	3&4-Methylphenol	1000	650	65	19-102
87-86-5	Pentachlorophenol	500	351	70	28-117
95-95-4	2,4,5-Trichlorophenol	500	532	106	56-112
88-06-2	2,4,6-Trichlorophenol	500	525	105	54-112
106-46-7	1,4-Dichlorobenzene	500	405	81	30-90
121-14-2	2,4-Dinitrotoluene	500	535	107	62-121
118-74-1	Hexachlorobenzene	500	522	104	49-128
87-68-3	Hexachlorobutadiene	500	406	81	22-96
67-72-1	Hexachloroethane	500	368	74	22-86
98-95-3	Nitrobenzene	500	425	85	50-117
110-86-1	Pyridine	500	178	36	10-86

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	50%	10-73%
4165-62-2	Phenol-d5	32%	10-58%
118-79-6	2,4,6-Tribromophenol	90%	15-125%
4165-60-0	Nitrobenzene-d5	78%	23-120%
321-60-8	2-Fluorobiphenyl	87%	31-102%
1718-51-0	Terphenyl-d14	94%	42-124%

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-BS	R50706.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-BSD	R50714.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
95-57-8	2-Chlorophenol	2400	1580	66	2200	89	33* a	39-104/30
59-50-7	4-Chloro-3-methyl phenol	2400	1640	68	2150	87	27	51-110/30
120-83-2	2,4-Dichlorophenol	2400	1660	69	2240	90	30	47-109/30
105-67-9	2,4-Dimethylphenol	2400	1630	68	2200	89	30	43-105/30
51-28-5	2,4-Dinitrophenol	2400	610	25	703	28	14	10-130/30
534-52-1	4,6-Dinitro-o-cresol	2400	1190	50	941	38	23	16-140/30
95-48-7	2-Methylphenol	2400	1590	66	2220	90	33* a	40-105/30
	3&4-Methylphenol	4800	3130	65	4300	87	31* a	39-113/30
88-75-5	2-Nitrophenol	2400	1520	63	2030	82	29	41-112/30
100-02-7	4-Nitrophenol	2400	1750	73	2450	99	33* a	28-134/30
87-86-5	Pentachlorophenol	2400	1410	59	1910	77	30	22-123/30
108-95-2	Phenol	2400	1550	65	2060	83	28	40-107/30
95-95-4	2,4,5-Trichlorophenol	2400	1930	80	2450	99	24	54-115/30
88-06-2	2,4,6-Trichlorophenol	2400	1890	79	2440	99	25	51-110/30
83-32-9	Acenaphthene	2400	1800	75	2300	93	24	49-108/30
208-96-8	Acenaphthylene	2400	1660	69	2150	87	26	37-102/30
120-12-7	Anthracene	2400	1690	70	2230	90	28	54-111/30
56-55-3	Benzo(a)anthracene	2400	1760	73	2380	96	30	56-117/30
50-32-8	Benzo(a)pyrene	2400	1730	72	2320	94	29	57-117/30
205-99-2	Benzo(b)fluoranthene	2400	1750	73	2280	92	26	55-122/30
191-24-2	Benzo(g,h,i)perylene	2400	1660	69	2210	89	28	52-123/30
207-08-9	Benzo(k)fluoranthene	2400	1760	73	2370	96	30	54-117/30
101-55-3	4-Bromophenyl phenyl ether	2400	2070	86	2670	108	25	54-118/30
85-68-7	Butyl benzyl phthalate	2400	1990	83	2800	113	34* a	54-121/30
91-58-7	2-Chloronaphthalene	2400	1840	77	2400	97	26	46-114/30
106-47-8	4-Chloroaniline	2400	1320	55	666	27	66* a	12-88/30
86-74-8	Carbazole	2400	1730	72	2300	93	28	56-116/30
218-01-9	Chrysene	2400	1720	72	2290	92	28	56-114/30
111-91-1	bis(2-Chloroethoxy)methane	2400	1540	64	2090	84	30	41-106/30
111-44-4	bis(2-Chloroethyl)ether	2400	1690	70	2310	93	31* a	28-113/30
108-60-1	bis(2-Chloroisopropyl)ether	2400	1790	75	2480	100	32* a	30-132/30
7005-72-3	4-Chlorophenyl phenyl ether	2400	2100	87	2730	110	26	54-114/30
95-50-1	1,2-Dichlorobenzene	2400	1750	73	2330	94	28	34-100/30
541-73-1	1,3-Dichlorobenzene	2400	1740	72	2360	95	30	35-99/30
106-46-7	1,4-Dichlorobenzene	2400	1690	70	2270	92	29	35-98/30
121-14-2	2,4-Dinitrotoluene	2400	1920	80	2480	100	25	50-121/30

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-BS	R50706.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-BSD	R50714.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
606-20-2	2,6-Dinitrotoluene	2400	1830	76	2360	95	25	52-115/30
91-94-1	3,3'-Dichlorobenzidine	2400	1260	52	1420	57	12	17-120/30
53-70-3	Dibenzo(a,h)anthracene	2400	1650	69	2210	89	29	54-121/30
132-64-9	Dibenzofuran	2400	1830	76	2370	96	26	52-109/30
84-74-2	Di-n-butyl phthalate	2400	1940	81	2640	107	31* a	55-113/30
117-84-0	Di-n-octyl phthalate	2400	1850	77	2470	100	29	53-126/30
84-66-2	Diethyl phthalate	2400	2080	87	2730	110	27	54-111/30
131-11-3	Dimethyl phthalate	2400	2060	86	2690	109	27	53-111/30
117-81-7	bis(2-Ethylhexyl)phthalate	2400	1870	78	2590	105	32* a	55-125/30
206-44-0	Fluoranthene	2400	1790	75	2350	95	27	55-116/30
86-73-7	Fluorene	2400	1950	81	2520	102	26	52-111/30
118-74-1	Hexachlorobenzene	2400	1880	78	2440	99	26	52-117/30
87-68-3	Hexachlorobutadiene	2400	1700	71	2310	93	30	36-108/30
77-47-4	Hexachlorocyclopentadiene	2400	1240	52	1290	52	4	10-99/30
67-72-1	Hexachloroethane	2400	1580	66	2120	86	29	33-100/30
193-39-5	Indeno(1,2,3-cd)pyrene	2400	1630	68	2200	89	30	55-120/30
78-59-1	Isophorone	2400	1660	69	2200	89	28	37-101/30
91-57-6	2-Methylnaphthalene	2400	1640	68	2200	89	29	38-114/30
88-74-4	2-Nitroaniline	2400	1780	74	2330	94	27	55-120/30
99-09-2	3-Nitroaniline	2400	1600	67	1270	51	23	31-103/30
100-01-6	4-Nitroaniline	2400	1650	69	1900	77	14	50-112/30
91-20-3	Naphthalene	2400	2050	85	2960	120	36* a	27-128/30
98-95-3	Nitrobenzene	2400	1590	66	2150	87	30	33-108/30
621-64-7	N-Nitroso-di-n-propylamine	2400	1750	73	2400	97	31* a	37-112/30
86-30-6	N-Nitrosodiphenylamine	2400	1710	71	2300	93	29	47-114/30
85-01-8	Phenanthrene	2400	1780	74	2340	94	27	54-112/30
129-00-0	Pyrene	2400	1860	77	2540	103	31* a	54-118/30
120-82-1	1,2,4-Trichlorobenzene	2400	1780	74	2430	98	31* a	38-105/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
367-12-4	2-Fluorophenol	63%	81%	25-109%
4165-62-2	Phenol-d5	66%	82%	29-113%
118-79-6	2,4,6-Tribromophenol	74%	88%	20-141%
4165-60-0	Nitrobenzene-d5	63%	79%	27-115%

\* = Outside of Control Limits.

## Blank Spike/Blank Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-BS	R50706.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-BSD	R50714.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
321-60-8	2-Fluorobiphenyl	74%	88%	34-118%
1718-51-0	Terphenyl-d14	80%	96%	42-139%

(a) Outside control limits. Individual spike recoveries within acceptance limits.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-MS	W30956.D	1	11/11/16	MR	11/10/16	OP49119	MSW1256
OP49119-MSD	W30957.D	1	11/11/16	MR	11/10/16	OP49119	MSW1256
MC48658-1	W30958.D	1	11/11/16	MR	11/10/16	OP49119	MSW1256

**The QC reported here applies to the following samples:**

**Method:** SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48658-1 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
95-48-7	2-Methylphenol	ND	500	314	63	500	299	60	5	30-130/20
	3&4-Methylphenol	ND	1000	582	58	1000	552	55	5	30-130/20
87-86-5	Pentachlorophenol	ND	500	367	73	500	362	72	1	30-130/20
95-95-4	2,4,5-Trichlorophenol	ND	500	469	94	500	454	91	3	30-130/20
88-06-2	2,4,6-Trichlorophenol	ND	500	463	93	500	436	87	6	30-130/20
106-46-7	1,4-Dichlorobenzene	ND	500	315	63	500	266	53	17	40-140/20
121-14-2	2,4-Dinitrotoluene	ND	500	471	94	500	472	94	0	40-140/20
118-74-1	Hexachlorobenzene	ND	500	491	98	500	482	96	2	40-140/20
87-68-3	Hexachlorobutadiene	ND	500	318	64	500	264	53	19	40-140/20
67-72-1	Hexachloroethane	ND	500	281	56	500	243	49	15	40-140/20
98-95-3	Nitrobenzene	ND	500	373	75	500	336	67	10	40-140/20
110-86-1	Pyridine	ND	500	184	37	500	186	37	1	10-86/20

CAS No.	Surrogate Recoveries	MS	MSD	MC48658-1	Limits
367-12-4	2-Fluorophenol	43%	41%	41%	10-73%
4165-62-2	Phenol-d5	27%	26%	26%	10-58%
118-79-6	2,4,6-Tribromophenol	100%	99%	93%	15-125%
4165-60-0	Nitrobenzene-d5	72%	66%	67%	23-120%
321-60-8	2-Fluorobiphenyl	75%	67%	70%	31-102%
1718-51-0	Terphenyl-d14	88%	89%	85%	42-124%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MS	R50710.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-MSD	R50712.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
MC48723-45	R50713.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	MC48723-45 Spike ug/kg	Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
95-57-8	2-Chlorophenol	ND		3170	1870	59	3040	1510	50	27-112/30
59-50-7	4-Chloro-3-methyl phenol	ND		3170	2380	75	3040	2240	74	30-130/30
120-83-2	2,4-Dichlorophenol	ND		3170	2400	76	3040	2090	69	36-119/30
105-67-9	2,4-Dimethylphenol	ND		3170	2050	65	3040	1790	59	28-118/30
51-28-5	2,4-Dinitrophenol	ND		3170	550	17	3040	481	16	10-149/30
534-52-1	4,6-Dinitro-o-cresol	ND		3170	823	26	3040	489	16	51* a 10-150/30
95-48-7	2-Methylphenol	ND		3170	2040	64	3040	1710	56	18 23-119/30
	3&4-Methylphenol	ND		6330	4120	65	6070	3590	59	14 24-124/30
88-75-5	2-Nitrophenol	ND		3170	1950	62	3040	1470	48	28 23-126/30
100-02-7	4-Nitrophenol	ND		3170	2600	82	3040	2440	80	6 18-141/30
87-86-5	Pentachlorophenol	ND		3170	2010	63	3040	1870	62	7 10-145/30
108-95-2	Phenol	ND		3170	1900	60	3040	1600	53	17 25-119/30
95-95-4	2,4,5-Trichlorophenol	ND		3170	2820	89	3040	2610	86	8 34-128/30
88-06-2	2,4,6-Trichlorophenol	ND		3170	2750	87	3040	2500	82	10 32-124/30
83-32-9	Acenaphthene	ND		3170	2530	80	3040	2340	77	8 27-133/30
208-96-8	Acenaphthylene	ND		3170	2350	74	3040	2180	72	8 25-111/30
120-12-7	Anthracene	ND		3170	2520	80	3040	2430	80	4 25-138/30
56-55-3	Benzo(a)anthracene	ND		3170	2690	85	3040	2590	85	4 23-147/30
50-32-8	Benzo(a)pyrene	ND		3170	2640	83	3040	2540	84	4 24-144/30
205-99-2	Benzo(b)fluoranthene	ND		3170	2600	82	3040	2510	83	4 25-149/30
191-24-2	Benzo(g,h,i)perylene	ND		3170	2710	86	3040	2390	79	13 18-150/30
207-08-9	Benzo(k)fluoranthene	ND		3170	2640	83	3040	2560	84	3 18-143/30
101-55-3	4-Bromophenyl phenyl ether	ND		3170	3040	96	3040	2910	96	4 42-128/30
85-68-7	Butyl benzyl phthalate	ND		3170	3110	98	3040	2960	97	5 39-132/30
91-58-7	2-Chloronaphthalene	ND		3170	2530	80	3040	2300	76	10 39-121/30
106-47-8	4-Chloroaniline	ND		3170	1640	52	3040	1320	43	22 10-105/30
86-74-8	Carbazole	ND		3170	2580	81	3040	2480	82	4 32-134/30
218-01-9	Chrysene	ND		3170	2600	82	3040	2520	83	3 23-145/30
111-91-1	bis(2-Chloroethoxy)methane	ND		3170	2040	64	3040	1750	58	15 32-114/30
111-44-4	bis(2-Chloroethyl)ether	ND		3170	1680	53	3040	1410	46	17 25-111/30
108-60-1	bis(2-Chloroisopropyl)ether	ND		3170	1910	60	3040	1570	52	20 24-136/30
7005-72-3	4-Chlorophenyl phenyl ether	ND		3170	3070	97	3040	2930	96	5 42-123/30
95-50-1	1,2-Dichlorobenzene	ND		3170	1480	47	3040	1310	43	12 25-105/30
541-73-1	1,3-Dichlorobenzene	ND		3170	1390	44	3040	1280	42	8 26-103/30
106-46-7	1,4-Dichlorobenzene	ND		3170	1370	43	3040	1270	42	8 25-104/30
121-14-2	2,4-Dinitrotoluene	ND		3170	2850	90	3040	2600	86	9 34-129/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MS	R50710.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-MSD	R50712.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
MC48723-45	R50713.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	MC48723-45 Spike ug/kg	Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
606-20-2	2,6-Dinitrotoluene	ND		3170	2710	86	3040	2500	8	39-124/30
91-94-1	3,3'-Dichlorobenzidine	ND		3170	1380	44	3040	1320	4	10-139/30
53-70-3	Dibenzo(a,h)anthracene	ND		3170	2630	83	3040	2430	8	35-134/30
132-64-9	Dibenzofuran	ND		3170	2600	82	3040	2450	6	30-131/30
84-74-2	Di-n-butyl phthalate	ND		3170	2970	94	3040	2850	4	41-123/30
117-84-0	Di-n-octyl phthalate	ND		3170	2790	88	3040	2630	6	33-142/30
84-66-2	Diethyl phthalate	ND		3170	3100	98	3040	2960	5	42-119/30
131-11-3	Dimethyl phthalate	ND		3170	3020	95	3040	2910	4	38-122/30
117-81-7	bis(2-Ethylhexyl)phthalate	ND		3170	2890	91	3040	2780	4	35-141/30
206-44-0	Fluoranthene	ND		3170	2700	85	3040	2570	5	17-151/30
86-73-7	Fluorene	ND		3170	2790	88	3040	2640	6	34-128/30
118-74-1	Hexachlorobenzene	ND		3170	2810	89	3040	2650	6	40-125/30
87-68-3	Hexachlorobutadiene	ND		3170	1820	57	3040	1490	20	30-113/30
77-47-4	Hexachlorocyclopentadiene	ND		3170	1330	42	3040	798	26	50* a 10-103/30
67-72-1	Hexachloroethane	ND		3170	1320	42	3040	1110	37	17 10-125/30
193-39-5	Indeno(1,2,3-cd)pyrene	ND		3170	2600	82	3040	2390	79	8 22-147/30
78-59-1	Isophorone	ND		3170	2140	68	3040	1890	62	12 29-109/30
91-57-6	2-Methylnaphthalene	35.5	J	3170	2160	67	3040	1910	62	12 26-127/30
88-74-4	2-Nitroaniline	ND		3170	2610	82	3040	2470	81	6 40-128/30
99-09-2	3-Nitroaniline	ND		3170	2310	73	3040	2110	69	9 21-116/30
100-01-6	4-Nitroaniline	ND		3170	2350	74	3040	2280	75	3 21-125/30
91-20-3	Naphthalene	ND		3170	2570	81	3040	2290	75	12 18-135/30
98-95-3	Nitrobenzene	ND		3170	1820	57	3040	1560	51	15 29-110/30
621-64-7	N-Nitroso-di-n-propylamine	ND		3170	2150	68	3040	1800	59	18 22-128/30
86-30-6	N-Nitrosodiphenylamine	ND		3170	2520	80	3040	2470	81	2 22-142/30
85-01-8	Phenanthrene	22.3	J	3170	2660	83	3040	2560	84	4 21-141/30
129-00-0	Pyrene	ND		3170	2820	89	3040	2690	89	5 22-148/30
120-82-1	1,2,4-Trichlorobenzene	ND		3170	2010	63	3040	1690	56	17 30-113/30

CAS No.	Surrogate Recoveries	MS	MSD	MC48723-45 Limits
367-12-4	2-Fluorophenol	51%	43%	42% 25-109%
4165-62-2	Phenol-d5	62%	54%	54% 29-113%
118-79-6	2,4,6-Tribromophenol	83%	81%	71% 20-141%
4165-60-0	Nitrobenzene-d5	56%	48%	46% 27-115%

\* = Outside of Control Limits.

## Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49144-MS	R50710.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
OP49144-MSD	R50712.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889
MC48723-45	R50713.D	1	11/16/16	MR	11/14/16	OP49144	MSR1889

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-1, MC48722-2, MC48722-4

CAS No.	Surrogate Recoveries	MS	MSD	MC48723-45 Limits	
321-60-8	2-Fluorobiphenyl	78%	73%	73%	34-118%
1718-51-0	Terphenyl-d14	92%	91%	95%	42-139%

(a) Outside control limits. Individual spike recoveries within acceptance limits.

\* = Outside of Control Limits.



# Leachate Spike Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LS1	R50880.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897
MC48722-2A	R50882.D	1	11/26/16	DRY	11/16/16	OP49119	MSR1897

**The QC reported here applies to the following samples:**

**Method:** SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48722-2ASpike		LS	LS	Limits
		ug/l	Q ug/l	ug/l	%	
95-48-7	2-Methylphenol	ND	500	354	71	30-130
	3&4-Methylphenol	ND	1000	634	63	30-130
87-86-5	Pentachlorophenol	ND	500	338	68	30-130
95-95-4	2,4,5-Trichlorophenol	ND	500	525	105	30-130
88-06-2	2,4,6-Trichlorophenol	ND	500	509	102	30-130
106-46-7	1,4-Dichlorobenzene	ND	500	398	80	40-140
121-14-2	2,4-Dinitrotoluene	ND	500	523	105	40-140
118-74-1	Hexachlorobenzene	ND	500	517	103	40-140
87-68-3	Hexachlorobutadiene	ND	500	405	81	40-140
67-72-1	Hexachloroethane	ND	500	360	72	40-140
98-95-3	Nitrobenzene	ND	500	431	86	40-140
110-86-1	Pyridine	ND	500	226	45	10-86

CAS No.	Surrogate Recoveries	LS	MC48722-2ALimits
367-12-4	2-Fluorophenol	52%	48% 10-73%
4165-62-2	Phenol-d5	34%	29% 10-58%
118-79-6	2,4,6-Tribromophenol	91%	79% 15-125%
4165-60-0	Nitrobenzene-d5	80%	74% 23-120%
321-60-8	2-Fluorobiphenyl	87%	80% 31-102%
1718-51-0	Terphenyl-d14	93%	94% 42-124%

\* = Outside of Control Limits.

# Leachate Spike Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LS2	R50867.D	1	11/23/16	MR	11/22/16	OP49119	MSR1896
MC48791-2	R50869.D	1	11/23/16	MR	11/22/16	OP49119	MSR1896

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48791-2 ug/l	Spike Q	LS ug/l	LS %	Limits
95-48-7	2-Methylphenol	ND	500	380	76	30-130
	3&4-Methylphenol	ND	1000	681	68	30-130
87-86-5	Pentachlorophenol	ND	500	420	84	30-130
95-95-4	2,4,5-Trichlorophenol	ND	500	507	101	30-130
88-06-2	2,4,6-Trichlorophenol	ND	500	488	98	30-130
106-46-7	1,4-Dichlorobenzene	ND	500	466	93	40-140
121-14-2	2,4-Dinitrotoluene	ND	500	504	101	40-140
118-74-1	Hexachlorobenzene	ND	500	496	99	40-140
87-68-3	Hexachlorobutadiene	ND	500	448	90	40-140
67-72-1	Hexachloroethane	ND	500	217	43	40-140
98-95-3	Nitrobenzene	ND	500	427	85	40-140
110-86-1	Pyridine	ND	500	206	41	10-86

CAS No.	Surrogate Recoveries	LS	MC48791-2	Limits
367-12-4	2-Fluorophenol	52%	41%	10-73%
4165-62-2	Phenol-d5	37%	26%	10-58%
118-79-6	2,4,6-Tribromophenol	90%	83%	15-125%
4165-60-0	Nitrobenzene-d5	77%	63%	23-120%
321-60-8	2-Fluorobiphenyl	83%	69%	31-102%
1718-51-0	Terphenyl-d14	92%	91%	42-124%

\* = Outside of Control Limits.

# Leachate Spike Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49119-LS3	R50897.D	1	11/28/16	MR	11/22/16	OP49119	MSR1898
MC48853-7	R50898.D	1	11/28/16	MR	11/22/16	OP49119	MSR1898

The QC reported here applies to the following samples:

Method: SW846 8270D

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48853-7 ug/l	Spike Q	LS ug/l	LS %	Limits
95-48-7	2-Methylphenol	ND	500	388	78	30-130
	3&4-Methylphenol	ND	1000	692	69	30-130
87-86-5	Pentachlorophenol	ND	500	367	73	30-130
95-95-4	2,4,5-Trichlorophenol	ND	500	522	104	30-130
88-06-2	2,4,6-Trichlorophenol	ND	500	499	100	30-130
106-46-7	1,4-Dichlorobenzene	ND	500	341	68	40-140
121-14-2	2,4-Dinitrotoluene	ND	500	567	113	40-140
118-74-1	Hexachlorobenzene	ND	500	502	100	40-140
87-68-3	Hexachlorobutadiene	ND	500	340	68	40-140
67-72-1	Hexachloroethane	ND	500	308	62	40-140
98-95-3	Nitrobenzene	ND	500	431	86	40-140
110-86-1	Pyridine	ND	500	167	33	10-86

CAS No.	Surrogate Recoveries	LS	MC48853-7	Limits
367-12-4	2-Fluorophenol	47%	47%	10-73%
4165-62-2	Phenol-d5	33%	30%	10-58%
118-79-6	2,4,6-Tribromophenol	81%	76%	15-125%
4165-60-0	Nitrobenzene-d5	75%	71%	23-120%
321-60-8	2-Fluorobiphenyl	70%	71%	31-102%
1718-51-0	Terphenyl-d14	88%	81%	42-124%

\* = Outside of Control Limits.

# Semivolatile Surrogate Recovery Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

**Method:** SW846 8270D

**Matrix:** LEACHATE

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
MC48722-3	R50883.D	46	29	79	76	82	94
MC48722-1A	R50881.D	48	30	83	73	78	94
MC48722-2A	R50882.D	48	29	79	74	80	94
OP49119-BS1	R50879.D	50	32	90	78	87	94
OP49119-LB1	R50878A.D	41	25	76	65	69	101
OP49119-LS1	R50880.D	52	34	91	80	87	93
OP49119-LS2	R50867.D	52	37	90	77	83	92
OP49119-LS3	R50897.D	47	33	81	75	70	88
OP49119-MB1	R50878.D	41	25	76	65	69	101
OP49119-MS	W30956.D	43	27	100	72	75	88
OP49119-MSD	W30957.D	41	26	99	66	67	89
OP49119-LB	W30954A.D	38	24	88	62	67	85
OP49119-LB2	R50865A.D	32	22	70	52	57	93
OP49119-MB	W30954.D	38	24	88	62	67	85
OP49119-MB2	R50865.D	32	22	70	52	57	93

## Surrogate Compounds

## Recovery Limits

<b>S1</b> = 2-Fluorophenol	10-73%
<b>S2</b> = Phenol-d5	10-58%
<b>S3</b> = 2,4,6-Tribromophenol	15-125%
<b>S4</b> = Nitrobenzene-d5	23-120%
<b>S5</b> = 2-Fluorobiphenyl	31-102%
<b>S6</b> = Terphenyl-d14	42-124%

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Semivolatile Surrogate Recovery Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Method: SW846 8270D	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
MC48722-1	R50715.D	36	50	81	42	70	88
MC48722-2	R50716.D	57	66	81	59	80	87
MC48722-4	R50717.D	60	68	82	66	82	89
OP49144-BS	R50706.D	63	66	74	63	74	80
OP49144-BSD	R50714.D	81	82	88	79	88	96
OP49144-MB	R50705.D	30	34	57	29	43	81
OP49144-MS	R50710.D	51	62	83	56	78	92
OP49144-MSD	R50712.D	43	54	81	48	73	91

Surrogate Compounds	Recovery Limits
S1 = 2-Fluorophenol	25-109%
S2 = Phenol-d5	29-113%
S3 = 2,4,6-Tribromophenol	20-141%
S4 = Nitrobenzene-d5	27-115%
S5 = 2-Fluorobiphenyl	34-118%
S6 = Terphenyl-d14	42-139%

## GC Volatiles

## QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries

Method Blank Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GWX3867-MB	WX78122.D	1	11/17/16	AF	n/a	n/a	GWX3867

The QC reported here applies to the following samples: Method: SW846 8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	ND	5.0	0.94	mg/kg	

CAS No.	Surrogate Recoveries	Limits
	2,3,4-Trifluorotoluene	106% 64-127%

7.1.1  
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Blank Spike/Blank Spike Duplicate Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GWX3867-BSP	WX78123.D	1	11/17/16	AF	n/a	n/a	GWX3867
GWX3867-BSD	WX78124.D	1	11/17/16	AF	n/a	n/a	GWX3867

The QC reported here applies to the following samples: Method: SW846 8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	BSD mg/kg	BSD %	RPD	Limits Rec/RPD
	TPH-GRO (VOA)	50	55.1	110	53.4	107	3	80-120/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
	2,3,4-Trifluorotoluene	106%	106%	64-127%

\* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC48722-1MS	WX78129.D	1	11/17/16	AF	n/a	n/a	GWX3867
MC48722-1MSD	WX78130.D	1	11/17/16	AF	n/a	n/a	GWX3867
MC48722-1	WX78128.D	1	11/17/16	AF	n/a	n/a	GWX3867

The QC reported here applies to the following samples: Method: SW846 8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	MC48722-1 mg/kg	Spike Q	mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (VOA)	4.46	J	118	130	107	118	132	109	2	54-130/20

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-1	Limits
	2,3,4-Trifluorotoluene	105%	106%	102%	64-127%

\* = Outside of Control Limits.

**Volatile Surrogate Recovery Summary**

**Job Number:** MC48722  
**Account:** BBLNYS Arcadis  
**Project:** National Grid, Washington Street, Rensselaer, NY

<b>Method:</b> SW846 8015	<b>Matrix:</b> SO
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**Samples and QC shown here apply to the above method**

Lab Sample ID	Lab File ID	S1 <sup>a</sup>
MC48722-1	WX78128.D	102
MC48722-2	WX78127.D	102
MC48722-4	WX78125.D	107
GWX3867-BSD	WX78124.D	106
GWX3867-BSP	WX78123.D	106
GWX3867-MB	WX78122.D	106
MC48722-1MS	WX78129.D	105
MC48722-1MSD	WX78130.D	106

Surrogate Compounds	Recovery Limits
S1 = 2,3,4-Trifluorotoluene	64-127%

(a) Recovery from GC signal #1

## GC Semi-volatiles

## QC Data Summaries



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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries

Method Blank Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49161-MB	YZ98708.D	1	11/28/16	TA	11/16/16	OP49161	GYZ8038

The QC reported here applies to the following samples: Method: SW846 8151

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	10	3.4	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	10	4.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
19719-28-9	2,4-DCAA	75% 30-150%
19719-28-9	2,4-DCAA	68% 30-150%

8.1.1  
8

## Method Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49159-MB	BE53422.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688

The QC reported here applies to the following samples:

Method: SW846 8081B

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	0.50	0.044	ug/l	
12789-03-6	Chlordane	ND	5.0	1.1	ug/l	
72-20-8	Endrin	ND	0.50	0.12	ug/l	
76-44-8	Heptachlor	ND	0.50	0.11	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.50	0.051	ug/l	
72-43-5	Methoxychlor	ND	0.50	0.21	ug/l	
8001-35-2	Toxaphene	ND	25	1.3	ug/l	

CAS No.	Surrogate Recoveries	Limits
877-09-8	Tetrachloro-m-xylene	62% 30-150%
877-09-8	Tetrachloro-m-xylene	73% 30-150%
2051-24-3	Decachlorobiphenyl	90% 30-150%
2051-24-3	Decachlorobiphenyl	80% 30-150%

8.1.2

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## Method Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49147-MB	BK63151.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	25	2.5	ug/kg	
11104-28-2	Aroclor 1221	ND	25	11	ug/kg	
11141-16-5	Aroclor 1232	ND	25	7.6	ug/kg	
53469-21-9	Aroclor 1242	ND	25	5.7	ug/kg	
12672-29-6	Aroclor 1248	ND	25	4.3	ug/kg	
11097-69-1	Aroclor 1254	ND	25	11	ug/kg	
11096-82-5	Aroclor 1260	ND	25	2.3	ug/kg	

CAS No.	Surrogate Recoveries	Limits
877-09-8	Tetrachloro-m-xylene	85% 25-145%
877-09-8	Tetrachloro-m-xylene	87% 25-145%
2051-24-3	Decachlorobiphenyl	86% 25-179%
2051-24-3	Decachlorobiphenyl	87% 25-179%

8.1.3

8

## Method Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49160-MB	BK63180.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	2.5	1.6	ug/l	
11104-28-2	Aroclor 1221	ND	2.5	1.6	ug/l	
11141-16-5	Aroclor 1232	ND	2.5	1.8	ug/l	
53469-21-9	Aroclor 1242	ND	2.5	1.9	ug/l	
12672-29-6	Aroclor 1248	ND	2.5	1.2	ug/l	
11097-69-1	Aroclor 1254	ND	2.5	1.6	ug/l	
11096-82-5	Aroclor 1260	ND	2.5	1.9	ug/l	

CAS No.	Surrogate Recoveries	Limits
877-09-8	Tetrachloro-m-xylene	86% 30-150%
877-09-8	Tetrachloro-m-xylene	89% 30-150%
2051-24-3	Decachlorobiphenyl	94% 30-150%
2051-24-3	Decachlorobiphenyl	97% 30-150%

8.1.4

8

Method Blank Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49158-MB	IR3252.D	1	11/18/16	MD	11/16/16	OP49158	GIR226

The QC reported here applies to the following samples: Method: SW846-8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (Semi-VOA)	ND	16	4.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	79% 17-130%

8.1.5  
8



# Leachate Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49161-LB	YZ98708A.D	1	11/28/16	TA	11/16/16	OP49161	GYZ8038

The QC reported here applies to the following samples:

Method: SW846 8151

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	10	3.4	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	10	4.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
19719-28-9	2,4-DCAA	75% 30-150%
19719-28-9	2,4-DCAA	68% 30-150%

8.2.1

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## Leachate Blank Summary

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**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49159-LB	BE53422A.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688

The QC reported here applies to the following samples:

Method: SW846 8081B

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	0.50	0.044	ug/l	
12789-03-6	Chlordane	ND	5.0	1.1	ug/l	
72-20-8	Endrin	ND	0.50	0.12	ug/l	
76-44-8	Heptachlor	ND	0.50	0.11	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.50	0.051	ug/l	
72-43-5	Methoxychlor	ND	0.50	0.21	ug/l	
8001-35-2	Toxaphene	ND	25	1.3	ug/l	

CAS No.	Surrogate Recoveries	Limits
877-09-8	Tetrachloro-m-xylene	62% 30-150%
877-09-8	Tetrachloro-m-xylene	73% 30-150%
2051-24-3	Decachlorobiphenyl	90% 30-150%
2051-24-3	Decachlorobiphenyl	80% 30-150%

8.2.2

8

# Leachate Blank Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49160-LB	BK63180A.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1A, MC48722-2A

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	2.5	1.6	ug/l	
11104-28-2	Aroclor 1221	ND	2.5	1.6	ug/l	
11141-16-5	Aroclor 1232	ND	2.5	1.8	ug/l	
53469-21-9	Aroclor 1242	ND	2.5	1.9	ug/l	
12672-29-6	Aroclor 1248	ND	2.5	1.2	ug/l	
11097-69-1	Aroclor 1254	ND	2.5	1.6	ug/l	
11096-82-5	Aroclor 1260	ND	2.5	1.9	ug/l	

CAS No.	Surrogate Recoveries	Limits
877-09-8	Tetrachloro-m-xylene	86% 30-150%
877-09-8	Tetrachloro-m-xylene	89% 30-150%
2051-24-3	Decachlorobiphenyl	94% 30-150%
2051-24-3	Decachlorobiphenyl	97% 30-150%

8.2.3

8

## Blank Spike Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49161-BS	YZ98709.D	1	11/28/16	TA	11/16/16	OP49161	GYZ8038

The QC reported here applies to the following samples:

Method: SW846 8151

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
94-75-7	2,4-D	40	43.2	108	40-140
93-72-1	2,4,5-TP (Silvex)	40	40.9	102	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
19719-28-9	2,4-DCAA	101%	30-150%
19719-28-9	2,4-DCAA	96%	30-150%

\* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49159-BS	BE53423.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688

The QC reported here applies to the following samples: Method: SW846 8081B

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
58-89-9	gamma-BHC (Lindane)	5	4.4	88	40-140
72-20-8	Endrin	5	5.2	104	40-140
76-44-8	Heptachlor	5	4.5	90	40-140
1024-57-3	Heptachlor epoxide	5	4.6	92	40-140
72-43-5	Methoxychlor	5	5.5	110	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
877-09-8	Tetrachloro-m-xylene	75%	30-150%
877-09-8	Tetrachloro-m-xylene	69%	30-150%
2051-24-3	Decachlorobiphenyl	82%	30-150%
2051-24-3	Decachlorobiphenyl	70%	30-150%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49160-BS	BK63181.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1A, MC48722-2A

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
12674-11-2	Aroclor 1016	20	21.1	106	40-140
11104-28-2	Aroclor 1221		ND		40-140
11141-16-5	Aroclor 1232		ND		40-140
53469-21-9	Aroclor 1242		ND		40-140
12672-29-6	Aroclor 1248		ND		40-140
11097-69-1	Aroclor 1254		ND		40-140
11096-82-5	Aroclor 1260	20	22.5	113	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
877-09-8	Tetrachloro-m-xylene	86%	30-150%
877-09-8	Tetrachloro-m-xylene	86%	30-150%
2051-24-3	Decachlorobiphenyl	95%	30-150%
2051-24-3	Decachlorobiphenyl	99%	30-150%

\* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49158-BS	IR3253.D	1	11/18/16	MD	11/16/16	OP49158	GIR226

The QC reported here applies to the following samples: Method: SW846-8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (Semi-VOA)	160	141	88	29-125

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	82%	17-130%

\* = Outside of Control Limits.

## Blank Spike/Blank Spike Duplicate Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49147-BS	BK63152.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
OP49147-BSD	BK63164.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
12674-11-2	Aroclor 1016	262	263	100	290	113	10	47-144/30
11104-28-2	Aroclor 1221		ND		ND		nc	40-140/30
11141-16-5	Aroclor 1232		ND		ND		nc	40-140/30
53469-21-9	Aroclor 1242		ND		ND		nc	40-140/30
12672-29-6	Aroclor 1248		ND		ND		nc	40-140/30
11097-69-1	Aroclor 1254		ND		ND		nc	40-140/30
11096-82-5	Aroclor 1260	262	262	100	269	105	3	45-156/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
877-09-8	Tetrachloro-m-xylene	94%	104%	25-145%
877-09-8	Tetrachloro-m-xylene	95%	113%	25-145%
2051-24-3	Decachlorobiphenyl	90%	92%	25-179%
2051-24-3	Decachlorobiphenyl	95%	100%	25-179%

\* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49161-MS	YZ98710.D	1	11/28/16	TA	11/16/16	OP49161	GYZ8038
OP49161-MSD	YZ98713.D	1	11/28/16	TA	11/16/16	OP49161	GYZ8038
MC48722-2A	YZ98718.D	1	11/29/16	TA	11/16/16	OP49161	GYZ8038

The QC reported here applies to the following samples: Method: SW846 8151

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48722-2ASpike ug/l	Q	ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
94-75-7	2,4-D	ND	40	44.3		111	40	42.2	106	5	30-150/30
93-72-1	2,4,5-TP (Silvex)	ND	40	42.4		106	40	40.2	101	5	30-150/30

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-2ALimits
19719-28-9	2,4-DCAA	101%	100%	60% 30-150%
19719-28-9	2,4-DCAA	96%	95%	47% 30-150%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49159-MS	BE53424.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688
OP49159-MSD	BE53425.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688
MC48722-2A	BE53427.D	1	11/21/16	TA	11/16/16	OP49159	GBE2688

The QC reported here applies to the following samples:

Method: SW846 8081B

MC48722-3, MC48722-1A, MC48722-2A

CAS No.	Compound	MC48722-2ASpike ug/l	Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
58-89-9	gamma-BHC (Lindane)	ND	5	4.7	94	5	3.8	76	21	30-150/30
72-20-8	Endrin	ND	5	5.6	112	5	4.8	96	15	30-150/30
76-44-8	Heptachlor	ND	5	4.9	98	5	4.1	82	18	30-150/30
1024-57-3	Heptachlor epoxide	ND	5	5.0	100	5	4.1	82	20	30-150/30
72-43-5	Methoxychlor	ND	5	6.0	120	5	5.3	106	12	30-150/30

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-2ALimits	
877-09-8	Tetrachloro-m-xylene	75%	57%	47%	30-150%
877-09-8	Tetrachloro-m-xylene	70%	56%	61%	30-150%
2051-24-3	Decachlorobiphenyl	85%	76%	32%	30-150%
2051-24-3	Decachlorobiphenyl	72%	67%	65%	30-150%

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49147-MS	BK63153.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
OP49147-MSD	BK63154.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996
MC48722-1	BK63163.D	1	11/17/16	TA	11/15/16	OP49147	GBK1996

The QC reported here applies to the following samples: Method: SW846 8082A

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	MC48722-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
12674-11-2	Aroclor 1016	ND	333	311	93	344	286	83	8	24-164/50
11104-28-2	Aroclor 1221	ND		ND			ND		nc	40-140/50
11141-16-5	Aroclor 1232	ND		ND			ND		nc	40-140/50
53469-21-9	Aroclor 1242	ND		ND			ND		nc	40-140/50
12672-29-6	Aroclor 1248	ND		ND			ND		nc	40-140/50
11097-69-1	Aroclor 1254	ND		ND			ND		nc	40-140/50
11096-82-5	Aroclor 1260	ND	333	329	99	344	295	86	11	19-177/50

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-1	Limits
877-09-8	Tetrachloro-m-xylene	145%	84%	83%	25-145%
877-09-8	Tetrachloro-m-xylene	97%	73%	74%	25-145%
2051-24-3	Decachlorobiphenyl	83%	78%	76%	25-179%
2051-24-3	Decachlorobiphenyl	75%	80%	76%	25-179%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49160-MS	BK63182.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997
OP49160-MSD	BK63183.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997
MC48722-2A	BK63185.D	1	11/18/16	TA	11/16/16	OP49160	GBK1997

The QC reported here applies to the following samples:

Method: SW846 8082A

MC48722-1A, MC48722-2A

CAS No.	Compound	MC48722-2ASpike ug/l	Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
12674-11-2	Aroclor 1016	ND	20	20.5	103	20	21.4	107	4	40-140/50
11104-28-2	Aroclor 1221	ND		ND			ND		nc	40-140/50
11141-16-5	Aroclor 1232	ND		ND			ND		nc	40-140/50
53469-21-9	Aroclor 1242	ND		ND			ND		nc	40-140/50
12672-29-6	Aroclor 1248	ND		ND			ND		nc	40-140/50
11097-69-1	Aroclor 1254	ND		ND			ND		nc	40-140/50
11096-82-5	Aroclor 1260	ND	20	22.3	112	20	23.3	117	4	40-140/50

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-2ALimits
877-09-8	Tetrachloro-m-xylene	83%	80%	68% 30-150%
877-09-8	Tetrachloro-m-xylene	84%	80%	70% 30-150%
2051-24-3	Decachlorobiphenyl	105%	102%	92% 30-150%
2051-24-3	Decachlorobiphenyl	110%	107%	96% 30-150%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** MC48722

**Account:** BBLNYS Arcadis

**Project:** National Grid, Washington Street, Rensselaer, NY

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP49158-MS	IR3258.D	1	11/18/16	MD	11/16/16	OP49158	GIR226
OP49158-MSD	IR3261.D	1	11/18/16	MD	11/16/16	OP49158	GIR226
MC48722-4	IR3257.D	1	11/18/16	MD	11/16/16	OP49158	GIR226

The QC reported here applies to the following samples:

Method: SW846-8015

MC48722-1, MC48722-2, MC48722-4

CAS No.	Compound	MC48722-4 mg/kg	Spike Q mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (Semi-VOA)	2200	195	4280	1069* <sup>a</sup>	203	2720	256* <sup>a</sup>	45	10-139/50

CAS No.	Surrogate Recoveries	MS	MSD	MC48722-4	Limits
84-15-1	o-Terphenyl	124%	131%* <sup>b</sup>	91%	17-130%

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Outside control limits due to possible matrix interference.

\* = Outside of Control Limits.

Semivolatile Surrogate Recovery Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Method: SW846 8151	Matrix: LEACHATE
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC48722-3	YZ98719.D	59	48
MC48722-1A	YZ98717.D	57	45
MC48722-2A	YZ98718.D	60	47
OP49161-BS	YZ98709.D	101	96
OP49161-LB	YZ98708A.D	75	68
OP49161-MB	YZ98708.D	75	68
OP49161-MS	YZ98710.D	101	96
OP49161-MSD	YZ98713.D	100	95

Surrogate Compounds	Recovery Limits
S1 = 2,4-DCAA	30-150%

(a) Recovery from GC signal #2  
(b) Recovery from GC signal #1

8.6.1  
8

Semivolatile Surrogate Recovery Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Method: SW846 8081B	Matrix: LEACHATE
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>	S2 <sup>a</sup>	S2 <sup>b</sup>
MC48722-3	BE53428.D	68	70	82	76
MC48722-1A	BE53426.D	50	53	82	75
MC48722-2A	BE53427.D	47	61	32	65
OP49159-BS	BE53423.D	75	69	82	70
OP49159-LB	BE53422A.D	62	73	90	80
OP49159-MB	BE53422.D	62	73	90	80
OP49159-MS	BE53424.D	75	70	85	72
OP49159-MSD	BE53425.D	57	56	76	67

Surrogate Compounds	Recovery Limits
S1 = Tetrachloro-m-xylene	30-150%
S2 = Decachlorobiphenyl	30-150%

- (a) Recovery from GC signal #1
- (b) Recovery from GC signal #2

8.6.2  
8

Semivolatile Surrogate Recovery Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Method: SW846 8082A	Matrix: LEACHATE
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>	S2 <sup>a</sup>	S2 <sup>b</sup>
MC48722-1A	BK63184.D	85	72	109	112
MC48722-2A	BK63185.D	68	70	92	96
OP49160-BS	BK63181.D	86	86	95	99
OP49160-LB	BK63180A.D	86	89	94	97
OP49160-MB	BK63180.D	86	89	94	97
OP49160-MS	BK63182.D	83	84	105	110
OP49160-MSD	BK63183.D	80	80	102	107

Surrogate Compounds	Recovery Limits
S1 = Tetrachloro-m-xylene	30-150%
S2 = Decachlorobiphenyl	30-150%

(a) Recovery from GC signal #1  
(b) Recovery from GC signal #2



Semivolatile Surrogate Recovery Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Method: SW846 8082A	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>	S2 <sup>a</sup>	S2 <sup>b</sup>
MC48722-1	BK63163.D	83	74	76	76
MC48722-2	BK63165.D	99	106	91	99
MC48722-4	BK63166.D	101	74	69	68
OP49147-BS	BK63152.D	94	95	90	95
OP49147-BSD	BK63164.D	104	113	92	100
OP49147-MB	BK63151.D	85	87	86	87
OP49147-MS	BK63153.D	145	97	83	75
OP49147-MSD	BK63154.D	84	73	78	80

Surrogate Compounds	Recovery Limits
S1 = Tetrachloro-m-xylene	25-145%
S2 = Decachlorobiphenyl	25-179%

- (a) Recovery from GC signal #1
- (b) Recovery from GC signal #2

8.6.4  
8

Semivolatile Surrogate Recovery Summary

Job Number: MC48722  
Account: BBLNYS Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Method: SW846-8015	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>
MC48722-1	IR3264.D	91
MC48722-2	IR3263.D	70
MC48722-4	IR3257.D	91
OP49158-BS	IR3253.D	82
OP49158-MB	IR3252.D	79
OP49158-MS	IR3258.D	124
OP49158-MSD	IR3261.D	131* <sup>b</sup>

Surrogate Compounds	Recovery Limits
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S1 = o-Terphenyl      17-130%

(a) Recovery from GC signal #1  
(b) Outside control limits due to possible matrix interference.

8.6.5  
8

## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27019  
Matrix Type: SOLID

Methods: SW846 7471B  
Units: mg/kg

Prep Date: 11/15/16

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.033	.0011	.0057	0.0070	<0.033

Associated samples MP27019: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27019  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48716-3 Original MS	Spikelot HGRWS1	% Rec	QC Limits
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Mercury	0.030	0.53	0.496	100.8	80-120
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Associated samples MP27019: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27019  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48716-3 Original MSD	Spikelot HGRWS1	% Rec	MSD RPD	QC Limit
Mercury	0.030	0.53	0.489	102.3	0.0 20

Associated samples MP27019: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Methods: SW846 7471B  
Units: mg/kg

11/15/16

Associated samples MP27019: MC48722-1, MC48722-2, MC48722-4

## 9.1.3

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27019  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/15/16

Metal	LCS Result	Spikelot HGLCS86	% Rec	QC Limits
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Mercury	19.6	20.2	97.0	71-129
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Associated samples MP27019: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 11/15/16

Metal	RL	IDL	MDL	MB raw	final
Aluminum	20	1.1	1.2		
Antimony	1.0	.13	.17	0.12	<1.0
Arsenic	1.0	.15	.2	-0.070	<1.0
Barium	5.0	.019	.076	0.040	<5.0
Beryllium	0.40	.016	.015	0.0	<0.40
Bismuth	5.0	.095	.15		
Boron	10	.97	.13		
Cadmium	0.40	.019	.031	-0.010	<0.40
Calcium	500	.76	.86		
Chromium	1.0	.039	.047	0.080	<1.0
Cobalt	5.0	.021	.031		
Copper	2.5	.055	.1		
Gold	5.0	.091	.11		
Iron	10	.19	.44		
Lead	1.0	.11	.11	0.030	<1.0
Lithium	50	.13	.18		
Magnesium	500	2.5	4		
Manganese	1.5	.011	.047		
Molybdenum	10	.017	.51		
Nickel	4.0	.033	.057	-0.010	<4.0
Palladium	5.0	.19	.14		
Platinum	5.0	.31	.54		
Potassium	500	2.7	3.4		
Selenium	1.0	.18	.3	0.13	<1.0
Silicon	10	.63	.51		
Silver	0.50	.027	.061	-0.010	<0.50
Sodium	500	.51	1.2		
Sulfur	5.0	.22	.31		
Strontium	1.0	.0079	.022		
Thallium	1.0	.13	.11	-0.080	<1.0
Tin	10	.08	.078		
Titanium	5.0	.032	.054		
Tungsten	10	.33	.93		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 11/15/16

Metal	RL	IDL	MDL	MB	
				raw	final
Vanadium	1.0	.037	.04	-0.010	<1.0
Zinc	2.0	.12	.17	0.22	<2.0
Zirconium	5.0	.032	.17		

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48731-1 Original MS		Spikelot MPICP7	% Rec	QC Limits
Aluminum					
Antimony	0.26	19.9	44.9	43.7 (a)	75-125
Arsenic	2.6	43.4	44.9	90.9	75-125
Barium	33.9	198	180	91.4	75-125
Beryllium	0.26	40.6	44.9	89.9	75-125
Bismuth					
Boron					
Cadmium	0.082	42.5	44.9	94.5	75-125
Calcium					
Chromium	12.5	52.2	44.9	88.4	75-125
Cobalt					
Copper					
Gold					
Iron					
Lead	19.4	107	89.8	97.6	75-125
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel	7.6	49.7	44.9	93.8	75-125
Palladium					
Platinum					
Potassium					
Selenium	0.0	40.4	44.9	90.0	75-125
Silicon					
Silver	0.082	15.2	18	84.2	75-125
Sodium					
Sulfur					
Strontium					
Thallium	0.0	42.0	44.9	93.6	75-125
Tin					
Titanium					
Tungsten					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48731-1 Original MS		Spikelot MPICP7	% Rec	QC Limits
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Vanadium 22.5 63.7 44.9 91.8 75-125

Zinc 28.2 79.0 44.9 113.2 75-125

Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity. Post spike within acceptable range.

9.2.2

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48731-1 Original	MSD	Spikelot MPICP7	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	0.26	20.3	44.9	44.6 (a)	2.0	20
Arsenic	2.6	43.6	44.9	91.3	0.5	20
Barium	33.9	193	180	88.6	2.6	20
Beryllium	0.26	40.9	44.9	90.5	0.7	20
Bismuth						
Boron						
Cadmium	0.082	42.8	44.9	95.2	0.7	20
Calcium						
Chromium	12.5	50.8	44.9	85.3	2.7	20
Cobalt						
Copper						
Gold						
Iron						
Lead	19.4	105	89.8	95.3	1.9	20
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	7.6	49.4	44.9	93.1	0.6	20
Palladium						
Platinum						
Potassium						
Selenium	0.0	40.7	44.9	90.7	0.7	20
Silicon						
Silver	0.082	15.2	18	84.2	0.0	20
Sodium						
Sulfur						
Strontium						
Thallium	0.0	42.4	44.9	94.4	0.9	20
Tin						
Titanium						
Tungsten						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16

Metal	MC48731-1		Spikelot		MSD	QC
	Original	MSD	MPICP7	% Rec	RPD	Limit

Vanadium	22.5	62.0	44.9	88.0	2.7	20
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Zinc	28.2	68.3	44.9	89.3	14.5	20
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Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike duplicate recovery indicates possible matrix interference and/or sample nonhomogeneity.

9.2.2

9

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722

Account: BBLNYS - Arcadis

Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020

Methods: SW846 6010C

Matrix Type: SOLID

Units: mg/kg

Prep Date:

11/15/16

11/15/16

Metal	BSP Result	Spikelot MPICP7	% Rec	QC Limits	BSD Result	Spikelot MPICP7	% Rec	BSD RPD	QC Limit
Aluminum									
Antimony	47.8	50	95.6	80-120	48.3	50	96.6	1.0	20
Arsenic	48.1	50	96.2	80-120	48.4	50	96.8	0.6	20
Barium	188	200	94.0	80-120	186	200	93.0	1.1	20
Beryllium	46.6	50	93.2	80-120	46.3	50	92.6	0.6	20
Bismuth									
Boron									
Cadmium	49.3	50	98.6	80-120	49.6	50	99.2	0.6	20
Calcium									
Chromium	46.0	50	92.0	80-120	45.9	50	91.8	0.2	20
Cobalt									
Copper									
Gold									
Iron									
Lead	95.5	100	95.5	80-120	96.3	100	96.3	0.8	20
Lithium									
Magnesium									
Manganese									
Molybdenum									
Nickel	47.3	50	94.6	80-120	47.5	50	95.0	0.4	20
Palladium									
Platinum									
Potassium									
Selenium	47.2	50	94.4	80-120	47.5	50	95.0	0.6	20
Silicon									
Silver	17.4	20	87.0	80-120	17.2	20	86.0	1.2	20
Sodium									
Sulfur									
Strontium									
Thallium	48.4	50	96.8	80-120	48.6	50	97.2	0.4	20
Tin									
Titanium									
Tungsten									

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16 11/15/16

Metal	BSP Result	Spikelot MPICP7	% Rec	QC Limits	BSD Result	Spikelot MPICP7	% Rec	BSD RPD	QC Limit
Vanadium	47.0	50	94.0	80-120	46.3	50	92.6	1.5	20
Zinc	47.1	50	94.2	80-120	47.4	50	94.8	0.6	20

Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

9.2.3

9



## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722

Account: BBLNYS - Arcadis

Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020

Methods: SW846 6010C

Matrix Type: SOLID

Units: mg/kg

Prep Date: 11/15/16

Metal	LCS Result	Spikelot MPLCS86	% Rec	QC Limits
Aluminum				
Antimony	52.3	86.5	60.5	1-199
Arsenic	91.7	97.5	94.1	78-122
Barium	290	306	94.8	83-117
Beryllium	90.8	100	90.8	83-118
Bismuth				
Boron				
Cadmium	73.2	76.6	95.6	82-118
Calcium				
Chromium	93.0	103	90.3	80-121
Cobalt				
Copper				
Gold				
Iron				
Lead	89.9	96.7	93.0	82-118
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	141	153	92.2	82-118
Palladium				
Platinum				
Potassium				
Selenium	150	161	93.2	78-123
Silicon				
Silver	43.6	49.3	88.4	75-125
Sodium				
Sulfur				
Strontium				
Thallium	114	119	95.8	79-121
Tin				
Titanium				
Tungsten				

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/15/16

Metal	LCS Result	Spikelot MPLCS86	% Rec	QC Limits
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Vanadium 95.2 102 93.3 78-123

Zinc 203 229 88.6 82-118

Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

9.2.3

9

SERIAL DILUTION RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 11/15/16

Metal	MC48731-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony	2.90	0.00	100.0(a)	0-10
Arsenic	28.8	24.0	16.7 (a)	0-10
Barium	372	391	5.1	0-10
Beryllium	2.80	2.60	7.1	0-10
Bismuth				
Boron				
Cadmium	0.900	0.00	100.0(a)	0-10
Calcium				
Chromium	137	143	4.5	0-10
Cobalt				
Copper				
Gold				
Iron				
Lead	213	215	0.7	0-10
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	83.1	82.6	0.6	0-10
Palladium				
Platinum				
Potassium				
Selenium	0.00	0.00	NC	0-10
Silicon				
Silver	0.900	0.00	100.0(a)	0-10
Sodium				
Sulfur				
Strontium				
Thallium	0.00	0.00	NC	0-10
Tin				
Titanium				
Tungsten				

# SERIAL DILUTION RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 11/15/16

Metal	MC48731-1 Original	SDL 1:5	%DIF	QC Limits
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Vanadium 247 260 5.1 0-10

Zinc 310 333 7.6 0-10

Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

9.2.4

9

POST DIGESTATE SPIKE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: ug/l

Prep Date:

11/15/16

Metal	Sample ml	Final ml	MC48731-1 Raw	PS Corr.**	PS ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum										
Antimony	10	10.1	2.9	2.871287	21.8	.1	2	19.80198	95.6	80-120
Arsenic										
Barium										
Beryllium										
Bismuth										
Boron										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Gold										
Iron										
Lead										
Lithium										
Magnesium										
Manganese										
Molybdenum										
Nickel										
Palladium										
Platinum										
Potassium										
Selenium										
Silicon										
Silver										
Sodium										
Sulfur										
Strontium										
Thallium										
Tin										
Titanium										
Tungsten										

POST DIGESTATE SPIKE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27020                      Methods: SW846 6010C  
 Matrix Type: SOLID                      Units: ug/l

Prep Date: 11/15/16

Metal	Sample ml	Final ml	MC48731-1 Raw	PS Corr.**	ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
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Vanadium

Zinc

Zirconium

Associated samples MP27020: MC48722-1, MC48722-2, MC48722-4

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (\*\*) Corr. sample result = Raw \* (sample volume / final volume)  
 (anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
Matrix Type: LEACHATE

Methods: SW846 6010C  
Units: mg/l

Prep Date: 11/16/16

Metal	RL	IDL	MDL	MB raw	final
Aluminum	0.20	.011	.025		
Antimony	0.0060	.0013	.0012		
Arsenic	0.010	.0015	.002	-0.00020	<0.010
Barium	0.50	.00019	.00057	0.00010	<0.50
Beryllium	0.0040	.00016	.00034		
Bismuth	0.050	.00095	.0018		
Boron	0.10	.0097	.0023		
Cadmium	0.0040	.00019	.0003	0.0	<0.0040
Calcium	5.0	.0076	.018		
Chromium	0.010	.00039	.0011	0.00010	<0.010
Cobalt	0.050	.00021	.00041		
Copper	0.025	.00055	.0042		
Gold	0.050	.00091	.0013		
Iron	0.10	.0019	.016		
Lead	0.010	.0011	.0011	0.00010	<0.010
Lithium	0.50	.0013	.0018		
Magnesium	5.0	.025	.056		
Manganese	0.015	.00011	.00041		
Molybdenum	0.10	.00017	.016		
Nickel	0.040	.00033	.00035		
Palladium	0.050	.0019	.0014		
Platinum	0.050	.0031	.0047		
Potassium	5.0	.027	.078		
Selenium	0.025	.0018	.0034	0.00080	<0.025
Silicon	0.10	.0063	.03		
Silver	0.0050	.00027	.0014	0.00010	<0.0050
Sodium	5.0	.0051	.035		
Sulfur	0.050	.0022	.0033		
Strontium	0.010	.000079	.00017		
Thallium	0.0050	.0013	.0018		
Tin	0.10	.0008	.0022		
Titanium	0.050	.00032	.00099		
Tungsten	0.10	.0033	.023		

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
Matrix Type: LEACHATE

Methods: SW846 6010C  
Units: mg/l

Prep Date: 11/16/16

Metal	RL	IDL	MDL	MB raw	final
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Vanadium 0.010 .00037 .0004

Zinc 0.10 .0012 .001

Zirconium 0.050 .00032 .0026

Associated samples MP27025: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: mg/l

Prep Date: 11/16/16

Metal	MC48722-1A Original MS		Spikelot MPICP7	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	0.0044	0.54	0.50	107.1	75-125
Barium	0.65	2.6	2.0	97.5	75-125
Beryllium					
Bismuth					
Boron					
Cadmium	0.0012	0.54	0.50	107.8	75-125
Calcium					
Chromium	0.00060	0.47	0.50	93.9	75-125
Cobalt					
Copper					
Gold					
Iron					
Lead	0.0012	1.0	1.0	99.9	75-125
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Palladium					
Platinum					
Potassium					
Selenium	0.0	0.55	0.50	110.0	75-125
Silicon					
Silver	0.00090	0.21	0.20	104.6	75-125
Sodium					
Sulfur					
Strontium					
Thallium					
Tin					
Titanium					
Tungsten					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: mg/l

Prep Date: 11/16/16

Metal	MC48722-1A Original MS	SpikeLot MPICP7	% Rec	QC Limits
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Vanadium

Zinc

Zirconium

Associated samples MP27025: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

9.3.2

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: mg/l

Prep Date: 11/16/16

Metal	MC48722-1A Original	MSD	Spikelot MPICP7	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	0.0044	0.55	0.50	109.1	1.8	20
Barium	0.65	2.6	2.0	97.5	0.0	20
Beryllium						
Bismuth						
Boron						
Cadmium	0.0012	0.55	0.50	109.8	1.8	20
Calcium						
Chromium	0.00060	0.47	0.50	93.9	0.0	20
Cobalt						
Copper						
Gold						
Iron						
Lead	0.0012	1.0	1.0	99.9	0.0	20
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Palladium						
Platinum						
Potassium						
Selenium	0.0	0.56	0.50	112.0	1.8	20
Silicon						
Silver	0.00090	0.21	0.20	104.6	0.0	20
Sodium						
Sulfur						
Strontium						
Thallium						
Tin						
Titanium						
Tungsten						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: mg/l

Prep Date: 11/16/16

Metal	MC48722-1A Original MSD	Spikelot MPICP7	% Rec	MSD RPD	QC Limit
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Vanadium

Zinc

Zirconium

Associated samples MP27025: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

9.3.2

9

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722

Account: BBLNYS - Arcadis

Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
Matrix Type: LEACHATEMethods: SW846 6010C  
Units: mg/l

Prep Date:

11/16/16

11/16/16

Metal	BSP Result	Spikelot MPICP7	% Rec	QC Limits	BSD Result	Spikelot MPICP7	% Rec	BSD RPD	QC Limit
Aluminum									
Antimony									
Arsenic	0.53	0.50	106.0	80-120	0.52	0.50	104.0	1.9	20
Barium	1.9	2.0	95.0	80-120	1.9	2.0	95.0	0.0	20
Beryllium									
Bismuth									
Boron									
Cadmium	0.52	0.50	104.0	80-120	0.51	0.50	102.0	1.9	20
Calcium									
Chromium	0.48	0.50	96.0	80-120	0.48	0.50	96.0	0.0	20
Cobalt									
Copper									
Gold									
Iron									
Lead	1.0	1.0	100.0	80-120	0.99	1.0	99.0	1.0	20
Lithium									
Magnesium									
Manganese									
Molybdenum									
Nickel									
Palladium									
Platinum									
Potassium									
Selenium	0.54	0.50	108.0	80-120	0.53	0.50	106.0	1.9	20
Silicon									
Silver	0.20	0.20	100.0	80-120	0.20	0.20	100.0	0.0	20
Sodium									
Sulfur									
Strontium									
Thallium									
Tin									
Titanium									
Tungsten									

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: mg/l

Prep Date: 11/16/16 11/16/16

Metal	BSP Result	Spikelot MPICP7	% Rec	QC Limits	BSD Result	Spikelot MPICP7	% Rec	BSD RPD	QC Limit
-------	---------------	--------------------	-------	--------------	---------------	--------------------	-------	------------	-------------

Vanadium

Zinc

Zirconium

Associated samples MP27025: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

9.3.3

9

# SERIAL DILUTION RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 11/16/16

Metal	MC48722-1A Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	4.40	9.40	113.6(a)	0-10
Barium	649	663	2.1	0-10
Beryllium				
Bismuth				
Boron				
Cadmium	1.20	2.00	66.7 (a)	0-10
Calcium				
Chromium	0.600	0.00	100.0(a)	0-10
Cobalt				
Copper				
Gold				
Iron				
Lead	1.20	0.00	100.0(a)	0-10
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Palladium				
Platinum				
Potassium				
Selenium	0.00	0.00	NC	0-10
Silicon				
Silver	0.900	0.00	100.0(a)	0-10
Sodium				
Sulfur				
Strontium				
Thallium				
Tin				
Titanium				
Tungsten				

# SERIAL DILUTION RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27025  
 Matrix Type: LEACHATE

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 11/16/16

Metal	MC48722-1A		QC	
	Original	SDL 1:5	%DIF	Limits

Vanadium

Zinc

Zirconium

Associated samples MP27025: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

9.3.4

9



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27030  
Matrix Type: LEACHATE

Methods: SW846 7470A  
Units: mg/l

Prep Date: 11/17/16

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

Mercury 0.00020 .0000068 .000034 -0.00010 <0.00020

Associated samples MP27030: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27030  
 Matrix Type: LEACHATE

Methods: SW846 7470A  
 Units: mg/l

Prep Date: 11/17/16

Metal	MC48751-1A		SpikeLot		QC
	Original	MS	HGRWS1	% Rec	Limits
Mercury	0.0	0.0029	0.0030	96.7	75-125

Associated samples MP27030: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Methods: SW846 7470A  
Units: mg/l

11/17/16

Associated samples MP27030: MC48722-3, MC48722-1A, MC48722-2A

## 9.4.2

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: MC48722  
 Account: BBLNYS - Arcadis  
 Project: National Grid, Washington Street, Rensselaer, NY

QC Batch ID: MP27030  
 Matrix Type: LEACHATE

Methods: SW846 7470A  
 Units: mg/l

Prep Date: 11/17/16

Metal	MC48722-1A		SpikeLot		QC
	Original	LS	HGRWS1	% Rec	Limits
Mercury	0.0	0.0029	0.0030	96.7	75-125

Associated samples MP27030: MC48722-3, MC48722-1A, MC48722-2A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Methods: SW846 7470A  
Units: mg/l

11/17/16

Associated samples MP27030: MC48722-3, MC48722-1A, MC48722-2A

### 9.4.3

## General Chemistry

### QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Cyanide	GP21141/GN55417	0.12	0.0	mg/kg	0.6	0.630	105.0	90-110%
Cyanide	GP21141/GN55417			mg/kg	4.8	4.78	99.6	90-110%

Associated Samples:  
Batch GP21141: MC48722-1, MC48722-2, MC48722-4  
(\*) Outside of QC limits

10.1  
10

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Cyanide	GP21141/GN55417	MC48722-1	mg/kg	2.6	2.4	8.0	0-20%
Solids, Percent	GN55333	MC48476-24	%	85.6	88	2.8	0-5%
Solids, Percent	GN55337	MC48745-7	%	90.2	92.2	2.2	0-5%

Associated Samples:

Batch GN55333: MC48722-1

Batch GN55337: MC48722-2, MC48722-4

Batch GP21141: MC48722-1, MC48722-2, MC48722-4

(\*) Outside of QC limits



MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: MC48722  
Account: BBLNYS - Arcadis  
Project: National Grid, Washington Street, Rensselaer, NY

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Cyanide	GP21141/GN55417	MC48722-1	mg/kg	2.6	1.47	4.8	149.9(a)	75-125%

Associated Samples:

Batch GP21141: MC48722-1, MC48722-2, MC48722-4

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity. Refer to spike blank.

## Misc. Forms

### Custody Documents and Other Forms

(SGS Accutest New Jersey)

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Includes the following where applicable:

- Chain of Custody

## 11.1

171 of 175  
ACCUTEST  
MC48722

## SGS Accutest Sample Receipt Summary

Job Number: MC48722

Client: \_\_\_\_\_

Project: \_\_\_\_\_

Date / Time Received: 11/15/2016 9:45:00 AM

Delivery Method: \_\_\_\_\_

Airbill #s: \_\_\_\_\_

Cooler Temps (Raw Measured) °C: Cooler 1: (2.1);

Cooler Temps (Corrected) °C: Cooler 1: (3.5);

### Cooler Security

Y or N

1. Custody Seals Present: ☒ ☐
2. Custody Seals Intact: ☒ ☐

Y or N

3. COC Present: ☒ ☐
4. Smp/ Dates/Time OK ☒ ☐

### Cooler Temperature

Y or N

1. Temp criteria achieved: ☒ ☐
2. Cooler temp verification: IR Gun
3. Cooler media: Ice (Bag)
4. No. Coolers: 1

### Quality Control Preservation

Y or N

N/A

1. Trip Blank present / cooler: ☐ ☒ ☐
2. Trip Blank listed on COC: ☐ ☒ ☐
3. Samples preserved properly: ☒ ☐ ☐
4. VOCs headspace free: ☐ ☐ ☒

### Sample Integrity - Documentation

Y or N

1. Sample labels present on bottles: ☒ ☐
2. Container labeling complete: ☒ ☐
3. Sample container label / COC agree: ☒ ☐

### Sample Integrity - Condition

Y or N

1. Sample recvd within HT: ☒ ☐
2. All containers accounted for: ☒ ☐
3. Condition of sample: Intact

### Sample Integrity - Instructions

Y or N N/A

1. Analysis requested is clear: ☒ ☐
2. Bottles received for unspecified tests: ☐ ☒
3. Sufficient volume recvd for analysis: ☒ ☐
4. Compositing instructions clear: ☐ ☐ ☒
5. Filtering instructions clear: ☐ ☐ ☒

Comments

MC48722: Chain of Custody

Page 2 of 2

## General Chemistry

### QC Data Summaries

(SGS Accutest New Jersey)

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: MC48722  
Account: ALNE - SGS Accutest New England  
Project: BBLNYS: National Grid, Washington Street, Rensselaer, NY

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Percent Sulfur	GN55368	0.10	0.0	%	xxxxxxx	0.60	90.6	80-120%
Percent Sulfur	GP1330/GN54926	0.10	0.0	%	.667	0.73	109.0	80-120%

Associated Samples:  
Batch GP1330: MC48722-1, MC48722-2, MC48722-4  
Batch GN55368: MC48722-1, MC48722-4  
(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: MC48722  
Account: ALNE - SGS Accutest New England  
Project: BBLNYS: National Grid, Washington Street, Rensselaer, NY

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Heat Content, BTU	GP1329/GN54841	LA26575-1	BTU/lb	6360	6200	2.5	0-45%
Percent Sulfur	GP1330/GN54926	TC941111-1	%	8.6	8.5	1.2	0-41%

Associated Samples:  
Batch GP1329: MC48722-1, MC48722-2, MC48722-4  
Batch GP1330: MC48722-1, MC48722-2, MC48722-4  
(\*) Outside of QC limits

# ATTACHMENT 9 - WASTE DISPOSAL DOCUMENTATION





SECRET

WORK ORDER NO

10. *Phragmites australis* (Cav.) Trin. ex Steud.

## STRAIGHT BILL OF LADING

VEHICLE ID #

TRANS. 1 PHONE ~~770-442-5800~~

VEHICLE ID #

TRANS. 2 PHONE

**SHIPPERS CERTIFICATION:** This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

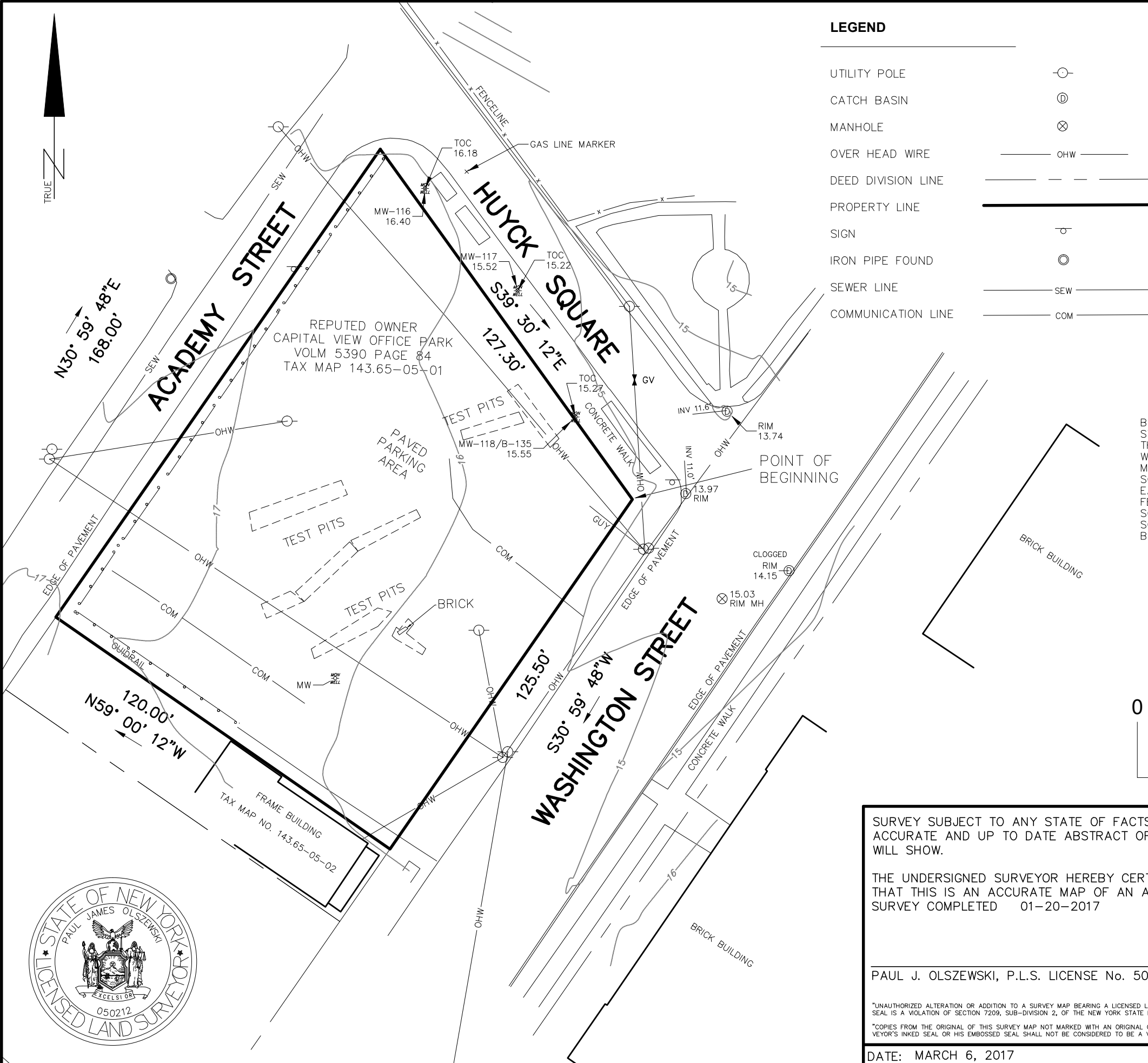
SHIPPER	PRINT <i>Shirley A. Smith</i>	SIGN <i>[Signature]</i>	DATE <i>11/11/77</i>
TRANSPORTER 1	PRINT <i>James Johnson</i>	SIGN <i>[Signature]</i>	DATE <i>11/11/77</i>
TRANSPORTER 2	PRINT	SIGN	DATE
RECEIVED BY	PRINT	SIGN	DATE

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator ID Number <b>NYR000133371</b>		2. Page 1 of <b>1</b>		3. Emergency Response Phone <b>800-424-9300</b>		4. Waste Tracking Number <b>07101789</b>	
		5. Generator's Name and Mailing Address <b>Niagara Mohawk Power Corp 300 Erie Blvd West Syracuse NY 13202</b>		Att: <b>Jim Morgan</b>		Generator's Site Address (if different than mailing address) <b>Niagara Mohawk Power Corp 89 Washington Street Rensselaer NY 12144</b>			
Generator's Phone: <b>315 428-3101</b>		6. Transporter 1 Company Name <b>Sun Environmental Corp</b>				U.S. EPA ID Number <b>NYR000176958</b>			
7. Transporter 2 Company Name						U.S. EPA ID Number			
8. Designated Facility Name and Site Address <b>Industrial Oil Tank Services 120 Dry Road Oriskany NY 13424</b>						U.S. EPA ID Number <b>NYR000005298</b>			
Facility's Phone: <b>315 736-6080</b>									
9. Waste Shipping Name and Description		10. Containers		11. Total Quantity		12. Unit Wt./Vol.			
		No.	Type						
1. Non RCRA, Non DOT Regulated Material (Non Hazardous Drill Cuttings)		<b>8</b>	<b>DM</b>	<b>EST 4,000</b>		<b>P</b>		<b>L</b>	
2. Non RCRA, Non DOT Regulated Material (Spent PPE/ Debris)		<b>2</b>	<b>DM</b>	<b>EST 100</b>		<b>P</b>		<b>L</b>	
<del>3. Non RCRA, Non DOT Regulated Material (Decon Water)</del>			<b>DM</b>			<b>P</b>		<b>R</b> <b>MG</b>	
4.									
13. Special Handling Instructions and Additional Information <b>Approval :</b>									
14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.									
Generator's/Offoror's Printed/Typed Name <b>Megan Guitford</b>		Signature <b>Megan Guitford</b>				Month Day Year <b>07 10 17</b>			
15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S.		Port of entry/exit: Date leaving U.S.:							
Transporter Signature (for exports only):									
16. Transporter Acknowledgment of Receipt of Materials									
Transporter 1 Printed/Typed Name <b>Tom Tennant</b>		Signature <b>Tom Tennant</b>				Month Day Year <b>07 10 17</b>			
Transporter 2 Printed/Typed Name		Signature				Month Day Year			
17. Discrepancy									
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection									
Manifest Reference Number:									
17b. Alternate Facility (or Generator)		U.S. EPA ID Number							
Facility's Phone:									
17c. Signature of Alternate Facility (or Generator)						Month Day Year			
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a									
Printed/Typed Name		Signature				Month Day Year			

**DESIGNATED FACILITY TO GENERATOR**

ATTACHMENT 10 - SITE SURVEY





LEGEND

UTILITY POLE	
CATCH BASIN	
MANHOLE	
OVER HEAD WIRE	
DEED DIVISION LINE	
PROPERTY LINE	
SIGN	
IRON PIPE FOUND	
SEWER LINE	
COMMUNICATION LINE	

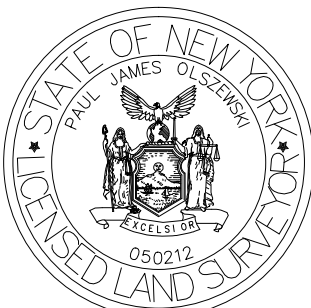
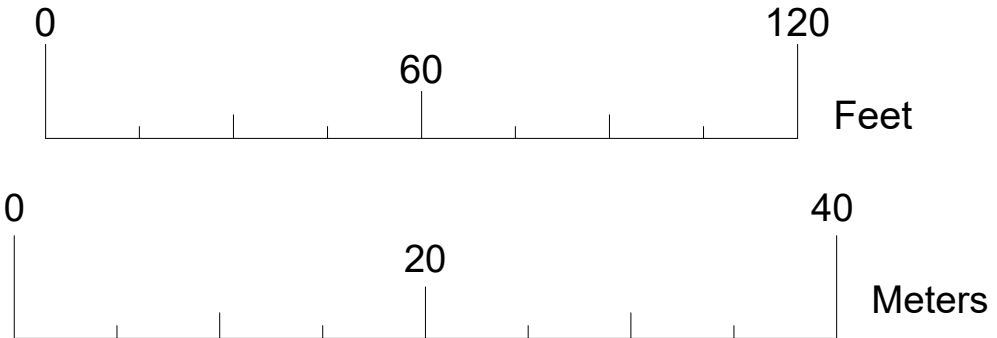
NOTES

- FEMA FLOOD ZONE A12
- DATUMS HORIZONTAL NAD83/CORS/96 EAST ZONE AND VERTICAL NAVD88
- UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THEREFORE THERE LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS UNKNOWN.

THIS PROPERTY IS SUBJECT TO AN ENVIRONMENTAL EASEMENT HELD BY THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PURSUANT TO TITLE 36 OF ARTICLE 71 OF THE NEW YORK ENVIRONMENTAL CONSERVATION LAW. THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THIS EASEMENT ARE SET FORTH IN THE SITE MANAGEMENT PLAN (SMP). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP CAN BE OBTAINED FROM NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, NY 12233 OR AT [DERWEB@DEC.NY.GOV](mailto:DERWEB@DEC.NY.GOV)

SURVEYORS LEGAL DESCRIPTION  
NEW YORK STATE ELECTRIC AND GAS  
RENSELAER SITE  
TAX MAP NO. 143.65-05-01

BEGINNING AT A POINT LOCATED IN THE NORTHWESTERLY BOUNDARY OF WASHINGTON STREET AT ITS INTERSECTION WITH THE SOUTHWESTERLY BOUNDARY OF HUYCK SQUARE; THENCE SOUTH 30 DEG 59 MIN 48 SEC WEST ALONG SAID NORTHWESTERLY BOUNDARY OF WASHINGTON STREET, A DISTANCE OF 125.50 FEET TO A POINT; THENCE NORTH 59 DEG 00 MIN 12 SEC WEST A DISTANCE OF 120.00 FEET TO A POINT LOCATED IN THE SOUTHEASTERLY BOUNDARY OF ACADEMY STREET; THENCE NORTH 30 DEG 59 MIN 48 SEC EAST ALONG SAID SOUTHEASTERLY BOUNDARY OF ACADEMY STREET, A DISTANCE OF 168.00 FEET TO A POINT LOCATED IN THE ABOVE MENTIONED SOUTHWESTERLY BOUNDARY OF HUYCK SQUARE; THENCE SOUTH 39 DEG 30 MIN 12 SEC EAST ALONG THE LAST MENTIONED SOUTHWESTERLY BOUNDARY, A DISTANCE OF 127.30 FEET TO THE POINT OF BEGINNING, BEING 0.40 ACRE MORE OR LESS.



SURVEY SUBJECT TO ANY STATE OF FACTS AN ACCURATE AND UP TO DATE ABSTRACT OF TITLE WILL SHOW.

THE UNDERSIGNED SURVEYOR HEREBY CERTIFIES THAT THIS IS AN ACCURATE MAP OF AN ACTUAL SURVEY COMPLETED 01-20-2017

PAUL J. OLSZEWSKI, P.L.S. LICENSE No. 50212

\*UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.  
\*COPIES FROM THE ORIGINAL OF THIS SURVEY MAP NOT MARKED WITH AN ORIGINAL OF THE LAND SURVEYOR'S INKED SEAL OR HIS EMBOSSED SEAL SHALL NOT BE CONSIDERED TO BE A VALID TRUE COPY.\*

NATIONAL GRID – RENSELAER MGP SITE  
WASHINGTON STREET  
SITE NUMBER 00488

CITY OF RENSELAER  
COUNTY OF RENSELAER      STATE OF NEW YORK

PAUL JAMES OLSZEWSKI, P.L.S., PLLC  
P.O. BOX 336  
CAMILLUS NEW YORK, 13031  
315-488-5552      paul@pjossurvey.com

# ATTACHMENT 2

Treatability Study Report



Steve Beam  
Project Manager  
Site Investigation & Remediation – Upstate NY  
National Grid  
300 Erie Boulevard West  
Syracuse, New York 13202

Arcadis of New York, Inc.  
One Lincoln Center  
110 West Fayette Street  
Suite 300  
Syracuse  
New York 13202  
Tel 315 446 9120  
Fax 315 449 0017  
www.arcadis.com

ENVIRONMENT

Subject:  
Rensselaer Non-Owned Former MGP Site  
Treatability Study Results

Dear Mr. Beam:

Date:  
July 24, 2020

This letter presents the bench-scale treatability study activities and results completed by the Arcadis Treatability Laboratory, located in Durham, North Carolina, in support of the developing an excavation support design for National Grid at the Rensselaer Non-Owned Former Manufactured Gas Plant (MGP) Site located in Rensselaer, New York (the site).

Contact:  
Jason Golubski, PE

Phone:  
315.671.9437

This memorandum documents the following:

Email:  
jason.golubski@arcadis.com

- Background information regarding the site conditions and rationale for utilizing a gravity wall as the excavation support method.
- The performance goals established for the excavation support design.
- The materials and methods used to complete the bench-testing.
- The results of the completed bench tests.
- Recommendations for the ISS mix design to be utilized.

Our ref:  
30004017

## BACKGROUND

The planned approach for conducting the bench-scale treatability study was presented in the New York State Department of Environmental Conservation- (NYSDEC-) approved July 2016 Remedial Design Work Plan (RDWP). At the time the RDWP was prepared, potential remedial activities to be implemented at the site included the in-situ soil solidification (ISS) of site soils containing MGP-related impacts, specifically in the northern portion of the site. Based on the results of the pre-design investigation (PDI) activities completed in 2016 and 2017, ISS treatment of site soil was not warranted. Rather, remedial activities were focused on the excavation of impacted soils in the vicinity of the tar well, northern gas holder, and southern gas holder.



During the initial development of the Remedial Design, ISS of site soils (i.e., construction of a gravity wall) was identified as the optimal excavation support to retain soil surrounding the targeted soil removal limits. Excavation support via a gravity wall was selected based on the following:

- The shallow depth to till prevents use of cantilevered steel sheet pile. Without significant embedment, internal excavation support would be required to brace the sheet pile, which would hinder excavation of impacted materials and former MGP structures.
- Benching/sloping of surrounding soils would require the excavation (and handling and backfilling) of additional material (i.e., beyond that requiring removal). The relatively small size of the project area provides limited room for material staging. Additionally, the limits of benching/sloping would encroach on the nearby roadways, utilities, and structures.

A majority of the gravity wall will be constructed within site soils that do not require remediation. However, the gravity wall may be constructed in areas containing residually impacted soils. Additionally, the northeast portion of the gravity wall will be constructed in an area known to contain MGP-related impacts. Site soil is impacted with volatile organic compounds (VOCs) including benzene, ethylbenzene, toluene, and xylenes (BTEX), and semi-volatile organic compounds (SVOCs) including polycyclic aromatic hydrocarbons (PAHs) associated with residual byproducts from former MGP operations (i.e., non-aqueous phase liquid [NAPL] in the form of sheens, blebs, or coal tar).

The primary purpose of the gravity wall is to provide retention of adjacent soils to facilitate removal of site material to the target excavation depths. Additionally, the gravity wall will provide hydraulic control for soil excavation below the water table.

## TREATABILITY STUDY GOALS

The underlying principle behind ISS technology for soil remediation is encapsulation of residual contaminants of concern, thus minimizing future contaminant flux from soil to groundwater. Pre-determined amounts of cementitious reagent(s) are mixed with (impacted or non-impacted) site soils, resulting in a solidified monolith of increased strength and reduced permeability, in comparison to native soil conditions at the site.

As indicated above, for this site, the primary purpose of the ISS gravity wall is to provide excavation support, and not a soil treatment technology. However, given the potential for the ISS gravity wall to be constructed in areas containing residually impacted soils, consistent with the performance goals for other ISS treatment projects, and in keeping with relevant ISS guidance documents (Interstate Technology Regulatory Council, 2011 and Bates and Hills, 2015), this treatability study evaluated the ability of the soil additive Portland cement to achieve the following goals:

1. Achieve an unconfined compressive strength (UCS) of at least 50 pounds per square inch (psi). UCS analysis was completed according to ASTM D-1633 after 7 and 28 days of curing time. A UCS of 50 psi is consistent with technical and health and safety requirements for an ISS gravity wall in support of soil excavation.
2. Reduce the hydraulic conductivity of the treated soil to less than  $1 \times 10^{-6}$  centimeters per second (cm/sec). Hydraulic conductivity analysis was completed according to ASTM D-5084 (flexible wall permeameter) after 28+ days of curing time. A reduced hydraulic conductivity on the boundaries of

the excavation footprint will assist to retard leaching of any VOCs/PAHs remaining on-site following excavation.

## **MATERIALS AND METHODS**

The materials and test methods used to complete the site-specific treatability study are detailed in the following subsections.

### **Sample Collection**

Arcadis collected bench-scale treatability study soil samples in accordance with the July 29, 2019 letter work plan submitted to the NYSDEC. Arcadis' drilling subcontractor, Parratt-Wolff, drilled soil borings B-143 and B-144 at the locations shown on Figure 1 (i.e., within the anticipated footprint of the ISS gravity wall). Soil sampling was performed continuously at each soil boring to refusal using 2-inch diameter split spoon sampling devices. Once completed, each borehole was grouted to the existing grade. Soil boring logs are included as Attachment 1 and details/characterization of the collected soil samples are discussed herein.

Approximately five (5) gallons of soil from each soil boring was containerized inside plastic DOT-rated 5-gallon buckets and shipped to the Arcadis Treatability Laboratory. A container of site potable water (consistent with the water source that would be used during full-scale ISS implementation) was also collected for use as the mixing water during ISS test mix creation.

Regionally available sample of Type I/II PC was obtained from LaFarge North America located in Ravena, New York.

### **Sample Receipt, Homogenization, and Baseline Testing**

Upon receipt at the Treatability Laboratory, soil from each location was homogenized thoroughly using a ½-inch drive steel mixing auger mounted to an electric variable speed drill. B-144 soil was also sieved using a 3/8" sieve to remove oversize material (16% of the total B-144 sample mass was removed as oversize during sieving). From each of the two soil homogenates, a one-gallon subsample was submitted to Geotechnics, Inc. in Raleigh, North Carolina (Geotechnics) for the following baseline geotechnical characterization.

- Water content by ASTM D2216
- Grain size (with hydrometer) by ASTM D422
- Atterberg limits by ASTM D4318
- Classification by ASTM D2487
- Loss on ignition by ASTM D2974
- Soil pH by ASTM D4972

Duplicate moisture content samples were also processed on both soil homogenates using the gravimetric oven-drying method.



### Mix Designs, Test Mix Creation, and In-Lab Testing

Cement addition rates are typically selected based on the assessment of the degree of NAPL present within the soils, geotechnical characterization results, as well as Arcadis' previous experience with ISS at other sites.

A total of six soil/cement mixes were evaluated in this bench-scale study: three mixes incorporated B-143 soil; and three incorporated B-144 soil. Cement addition rates were standardized between the two soil types at 8%, 10%, and 12% Portland cement by soil dry mass (w/w) (see Table 1). Admixture addition rates were based on soil dry mass and added to each mix as a dry powder. Potable mixing water was added to the mixes at a rate which targeted adequate mix workability while minimizing water addition. Each mix was then thoroughly homogenized in a stainless-steel bowl using a Hobart Model HL-200 planetary mixer.

The workability of the mix was quantitatively determined through slump testing. During slump determination, the test mix is loaded into an inverted cone, and the slump is measured as the difference between the initial sample height and final sample height after the cone is gently removed.

A miniature slump cone test, derived from ASTM Method C143-00, was used to measure the slump of each mix, as a standard slump cone is not feasible for laboratory scale studies due to a large sample volume requirement. A miniature slump cone has a height of 150 millimeters (mm), a bottom diameter of 100 mm, and a top diameter of 75 mm. This miniature slump measurement was then converted to a standard slump measurement using the following equation, as determined by Malusis et al. (2008):

$$S_s = 60 + 1.8S_m,$$

$S_s$  = Standard Slump

$S_m$  = Miniature Slump

Following slump testing, the mixes were transferred to a series of seven 2-inch by 4-inch plastic geotechnical molds and two 50 cubic-centimeter (cm<sup>3</sup>) centrifuge tube molds. Molds were packed in lifts and tapped continuously during filling to prevent the entrainment of air bubbles within the cured sample. Filled molds were cured in a humid environment inside large airtight plastic bags at ambient room temperature until further processing. Early strength development was assessed on one 2-inch by 4-inch mold from each mix at two days of curing using a pocket penetrometer.

### Geotechnical Performance Testing

At eight days of curing, one mold from each mix was analyzed by Geotechnics for UCS testing by ASTM D1633. At 29 days of curing, Geotechnics performed UCS on each mix in duplicate. At 50 days of curing, one mold from each mix was analyzed by Geotechnics for hydraulic conductivity analysis by ASTM D5084.

### Monolith Leachability Testing

The results of UCS and hydraulic conductivity testing were used to select one test mix from each soil type for monolith leachability testing. Mix-2 (10% PC using B-143 soil) and Mix-5 (10% PC using B-144 soil) were selected for monolith leachability testing. Monolith leachability is a procedure which incorporates elements from Environmental Protection Agency (EPA) Method 1312 – Synthetic Precipitation Leaching

Procedure (SPLP) and the American Nuclear Society (ANS) Method 16.1. Monolith leaching is introduced in previously referenced ITRC guidance document and the Bates and Hills guidance document.

From each of these two mixes, one 50 cm<sup>3</sup> centrifuge tube mold and one 2-inch by 4-inch mold were sized to yield a specific leachate volume-to-monolith surface area ratio (L/A) of 10:1 per ANSI Method 16.1. For VOC leaching evaluation, a 50 cm<sup>3</sup> centrifuge tube mold from each mix was cut to 4.8 cm in length using a standard hacksaw. These dimensions yield a monolith volume of 24.32 cm<sup>3</sup> and a surface area of 48.44 cm<sup>2</sup>. This results in an L/A of 9.82:1 when placed in a 500 cm<sup>3</sup> zero-headspace extractor defined in USEPA Method 1312. For SVOC leaching evaluation, a 2-inch by 4-inch mold was cut to 3.5 inches in length using a standard hacksaw. These dimensions yield a monolith volume of 180.19 cm<sup>3</sup> and a surface area of 182.41 cm<sup>2</sup>. This results in an L/A of 9.97:1 when placed in a 2000 cm<sup>3</sup> amber borosilicate glass jar.

After sizing, the monoliths were weighed and packaged for shipment to Eurofins Lancaster Laboratories located in Lancaster, Pennsylvania, for monolith leachability testing. The selection of the leaching vessels is consistent with USEPA Method 1312 (synthetic precipitation leaching procedure (SPLP)). Following placement of the monoliths within their respective leaching vessels, the vessels were filled with deionized water and left to sit quiescently for a 24-hour duration, or “cycle”. At the end of each cycle, the leachate was removed, preserved according to either Method 8260 or Method 8270, and the leaching vessels were filled with clean deionized water, beginning a new cycle. A total of 20 leaching cycles were performed in this manner for each of the monolithic samples. Leachate from cycles 1, 5, 10, 15, and 20 were extracted and analyzed for either VOCs by Method 8260 (small monoliths) or SVOCs by Method 8270 (large monoliths), while leachate from the interim cycles was discarded.

In addition to leaching solidified soil/cement mixtures, non-amended samples of B-143 and B-144 soil were subjected to one 24-hour cycle of the USEPA 1312 leaching procedure to establish “baseline” leaching performance. The mass of soil at native moisture content incorporated into each of the monolithic samples was calculated, and Eurofins Lancaster was instructed to leach that mass of soil in a manner identical to the monolithic samples (i.e. no tumbling). The contaminant profiles leaching from the solidified soil/cement mixes could then be compared with the concentrations leaching from the same mass of soil without any amendment.

## TREATABILITY STUDY RESULTS

The results of the various bench-testing activities completed by the Arcadis Treatability Laboratory, Geotechnics, and Eurofins Lancaster are presented in the following subsections.

### Baseline Characterization

The Arcadis Treatability Laboratory observed residual NAPL impacts in soil collected from both borings. Within certain discrete intervals of each location, visible NAPL was observed coating soil particles. A moderate hydrocarbon odor was present in most of the discrete samples.

Results of baseline geotechnical characterization are presented in Table 2. Geotechnical laboratory reports are included as Attachment 2. Results for B-144 soil are skewed due to the removal of particles greater than 3/8” in the treatability laboratory prior to analysis. B-143 soil was classified as a clayey sand

and B-144 soil was classified as a sandy lean clay. Soil pH values were just above neutral, with B-143 having a slightly higher pH than B-144.

### **In-Lab Testing Results**

Results of in-lab testing parameters (slump and pocket penetrometer screening) performed during test mix creation are presented in Table 3. Test mixes had standard slump values within a range of 4.49 inches (Mix-4) to 4.98 inches (Mixes 3 and 6). In general, mixes using B-143 soil required slightly greater water-to-cement ratios to achieve similar slump values to the respective B-144 mixes.

The mixes demonstrated early strength development, as determined by pocket penetrometer testing. At two days of curing, only Mix-1 (8% PC with B-143 soil) had not developed strength exceeding the range of the pocket penetrometer (4.5 tons per square-foot, tsf), but registered 4.0 tsf, which indicated early strength development was still occurring in that sample.

### **Geotechnical Performance Testing Results**

Results of geotechnical performance testing (UCS and hydraulic conductivity) are presented in Table 4 and on Figure 2. Geotechnical laboratory reports are included as Attachment 2. All test mixes developed strength exceeding the 50 psi target at eight days of curing with the Exception of Mix-4 (8% PC with B-144 soil), which achieved 46.0 psi. All six mixes yielded UCS results greater than 50 psi at the 29-day testing interval, with good agreement between duplicate tests from each mix design. As expected, strength development increased with increasing Portland cement addition rate in both soil locations. Mixes using soil from location B-143 had higher UCS results than their counterparts using B-144 soil, possibly due to the higher degree of impacts observed in B-144 soil, which is known to interfere with cement hydration reactions.

All six test mix formulations resulted in hydraulic conductivity values lower than the maximum target of  $1.0 \times 10^{-6}$  cm/sec. Note that hydraulic conductivity results are plotted on a secondary inverse Y-axis on Figure 2 (i.e. lower values are higher on the secondary Y-axis). Mixes using B-143 soil yielded better hydraulic conductivity performance (i.e. lower hydraulic conductivity) than their B-144 soil counterparts. In B-144 soil, hydraulic conductivity values decreased consistently with increasing cement addition rate, with 12% PC by soil dry mass (Mix-6) achieving the lowest hydraulic conductivity in that soil location. For B-143 soil, while hydraulic conductivities using various mixes were similar, the lowest hydraulic conductivity value observed was with the 10% PC by soil dry mass addition rate (Mix-2).

### **Monolith Leachability Performance Results**

Mixes 2 and 5 (10% PC by soil dry mass using B-143 and B-144 soil, respectively) were selected for monolith leachability evaluation based on geotechnical performance results. A 10% PC addition rate in both soil locations resulted in UCS results which achieved the 50 psi target with a comfortable margin, and achieved the desired reduction in hydraulic conductivity.

In addition to the small and large monolithic samples submitted to Eurofins Lancaster for Mixes 2 and 5, subsamples of unamended B-143 and B-144 soil were also submitted for targeted mass leaching for one cycle (as described above). The results of unamended baseline leaching and monolith leaching tests for

Mix-2 (B-143 soil) and Mix-5 (B-144 soil) are presented in Tables 5 and 6, respectively. Analytical laboratory reports are included as Attachment 2.

There were no detections of analyzed constituents in the single cycle of unamended baseline leaching from B-143 soil. Toluene was detected in Cycle 10 at an estimated concentration of 0.3 micrograms per liter ( $\mu\text{g/L}$ ), with no other BTEX constituents detected above the method detection limit in any of the analyzed leaching cycles for Mix-2. In each of the five analyzed leaching cycles for Mix-2, there were low-level detections of PAHs, primarily fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene. The highest concentration of any analyte detected in Mix-2 leachate analysis was 1  $\mu\text{g/L}$  naphthalene in Cycle 20 leachate.

Greater concentrations of analytes were detected in the leaching of unamended B-144 soil and in leachate samples generated from Mix-5 monoliths. These higher concentrations are consistent with the visual observation of higher degree of impacts present in B-144 during initial soil characterization. Ethylbenzene and total xylenes were the BTEX constituents detected at the greatest concentrations in Mix-5 leachate samples. Naphthalene, 2-methylnaphthalene, and acenaphthene were the three PAHs detected at the greatest concentrations in Mix-5 leachate samples. While there were no clear trends associated with individual constituent leachate concentration reductions, the concentration of these constituents remained generally within the same order of magnitude throughout the 20-cycle leaching process. The high surface area-to-volume ratio associated with the bench-scale monoliths leached during the treatability study is considered conservative when compared with the surface area-to-volume ratio of the field-scale gravity walls.

## RECOMMENDATIONS

Based on these findings, Arcadis recommends that a mix design of 10% Type I/II Portland cement by soil dry weight will achieve geotechnical performance goals in site soils from both locations (B-143 and B-144) evaluated during this bench-scale treatability study. This cement addition rate resulted in adequate eight-day and 29-day unconfined compressive strength values, which exceeded the minimum strength target of 50 psi. This cement addition rate also reduced the hydraulic conductivity of both soils to values less than the target maximum of  $1 \times 10^{-6}$  cm/sec, with no significant improvements in hydraulic conductivity performance associated with higher addition rates of cementitious admixtures in the soil samples tested.

While no clear trends in leachate concentration were observed for primary constituents of concern during the monolith leaching test, the results were not indicative of degradation of the integrity of the monolithic samples. Additionally, it should be noted that for this project, large sections of the ISS gravity wall will be removed following excavation and during backfill/restoration activities.

## REFERENCES

Interstate Technology Regulatory Council, "Development of Performance Specifications for Solidification/Stabilization, 2011.

[https://www.itrcweb.org/GuidanceDocuments/solidification\\_stabilization/ss-1.pdf](https://www.itrcweb.org/GuidanceDocuments/solidification_stabilization/ss-1.pdf)

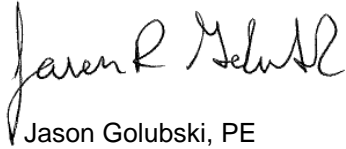
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Michael A. Malusis, Jeffrey C. Evans, Michael H. McLane, and Nikki R. Woodward "A Miniature Cone for Measuring the Slump of Soil-Bentonite Cutoff Wall Backfill". Geotechnical Testing Journal, Vol. 31, No. 5. September 2008.

Steve Beam  
National Grid  
July 24, 2020

Sincerely,

Arcadis of New York, Inc.



Jason Golubski, PE  
Principal Environmental Engineer

Copies:

Terry Young, PE, Arcadis  
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Enclosures:

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- 3 In-Lab Test Mix Parameters
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- 1 Soil Boring Logs
- 2 Geotechnical Laboratory Reports
- 3 Analytical Laboratory Reports

# Tables



**Table 1**  
**Test Mix Design Details**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**ISS Treatability Study Summary Report**

Mix Number	Boring Location	Mix Description	Soil Wet Wt (g)	Soil Moisture (% , gravimetric)	Soil Dry Wt (g)	PC Addition <sup>1</sup> (%)	PC Mass (g)	Mixing Water (g)	W/C Ratio <sup>2</sup>
Mix-1	B-143 Soil	8% PC	2,500	24.9%	1,877	8%	150	460	3.1
Mix-2		10% PC	2,500	24.9%	1,877	10%	188	480	2.6
Mix-3		12% PC	2,500	24.9%	1,877	12%	225	493	2.2
Mix-4	B-144 Soil	8% PC	2,500	19.3%	2,018	8%	161	242	1.5
Mix-5		10% PC	2,500	19.3%	2,018	10%	202	272	1.3
Mix-6		12% PC	2,500	19.3%	2,018	12%	242	258	1.1

Notes:

1. PC - Type I/II Portland cement
2. W/C Ratio - mixing water-to-cement ratio



**Table 2**  
**Baseline Geotechnical Results**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**ISS Treatability Study Summary Report**

Sample ID:		B-143	B-144
Moisture Content: ASTM D2216-10			
Water Content:		14%	22%
Atterberg Limits: ASTM D4318-10			
Liquid Limit:		23%	31%
Plastic Limit:		14%	19%
Plasticity Index:		9%	12%
UCSC Symbol:		CL	CL
Grain Size Analysis and Classification: ASTM D422-63/D2487			
Actual Percentage <sup>1</sup>	Gravel:	14%	4%
	Sand:	36%	40%
	Silt & Clay:	49%	56%
Classification:		Clayey Sand	Sandy Lean Clay
Loss On Ignition: ASTM D2974-14, AASHTO T 267-86			
Ash Content:		98%	96%
Organic Matter:		2.2%	3.8%
Soil pH: ASTM D4972-01			
pH:		8.3	7.7

Notes:

1. Results skewed following in-lab sieving using 3/8" sieve.

**Table 3**  
**In-Lab Test Mix Parameters**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**ISS Treatability Study Summary Report**

Sample ID	Soil Boring Location	Sample Description <sup>1</sup>	Slump Measurement		Pocket Penetrometer Result (tons per sf)
			S <sub>m</sub> (cm)	S <sub>s</sub> (in)	Day 2
Mix-1	B-143 Soil	8% PC	3.5	4.84	4.0
Mix-2		10% PC	3.5	4.84	> 4.5
Mix-3		12% PC	3.7	4.98	> 4.5
Mix-4	B-144 Soil	8% PC	3.0	4.49	> 4.5
Mix-5		10% PC	3.4	4.77	> 4.5
Mix-6		12% PC	3.7	4.98	> 4.5

Notes:

1. S<sub>m</sub> - minature slump
2. S<sub>s</sub> - standard slump

**Table 4**  
**UCS and Hydraulic Conductivity Performance Results**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**ISS Treatability Study Summary Report**

Mix Number	Boring Location	Mix Description	Unconfined Compressive Strength (psi)				Hydraulic Conductivity (cm/sec)
			Day 8	Day 29			Day 50
				A	B	Average	
Mix-1	B-143 Soil	8% PC	51	79	77	78	9.9E-08
Mix-2		10% PC	76	97	108	102	4.9E-08
Mix-3		12% PC	106	159	158	159	7.9E-08
Mix-4	B-144 Soil	8% PC	46	54	56	55	4.7E-07
Mix-5		10% PC	71	90	93	91	4.1E-07
Mix-6		12% PC	94	130	130	130	8.4E-08

**Table 5**  
**Mix-2 (10% PC using B-143 soil) Monolith Leaching Data**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**ISS Treatability Study Summary Report**

Analyte	Untreated Leaching Result	Cycle 1	Cycle 5	Cycle 10	Cycle 15	Cycle 20
	"Target Mass Baseline"					
Method 8260: Volatile Organic Contaminants (µg/L)						
Benzene	0.2 U	0.2 U	0.2 U	0.2 ND	0.2 U	0.2 U
Ethylbenzene	0.4 U	0.4 U	0.4 U	0.4 ND	0.4 U	0.4 U
Toluene	0.2 U	0.2 U	0.2 U	0.3 J	0.2 U	0.2 U
Xylene (Total)	1 U	1 U	1 U	1 ND	1 U	1 U
Method 8270: Semivolatile Organic Contaminants (µg/L)						
Acenaphthene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 J
Acenaphthylene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 J
Anthracene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 J
Benzo(a)anthracene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(a)pyrene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(b)fluoranthene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(g,h,i)perylene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(k)fluoranthene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Chrysene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Dibenz(a,h)anthracene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Fluoranthene	0.1 U	0.2 J	0.1 U	0.2 J	0.1 U	0.5
Fluorene	0.1 U	0.1 J	0.1 U	0.1 J	0.1 U	0.3 J
Indeno(1,2,3-cd)pyrene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2-Methylnaphthalene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.3 J
Naphthalene	0.1 U	0.2 J	0.1 U	0.2 J	0.1 U	0.5 J
Phenanthrene	0.1 U	0.4 J	0.4 J	0.4 J	0.2 J	1
Pyrene	0.1 U	0.2 J	0.2 J	0.2 J	0.1 U	0.6

Notes:

1. Bolded values indicate detections above MDL.
2. J - Estimated value ≥ method detection limit and < limit of quantitation.
3. U - Analyte not detected at the value indicated.
4. ug/L - micrograms per liter.

**Table 6**  
**Mix-5 (10% PC using B-144 soil) Monolith Leaching Data**

**National Grid - Non-Owned Former MGP Site - Rensselaer, New York**  
**ISS Treatability Study Summary Report**

Analyte	Untreated Leaching Result	Cycle 1	Cycle 5	Cycle 10	Cycle 15	Cycle 20
	"Target Mass Baseline"					
Method 8260: Volatile Organic Contaminants (µg/L)						
Benzene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	0.4 U	0.4 U	12	7	12	7
Toluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 J	0.2 U
Xylene (Total)	1 U	1 U	15	9	15	9
Method 8270: Semivolatile Organic Contaminants (µg/L)						
Acenaphthene	6	11	5	9	5	17
Acenaphthylene	0.3 J	1	0.6	1	0.6	2
Anthracene	0.7	2	1	2	1	3
Benzo(a)anthracene	0.1 J	0.1 U	0.1 U	0.2 J	0.1 U	0.2 J
Benzo(a)pyrene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(b)fluoranthene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(g,h,i)perylene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Benzo(k)fluoranthene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Chrysene	0.1 U	0.1 U	0.1 J	0.2 J	0.1 U	0.2 J
Dibenz(a,h)anthracene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Fluoranthene	0.8	0.9	0.7	1	0.8	2
Fluorene	2	5	2	4	2	7
Indeno(1,2,3-cd)pyrene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2-Methylnaphthalene	1	16	7	13	7	25
Naphthalene	2	62	26	45	25	94
Phenanthrene	1	9	5	8	5	14
Pyrene	2	1	1	2	1	2

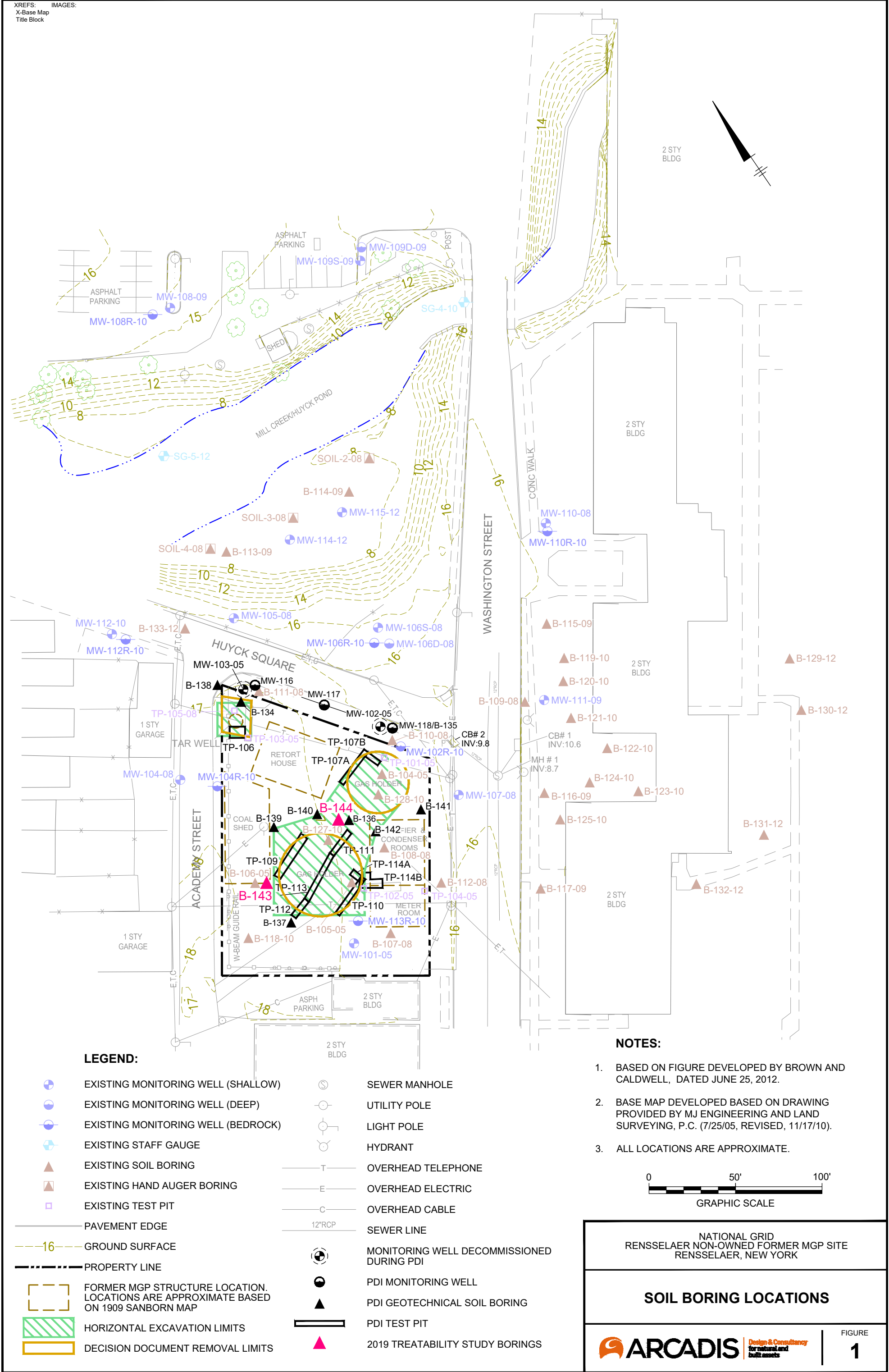
Notes:

1. Bolded values indicate detections above MDL.
2. J - Estimated value ≥ method detection limit and < limit of quantitation.
3. U - Analyte not detected at the value indicated.
4. ug/L - micrograms per liter.

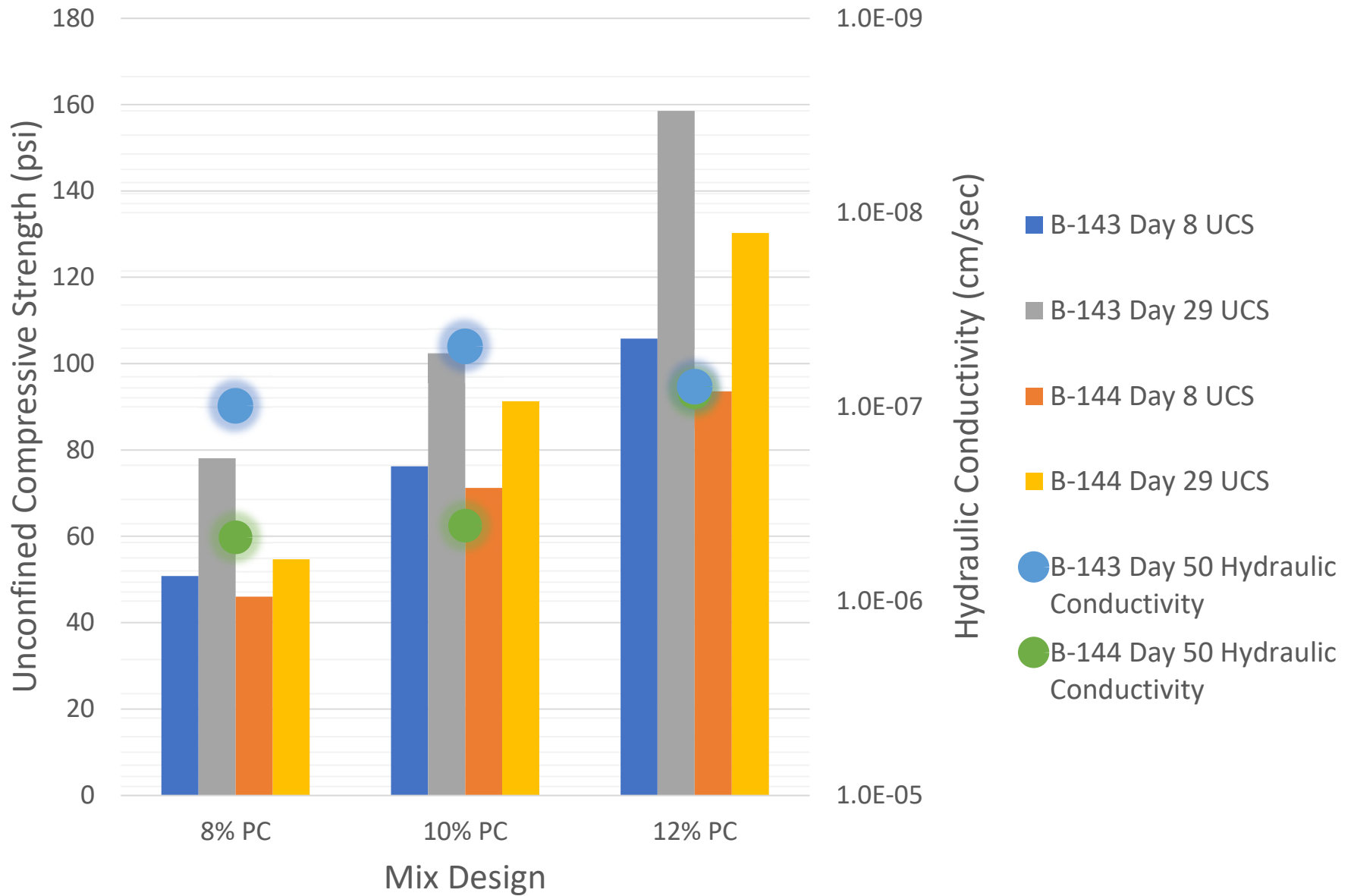
# Figures



XREFS:    IMAGES:  
X-Base Map  
Title Block



**Figure 2. UCS and Hydraulic Conductivity Performance Results**





# Attachment 1

## Soil Boring Logs





# Sample/Core Log

Boring/Well B-143 Project/No. National Grid Rensselaer Page        of       

Site Washington Street, Rensselaer Drilling 8-10-19 Drilling 8-10-19 @  
Location Washington Street, Rensselaer Started @ 9:53 Completed 10:56

Total Depth Drilled 12' 3" Feet Hole Diameter        inches Type of Sample/  
Coring Device Split Spoon

Length and Diameter of Coring Device 2' x 3" Sampling Interval Continuous feet

Land-Surface Elev.        feet ☐ Surveyed ☐ Estimated Datum       

Drilling Fluid Used        Drilling Method Auger

Drilling Contractor Parrott Wolff Driller Mark Helper Max

Prepared By K. Liloia Hammer        Hammer         
Weight        Drop        ins.

Sample/Core Depth (feet below land surface)	Core Recovery (feet)	PID Reading (ppm)	Time/Hydraulic Pressure or Blows per 6 Inches	Sample/Core Description
From To				
0' 4'	NA	NA	NA	Cleared using vacuum
4' 6'	2'	0.1/0.7	2,3,3,3	DK. Brown silt w/ little f sand Δ's to silty clay w/ coarse sand throughout - slight Petro odor
6' 8'	2'	0.8/2.0	2,3,3,9	Gray clay w/ cobbles + m/c sand - wet - Sheen on water - no staining - Petro odor - Δ's to silty clay w/ m/f sand - Plastic
8' 10'	2'	0.2/3.4	0,9,16,23	Gray silty (Plastic clay) w/ Tan F sand lenses, little coarse sand throughout - Mild Petro odor @ 9' <sup>← Tight</sup>
10' 12'	2'	0.7/5.3	9,20,50/2	SAA changes to Plastic Silty Clay → Tight glacial Till - No visible staining or Strong odor
12' 12.3'	<del>2.0</del> 2.3"	N/A	50/1.3	Rock fragments
				Refusal @ 12.3'



# Sample/Core Log

Boring/Well B-144 Project/No. National Grid - Rensselaer Page 1 of 1

Site Location Washington Street, Rensselaer Drilling Started 8-10-19 Drilling Completed 8-10-19  
@ 11:43 ~1 pm

Total Depth Drilled 12.6" Feet Hole Diameter 6" inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 2' x 3" Sampling Interval Continuous feet

Land-Surface Elev.            feet ☐ Surveyed ☐ Estimated Datum           

Drilling Fluid Used            Drilling Method Auger

Drilling Contractor Parrott Wolff Driller Mark Helper Max

Prepared By K. Liloia Hammer Weight            Hammer Drop            ins.

From	To	Core Recovery (feet)	PID Reading (ppm)	Time/Hydraulic Pressure or Blows per 6 Inches	Sample/Core Description
0'	4'	NA	NA	NA	Material Saw cut & Vacuumed out
4'	6'	Ø	NA	7,5,5,4	No recovery
6'	8'	0.6"	85.9	3,4,5,3	NAPL In spoon, Staining present - Sheen on soil, wet. Black clay (Plastic) with coarse sand throughout - wood debris - Strong odor
8'	10'	2'	344/254	8,11,11, 21	SAA w/ increase in c/m sand @ 8-9' - Saturated - NAPL in spoon, staining Present - Sheen on water & soil - Δ's to tan/greenish tint silty clay with fine sand striations - Gravel throughout - Strong odor.
10'	12'	2'	157	3,7,17, 40	SAA Δ's to c/m sand w/ cobbles throughout - Saturated - Product - Staining - Sheen odor Present.
12'	12.6'	~3"	48.9	47/50/2.1	SAA
					Refusal met @ 12' 6"

# Attachment 2

Geotechnical Laboratory Reports





March 18, 2020

Project No. R-2020-048-001

Mr. Andrew Baumeister  
David.Liles@arcadis-us.com  
Arcadis U.S., Inc.  
4915 Prospectus Drive, Suite F  
Durham, NC 27713

Andrew.Baumeister@arcadis-us.com

**Transmittal**  
**Laboratory Test Results**  
**NG Rensselaer**

Please find attached the laboratory test results for the above referenced project. The tests were outlined on the Project Verification Form that was transmitted to your firm prior to the testing. The testing was performed in general accordance with the methods listed on the enclosed data sheets. The test results are believed to be representative of the samples that were submitted for testing and are indicative only of the specimens which were evaluated. We have no direct knowledge of the origin of the samples and imply no position with regard to the nature of the test results, i.e. pass/fail and no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization by our Client. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please contact our office.

Respectively submitted,  
**Geotechnics, Inc.**

Michael P. Smith  
Regional Manager

***We understand that you have a choice in your laboratory services  
and we thank you for choosing Geotechnics.***

## MOISTURE CONTENT

ASTM D 2216-10

Client: Arcadis, U.S., Inc.  
Client Reference: NG Rensselaer  
Project No.: R-2020-048-001

Lab ID:	001	002
Boring No.:	NA	NA
Depth (ft):	NA	NA
Sample No.:	B-143	B-144

Tare Number	13	7
Wt. of Tare & Wet Sample (g)	91.86	87.09
Wt. of Tare & Dry Sample (g)	83.09	75.56
Weight of Tare (g)	22.28	23.13
Weight of Water (g)	8.77	11.53
Weight of Dry Sample (g)	60.81	52.43

<b>Water Content (%)</b>	<b>14.4</b>	<b>22.0</b>
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Notes :

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Tested By	RFF	Date	3/9/20	Checked By	GEM	Date	3/10/20
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page 1 of 1

DCN: CT-S1 DATE: 3/18/13 REVISION: 4

S:\Excel\Excel Qa\Spreadsheets\Water Content.xls

## Moisture, Ash, and Organic Matter (Loss on Ignition)

ASTM D 2974-14

Client: Arcadis, U.S., Inc.  
 Client Reference: NG Rensselaer  
 Project No.: R-2020-048-001

Method B (To 0.1%)

### Moisture Content

ASTM D2216

Lab ID:	001	002
Boring No.:	NA	NA
Depth (ft):	NA	NA
Sample No.:	B-143	B-144
Tare Number	13	7
Weight of Tare & Wet Sample (g)	91.86	87.09
Weight of Tare & Dry Sample (g)	83.09	75.56
Weight of Tare (g)	22.28	23.13
Weight of Water (g)	8.77	11.53
Weight of Dry Sample (g)	60.81	52.43
<b>Moisture Content</b>	<b>14.4%</b>	<b>22.0%</b>

Method C

### Ash Content, Organic Matter

Furnace Temperature (°C)	440	440
Weight of Tare & Ash (g)	81.73	73.55
Weight of Volatiles (g)	1.36	2.01
Weight of Ash (g)	59.45	50.42
<b>Ash Content (%)</b>	<b>97.8%</b>	<b>96.2%</b>
<b>Organic Matter (%)</b>	<b>2.2%</b>	<b>3.8%</b>

Tested By RFF Date 3/9/20 Checked By GEM Date 3/10/20

page 1 of 1

DCN: CT-S8, REV: 4e, DATE: 4/18/17

\\192.168.0.21\Data Drive\Excel\Excel Qa\Spreadsheets\Seldom Used\LOI D2974.XLS\Sheet1

## pH OF SOILS

ASTM D 4972-13

Client: Arcadis, U.S., Inc.  
 Client Reference: NG Rennsselaer  
 Project No.: R-2020-048-001

Lab ID:	001	002
Boring No.:	NA	NA
Depth (ft):	NA	NA
Sample No.:	B-143	B-144

Drying Tare No.:	825	826
Testing Tare No.:	X-13	X-1

Temperature (°C):	22.5	22.5
-------------------	------	------

<b>pH of Sample:</b>	<b>Test 1:</b>	<b>8.25</b>	<b>7.67</b>
	<b>Test 2:</b>	<b>8.4</b>	<b>7.79</b>

Agreement (+/- 0.2 units):	-0.2	-0.1
----------------------------	------	------

Meter Calibration		
Buffer pH	Meter Reading	Meter Model
4.00	4.01	Ohaus Starter 3100
10.00	10.03	

<b>pH of Distilled Water:</b> (Acceptable range 6.5 - 7.5)	6.53
---	------

Tested By	RFF	Date	3/17/20	Checked By	GEM	Date	3/18/20
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DCN: CT-S36 DATE 6/5/14 REVISION: 5

S:\Excel\Excel QA\Spreadsheets\ph.xls



# SIEVE ANALYSIS

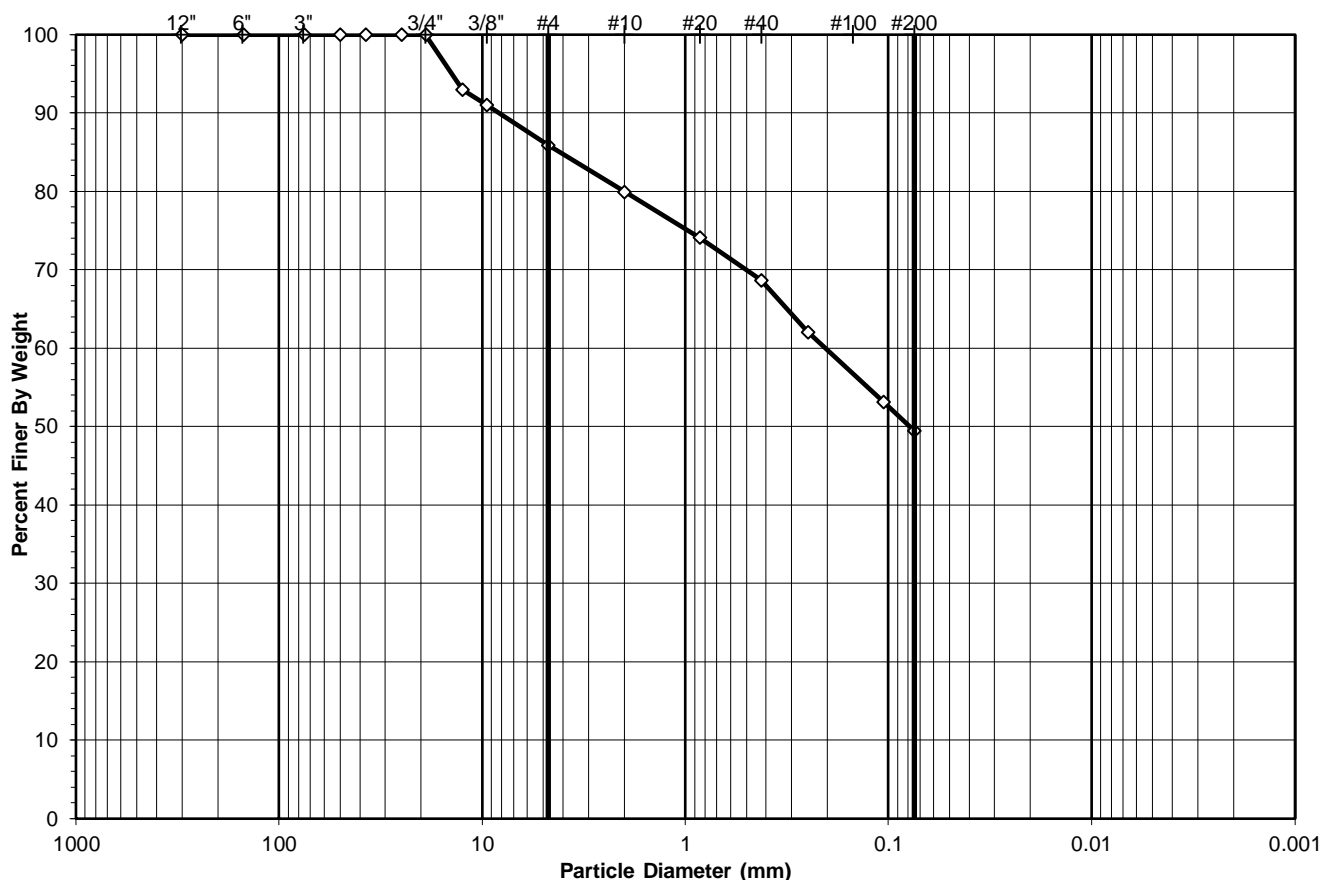
ASTM D 422-63 (2007)



Client: Arcadis, U.S., Inc.  
 Client Reference: NG Rensselaer  
 Project No.: R-2020-048-001  
 Lab ID: R-2020-048-001-001

Boring No.: NA  
 Depth (ft): NA  
 Sample No.: B-143  
 Soil Color: Dark Gray

USCS USDA	SIEVE ANALYSIS				HYDROMETER	
	cobbles	gravel	sand		silt and clay fraction	
	cobbles	gravel	sand		silt	clay



USCS Summary		
Sieve Sizes (mm)		Percentage
Greater Than #4	Gravel	14.11
#4 To #200	Sand	36.41
Finer Than #200	Silt & Clay	49.49
<b>USCS Symbol:</b> SC, TESTED		
<b>USCS Classification:</b> CLAYEY SAND		

# WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client: Arcadis, U.S., Inc.  
 Client Reference: NG Rensselaer  
 Project No.: R-2020-048-001  
 Lab ID: R-2020-048-001-001

Boring No.: NA  
 Depth (ft): NA  
 Sample No.: B-143  
 Soil Color: Dark Gray

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	217	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	696.78	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	630.56	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	170.82	Weight of Tare (g):	NA
Weight of Water (g):	66.22	Weight of Water (g):	NA
Weight of Dry Soil (g):	459.74	Weight of Dry Soil (g):	NA
<b>Moisture Content (%):</b>	<b>14.4</b>	<b>Moisture Content (%):</b>	<b>0.0</b>

Wet Weight of -3/4" Sample (g):	526.58	Weight of the Dry Sample (g):	459.74
Dry Weight of - 3/4" Sample (g):	460.3	Weight of Minus #200 Material (g):	227.51
Wet Weight of +3/4" Sample (g):	0.00	Weight of Plus #200 Material (g):	232.23
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	460.3		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	0.00	0.00	0.00	100.00	100.00
2"	50	0.00	( * )	0.00	100.00	100.00
1 1/2"	37.5	0.00	0.00	0.00	100.00	100.00
1"	25.0	0.00	0.00	0.00	100.00	100.00
3/4"	19.0	0.00	0.00	0.00	100.00	100.00
1/2"	12.5	32.34	7.03	7.03	92.97	92.97
3/8"	9.50	9.13	1.99	9.02	90.98	90.98
#4	4.75	23.39	5.09	14.11	85.89	85.89
#10	2.00	27.34	5.95	20.05	79.95	79.95
#20	0.85	26.80	( ** )	25.88	74.12	74.12
#40	0.425	25.06	5.45	31.34	68.66	68.66
#60	0.250	30.36	6.60	37.94	62.06	62.06
#140	0.106	40.92	8.90	46.84	53.16	53.16
#200	0.075	16.89	3.67	50.51	49.49	49.49
Pan	-	227.51	49.49	100.00	-	-

**Notes :** ( \* ) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample  
 ( \*\* ) The - 3/4" sieve analysis is based on the Weight of the Dry Sample

Tested By GG Date 3/12/20 Checked By GEM Date 3/13/20

## ATTERBERG LIMITS

ASTM D 4318-17

Client: Arcadis, U.S., Inc.

Client Reference: NG Rensselaer

Project No.: R-2020-048-001

Lab ID: R-2020-048-001-001

Boring No.: NA

Depth (ft): NA

Sample No.: B-143

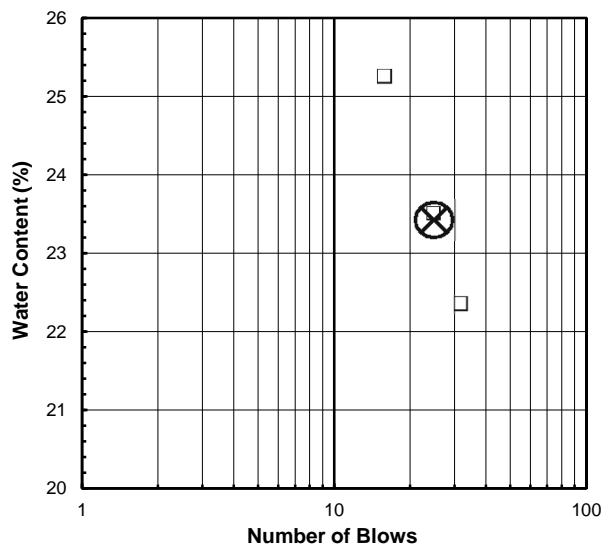
Soil Description: DARK GRAY LEAN CLAY

**Note: The USCS symbol used with this test refers only to the minus No. 40** (Minus No. 40 sieve material, Air dried)  
**sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.**

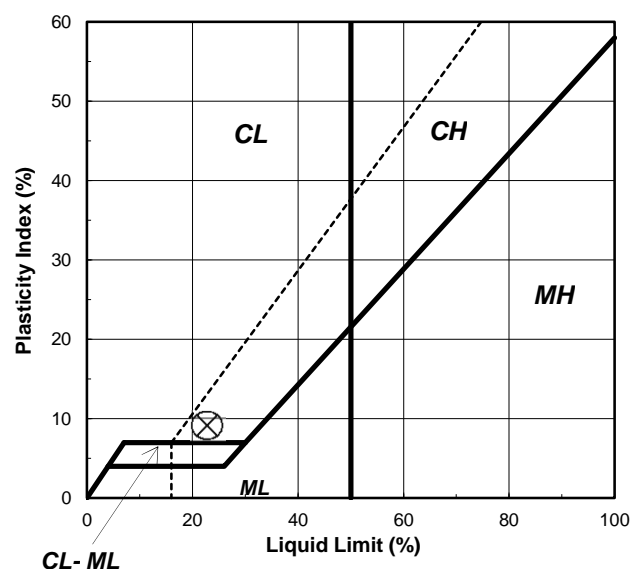
As Received Moisture Content		Liquid Limit Test			
ASTM D2216-19		<b>1</b>	<b>2</b>	<b>3</b>	<b>M</b>
Tare Number:	13	AT	1	AO	<b>U</b>
Wt. of Tare & Wet Sample (g):	91.86	29.38	31.04	30.64	<b>L</b>
Wt. of Tare & Dry Sample (g):	83.09	26.85	28.10	27.56	<b>T</b>
Weight of Tare (g):	22.28	15.53	15.59	15.36	<b>I</b>
Weight of Water (g):	8.8	2.5	2.9	3.1	<b>P</b>
Weight of Dry Sample (g):	60.8	11.3	12.5	12.2	<b>O</b>
Was As Received MC Preserved:	<b>Yes</b>				<b>I</b>
<b>Moisture Content (%):</b>	<b>14.4</b>	<b>22.3</b>	<b>23.5</b>	<b>25.2</b>	<b>N</b>
<b>Number of Blows:</b>		<b>32</b>	<b>25</b>	<b>16</b>	<b>T</b>

Plastic Limit Test	1	2	Range	Test Results
Tare Number:	3	21		<b>Liquid Limit (%): 23</b>
Wt. of Tare & Wet Sample (g):	13.36	13.69		<b>Plastic Limit (%): 14</b>
Wt. of Tare & Dry Sample (g):	12.58	12.86		<b>Plasticity Index (%): 9</b>
Weight of Tare (g):	7.06	7.04		<b>USCS Symbol: CL</b>
Weight of Water (g):	0.8	0.8		
Weight of Dry Sample (g):	5.5	5.8		
<b>Moisture Content (%):</b>	<b>14.1</b>	<b>14.3</b>	<b>-0.1</b>	
<i>Note: The acceptable range of the two Moisture Contents is <math>\pm</math> 1.12</i>				

Flow Curve



Plasticity Chart



Tested By BW Date 1/3/00 Checked By GEM Date 3/11/20

# SIEVE ANALYSIS

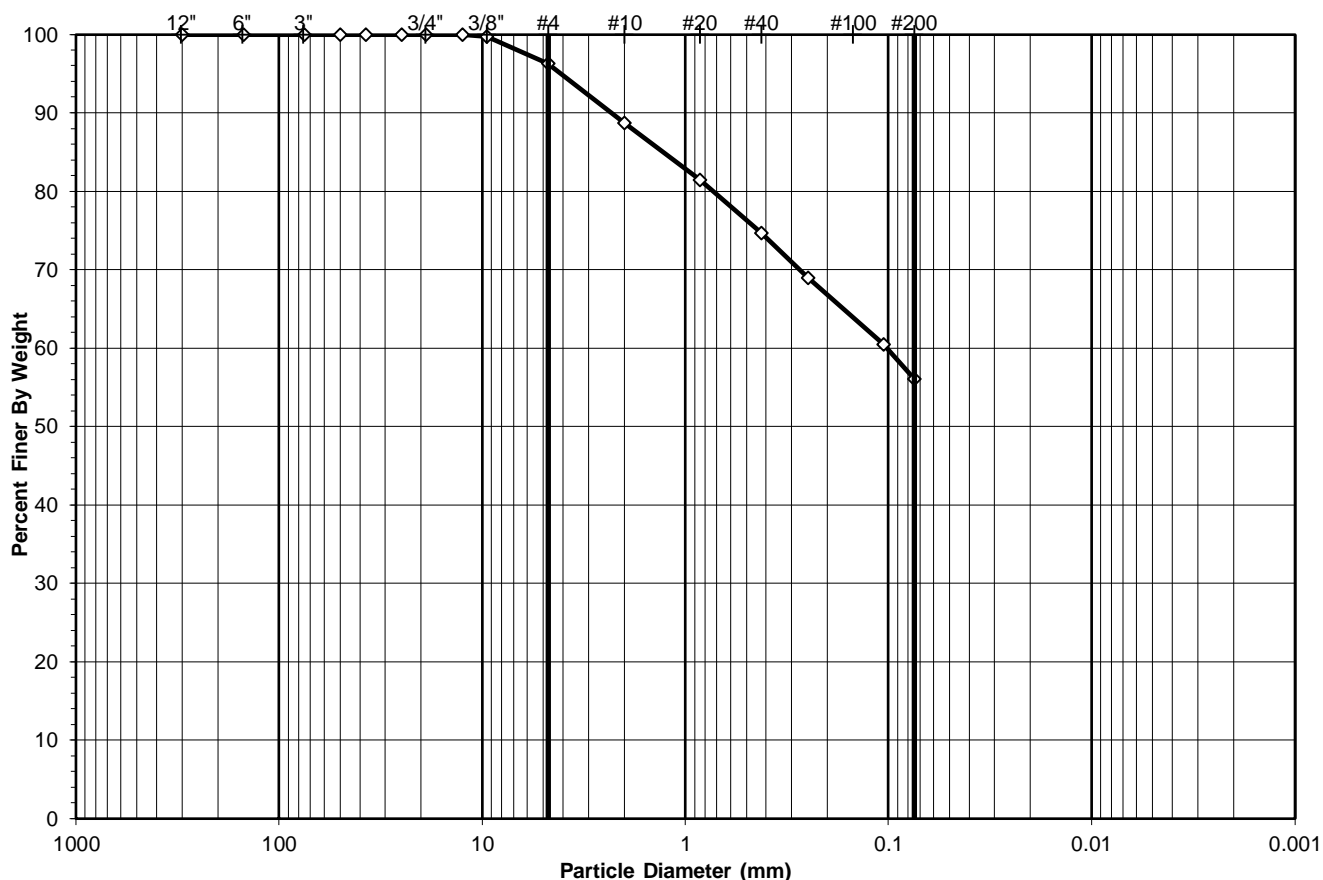
ASTM D 422-63 (2007)



Client: Arcadis, U.S., Inc.  
 Client Reference: NG Rensselaer  
 Project No.: R-2020-048-001  
 Lab ID: R-2020-048-001-002

Boring No.: NA  
 Depth (ft): NA  
 Sample No.: B-144  
 Soil Color: Dark Gray

USCS USDA	SIEVE ANALYSIS				HYDROMETER	
	cobbles	gravel	sand		silt and clay fraction	
	cobbles	gravel	sand		silt	clay



USCS Summary		
Sieve Sizes (mm)		Percentage
Greater Than #4	Gravel	3.69
#4 To #200	Sand	40.18
Finer Than #200	Silt & Clay	56.12
<b>USCS Symbol:</b> CL, TESTED		
<b>USCS Classification:</b> SANDY LEAN CLAY		

# WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client: Arcadis, U.S., Inc.  
 Client Reference: NG Rensselaer  
 Project No.: R-2020-048-001  
 Lab ID: R-2020-048-001-002

Boring No.: NA  
 Depth (ft): NA  
 Sample No.: B-144  
 Soil Color: Dark Gray

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	210	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	828.82	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	712.41	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	172.58	Weight of Tare (g):	NA
Weight of Water (g):	116.41	Weight of Water (g):	NA
Weight of Dry Soil (g):	539.83	Weight of Dry Soil (g):	NA
<b>Moisture Content (%):</b>	<b>21.6</b>	<b>Moisture Content (%):</b>	<b>0.0</b>

Wet Weight of -3/4" Sample (g):	656.22	Weight of the Dry Sample (g):	539.83
Dry Weight of - 3/4" Sample (g):	539.8	Weight of Minus #200 Material (g):	302.96
Wet Weight of +3/4" Sample (g):	0.00	Weight of Plus #200 Material (g):	236.87
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	539.8		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	0.00	0.00	0.00	100.00	100.00
2"	50	0.00	( * )	0.00	100.00	100.00
1 1/2"	37.5	0.00	0.00	0.00	100.00	100.00
1"	25.0	0.00	0.00	0.00	100.00	100.00
3/4"	19.0	0.00	0.00	0.00	100.00	100.00
1/2"	12.5	0.00	0.00	0.00	100.00	100.00
3/8"	9.50	1.39	0.26	0.26	99.74	99.74
#4	4.75	18.55	3.44	3.69	96.31	96.31
#10	2.00	40.93	7.58	11.28	88.72	88.72
#20	0.85	39.11	( ** )	18.52	81.48	81.48
#40	0.425	36.46	6.75	25.27	74.73	74.73
#60	0.250	30.99	5.74	31.02	68.98	68.98
#140	0.106	45.79	8.48	39.50	60.50	60.50
#200	0.075	23.65	4.38	43.88	56.12	56.12
Pan	-	302.96	56.12	100.00	-	-

**Notes :** ( \* ) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample  
 ( \*\* ) The - 3/4" sieve analysis is based on the Weight of the Dry Sample

Tested By GG Date 3/12/20 Checked By GEM Date 3/13/20

## ATTERBERG LIMITS

ASTM D 4318-17

Client: Arcadis, U.S., Inc.

Client Reference: NG Rensselaer

Project No.: R-2020-048-001

Lab ID: R-2020-048-001-002

Boring No.: NA

Depth (ft): NA

Sample No.: B-144

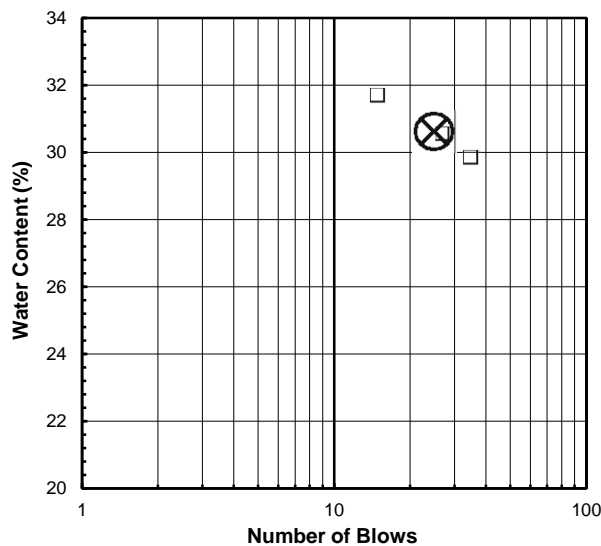
Soil Description: BLACK LEAN CLAY

**Note:** The USCS symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried) sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

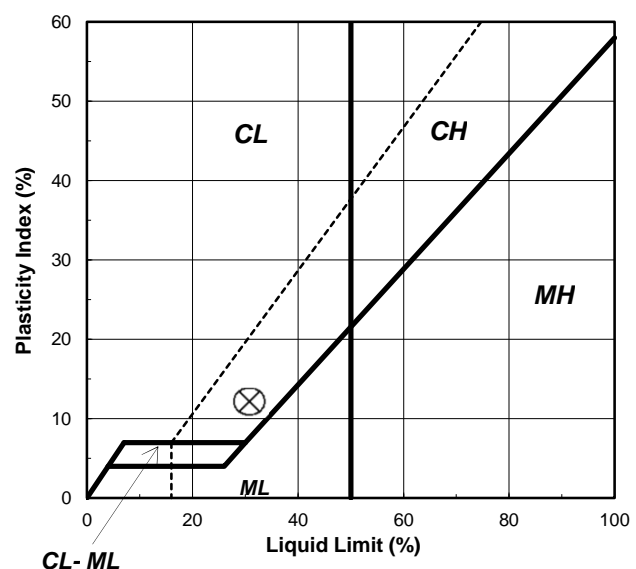
As Received Moisture Content		Liquid Limit Test			
ASTM D2216-19		<b>1</b>	<b>2</b>	<b>3</b>	<b>M</b>
Tare Number:	7	AI	2M	KP	U
Wt. of Tare & Wet Sample (g):	87.09	29.53	29.76	27.78	L
Wt. of Tare & Dry Sample (g):	75.56	26.28	26.44	24.82	T
Weight of Tare (g):	23.13	15.39	15.57	15.48	I
Weight of Water (g):	11.5	3.3	3.3	3.0	P
Weight of Dry Sample (g):	52.4	10.9	10.9	9.3	O
Was As Received MC Preserved:	Yes				I
<b>Moisture Content (%):</b>	<b>22.0</b>	<b>29.8</b>	<b>30.5</b>	<b>31.7</b>	<b>N</b>
<b>Number of Blows:</b>		<b>35</b>	<b>27</b>	<b>15</b>	<b>T</b>

Plastic Limit Test	1	2	Range	Test Results
Tare Number:	9	20		Liquid Limit (%): 31
Wt. of Tare & Wet Sample (g):	13.99	13.47		Plastic Limit (%): 19
Wt. of Tare & Dry Sample (g):	12.87	12.46		Plasticity Index (%): 12
Weight of Tare (g):	6.99	7.02		USCS Symbol: CL
Weight of Water (g):	1.1	1.0		
Weight of Dry Sample (g):	5.9	5.4		
<b>Moisture Content (%):</b>	<b>19.0</b>	<b>18.6</b>	<b>0.5</b>	
<i>Note: The acceptable range of the two Moisture Contents is <math>\pm</math> 1.12</i>				

Flow Curve



Plasticity Chart



Tested By BW Date 3/10/20 Checked By GEM Date 3/11/20



November 6, 2019

Project No. R-2019-267-003

Mr. Andrew Baumeister  
Arcadis U.S., Inc.  
4915 Prospectus Drive, Suite F  
Durham, NC 27713

Transmittal  
Laboratory Test Results  
NG Rensselaer

Please find attached the laboratory test results for the above referenced project. The tests were outlined on the Project Verification Form that was transmitted to your firm prior to the testing. The testing was performed in general accordance with the methods listed on the enclosed data sheets. The test results are believed to be representative of the samples that were submitted for testing and are indicative only of the specimens which were evaluated. We have no direct knowledge of the origin of the samples and imply no position with regard to the nature of the test results, i.e. pass/fail and no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization by our Client. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please contact our office.

Respectively submitted,  
**Geotechnics, Inc.**

Michael P. Smith  
Regional Manager

***We understand that you have a choice in your laboratory services  
and we thank you for choosing Geotechnics.***

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-003  
 Lab ID R-2019-267-003-001

Boring No. Mix - 1  
 Depth (ft.) N/A  
 Sample No. Day 8  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	4.044	Top Dia. (in)	1.983
Length 2(in)	4.007	Mid. Dia. (in)	1.987
Length 3(in)	4.008	Bot. Dia. (in)	1.998
Avg.Length(in)	4.020	Area (in. <sup>2</sup> )	3.108

### WATER CONTENT AFTER TEST

Tare No.	SS-0
Wt. Tare + WS.(g)	486.54
Wt. Tare + DS.(g)	398.58
Wt. of Tare(g)	100.58
% Moisture	29.52

### UNIT WEIGHT

Wt. Tube & WS.(g.)	387.15	Sample Volume(cc.)	204.7
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.89
Wt. Of WS.(g.)	387.15	Unit Wet Wt.(pcf.)	118.00
Diameter (in.)	1.99	Moisture Content, %	29.52
Length (in.)	4.02	Unit Dry Wt.(pcf.)	91.10
Length (cm.)	10.21		

### ELECTRONIC DEVICE

PEAK LOAD (lbs)

STRESS (psi)

158.0

50.8



Tested By MY Date 10/29/19 Input Checked By GEM Date 11/6/19



# **UNCONFINED COMPRESSIVE STRENGTH**

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-003  
 Lab ID R-2019-267-003-002

Boring No. Mix - 2  
 Depth (ft.) N/A  
 Sample No. Day 8  
 Visual Gray Soil Mix

## **INITIAL SAMPLE DIMENSIONS**

Length 1(in)	3.970	Top Dia. (in)	1.982
Length 2(in)	3.904	Mid. Dia. (in)	1.988
Length 3(in)	3.977	Bot. Dia. (in)	1.995
Avg.Length(in)	3.950	Area (in. <sup>2</sup> )	3.105

## **WATER CONTENT AFTER TEST**

Tare No.	SS-1
Wt. Tare + WS.(g)	480.68
Wt. Tare + DS.(g)	390.47
Wt. of Tare(g)	100.32
% Moisture	31.09

## **UNIT WEIGHT**

Wt. Tube & WS.(g)	380.8	Sample Volume(cc.)	201.0
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.89
Wt. Of WS.(g.)	380.8	Unit Wet Wt.(pcf.)	118.22
Diameter (in.)	1.99	Moisture Content, %	31.09
Length (in.)	3.95	Unit Dry Wt.(pcf.)	90.18
Length (cm.)	10.03		

## **ELECTRONIC DEVICE**

**PEAK LOAD (lbs)**

**STRESS (psi)**

236.6

76.2



Tested By MY Date 10/29/19 Input Checked By GEM Date 11/6/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-003  
 Lab ID R-2019-267-003-003

Boring No. Mix - 3  
 Depth (ft.) N/A  
 Sample No. Day 8  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	4.017	Top Dia. (in)	1.992
Length 2(in)	3.989	Mid. Dia. (in)	1.991
Length 3(in)	4.003	Bot. Dia. (in)	1.997
Avg.Length(in)	4.003	Area (in. <sup>2</sup> )	3.121

### WATER CONTENT AFTER TEST

Tare No.	SS-8
Wt. Tare + WS.(g)	480.3
Wt. Tare + DS.(g)	387.57
Wt. of Tare(g)	99.75
% Moisture	32.22

### UNIT WEIGHT

Wt. Tube & WS.(g)	381.42	Sample Volume(cc.)	204.7
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.86
Wt. Of WS.(g.)	381.42	Unit Wet Wt.(pcf.)	116.27
Diameter (in.)	1.99	Moisture Content, %	32.22
Length (in.)	4.00	Unit Dry Wt.(pcf.)	87.93
Length (cm.)	10.17		

### ELECTRONIC DEVICE

PEAK LOAD (lbs)

STRESS (psi)

330.3

105.8



Tested By MY Date 10/29/19 Input Checked By GEM Date 11/6/19

# UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-003  
 Lab ID R-2019-267-003-004

Boring No. Mix - 4  
 Depth (ft.) N/A  
 Sample No. Day 8  
 Visual Gray Soil Mix

## INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.999	Top Dia. (in)	1.995
Length 2(in)	3.989	Mid. Dia. (in)	1.994
Length 3(in)	4.001	Bot. Dia. (in)	1.984
Avg.Length(in)	3.996	Area (in. <sup>2</sup> )	3.113

## WATER CONTENT AFTER TEST

Tare No.	SS-6
Wt. Tare + WS.(g)	478.25
Wt. Tare + DS.(g)	392.49
Wt. of Tare(g)	100.68
% Moisture	29.39

## UNIT WEIGHT

Wt. Tube & WS.(g.)	378.21	Sample Volume(cc.)	203.9
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.85
Wt. Of WS.(g.)	378.21	Unit Wet Wt.(pcf.)	115.75
Diameter (in.)	1.99	Moisture Content, %	29.39
Length (in.)	4.00	Unit Dry Wt.(pcf.)	89.46
Length (cm.)	10.15		

## ELECTRONIC DEVICE

PEAK LOAD (lbs)

STRESS (psi)

143.1

46.0



Tested By MY Date 10/29/19 Input Checked By GEM Date 11/6/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-003  
 Lab ID R-2019-267-003-005

Boring No. Mix - 5  
 Depth (ft.) N/A  
 Sample No. Day 8  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	4.016	Top Dia. (in)	1.996
Length 2(in)	3.990	Mid. Dia. (in)	1.990
Length 3(in)	3.998	Bot. Dia. (in)	1.984
Avg.Length(in)	4.001	Area (in. <sup>2</sup> )	3.110

### WATER CONTENT AFTER TEST

Tare No.	SS-9
Wt. Tare + WS.(g)	478.3
Wt. Tare + DS.(g)	391.93
Wt. of Tare(g)	101.32
% Moisture	29.72

### UNIT WEIGHT

Wt. Tube & WS.(g.)	377.42	Sample Volume(cc.)	203.9
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.85
Wt. Of WS.(g.)	377.42	Unit Wet Wt.(pcf.)	115.48
Diameter (in.)	1.99	Moisture Content, %	29.72
Length (in.)	4.00	Unit Dry Wt.(pcf.)	89.02
Length (cm.)	10.16		

### ELECTRONIC DEVICE

PEAK LOAD (lbs)

STRESS (psi)

221.4

71.2



Tested By MY Date 10/29/19 Input Checked By GEM Date 11/6/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-003  
 Lab ID R-2019-267-003-006

Boring No. Mix - 6  
 Depth (ft.) N/A  
 Sample No. Day 8  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	4.022	Top Dia. (in)	2.005
Length 2(in)	4.002	Mid. Dia. (in)	1.986
Length 3(in)	3.992	Bot. Dia. (in)	1.987
Avg.Length(in)	4.005	Area (in. <sup>2</sup> )	3.119

### WATER CONTENT AFTER TEST

Tare No.	SS-3
Wt. Tare + WS.(g)	477.74
Wt. Tare + DS.(g)	390.88
Wt. of Tare(g)	100.74
% Moisture	29.94

### UNIT WEIGHT

Wt. Tube & WS.(g)	377.83	Sample Volume(cc.)	204.7
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.85
Wt. Of WS.(g.)	377.83	Unit Wet Wt.(pcf.)	115.18
Diameter (in.)	1.99	Moisture Content, %	29.94
Length (in.)	4.01	Unit Dry Wt.(pcf.)	88.64
Length (cm.)	10.17		

### ELECTRONIC DEVICE

PEAK LOAD (lbs)

STRESS (psi)

292.0

93.6



Tested By MY Date 10/29/19 Input Checked By GEM Date 11/6/19



December 4, 2019

Project No. R-2019-267-004

Mr. Andrew Baumeister  
Arcadis U.S., Inc.  
4915 Prospectus Drive, Suite F  
Durham, NC 27713

Transmittal  
Laboratory Test Results  
NG Rensselaer

Please find attached the laboratory test results for the above referenced project. The tests were outlined on the Project Verification Form that was transmitted to your firm prior to the testing. The testing was performed in general accordance with the methods listed on the enclosed data sheets. The test results are believed to be representative of the samples that were submitted for testing and are indicative only of the specimens which were evaluated. We have no direct knowledge of the origin of the samples and imply no position with regard to the nature of the test results, i.e. pass/fail and no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization by our Client. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please contact our office.

Respectively submitted,  
**Geotechnics, Inc.**

Michael P. Smith  
Regional Manager

***We understand that you have a choice in your laboratory services  
and we thank you for choosing Geotechnics.***



## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-001

Boring No. Mix - 1  
 Depth (ft.) N/A  
 Sample No. Day 29A  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.987	Top Dia. (in)	1.985
Length 2(in)	3.953	Mid. Dia. (in)	2.001
Length 3(in)	3.977	Bot. Dia. (in)	1.992
Avg.Length(in)	3.972	Area (in. <sup>2</sup> )	3.119

### WATER CONTENT AFTER TEST

Tare No.	907
Wt. Tare + WS.(g)	488.57
Wt. Tare + DS.(g)	401.11
Wt. of Tare(g)	101.44
% Moisture	29.19

### UNIT WEIGHT

Wt. Tube & WS.(g.)	387.71	Sample Volume(cc.)	203.0
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.91
Wt. Of WS.(g.)	387.71	Unit Wet Wt.(pcf.)	119.18
Diameter (in.)	1.99	Moisture Content, %	29.19
Length (in.)	3.97	Unit Dry Wt.(pcf.)	92.25
Length (cm.)	10.09		

### ELECTRONIC DEVICE PEAK LOAD (lbs)

### STRESS (psi)

247.3

79.3



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-002

Boring No. Mix - 1  
 Depth (ft.) N/A  
 Sample No. Day 29B  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.965	Top Dia. (in)	1.987
Length 2(in)	3.961	Mid. Dia. (in)	1.992
Length 3(in)	3.969	Bot. Dia. (in)	1.982
Avg.Length(in)	3.965	Area (in. <sup>2</sup> )	3.101

### WATER CONTENT AFTER TEST

Tare No.	905
Wt. Tare + WS.(g)	485.5
Wt. Tare + DS.(g)	395.8
Wt. of Tare(g)	102.08
% Moisture	30.54

### UNIT WEIGHT

Wt. Tube & WS.(g.)	383.96	Sample Volume(cc.)	201.5
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.91
Wt. Of WS.(g.)	383.96	Unit Wet Wt.(pcf.)	118.92
Diameter (in.)	1.99	Moisture Content, %	30.54
Length (in.)	3.97	Unit Dry Wt.(pcf.)	91.10
Length (cm.)	10.07		

### ELECTRONIC DEVICE PEAK LOAD (lbs)

### STRESS (psi)

238.2

76.8



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19



## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-003

Boring No. Mix - 2  
 Depth (ft.) N/A  
 Sample No. Day 29A  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.991	Top Dia. (in)	1.992
Length 2(in)	3.946	Mid. Dia. (in)	1.991
Length 3(in)	3.962	Bot. Dia. (in)	1.998
Avg.Length(in)	3.966	Area (in. <sup>2</sup> )	3.122

### WATER CONTENT AFTER TEST

Tare No.	913
Wt. Tare + WS.(g)	482.16
Wt. Tare + DS.(g)	393.44
Wt. of Tare(g)	102.17
% Moisture	30.46

### UNIT WEIGHT

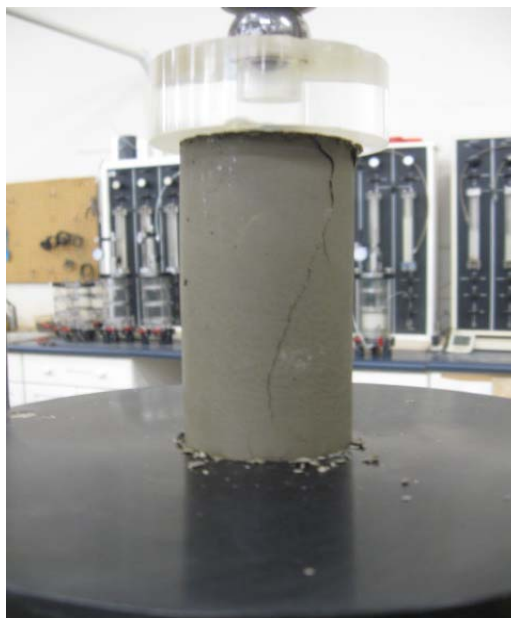
Wt. Tube & WS.(g.)	381.26	Sample Volume(cc.)	202.9
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.88
Wt. Of WS.(g.)	381.26	Unit Wet Wt.(pcf.)	117.25
Diameter (in.)	1.99	Moisture Content, %	30.46
Length (in.)	3.97	Unit Dry Wt.(pcf.)	89.88
Length (cm.)	10.07		

**ELECTRONIC DEVICE**  
**PEAK LOAD (lbs)**

**STRESS (psi)**

303.2

97.1



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-004

Boring No. Mix - 2  
 Depth (ft.) N/A  
 Sample No. Day 29B  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.980	Top Dia. (in)	1.996
Length 2(in)	3.968	Mid. Dia. (in)	1.995
Length 3(in)	3.984	Bot. Dia. (in)	1.986
Avg.Length(in)	3.977	Area (in. <sup>2</sup> )	3.118

### WATER CONTENT AFTER TEST

Tare No.	914
Wt. Tare + WS.(g)	484.72
Wt. Tare + DS.(g)	397.49
Wt. of Tare(g)	102.22
% Moisture	29.54

### UNIT WEIGHT

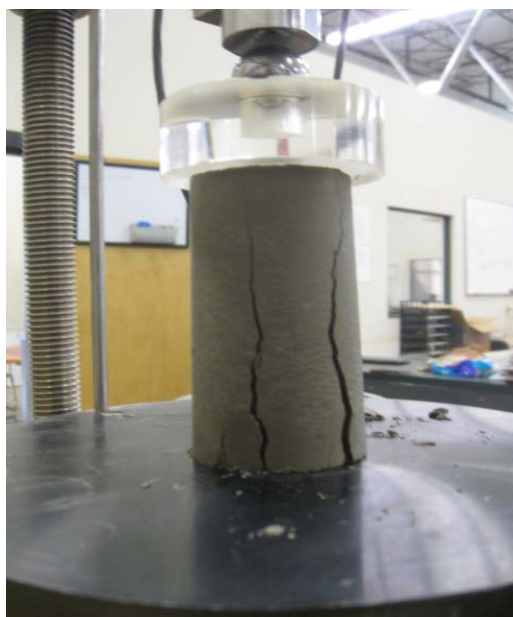
Wt. Tube & WS.(g.)	383.11	Sample Volume(cc.)	203.2
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.89
Wt. Of WS.(g.)	383.11	Unit Wet Wt.(pcf.)	117.65
Diameter (in.)	1.99	Moisture Content, %	29.54
Length (in.)	3.98	Unit Dry Wt.(pcf.)	90.82
Length (cm.)	10.10		

**ELECTRONIC DEVICE**  
**PEAK LOAD (lbs)**

**STRESS (psi)**

335.4

107.6



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-005

Boring No. Mix - 3  
 Depth (ft.) N/A  
 Sample No. Day 29A  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.953	Top Dia. (in)	1.984
Length 2(in)	3.985	Mid. Dia. (in)	2.006
Length 3(in)	3.986	Bot. Dia. (in)	2.004
Avg.Length(in)	3.975	Area (in. <sup>2</sup> )	3.135

### WATER CONTENT AFTER TEST

Tare No.	911
Wt. Tare + WS.(g)	484.58
Wt. Tare + DS.(g)	399.07
Wt. of Tare(g)	102.23
% Moisture	28.81

### UNIT WEIGHT

Wt. Tube & WS.(g.)	382.78	Sample Volume(cc.)	204.2
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.87
Wt. Of WS.(g.)	382.78	Unit Wet Wt.(pcf.)	116.96
Diameter (in.)	2.00	Moisture Content, %	28.81
Length (in.)	3.97	Unit Dry Wt.(pcf.)	90.81
Length (cm.)	10.10		

### ELECTRONIC DEVICE PEAK LOAD (lbs)

### STRESS (psi)

499.7

159.4



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-006

Boring No. Mix - 3  
 Depth (ft.) N/A  
 Sample No. Day 29B  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.950	Top Dia. (in)	1.992
Length 2(in)	3.976	Mid. Dia. (in)	1.997
Length 3(in)	3.985	Bot. Dia. (in)	1.985
Avg.Length(in)	3.970	Area (in. <sup>2</sup> )	3.114

### WATER CONTENT AFTER TEST

Tare No.	SS-2
Wt. Tare + WS.(g)	482.96
Wt. Tare + DS.(g)	395.79
Wt. of Tare(g)	100.46
% Moisture	29.52

### UNIT WEIGHT

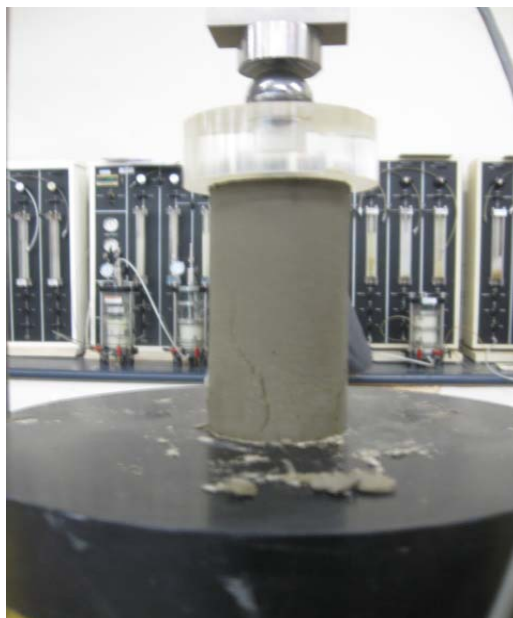
Wt. Tube & WS.(g.)	382.85	Sample Volume(cc.)	202.6
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.89
Wt. Of WS.(g.)	382.85	Unit Wet Wt.(pcf.)	117.90
Diameter (in.)	1.99	Moisture Content, %	29.52
Length (in.)	3.97	Unit Dry Wt.(pcf.)	91.03
Length (cm.)	10.08		

**ELECTRONIC DEVICE**  
**PEAK LOAD (lbs)**

**STRESS (psi)**

491.3

157.7



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-007

Boring No. Mix - 4  
 Depth (ft.) N/A  
 Sample No. Day 29A  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.980	Top Dia. (in)	2.005
Length 2(in)	3.977	Mid. Dia. (in)	1.986
Length 3(in)	3.997	Bot. Dia. (in)	1.986
Avg.Length(in)	3.985	Area (in. <sup>2</sup> )	3.118

### WATER CONTENT AFTER TEST

Tare No.	SS-9
Wt. Tare + WS.(g)	480.83
Wt. Tare + DS.(g)	399.32
Wt. of Tare(g)	101.72
% Moisture	27.39

### UNIT WEIGHT

Wt. Tube & WS.(g.)	380.06	Sample Volume(cc.)	203.6
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.87
Wt. Of WS.(g.)	380.06	Unit Wet Wt.(pcf.)	116.50
Diameter (in.)	1.99	Moisture Content, %	27.39
Length (in.)	3.98	Unit Dry Wt.(pcf.)	91.45
Length (cm.)	10.12		

### ELECTRONIC DEVICE PEAK LOAD (lbs)

### STRESS (psi)

167.2

53.6



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-008

Boring No. Mix - 4  
 Depth (ft.) N/A  
 Sample No. Day 29B  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.970	Top Dia. (in)	1.991
Length 2(in)	3.963	Mid. Dia. (in)	1.903
Length 3(in)	3.972	Bot. Dia. (in)	1.987
Avg.Length(in)	3.968	Area (in. <sup>2</sup> )	3.018

### WATER CONTENT AFTER TEST

Tare No.	SS-1
Wt. Tare + WS.(g)	478.12
Wt. Tare + DS.(g)	394.63
Wt. of Tare(g)	100.46
% Moisture	28.38

### UNIT WEIGHT

Wt. Tube & WS.(g.)	378.13	Sample Volume(cc.)	196.3
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.93
Wt. Of WS.(g.)	378.13	Unit Wet Wt.(pcf.)	120.22
Diameter (in.)	1.96	Moisture Content, %	28.38
Length (in.)	3.97	Unit Dry Wt.(pcf.)	93.64
Length (cm.)	10.08		

### ELECTRONIC DEVICE PEAK LOAD (lbs)

### STRESS (psi)

168.5

55.8



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19



## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-009

Boring No. Mix - 5  
 Depth (ft.) N/A  
 Sample No. Day 29A  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.976	Top Dia. (in)	1.994
Length 2(in)	3.956	Mid. Dia. (in)	1.993
Length 3(in)	3.967	Bot. Dia. (in)	1.984
Avg.Length(in)	3.966	Area (in. <sup>2</sup> )	3.111

### WATER CONTENT AFTER TEST

Tare No.	SS-8
Wt. Tare + WS.(g)	480.67
Wt. Tare + DS.(g)	398.41
Wt. of Tare(g)	99.82
% Moisture	27.55

### UNIT WEIGHT

Wt. Tube & WS.(g.)	381.51	Sample Volume(cc.)	202.2
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.89
Wt. Of WS.(g.)	381.51	Unit Wet Wt.(pcf.)	117.72
Diameter (in.)	1.99	Moisture Content, %	27.55
Length (in.)	3.97	Unit Dry Wt.(pcf.)	92.30
Length (cm.)	10.07		

**ELECTRONIC DEVICE**  
**PEAK LOAD (lbs)**

**STRESS (psi)**

278.3

89.5



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-010

Boring No. Mix - 5  
 Depth (ft.) N/A  
 Sample No. Day 29B  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.987	Top Dia. (in)	2.007
Length 2(in)	4.000	Mid. Dia. (in)	1.987
Length 3(in)	3.990	Bot. Dia. (in)	1.988
Avg.Length(in)	3.992	Area (in. <sup>2</sup> )	3.123

### WATER CONTENT AFTER TEST

Tare No.	SS-0
Wt. Tare + WS.(g)	479.3
Wt. Tare + DS.(g)	394.75
Wt. of Tare(g)	100.7
% Moisture	28.75

### UNIT WEIGHT

Wt. Tube & WS.(g.)	379.03	Sample Volume(cc.)	204.3
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.86
Wt. Of WS.(g.)	379.03	Unit Wet Wt.(pcf.)	115.77
Diameter (in.)	1.99	Moisture Content, %	28.75
Length (in.)	3.99	Unit Dry Wt.(pcf.)	89.91
Length (cm.)	10.14		

**ELECTRONIC DEVICE**  
**PEAK LOAD (lbs)**

**STRESS (psi)**

290.6

93.1



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19



## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-011

Boring No. Mix - 6  
 Depth (ft.) N/A  
 Sample No. Day 29A  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.979	Top Dia. (in)	2.004
Length 2(in)	3.976	Mid. Dia. (in)	1.991
Length 3(in)	3.986	Bot. Dia. (in)	1.994
Avg.Length(in)	3.980	Area (in. <sup>2</sup> )	3.130

### WATER CONTENT AFTER TEST

Tare No.	TB-11
Wt. Tare + WS.(g)	514.38
Wt. Tare + DS.(g)	429.33
Wt. of Tare(g)	134.6
% Moisture	28.86

### UNIT WEIGHT

Wt. Tube & WS.(g.)	380.43	Sample Volume(cc.)	204.2
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.86
Wt. Of WS.(g.)	380.43	Unit Wet Wt.(pcf.)	116.27
Diameter (in.)	2.00	Moisture Content, %	28.86
Length (in.)	3.98	Unit Dry Wt.(pcf.)	90.23
Length (cm.)	10.11		

**ELECTRONIC DEVICE**  
**PEAK LOAD (lbs)**

**STRESS (psi)**

408.0

130.3



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-004  
 Lab ID R-2019-267-004-012

Boring No. Mix - 6  
 Depth (ft.) N/A  
 Sample No. Day 29B  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.971	Top Dia. (in)	2.002
Length 2(in)	3.974	Mid. Dia. (in)	1.988
Length 3(in)	3.955	Bot. Dia. (in)	1.989
Avg.Length(in)	3.967	Area (in. <sup>2</sup> )	3.120

### WATER CONTENT AFTER TEST

Tare No.	TB-08
Wt. Tare + WS.(g)	512.32
Wt. Tare + DS.(g)	427.01
Wt. of Tare(g)	135.74
% Moisture	29.29

### UNIT WEIGHT

Wt. Tube & WS.(g.)	377.54	Sample Volume(cc.)	202.8
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.86
Wt. Of WS.(g.)	377.54	Unit Wet Wt.(pcf.)	116.18
Diameter (in.)	1.99	Moisture Content, %	29.29
Length (in.)	3.97	Unit Dry Wt.(pcf.)	89.86
Length (cm.)	10.08		

**ELECTRONIC DEVICE**  
**PEAK LOAD (lbs)**

**STRESS (psi)**

406.3

130.2



Tested By MY Date 11/19/19 Input Checked By EL Date 12/4/19



January 7, 2020

Project No. R-2019-267-005

Mr. Andrew Baumeister  
Arcadis U.S., Inc.  
4915 Prospectus Drive, Suite F  
Durham, NC 27713

Transmittal  
Laboratory Test Results  
NG Rensselaer

Please find attached the laboratory test results for the above referenced project. The tests were outlined on the Project Verification Form that was transmitted to your firm prior to the testing. The testing was performed in general accordance with the methods listed on the enclosed data sheets. The test results are believed to be representative of the samples that were submitted for testing and are indicative only of the specimens which were evaluated. We have no direct knowledge of the origin of the samples and imply no position with regard to the nature of the test results, i.e. pass/fail and no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization by our Client. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please contact our office.

Respectively submitted,  
**Geotechnics, Inc.**

Michael P. Smith  
Regional Manager

***We understand that you have a choice in your laboratory services  
and we thank you for choosing Geotechnics.***

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

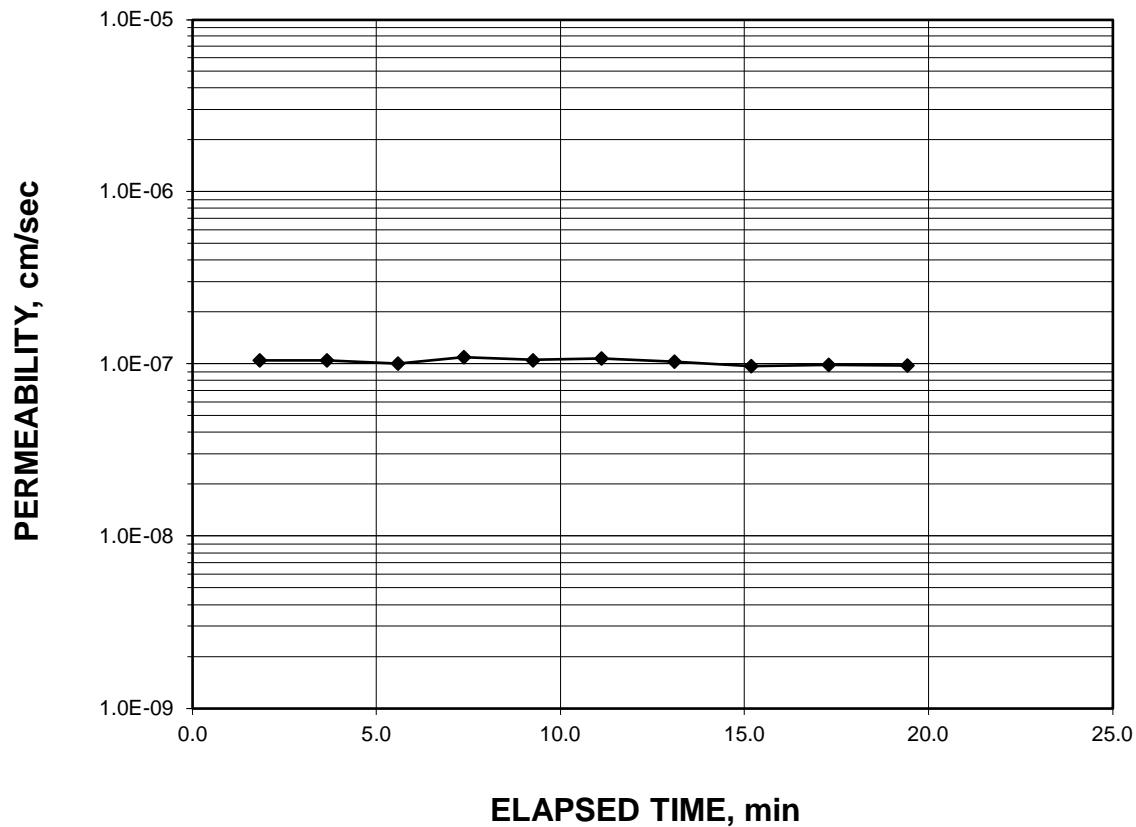
Client Arcadis U.S., Inc.  
Client Project NG Rensselaer  
Project No. R-2019-267-005  
Lab ID No. R-2019-267-005-001

Boring No. Mix-1  
Depth (ft.) NA  
Sample No. Day 50

Visual Description: Gray Soil Mix

AVERAGE PERMEABILITY =  $9.9\text{E-}08$  cm/sec @ 20°C  
AVERAGE PERMEABILITY =  $9.9\text{E-}10$  m/sec @ 20°C

## PERMEABILITY vs. TIME



Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client Arcadis U.S., Inc.  
Client Project NG Rensselaer  
Project No. R-2019-267-005  
Lab ID No. R-2019-267-005-001

Boring No. Mix-1  
Depth (ft.) NA  
Sample No. Day 50

Specific Gravity 2.70  
Sample Condition Assumed Undisturbed

Visual Description: Gray Soil Mix

Permeant Type: Deaired Tap Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	SS-O	TB-03
Wt. of Tare & WS (gm.)	486.54	520.23
Wt. of Tare & DS (gm.)	398.58	427.34
Wt. of Tare (gm.)	100.58	134.59
Wt. of Water (gm.)	87.96	92.89
Wt. of DS (gm.)	298.00	292.75
Moisture Content (%)	29.5	31.7

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	383.36	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	383.36	389.91
Length 1 (in.)	3.959	3.956
Length 2 (in.)	3.979	3.974
Length 3 (in.)	3.976	3.977
Top Diameter (in.)	2.001	2.004
Middle Diameter (in.)	1.994	1.988
Bottom Diameter (in.)	1.984	1.981
Average Length (in.)	3.97	3.97
Average Area (in. <sup>2</sup> )	3.12	3.11
Sample Volume (cm <sup>3</sup> )	203.02	202.50
Unit Wet Wt. (gm./ cm <sup>3</sup> )	1.888	1.926
Unit Wet Wt. (pcf)	117.9	120.2
Unit Dry Wt. (pcf)	91.0	91.2
Unit Dry Wt. (gm./ cm <sup>3</sup> )	1.458	1.462
Void Ratio, e	0.852	0.847
Porosity, n	0.460	0.459
Pore Volume (cm <sup>3</sup> )	93.4	92.9
Total Wt. Of Sample After Test		383.85

Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client	Arcadis U.S., Inc.	Boring No.	Mix-1
Client Project	NG Rensselaer	Depth (ft.)	NA
Project No.	R-2019-267-005	Sample No.	Day 50
Lab ID No.	R-2019-267-005-001		

### Test Pressures

Cell Pressure(psi)	55.0
Back Pressure(psi)	50.0
Eff. Cons. Pressure(psi)	5.0
Response (%)	95

### Final Sample Dimensions

Sample Length (cm), L	10.08
Sample Area (cm <sup>2</sup> ), A	20.09
Pipette Area (cm <sup>2</sup> ), a <sub>p</sub>	0.03142
Annulus Area (cm <sup>2</sup> ), a <sub>a</sub>	0.76712
Equilibrium Level (cm), R <sub>eq</sub>	1

**AVERAGE PERMEABILITY = 9.9E-08 cm/sec @ 20°C**  
**AVERAGE PERMEABILITY = 9.9E-10 m/sec @ 20°C**

DATE	TIME				ELAPSED TIME	PIPETTE READING	INCREMENT GRADIENT	TEMP.	INCREMENTAL PERMEABILITY
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	t (min)	R <sub>p</sub> (cm)	i (cm/cm)	(°C)	@ 20°C (cm/sec)
1/3/20	12	55	11	55.18	0.000	11.0	13.0	22.5	NA
1/3/20	12	57	0	57.00	1.817	10.9	12.8	22.5	1.0E-07
1/3/20	12	58	50	58.83	3.650	10.8	12.7	22.5	1.0E-07
1/3/20	13	0	46	0.77	5.583	10.7	12.6	22.5	1.0E-07
1/3/20	13	2	33	2.55	7.367	10.6	12.4	22.5	1.1E-07
1/3/20	13	4	26	4.43	9.250	10.5	12.3	22.5	1.1E-07
1/3/20	13	6	18	6.30	11.117	10.4	12.2	22.5	1.1E-07
1/3/20	13	8	16	8.27	13.083	10.3	12.0	22.5	1.0E-07
1/3/20	13	10	22	10.37	15.183	10.2	11.9	22.5	9.8E-08
1/3/20	13	12	28	12.47	17.283	10.1	11.8	22.5	9.9E-08
1/3/20	13	14	36	14.60	19.417	10.0	11.7	22.5	9.8E-08

Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

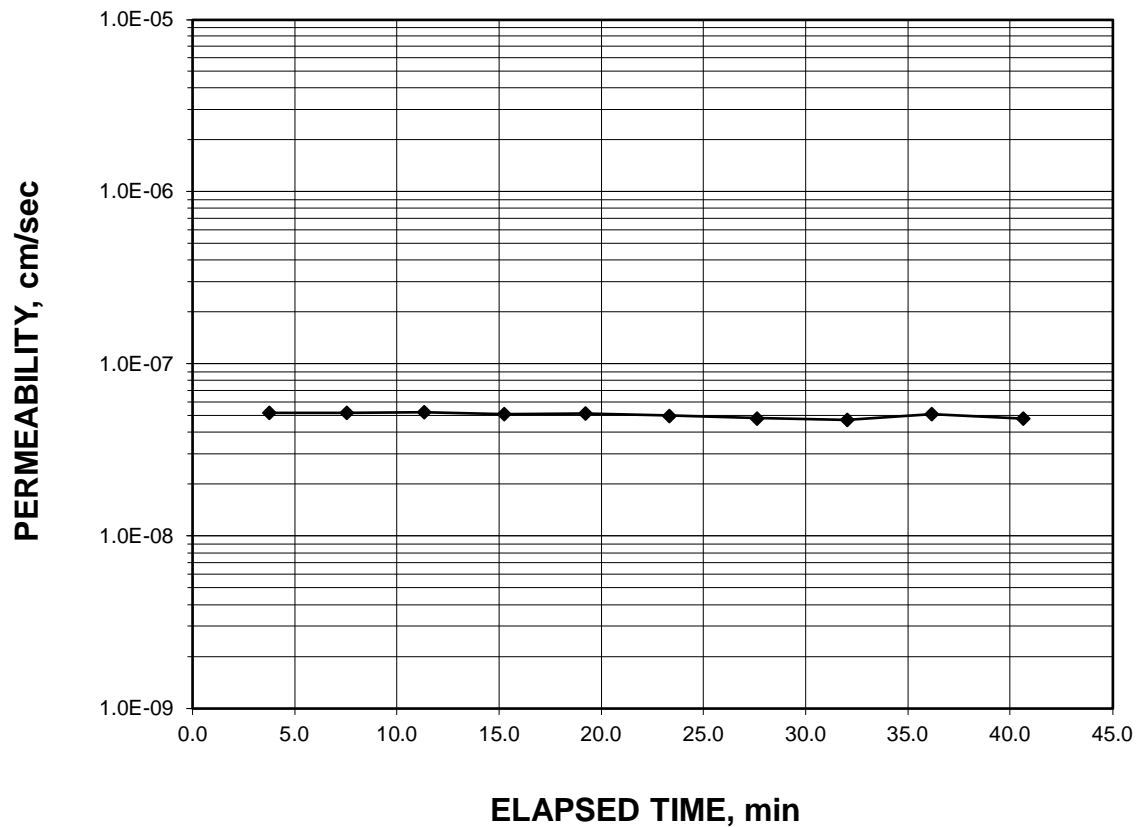
Client Arcadis U.S., Inc.  
Client Project NG Rensselaer  
Project No. R-2019-267-005  
Lab ID No. R-2019-267-005-002

Boring No. Mix-2  
Depth (ft.) NA  
Sample No. Day 50

Visual Description: Gray Soil Mix

AVERAGE PERMEABILITY =  $4.9\text{E-}08$  cm/sec @ 20°C  
AVERAGE PERMEABILITY =  $4.9\text{E-}10$  m/sec @ 20°C

## PERMEABILITY vs. TIME



Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client Arcadis U.S., Inc.  
Client Project NG Rensselaer  
Project No. R-2019-267-005  
Lab ID No. R-2019-267-005-002

Boring No. Mix-2  
Depth (ft.) NA  
Sample No. Day 50

Specific Gravity 2.70  
Sample Condition Assumed Undisturbed

Visual Description: Gray Soil Mix

Permeant Type: Deaired Tap Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	SS-1	TB-05
Wt. of Tare & WS (gm.)	480.68	524.06
Wt. of Tare & DS (gm.)	390.47	430.72
Wt. of Tare (gm.)	100.32	136.18
Wt. of Water (gm.)	90.21	93.34
Wt. of DS (gm.)	290.15	294.54
Moisture Content (%)	31.1	31.7

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	385.00	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	385.00	386.76
Length 1 (in.)	3.983	3.976
Length 2 (in.)	3.973	3.966
Length 3 (in.)	3.983	3.973
Top Diameter (in.)	1.985	1.999
Middle Diameter (in.)	1.997	1.996
Bottom Diameter (in.)	2.007	2.007
Average Length (in.)	3.98	3.97
Average Area (in. <sup>2</sup> )	3.13	3.14
Sample Volume (cm <sup>3</sup> )	204.13	204.60
Unit Wet Wt. (gm./ cm <sup>3</sup> )	1.886	1.890
Unit Wet Wt. (pcf)	117.7	118.0
Unit Dry Wt. (pcf)	89.8	89.6
Unit Dry Wt. (gm./ cm <sup>3</sup> )	1.439	1.435
Void Ratio, e	0.877	0.881
Porosity, n	0.467	0.468
Pore Volume (cm <sup>3</sup> )	95.4	95.8
Total Wt. Of Sample After Test		387.95

Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20



# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client	Arcadis U.S., Inc.	Boring No.	Mix-2
Client Project	NG Rensselaer	Depth (ft.)	NA
Project No.	R-2019-267-005	Sample No.	Day 50
Lab ID No.	R-2019-267-005-002		

### Test Pressures

Cell Pressure(psi)	55.0
Back Pressure(psi)	50.0
Eff. Cons. Pressure(psi)	5.0
Response (%)	100

### Final Sample Dimensions

Sample Length (cm), L	10.09
Sample Area (cm <sup>2</sup> ), A	20.28
Pipette Area (cm <sup>2</sup> ), a <sub>p</sub>	0.03142
Annulus Area (cm <sup>2</sup> ), a <sub>a</sub>	0.76712
Equilibrium Level (cm), R <sub>eq</sub>	1

**AVERAGE PERMEABILITY = 4.9E-08 cm/sec @ 20°C**  
**AVERAGE PERMEABILITY = 4.9E-10 m/sec @ 20°C**

DATE	TIME				ELAPSED TIME	PIPETTE READING	INCREMENT GRADIENT	TEMP.	INCREMENTAL PERMEABILITY
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	t (min)	R <sub>p</sub> (cm)	i (cm/cm)	(°C)	@ 20°C (cm/sec)
1/6/20	12	33	49	33.82	0.000	11.0	12.9	21.1	NA
1/6/20	12	37	34	37.57	3.750	10.9	12.8	21.1	5.2E-08
1/6/20	12	41	21	41.35	7.533	10.8	12.7	21.1	5.2E-08
1/6/20	12	45	8	45.13	11.317	10.7	12.6	21.1	5.3E-08
1/6/20	12	49	4	49.07	15.250	10.6	12.4	21.1	5.1E-08
1/6/20	12	53	1	53.02	19.200	10.5	12.3	21.1	5.1E-08
1/6/20	12	57	7	57.12	23.300	10.4	12.2	21.1	5.0E-08
1/6/20	13	1	25	1.42	27.600	10.3	12.0	21.1	4.8E-08
1/6/20	13	5	50	5.83	32.017	10.2	11.9	21.1	4.8E-08
1/6/20	13	9	59	9.98	36.167	10.1	11.8	21.1	5.1E-08
1/6/20	13	14	26	14.43	40.617	10.0	11.7	21.1	4.8E-08

Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

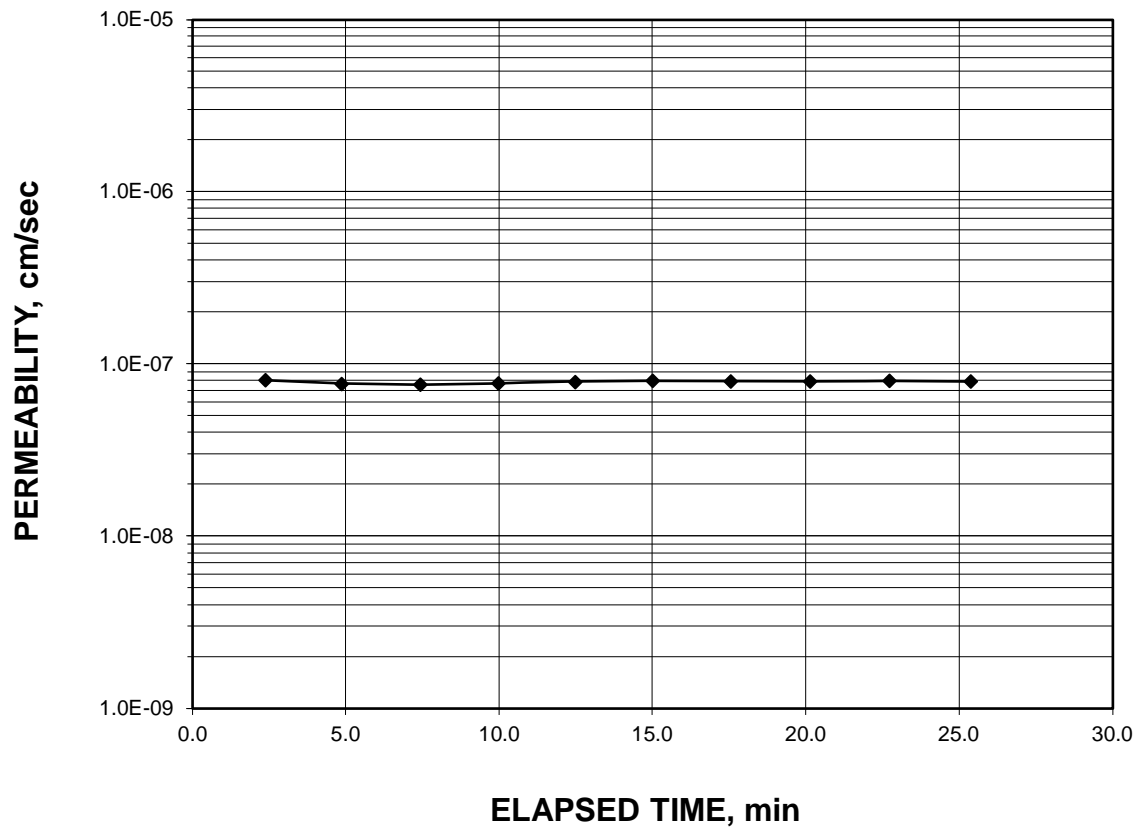
Client Arcadis U.S., Inc.  
Client Project NG Rensselaer  
Project No. R-2019-267-005  
Lab ID No. R-2019-267-005-003

Boring No. Mix-3  
Depth (ft.) NA  
Sample No. Day 50

Visual Description: Gray Soil Mix

AVERAGE PERMEABILITY =  $7.9\text{E-}08$  cm/sec @ 20°C  
AVERAGE PERMEABILITY =  $7.9\text{E-}10$  m/sec @ 20°C

## PERMEABILITY vs. TIME



Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client	Arcadis U.S., Inc.	Boring No.	Mix-3
Client Project	NG Rensselaer	Depth (ft.)	NA
Project No.	R-2019-267-005	Sample No.	Day 50
Lab ID No.	R-2019-267-005-003		
	Specific Gravity	2.70	Assumed
	Sample Condition		Undisturbed

Visual Description: Gray Soil Mix

Permeant Type: Deaired Tap Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	SS-8	TB-06
Wt. of Tare & WS (gm.)	480.30	522.35
Wt. of Tare & DS (gm.)	387.57	427.09
Wt. of Tare (gm.)	99.75	134.85
Wt. of Water (gm.)	92.73	95.26
Wt. of DS (gm.)	287.82	292.24
Moisture Content (%)	<b>32.2</b>	<b>32.6</b>

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	384.84	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	384.84	385.94
Length 1 (in.)	3.977	3.998
Length 2 (in.)	3.998	3.979
Length 3 (in.)	3.971	3.973
Top Diameter (in.)	1.988	2.001
Middle Diameter (in.)	1.988	1.991
Bottom Diameter (in.)	1.868	1.987
Average Length (in.)	3.98	3.98
Average Area (in. <sup>2</sup> )	2.98	3.12
Sample Volume (cm <sup>3</sup> )	194.48	203.63
Unit Wet Wt. (gm./ cm <sup>3</sup> )	1.979	1.895
Unit Wet Wt. (pcf)	123.5	118.3
Unit Dry Wt. (pcf)	93.4	89.2
Unit Dry Wt. (gm./ cm <sup>3</sup> )	1.497	1.429
Void Ratio, e	0.804	0.889
Porosity, n	0.446	0.471
Pore Volume (cm <sup>3</sup> )	86.7	95.8
Total Wt. Of Sample After Test		387.79

Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client	Arcadis U.S., Inc.	Boring No.	Mix-3
Client Project	NG Rensselaer	Depth (ft.)	NA
Project No.	R-2019-267-005	Sample No.	Day 50
Lab ID No.	R-2019-267-005-003		

### Test Pressures

Cell Pressure(psi)	55.0
Back Pressure(psi)	50.0
Eff. Cons. Pressure(psi)	5.0
Response (%)	95

### Final Sample Dimensions

Sample Length (cm), L	10.12
Sample Area (cm <sup>2</sup> ), A	20.13
Pipette Area (cm <sup>2</sup> ), a <sub>p</sub>	0.03142
Annulus Area (cm <sup>2</sup> ), a <sub>a</sub>	0.76712
Equilibrium Level (cm), R <sub>eq</sub>	1

**AVERAGE PERMEABILITY = 7.9E-08 cm/sec @ 20°C**  
**AVERAGE PERMEABILITY = 7.9E-10 m/sec @ 20°C**

DATE	TIME				ELAPSED TIME	PIPETTE READING	INCREMENT GRADIENT	TEMP.	INCREMENTAL PERMEABILITY
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	t (min)	R <sub>p</sub> (cm)	i (cm/cm)	(°C)	@ 20°C (cm/sec)
1/3/20	13	30	33	30.55	0.000	11.0	12.9	22.6	NA
1/3/20	13	32	55	32.92	2.367	10.9	12.8	22.6	8.0E-08
1/3/20	13	35	25	35.42	4.867	10.8	12.6	22.6	7.7E-08
1/3/20	13	37	58	37.97	7.417	10.7	12.5	22.6	7.6E-08
1/3/20	13	40	31	40.52	9.967	10.6	12.4	22.6	7.7E-08
1/3/20	13	43	2	43.03	12.483	10.5	12.3	22.6	7.9E-08
1/3/20	13	45	33	45.55	15.000	10.4	12.1	22.6	8.0E-08
1/3/20	13	48	6	48.10	17.550	10.3	12.0	22.6	7.9E-08
1/3/20	13	50	41	50.68	20.133	10.2	11.9	22.6	7.9E-08
1/3/20	13	53	17	53.28	22.733	10.1	11.7	22.6	8.0E-08
1/3/20	13	55	56	55.93	25.383	10.0	11.6	22.6	7.9E-08

Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

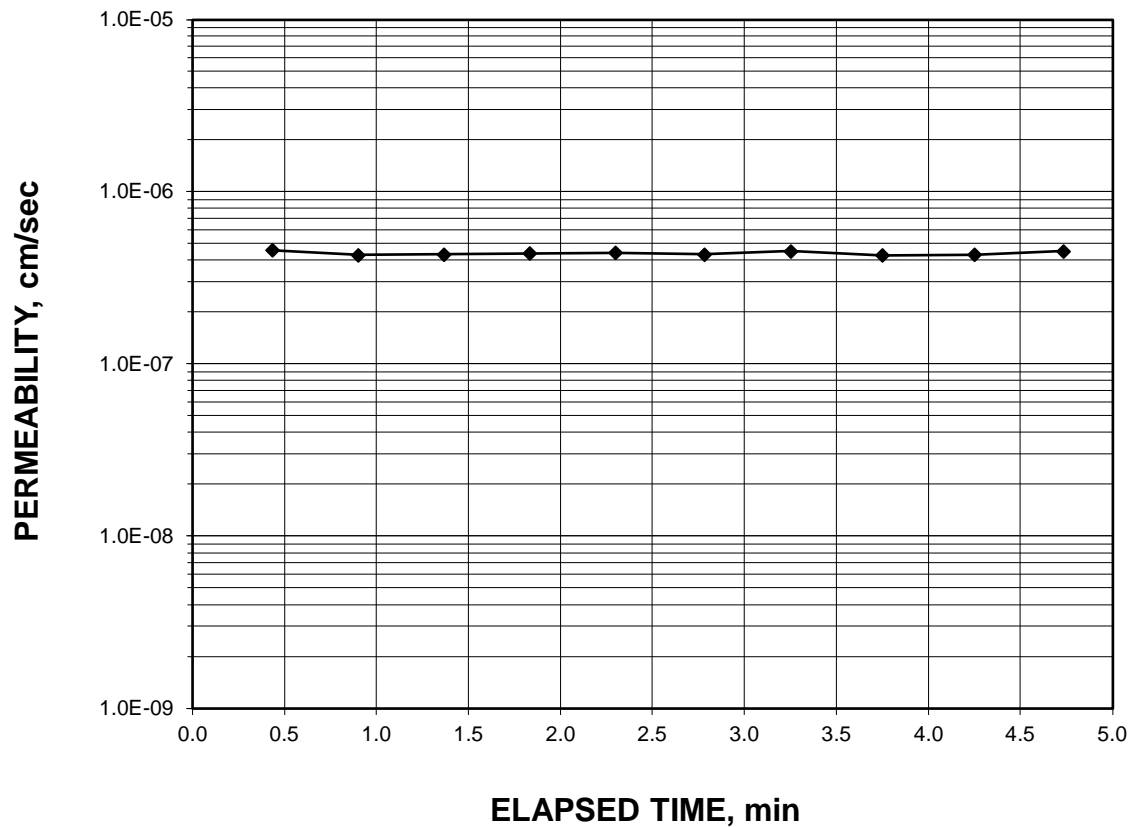
Client Arcadis U.S., Inc.  
Client Project NG Rensselaer  
Project No. R-2019-267-005  
Lab ID No. R-2019-267-005-004

Boring No. Mix-4  
Depth (ft.) NA  
Sample No. Day 50

Visual Description: Gray Soil Mix

AVERAGE PERMEABILITY =  $4.4\text{E-}07$  cm/sec @ 20°C  
AVERAGE PERMEABILITY =  $4.4\text{E-}09$  m/sec @ 20°C

## PERMEABILITY vs. TIME



Tested By: MY Date: 12/30/19 Checked By: GEM Date: 1/3/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client	Arcadis U.S., Inc.	Boring No.	Mix-4
Client Project	NG Rensselaer	Depth (ft.)	NA
Project No.	R-2019-267-005	Sample No.	Day 50
Lab ID No.	R-2019-267-005-004		
	Specific Gravity	2.70	Assumed
	Sample Condition		Undisturbed

Visual Description: Gray Soil Mix

Permeant Type: Deaired Tap Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	SS-1	TB-01
Wt. of Tare & WS (gm.)	478.12	520.7
Wt. of Tare & DS (gm.)	394.63	431.89
Wt. of Tare (gm.)	100.46	135.65
Wt. of Water (gm.)	83.49	88.81
Wt. of DS (gm.)	294.17	296.24
Moisture Content (%)	<b>28.4</b>	<b>30.0</b>

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	379.99	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	379.99	384.72
Length 1 (in.)	3.985	3.979
Length 2 (in.)	3.976	3.973
Length 3 (in.)	3.978	3.967
Top Diameter (in.)	1.994	1.994
Middle Diameter (in.)	1.985	1.995
Bottom Diameter (in.)	1.983	1.983
Average Length (in.)	3.98	3.97
Average Area (in. <sup>2</sup> )	3.10	3.11
Sample Volume (cm <sup>3</sup> )	202.29	202.63
Unit Wet Wt. (gm./ cm <sup>3</sup> )	1.878	1.899
Unit Wet Wt. (pcf)	117.3	118.5
Unit Dry Wt. (pcf)	91.3	91.2
Unit Dry Wt. (gm./ cm <sup>3</sup> )	1.463	1.461
Void Ratio, e	0.845	0.848
Porosity, n	0.458	0.459
Pore Volume (cm <sup>3</sup> )	92.7	93.0
Total Wt. Of Sample After Test		385.27

Tested By: MY Date: 12/30/19 Checked By: GEM Date: 1/3/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client	Arcadis U.S., Inc.	Boring No.	Mix-4
Client Project	NG Rensselaer	Depth (ft.)	NA
Project No.	R-2019-267-005	Sample No.	Day 50
Lab ID No.	R-2019-267-005-004		

### Test Pressures

Cell Pressure(psi)	55.0
Back Pressure(psi)	50.0
Eff. Cons. Pressure(psi)	5.0
Response (%)	95

### Final Sample Dimensions

Sample Length (cm), L	10.09
Sample Area (cm <sup>2</sup> ), A	20.08
Pipette Area (cm <sup>2</sup> ), a <sub>p</sub>	0.03142
Annulus Area (cm <sup>2</sup> ), a <sub>a</sub>	0.76712
Equilibrium Level (cm), R <sub>eq</sub>	1

**AVERAGE PERMEABILITY = 4.4E-07 cm/sec @ 20°C**  
**AVERAGE PERMEABILITY = 4.4E-09 m/sec @ 20°C**

DATE		TIME		ELAPSED TIME		PIPETTE	INCREMENT	TEMP.	INCREMENTAL
						READING	GRADIENT		PERMEABILITY
						R <sub>p</sub>	i		@ 20°C
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	(min)	(cm)	(cm/cm)	(°C)	(cm/sec)
1/2/20	11	54	53	54.88	0.000	11.0	12.9	20.9	NA
1/2/20	11	55	19	55.32	0.433	10.9	12.8	20.9	4.6E-07
1/2/20	11	55	47	55.78	0.900	10.8	12.7	20.9	4.3E-07
1/2/20	11	56	15	56.25	1.367	10.7	12.6	20.9	4.3E-07
1/2/20	11	56	43	56.72	1.833	10.6	12.4	20.9	4.4E-07
1/2/20	11	57	11	57.18	2.300	10.5	12.3	20.9	4.4E-07
1/2/20	11	57	40	57.67	2.783	10.4	12.2	20.9	4.3E-07
1/2/20	11	58	8	58.13	3.250	10.3	12.0	20.9	4.5E-07
1/2/20	11	58	38	58.63	3.750	10.2	11.9	20.9	4.3E-07
1/2/20	11	59	8	59.13	4.250	10.1	11.8	20.9	4.3E-07
1/2/20	11	59	37	59.62	4.733	10.0	11.6	20.9	4.5E-07

Tested By: MY Date: 12/30/19 Checked By: GEM Date: 1/3/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

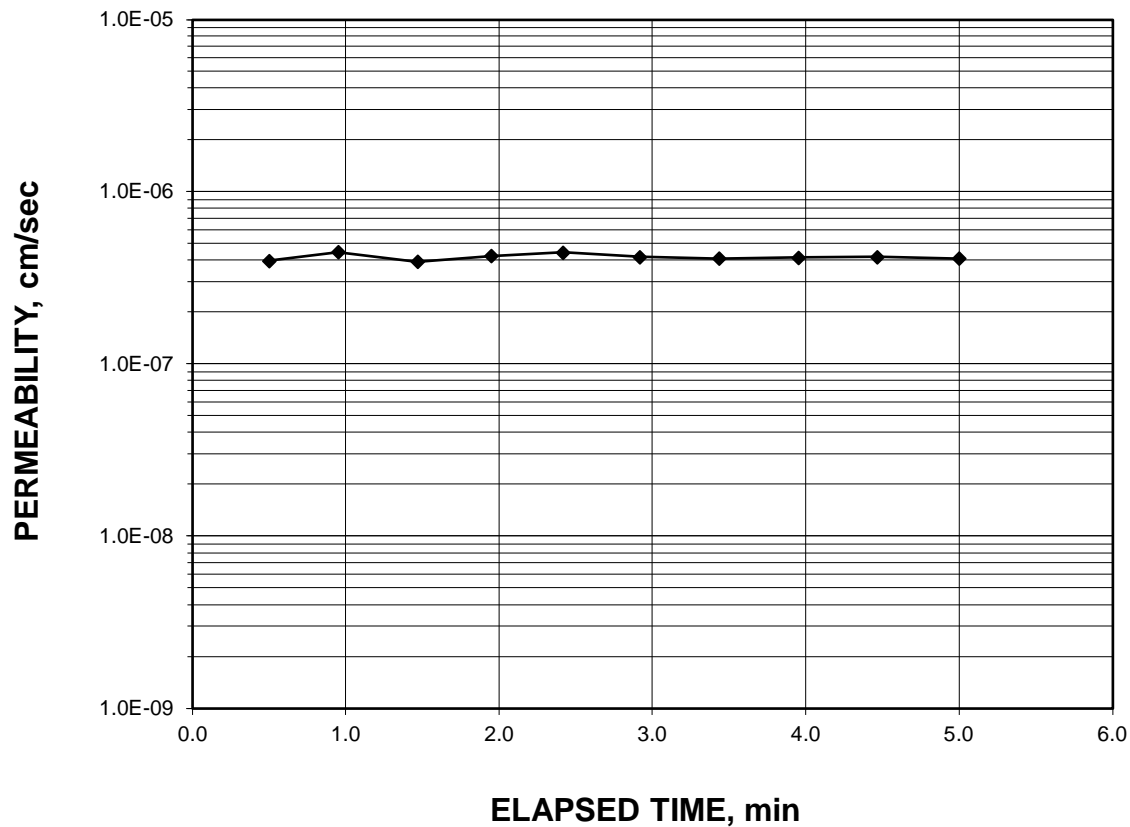
Client Arcadis U.S., Inc.  
Client Project NG Rensselaer  
Project No. R-2019-267-005  
Lab ID No. R-2019-267-005-005

Boring No. Mix-5  
Depth (ft.) NA  
Sample No. Day 50

Visual Description: Gray Soil Mix

AVERAGE PERMEABILITY =  $4.1\text{E-}07$  cm/sec @ 20°C  
AVERAGE PERMEABILITY =  $4.1\text{E-}09$  m/sec @ 20°C

## PERMEABILITY vs. TIME



Tested By: MY Date: 12/30/19 Checked By: GEM Date: 1/3/20



# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client Arcadis U.S., Inc.  
Client Project NG Rensselaer  
Project No. R-2019-267-005  
Lab ID No. R-2019-267-005-005

Boring No. Mix-5  
Depth (ft.) NA  
Sample No. Day 50

Specific Gravity 2.70  
Sample Condition Assumed Undisturbed

Visual Description: Gray Soil Mix

Permeant Type: Deaired Tap Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	SS-0	TB-03
Wt. of Tare & WS (gm.)	479.30	521.21
Wt. of Tare & DS (gm.)	394.75	432.71
Wt. of Tare (gm.)	100.70	134.49
Wt. of Water (gm.)	84.55	88.50
Wt. of DS (gm.)	294.05	298.22
Moisture Content (%)	28.8	29.7

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	381.85	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	381.85	384.59
Length 1 (in.)	3.980	3.966
Length 2 (in.)	3.985	3.976
Length 3 (in.)	3.981	3.969
Top Diameter (in.)	1.985	1.980
Middle Diameter (in.)	1.986	1.988
Bottom Diameter (in.)	1.985	1.986
Average Length (in.)	3.98	3.97
Average Area (in. <sup>2</sup> )	3.10	3.09
Sample Volume (cm <sup>3</sup> )	202.00	201.28
Unit Wet Wt. (gm./ cm <sup>3</sup> )	1.890	1.911
Unit Wet Wt. (pcf)	118.0	119.3
Unit Dry Wt. (pcf)	91.6	92.0
Unit Dry Wt. (gm./ cm <sup>3</sup> )	1.468	1.473
Void Ratio, e	0.839	0.832
Porosity, n	0.456	0.454
Pore Volume (cm <sup>3</sup> )	92.2	91.4
Total Wt. Of Sample After Test		387.05

Tested By: MY Date: 12/30/19 Checked By: GEM Date: 1/3/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client	Arcadis U.S., Inc.	Boring No.	Mix-5
Client Project	NG Rensselaer	Depth (ft.)	NA
Project No.	R-2019-267-005	Sample No.	Day 50
Lab ID No.	R-2019-267-005-005		

### Test Pressures

Cell Pressure(psi)	55.0
Back Pressure(psi)	50.0
Eff. Cons. Pressure(psi)	5.0
Response (%)	95

### Final Sample Dimensions

Sample Length (cm), L	10.08
Sample Area (cm <sup>2</sup> ), A	19.96
Pipette Area (cm <sup>2</sup> ), a <sub>p</sub>	0.03142
Annulus Area (cm <sup>2</sup> ), a <sub>a</sub>	0.76712
Equilibrium Level (cm), R <sub>eq</sub>	1

**AVERAGE PERMEABILITY = 4.1E-07 cm/sec @ 20°C**  
**AVERAGE PERMEABILITY = 4.1E-09 m/sec @ 20°C**

DATE		TIME		ELAPSED TIME		PIPETTE READING	INCREMENT GRADIENT	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	(min)	R <sub>p</sub> (cm)	i (cm/cm)	(°C)	(cm/sec)
1/2/20	12	8	12	8.20	0.000	11.0	13.0	21.0	NA
1/2/20	12	8	42	8.70	0.500	10.9	12.8	21.0	4.0E-07
1/2/20	12	9	9	9.15	0.950	10.8	12.7	21.0	4.5E-07
1/2/20	12	9	40	9.67	1.467	10.7	12.6	21.0	3.9E-07
1/2/20	12	10	9	10.15	1.950	10.6	12.4	21.0	4.2E-07
1/2/20	12	10	37	10.62	2.417	10.5	12.3	21.0	4.4E-07
1/2/20	12	11	7	11.12	2.917	10.4	12.2	21.0	4.2E-07
1/2/20	12	11	38	11.63	3.433	10.3	12.0	21.0	4.1E-07
1/2/20	12	12	9	12.15	3.950	10.2	11.9	21.0	4.1E-07
1/2/20	12	12	40	12.67	4.467	10.1	11.8	21.0	4.2E-07
1/2/20	12	13	12	13.20	5.000	10.0	11.7	21.0	4.1E-07

Tested By: MY Date: 12/30/19 Checked By: GEM Date: 1/3/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

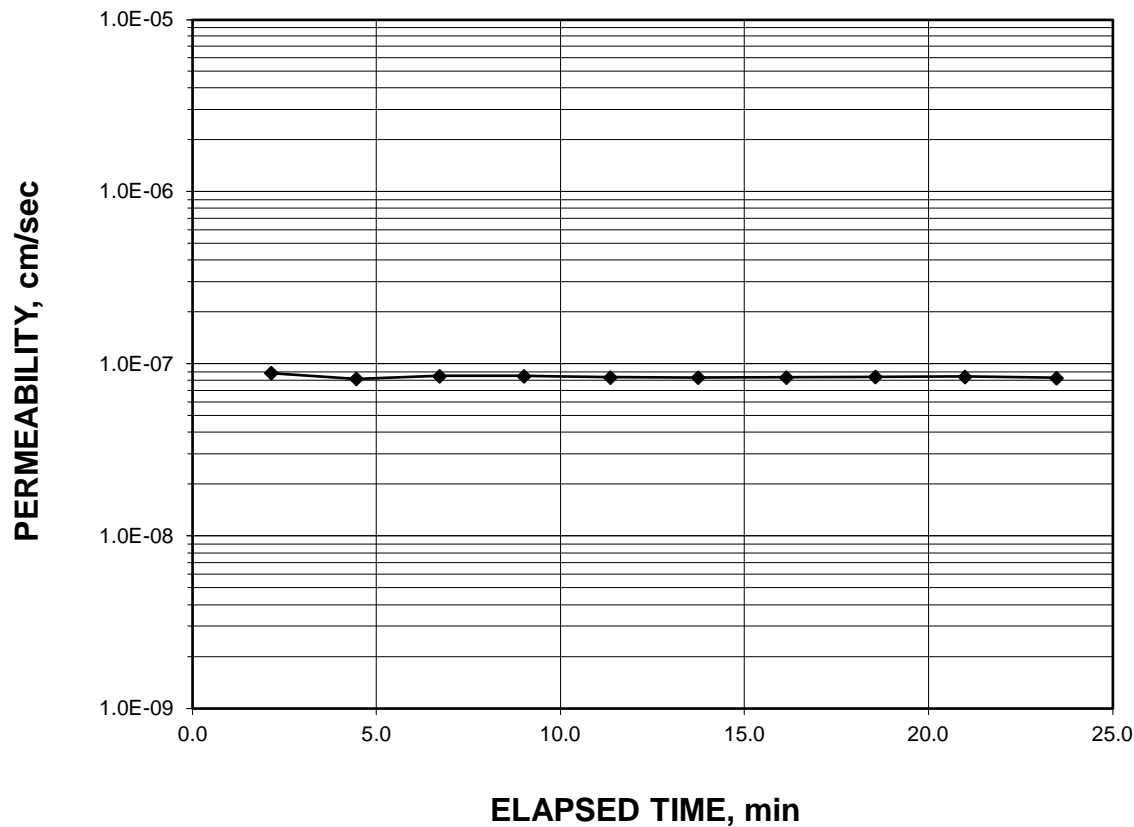
Client Arcadis U.S., Inc.  
Client Project NG Rensselaer  
Project No. R-2019-267-005  
Lab ID No. R-2019-267-005-006

Boring No. Mix-6  
Depth (ft.) NA  
Sample No. Day 50

Visual Description: Gray Soil Mix

AVERAGE PERMEABILITY =  $8.4\text{E-}08$  cm/sec @ 20°C  
AVERAGE PERMEABILITY =  $8.4\text{E-}10$  m/sec @ 20°C

## PERMEABILITY vs. TIME



Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client Arcadis U.S., Inc.  
Client Project NG Rensselaer  
Project No. R-2019-267-005  
Lab ID No. R-2019-267-005-006

Boring No. Mix-6  
Depth (ft.) NA  
Sample No. Day 50

Specific Gravity 2.70  
Sample Condition Assumed Undisturbed

Visual Description: Gray Soil Mix

Permeant Type: Deaired Tap Water

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	SS-3	TB-09
Wt. of Tare & WS (gm.)	477.74	519.03
Wt. of Tare & DS (gm.)	390.88	427.39
Wt. of Tare (gm.)	100.74	134.97
Wt. of Water (gm.)	86.86	91.64
Wt. of DS (gm.)	290.14	292.42
Moisture Content (%)	29.9	31.3

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	378.18	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.) (gm.)	378.18	382.26
Length 1 (in.)	3.980	3.977
Length 2 (in.)	3.959	3.965
Length 3 (in.)	3.970	3.967
Top Diameter (in.)	2.004	2.009
Middle Diameter (in.)	1.997	1.995
Bottom Diameter (in.)	1.986	1.985
Average Length (in.)	3.97	3.97
Average Area (in. <sup>2</sup> )	3.13	3.13
Sample Volume (cm <sup>3</sup> )	203.48	203.62
Unit Wet Wt. (gm./ cm <sup>3</sup> )	1.859	1.877
Unit Wet Wt. (pcf)	116.0	117.2
Unit Dry Wt. (pcf)	89.3	89.2
Unit Dry Wt. (gm./ cm <sup>3</sup> )	1.430	1.429
Void Ratio, e	0.888	0.889
Porosity, n	0.470	0.471
Pore Volume (cm <sup>3</sup> )	95.7	95.8
Total Wt. Of Sample After Test		384.47

Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20

# FLEXIBLE WALL PERMEABILITY TEST

## PERMOMETER METHOD

ASTM D 5084-16a  
(SOP-S22C)

Client	Arcadis U.S., Inc.	Boring No.	Mix-6
Client Project	NG Rensselaer	Depth (ft.)	NA
Project No.	R-2019-267-005	Sample No.	Day 50
Lab ID No.	R-2019-267-005-006		

### Test Pressures

Cell Pressure(psi)	55.0
Back Pressure(psi)	50.0
Eff. Cons. Pressure(psi)	5.0
Response (%)	95

### Final Sample Dimensions

Sample Length (cm), L	10.08
Sample Area (cm <sup>2</sup> ), A	20.19
Pipette Area (cm <sup>2</sup> ), a <sub>p</sub>	0.03142
Annulus Area (cm <sup>2</sup> ), a <sub>a</sub>	0.76712
Equilibrium Level (cm), R <sub>eq</sub>	1

**AVERAGE PERMEABILITY = 8.4E-08 cm/sec @ 20°C**  
**AVERAGE PERMEABILITY = 8.4E-10 m/sec @ 20°C**

DATE	TIME				ELAPSED TIME	PIPETTE READING	INCREMENT GRADIENT	TEMP.	INCREMENTAL PERMEABILITY
(mm/dd/yy)	(hr)	(min)	(sec)	(min)	t (min)	R <sub>p</sub> (cm)	i (cm/cm)	(°C)	@ 20°C (cm/sec)
1/3/20	14	11	38	11.63	0.000	11.0	13.0	22.7	NA
1/3/20	14	13	46	13.77	2.133	10.9	12.8	22.7	8.8E-08
1/3/20	14	16	5	16.08	4.450	10.8	12.7	22.7	8.2E-08
1/3/20	14	18	21	18.35	6.717	10.7	12.6	22.7	8.5E-08
1/3/20	14	20	38	20.63	9.000	10.6	12.4	22.7	8.5E-08
1/3/20	14	22	59	22.98	11.350	10.5	12.3	22.7	8.4E-08
1/3/20	14	25	22	25.37	13.733	10.4	12.2	22.7	8.3E-08
1/3/20	14	27	46	27.77	16.133	10.3	12.0	22.7	8.4E-08
1/3/20	14	30	11	30.18	18.550	10.2	11.9	22.7	8.4E-08
1/3/20	14	32	37	32.62	20.983	10.1	11.8	22.7	8.4E-08
1/3/20	14	35	7	35.12	23.483	10.0	11.7	22.7	8.3E-08

Tested By: MY Date: 12/30/20 Checked By: GEM Date: 1/7/20



September 24, 2019

Project No. R-2019-267-001

Mr. Andrew Baumeister  
Arcadis U.S., Inc.  
4915 Prospectus Drive, Suite F  
Durham, NC 27713

**Transmittal**  
**Laboratory Test Results**  
**NG Rensselaer**

Please find attached the laboratory test results for the above referenced project. The tests were outlined on the Project Verification Form that was transmitted to your firm prior to the testing. The testing was performed in general accordance with the methods listed on the enclosed data sheets. The test results are believed to be representative of the samples that were submitted for testing and are indicative only of the specimens which were evaluated. We have no direct knowledge of the origin of the samples and imply no position with regard to the nature of the test results, i.e. pass/fail and no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization by our Client. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please contact our office.

Respectively submitted,  
**Geotechnics, Inc.**

Michael P. Smith  
Regional Manager

***We understand that you have a choice in your laboratory services  
and we thank you for choosing Geotechnics.***

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-001  
 Lab ID R-2019-267-001-001

Boring No. Pretest-1  
 Depth (ft.) N/A  
 Sample No. Day 7  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.963	Top Dia. (in)	1.991
Length 2(in)	3.971	Mid. Dia. (in)	1.973
Length 3(in)	3.941	Bot. Dia. (in)	1.982
Avg.Length(in)	3.958	Area (in. <sup>2</sup> )	3.085

### WATER CONTENT AFTER TEST

Tare No.	SS-1
Wt. Tare + WS.(g)	484.11
Wt. Tare + DS.(g)	393.74
Wt. of Tare(g)	100.18
% Moisture	30.78

### UNIT WEIGHT

Wt. Tube & WS.(g.)	384.78	Sample Volume(cc.)	200.1
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.92
Wt. Of WS.(g.)	384.78	Unit Wet Wt.(pcf.)	119.97
Diameter (in.)	1.98	Moisture Content, %	30.78
Length (in.)	3.96	Unit Dry Wt.(pcf.)	91.73
Length (cm.)	10.05		

### ELECTRONIC DEVICE

PEAK LOAD (lbs)

STRESS (psi)

71.0

23.0



Tested By MY Date 9/17/19 Input Checked By GEM Date 9/24/19

# UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-001  
 Lab ID R-2019-267-001-002

Boring No. Pretest-2  
 Depth (ft.) N/A  
 Sample No. Day 7  
 Visual Gray Soil Mix

## INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.982	Top Dia. (in)	1.991
Length 2(in)	3.969	Mid. Dia. (in)	1.994
Length 3(in)	3.958	Bot. Dia. (in)	1.986
Avg.Length(in)	3.970	Area (in. <sup>2</sup> )	3.111

## WATER CONTENT AFTER TEST

Tare No.	SS-9
Wt. Tare + WS.(g)	487.6
Wt. Tare + DS.(g)	397.19
Wt. of Tare(g)	101.49
% Moisture	30.57

## UNIT WEIGHT

Wt. Tube & WS.(g.)	387.06	Sample Volume(cc.)	202.4
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.91
Wt. Of WS.(g.)	387.06	Unit Wet Wt.(pcf.)	119.33
Diameter (in.)	1.99	Moisture Content, %	30.57
Length (in.)	3.97	Unit Dry Wt.(pcf.)	91.39
Length (cm.)	10.08		

## ELECTRONIC DEVICE

PEAK LOAD (lbs)

STRESS (psi)

233.6

75.1



Tested By MY Date 9/17/19 Input Checked By GEM Date 9/24/19



# UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-001  
 Lab ID R-2019-267-001-003

Boring No. Pretest-3  
 Depth (ft.) N/A  
 Sample No. Day 7  
 Visual Gray Soil Mix

## INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.938	Top Dia. (in)	1.985
Length 2(in)	3.941	Mid. Dia. (in)	1.978
Length 3(in)	3.990	Bot. Dia. (in)	1.977
Avg.Length(in)	3.956	Area (in. <sup>2</sup> )	3.079

## WATER CONTENT AFTER TEST

Tare No.	SS-0
Wt. Tare + WS.(g)	474.3
Wt. Tare + DS.(g)	390.92
Wt. of Tare(g)	100.5
% Moisture	28.71

## UNIT WEIGHT

Wt. Tube & WS.(g.)	375.2	Sample Volume(cc.)	199.6
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.88
Wt. Of WS.(g.)	375.2	Unit Wet Wt.(pcf.)	117.28
Diameter (in.)	1.98	Moisture Content, %	28.71
Length (in.)	3.96	Unit Dry Wt.(pcf.)	91.12
Length (cm.)	10.05		

## ELECTRONIC DEVICE

PEAK LOAD (lbs)

STRESS (psi)

61.8

20.1



Tested By MY Date 9/17/19 Input Checked By GEM Date 9/24/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-001  
 Lab ID R-2019-267-001-004

Boring No. Pretest-4  
 Depth (ft.) N/A  
 Sample No. Day 7  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.973	Top Dia. (in)	1.992
Length 2(in)	3.954	Mid. Dia. (in)	1.983
Length 3(in)	3.983	Bot. Dia. (in)	1.981
Avg.Length(in)	3.970	Area (in. <sup>2</sup> )	3.096

### WATER CONTENT AFTER TEST

Tare No.	SS-8
Wt. Tare + WS.(g)	476.3
Wt. Tare + DS.(g)	390.62
Wt. of Tare(g)	99.5
% Moisture	29.43

### UNIT WEIGHT

Wt. Tube & WS.(g.)	378.25	Sample Volume(cc.)	201.4
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.88
Wt. Of WS.(g.)	378.25	Unit Wet Wt.(pcf.)	117.20
Diameter (in.)	1.99	Moisture Content, %	29.43
Length (in.)	3.97	Unit Dry Wt.(pcf.)	90.55
Length (cm.)	10.08		

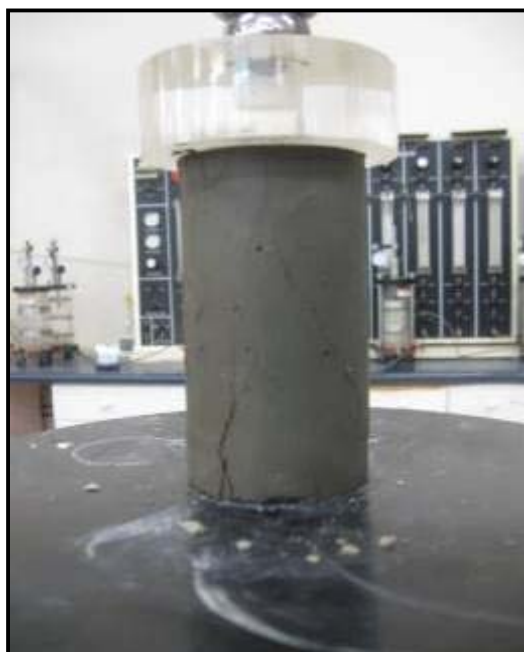
### ELECTRONIC DEVICE

PEAK LOAD (lbs)

STRESS (psi)

244.8

79.1



Tested By MY Date 9/17/19 Input Checked By GEM Date 9/24/19



October 9, 2019

Project No. R-2019-267-002

Mr. Andrew Baumeister  
Arcadis U.S., Inc.  
4915 Prospectus Drive, Suite F  
Durham, NC 27713

Transmittal  
Laboratory Test Results  
NG Rensselaer

Please find attached the laboratory test results for the above referenced project. The tests were outlined on the Project Verification Form that was transmitted to your firm prior to the testing. The testing was performed in general accordance with the methods listed on the enclosed data sheets. The test results are believed to be representative of the samples that were submitted for testing and are indicative only of the specimens which were evaluated. We have no direct knowledge of the origin of the samples and imply no position with regard to the nature of the test results, i.e. pass/fail and no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization by our Client. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please contact our office.

Respectively submitted,  
**Geotechnics, Inc.**

Michael P. Smith  
Regional Manager

***We understand that you have a choice in your laboratory services  
and we thank you for choosing Geotechnics.***

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-002  
 Lab ID R-2019-267-002-001

Boring No. Pretest-1  
 Depth (ft.) N/A  
 Sample No. Day 23  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.983	Top Dia. (in)	2.001
Length 2(in)	3.962	Mid. Dia. (in)	1.986
Length 3(in)	4.011	Bot. Dia. (in)	1.982
Avg.Length(in)	3.985	Area (in. <sup>2</sup> )	3.109

### WATER CONTENT AFTER TEST

Tare No.	TB-09
Wt. Tare + WS.(g)	516.8
Wt. Tare + DS.(g)	424.7
Wt. of Tare(g)	134.15
% Moisture	31.70

### UNIT WEIGHT

Wt. Tube & WS.(g.)	383.3	Sample Volume(cc.)	203.1
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.89
Wt. Of WS.(g.)	383.3	Unit Wet Wt.(pcf.)	117.79
Diameter (in.)	1.99	Moisture Content, %	31.70
Length (in.)	3.99	Unit Dry Wt.(pcf.)	89.44
Length (cm.)	10.12		

### ELECTRONIC DEVICE

PEAK LOAD (lbs)

STRESS (psi)

81.9

26.3



Tested By MY Date 10/3/19 Input Checked By GEM Date 10/9/19

## UNCONFINED COMPRESSIVE STRENGTH

ASTM D1633-00 (2007) (Method B)

Client Arcadis U.S., Inc.  
 Client Reference NG Rensselaer  
 Project No. R-2019-267-002  
 Lab ID R-2019-267-002-002

Boring No. Pretest-3  
 Depth (ft.) N/A  
 Sample No. Day 23  
 Visual Gray Soil Mix

### INITIAL SAMPLE DIMENSIONS

Length 1(in)	3.957	Top Dia. (in)	1.985
Length 2(in)	3.942	Mid. Dia. (in)	1.985
Length 3(in)	3.962	Bot. Dia. (in)	1.993
Avg.Length(in)	3.954	Area (in. <sup>2</sup> )	3.103

### WATER CONTENT AFTER TEST

Tare No.	TB-08
Wt. Tare + WS.(g)	516.41
Wt. Tare + DS.(g)	135.38
Wt. of Tare(g)	134.15
% Moisture	30978.05

### UNIT WEIGHT

Wt. Tube & WS.(g.)	381.52	Sample Volume(cc.)	201.0
Wt. Of Tube(g.)	0.0	Unit Wet Wt.(gms/cc)	1.90
Wt. Of WS.(g.)	381.52	Unit Wet Wt.(pcf.)	118.42
Diameter (in.)	1.99	Moisture Content, %	30978.05
Length (in.)	3.95	Unit Dry Wt.(pcf.)	0.38
Length (cm.)	10.04		

### ELECTRONIC DEVICE

PEAK LOAD (lbs)

STRESS (psi)

68.9

22.2



Tested By MY Date 10/3/19 Input Checked By GEM Date 10/8/19

# Attachment 3

Analytical Laboratory Reports





## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

ARCADIS U.S., Inc.  
630 Plaza Drive  
Suite 600  
Highlands Ranch CO 80129

Report Date: March 04, 2020 18:07

### Project: NG Rensselaer ISSS

Account #: 03074  
Group Number: 2085852  
SDG: RNL01  
PO Number: 30004017.00006  
State of Sample Origin: NY

Electronic Copy To Arcadis  
Electronic Copy To ExxonMobil c/o Arcadis

Attn: David Liles  
Attn: Andy Baumeister

Respectfully Submitted,



Megan A. Moeller  
Senior Specialist

(717) 556-7261

To view our laboratory's current scopes of accreditation please go to <https://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/certifications-and-accreditations-eurofins-lancaster-laboratories-environmental/> . Historical copies may be requested through your project manager.



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection</u> <u>Date/Time</u>	<u>ELLE#</u>
Mix-2 Soil	01/29/2020 12:00	1251263
Mix-2 Soil	01/29/2020 12:00	1251264
Mix-2 Soil	01/29/2020 12:00	1251265
Mix-2 Soil	01/29/2020 12:00	1251266
Mix-2 Soil	01/29/2020 12:00	1251267
Mix-2 Soil	01/29/2020 12:00	1251268
Mix-2 Soil	01/29/2020 12:00	1251269
Mix-2 Soil	01/29/2020 12:00	1251270
Mix-2 Soil	01/29/2020 12:00	1251271
Mix-2 Soil	01/29/2020 12:00	1251272
Mix-5 Soil	01/29/2020 12:00	1251273
Mix-5 Soil	01/29/2020 12:00	1251274
Mix-5 Soil	01/29/2020 12:00	1251275
Mix-5 Soil	01/29/2020 12:00	1251276
Mix-5 Soil	01/29/2020 12:00	1251277
Mix-5 Soil	01/29/2020 12:00	1251278
Mix-5 Soil	01/29/2020 12:00	1251279
Mix-5 Soil	01/29/2020 12:00	1251280
Mix-5 Soil	01/29/2020 12:00	1251281
Mix-5 Soil	01/29/2020 12:00	1251282

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.



Project Name: NG Rensselaer ISSS  
ELLE Group #: 2085852

## General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below.  
Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set.

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

## Analysis Specific Comments:

### SW-846 8270D, GC/MS Semivolatiles

Batch #: 20048WAA026 (Sample number(s): 1251267, 1251277)

The recovery(ies) for one or more surrogates were below the acceptance window for sample(s) 1251267

**Sample Description:** Mix-2 Soil  
Day 1 SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251263  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submission Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS</b>	<b>Semivolatiles</b>	<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	N.D.	0.1	0.5	1
14250	Acenaphthylene	208-96-8	N.D.	0.1	0.5	1
14250	Anthracene	120-12-7	N.D.	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	N.D.	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	N.D.	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	0.2 J	0.1	0.5	1
14250	Fluorene	86-73-7	0.1 J	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	N.D.	0.1	0.5	1
14250	Naphthalene	91-20-3	0.2 J	0.1	0.5	1
14250	Phenanthrene	85-01-8	0.4 J	0.1	0.5	1
14250	Pyrene	129-00-0	0.2 J	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20038WAB026	02/10/2020 12:50	Kira N Beck	1
07807	BNA Water Extraction	SW-846 3510C	1	20038WAB026	02/07/2020 17:00	Oswaldo R Sanchez	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20037-16818-1567	02/06/2020 14:03	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-2 Soil  
Day 1 SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251264  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-02

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	N.D.	0.4	1	1
11997	Toluene	108-88-3	N.D.	0.2	1	1
11997	Xylene (Total)	1330-20-7	N.D.	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	Y200431AA	02/12/2020 16:27	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y200431AA	02/12/2020 16:26	Anita M Dale	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20039-16818-8792	02/08/2020 14:30	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-2 Soil  
Day 5 SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251265  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submission Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	N.D.	0.1	0.5	1
14250	Acenaphthylene	208-96-8	N.D.	0.1	0.5	1
14250	Anthracene	120-12-7	N.D.	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	N.D.	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	N.D.	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	N.D.	0.1	0.5	1
14250	Fluorene	86-73-7	N.D.	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	N.D.	0.1	0.5	1
14250	Naphthalene	91-20-3	N.D.	0.1	0.5	1
14250	Phenanthrene	85-01-8	0.4 J	0.1	0.5	1
14250	Pyrene	129-00-0	0.2 J	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20042WAB026	02/12/2020 15:45	Edward C Monborne	1
07807	BNA Water Extraction	SW-846 3510C	1	20042WAB026	02/11/2020 19:37	Laura Duquette	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20042-16818-1567	02/11/2020 14:00	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-2 Soil  
Day 5 SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251266  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-04

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	N.D.	0.4	1	1
11997	Toluene	108-88-3	N.D.	0.2	1	1
11997	Xylene (Total)	1330-20-7	N.D.	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	W200482AA	02/18/2020 00:01	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	W200482AA	02/18/2020 00:00	Sara E Johnson	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20043-2807-8792	02/12/2020 14:46	Nicholas W Shroyer	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-2 Soil  
Day 10 SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251267  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-05

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS</b>	<b>Semivolatiles</b>	<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	N.D.	0.1	0.5	1
14250	Acenaphthylene	208-96-8	N.D.	0.1	0.5	1
14250	Anthracene	120-12-7	N.D.	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	N.D.	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	N.D.	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	0.2 J	0.1	0.5	1
14250	Fluorene	86-73-7	0.1 J	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	N.D.	0.1	0.5	1
14250	Naphthalene	91-20-3	0.2 J	0.1	0.5	1
14250	Phenanthrene	85-01-8	0.4 J	0.1	0.5	1
14250	Pyrene	129-00-0	0.2 J	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20048WAA026	02/18/2020 12:24	Edward C Monborne	1
07807	BNA Water Extraction	SW-846 3510C	1	20048WAA026	02/17/2020 17:25	Laura Duquette	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20047-2807-1567	02/16/2020 12:00	Nicholas W Shroyer	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-2 Soil  
Day 10 SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251268  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	N.D.	0.4	1	1
11997	Toluene	108-88-3	0.3 J	0.2	1	1
11997	Xylene (Total)	1330-20-7	N.D.	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	5200501AA	02/19/2020 18:30	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	5200501AA	02/19/2020 18:29	Don V Viray	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20048-2807-8792	02/17/2020 11:00	Nicholas W Shroyer	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-2 Soil  
Day 15 SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251269  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submission Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-07

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS</b>	<b>Semivolatiles</b>	<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	N.D.	0.1	0.5	1
14250	Acenaphthylene	208-96-8	N.D.	0.1	0.5	1
14250	Anthracene	120-12-7	N.D.	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	N.D.	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	N.D.	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	N.D.	0.1	0.5	1
14250	Fluorene	86-73-7	N.D.	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	N.D.	0.1	0.5	1
14250	Naphthalene	91-20-3	N.D.	0.1	0.5	1
14250	Phenanthrene	85-01-8	0.2 J	0.1	0.5	1
14250	Pyrene	129-00-0	N.D.	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20052WAB026	02/22/2020 21:50	Ashley R Transue	1
07807	BNA Water Extraction	SW-846 3510C	1	20052WAB026	02/21/2020 16:27	Laura Duquette	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20052-16818-1567	02/21/2020 12:38	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result



**Sample Description:** Mix-2 Soil  
Day 15 SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251270  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-08

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	N.D.	0.4	1	1
11997	Toluene	108-88-3	N.D.	0.2	1	1
11997	Xylene (Total)	1330-20-7	N.D.	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	Y200573AA	02/27/2020 05:57	Miranda Campbell	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y200573AA	02/27/2020 05:56	Miranda Campbell	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20053-16818-8792	02/22/2020 12:32	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-2 Soil  
Day 20 SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251271  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-09

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	0.2 J	0.1	0.5	1
14250	Acenaphthylene	208-96-8	0.2 J	0.1	0.5	1
14250	Anthracene	120-12-7	0.2 J	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	N.D.	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	N.D.	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	0.5	0.1	0.5	1
14250	Fluorene	86-73-7	0.3 J	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	0.3 J	0.1	0.5	1
14250	Naphthalene	91-20-3	0.5 J	0.1	0.5	1
14250	Phenanthrene	85-01-8	1	0.1	0.5	1
14250	Pyrene	129-00-0	0.6	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20057WAB026	02/27/2020 12:03	Kira N Beck	1
07807	BNA Water Extraction	SW-846 3510C	1	20057WAB026	02/26/2020 16:45	Osvaldo R Sanchez	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20057-16818-1567	02/26/2020 12:45	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-2 Soil  
Day 20 SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251272  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	N.D.	0.4	1	1
11997	Toluene	108-88-3	N.D.	0.2	1	1
11997	Xylene (Total)	1330-20-7	N.D.	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	Y200641AA	03/04/2020 12:31	Corie Mellinger	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y200641AA	03/04/2020 12:30	Corie Mellinger	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20058-16818-8792	02/27/2020 11:45	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-5 Soil  
Day 1 SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251273  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-11

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	11	0.1	0.5	1
14250	Acenaphthylene	208-96-8	1	0.1	0.5	1
14250	Anthracene	120-12-7	2	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	N.D.	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	N.D.	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	0.9	0.1	0.5	1
14250	Fluorene	86-73-7	5	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	16	0.1	0.5	1
14250	Naphthalene	91-20-3	62	0.1	0.5	1
14250	Phenanthrene	85-01-8	9	0.1	0.5	1
14250	Pyrene	129-00-0	1	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20038WAB026	02/10/2020 13:20	Kira N Beck	1
07807	BNA Water Extraction	SW-846 3510C	1	20038WAB026	02/07/2020 17:00	Oswaldo R Sanchez	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20037-16818-1567	02/06/2020 14:03	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-5 Soil  
Day 1 SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251274  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-12

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	N.D.	0.4	1	1
11997	Toluene	108-88-3	N.D.	0.2	1	1
11997	Xylene (Total)	1330-20-7	N.D.	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	Y200431AA	02/12/2020 16:49	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y200431AA	02/12/2020 16:48	Anita M Dale	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20039-16818-8792	02/08/2020 14:30	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-5 Soil  
Day 5 SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251275  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submission Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-13

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS</b>	<b>Semivolatiles</b>	<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	5	0.1	0.5	1
14250	Acenaphthylene	208-96-8	0.6	0.1	0.5	1
14250	Anthracene	120-12-7	1	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	N.D.	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	0.1 J	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	0.7	0.1	0.5	1
14250	Fluorene	86-73-7	2	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	7	0.1	0.5	1
14250	Naphthalene	91-20-3	26	0.1	0.5	1
14250	Phenanthrene	85-01-8	5	0.1	0.5	1
14250	Pyrene	129-00-0	1	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20042WAB026	02/12/2020 16:14	Edward C Monborne	1
07807	BNA Water Extraction	SW-846 3510C	1	20042WAB026	02/11/2020 19:37	Laura Duquette	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20042-16818-1567	02/11/2020 14:00	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-5 Soil  
Day 5 SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251276  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-14

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	12	0.4	1	1
11997	Toluene	108-88-3	N.D.	0.2	1	1
11997	Xylene (Total)	1330-20-7	15	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	E200491AA	02/18/2020 15:43	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	E200491AA	02/18/2020 15:42	Kevin A Sposito	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20043-2807-8792	02/12/2020 14:46	Nicholas W Shroyer	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-5 Soil  
Day 10 SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251277  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	9	0.1	0.5	1
14250	Acenaphthylene	208-96-8	1	0.1	0.5	1
14250	Anthracene	120-12-7	2	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	0.2 J	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	0.2 J	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	1	0.1	0.5	1
14250	Fluorene	86-73-7	4	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	13	0.1	0.5	1
14250	Naphthalene	91-20-3	45	0.1	0.5	1
14250	Phenanthrene	85-01-8	8	0.1	0.5	1
14250	Pyrene	129-00-0	2	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20048WAA026	02/18/2020 12:52	Edward C Monborne	1
07807	BNA Water Extraction	SW-846 3510C	1	20048WAA026	02/17/2020 17:25	Laura Duquette	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20047-2807-1567	02/16/2020 12:00	Nicholas W Shroyer	n.a.

\*=This limit was used in the evaluation of the final result



**Sample Description:** Mix-5 Soil  
Day 10 SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251278  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-16

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	7	0.4	1	1
11997	Toluene	108-88-3	N.D.	0.2	1	1
11997	Xylene (Total)	1330-20-7	9	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	5200501AA	02/19/2020 19:33	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	5200501AA	02/19/2020 19:32	Don V Viray	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20048-2807-8792	02/17/2020 11:00	Nicholas W Shroyer	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-5 Soil  
Day 15 SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251279  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submission Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-17

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS</b>	<b>Semivolatiles</b>	<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	5	0.1	0.5	1
14250	Acenaphthylene	208-96-8	0.6	0.1	0.5	1
14250	Anthracene	120-12-7	1	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	N.D.	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	N.D.	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	0.8	0.1	0.5	1
14250	Fluorene	86-73-7	2	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	7	0.1	0.5	1
14250	Naphthalene	91-20-3	25	0.1	0.5	1
14250	Phenanthrene	85-01-8	5	0.1	0.5	1
14250	Pyrene	129-00-0	1	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20052WAB026	02/22/2020 22:18	Ashley R Transue	1
07807	BNA Water Extraction	SW-846 3510C	1	20052WAB026	02/21/2020 16:27	Laura Duquette	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20052-16818-1567	02/21/2020 12:38	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-5 Soil  
Day 15 SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251280  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-18

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	12	0.4	1	1
11997	Toluene	108-88-3	0.2 J	0.2	1	1
11997	Xylene (Total)	1330-20-7	15	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	Y200573AA	02/27/2020 06:41	Miranda Campbell	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y200573AA	02/27/2020 06:40	Miranda Campbell	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20053-16818-8792	02/22/2020 12:32	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-5 Soil  
Day 20 SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251281  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-19

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS</b>	<b>Semivolatiles</b>	<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	17	0.1	0.5	1
14250	Acenaphthylene	208-96-8	2	0.1	0.5	1
14250	Anthracene	120-12-7	3	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	0.2 J	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	0.2 J	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	2	0.1	0.5	1
14250	Fluorene	86-73-7	7	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	25	0.1	0.5	1
14250	Naphthalene	91-20-3	94	0.1	0.5	1
14250	Phenanthrene	85-01-8	14	0.1	0.5	1
14250	Pyrene	129-00-0	2	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20057WAB026	02/27/2020 12:32	Kira N Beck	1
07807	BNA Water Extraction	SW-846 3510C	1	20057WAB026	02/26/2020 16:45	Osvaldo R Sanchez	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20057-16818-1567	02/26/2020 12:45	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** Mix-5 Soil  
Day 20 SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251282  
ELLE Group #: 2085852  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL01-20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	7	0.4	1	1
11997	Toluene	108-88-3	N.D.	0.2	1	1
11997	Xylene (Total)	1330-20-7	9	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	Y200641AA	03/04/2020 13:15	Corie Mellinger	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y200641AA	03/04/2020 13:14	Corie Mellinger	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20058-16818-8792	02/27/2020 11:45	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 03/04/2020 18:07

Group Number: 2085852

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

## Method Blank

Analysis Name	Result ug/l	MDL** ug/l	LOQ ug/l
Batch number: 5200501AA	Sample number(s): 1251268,1251278		
Benzene	N.D.	0.2	1
Ethylbenzene	N.D.	0.4	1
Toluene	N.D.	0.2	1
Xylene (Total)	N.D.	1	6
Batch number: E200491AA	Sample number(s): 1251276		
Benzene	N.D.	0.2	1
Ethylbenzene	N.D.	0.4	1
Toluene	N.D.	0.2	1
Xylene (Total)	N.D.	1	6
Batch number: W200482AA	Sample number(s): 1251266		
Benzene	N.D.	0.2	1
Ethylbenzene	N.D.	0.4	1
Toluene	N.D.	0.2	1
Xylene (Total)	N.D.	1	6
Batch number: Y200431AA	Sample number(s): 1251264,1251274		
Benzene	N.D.	0.2	1
Ethylbenzene	N.D.	0.4	1
Toluene	N.D.	0.2	1
Xylene (Total)	N.D.	1	6
Batch number: Y200573AA	Sample number(s): 1251270,1251280		
Benzene	N.D.	0.2	1
Ethylbenzene	N.D.	0.4	1
Toluene	N.D.	0.2	1
Xylene (Total)	N.D.	1	6
Batch number: Y200641AA	Sample number(s): 1251272,1251282		
Benzene	N.D.	0.2	1
Ethylbenzene	N.D.	0.4	1
Toluene	N.D.	0.2	1
Xylene (Total)	N.D.	1	6
Batch number: 20038WAB026	Sample number(s): 1251263,1251273		
Acenaphthene	N.D.	0.1	0.5
Acenaphthylene	N.D.	0.1	0.5
Anthracene	N.D.	0.1	0.5
Benzo(a)anthracene	N.D.	0.1	0.5
Benzo(a)pyrene	N.D.	0.1	0.5

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 03/04/2020 18:07

Group Number: 2085852

### Method Blank (continued)

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
Benzo(b)fluoranthene	N.D.	0.1	0.5
Benzo(g,h,i)perylene	N.D.	0.1	0.5
Benzo(k)fluoranthene	N.D.	0.1	0.5
Chrysene	N.D.	0.1	0.5
Dibenz(a,h)anthracene	N.D.	0.1	0.5
Fluoranthene	N.D.	0.1	0.5
Fluorene	N.D.	0.1	0.5
Indeno(1,2,3-cd)pyrene	N.D.	0.1	0.5
2-Methylnaphthalene	N.D.	0.1	0.5
Naphthalene	N.D.	0.1	0.5
Phenanthrene	N.D.	0.1	0.5
Pyrene	N.D.	0.1	0.5
Batch number: 20042WAB026	Sample number(s): 1251265,1251275		
Acenaphthene	N.D.	0.1	0.5
Acenaphthylene	N.D.	0.1	0.5
Anthracene	N.D.	0.1	0.5
Benzo(a)anthracene	N.D.	0.1	0.5
Benzo(a)pyrene	N.D.	0.1	0.5
Benzo(b)fluoranthene	N.D.	0.1	0.5
Benzo(g,h,i)perylene	N.D.	0.1	0.5
Benzo(k)fluoranthene	N.D.	0.1	0.5
Chrysene	N.D.	0.1	0.5
Dibenz(a,h)anthracene	N.D.	0.1	0.5
Fluoranthene	N.D.	0.1	0.5
Fluorene	N.D.	0.1	0.5
Indeno(1,2,3-cd)pyrene	N.D.	0.1	0.5
2-Methylnaphthalene	N.D.	0.1	0.5
Naphthalene	N.D.	0.1	0.5
Phenanthrene	N.D.	0.1	0.5
Pyrene	N.D.	0.1	0.5
Batch number: 20048WAA026	Sample number(s): 1251267,1251277		
Acenaphthene	N.D.	0.1	0.5
Acenaphthylene	N.D.	0.1	0.5
Anthracene	N.D.	0.1	0.5
Benzo(a)anthracene	N.D.	0.1	0.5
Benzo(a)pyrene	N.D.	0.1	0.5
Benzo(b)fluoranthene	N.D.	0.1	0.5
Benzo(g,h,i)perylene	N.D.	0.1	0.5
Benzo(k)fluoranthene	N.D.	0.1	0.5
Chrysene	N.D.	0.1	0.5
Dibenz(a,h)anthracene	N.D.	0.1	0.5
Fluoranthene	N.D.	0.1	0.5
Fluorene	N.D.	0.1	0.5
Indeno(1,2,3-cd)pyrene	N.D.	0.1	0.5

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 03/04/2020 18:07

Group Number: 2085852

### Method Blank (continued)

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
2-Methylnaphthalene	N.D.	0.1	0.5
Naphthalene	N.D.	0.1	0.5
Phenanthrene	N.D.	0.1	0.5
Pyrene	N.D.	0.1	0.5
Batch number: 20052WAB026	Sample number(s): 1251269,1251279		
Acenaphthene	N.D.	0.1	0.5
Acenaphthylene	N.D.	0.1	0.5
Anthracene	N.D.	0.1	0.5
Benzo(a)anthracene	N.D.	0.1	0.5
Benzo(a)pyrene	N.D.	0.1	0.5
Benzo(b)fluoranthene	N.D.	0.1	0.5
Benzo(g,h,i)perylene	N.D.	0.1	0.5
Benzo(k)fluoranthene	N.D.	0.1	0.5
Chrysene	N.D.	0.1	0.5
Dibenz(a,h)anthracene	N.D.	0.1	0.5
Fluoranthene	N.D.	0.1	0.5
Fluorene	N.D.	0.1	0.5
Indeno(1,2,3-cd)pyrene	N.D.	0.1	0.5
2-Methylnaphthalene	N.D.	0.1	0.5
Naphthalene	N.D.	0.1	0.5
Phenanthrene	N.D.	0.1	0.5
Pyrene	N.D.	0.1	0.5
Batch number: 20057WAB026	Sample number(s): 1251271,1251281		
Acenaphthene	N.D.	0.1	0.5
Acenaphthylene	N.D.	0.1	0.5
Anthracene	N.D.	0.1	0.5
Benzo(a)anthracene	N.D.	0.1	0.5
Benzo(a)pyrene	N.D.	0.1	0.5
Benzo(b)fluoranthene	N.D.	0.1	0.5
Benzo(g,h,i)perylene	N.D.	0.1	0.5
Benzo(k)fluoranthene	N.D.	0.1	0.5
Chrysene	N.D.	0.1	0.5
Dibenz(a,h)anthracene	N.D.	0.1	0.5
Fluoranthene	N.D.	0.1	0.5
Fluorene	N.D.	0.1	0.5
Indeno(1,2,3-cd)pyrene	N.D.	0.1	0.5
2-Methylnaphthalene	N.D.	0.1	0.5
Naphthalene	N.D.	0.1	0.5
Phenanthrene	N.D.	0.1	0.5
Pyrene	N.D.	0.1	0.5

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.



## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 03/04/2020 18:07

Group Number: 2085852

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 5200501AA	Sample number(s): 1251268,1251278								
Benzene	20	19.75	20	19.94	99	100	80-120	1	30
Ethylbenzene	20	20.1	20	19.8	101	99	80-120	2	30
Toluene	20	19.95	20	19.75	100	99	80-120	1	30
Xylene (Total)	60	59.9	60	59.31	100	99	80-120	1	30
Batch number: E200491AA	Sample number(s): 1251276								
Benzene	20	20.57			103		80-120		
Ethylbenzene	20	20.7			104		80-120		
Toluene	20	20.53			103		80-120		
Xylene (Total)	60	63.72			106		80-120		
Batch number: W200482AA	Sample number(s): 1251266								
Benzene	20	21.64	20	23.41	108	117	80-120	8	30
Ethylbenzene	20	21.76	20	23.8	109	119	80-120	9	30
Toluene	20	21.42	20	23.33	107	117	80-120	9	30
Xylene (Total)	60	64.19	60	70.88	107	118	80-120	10	30
Batch number: Y200431AA	Sample number(s): 1251264,1251274								
Benzene	20	22.66			113		80-120		
Ethylbenzene	20	22.02			110		80-120		
Toluene	20	22.21			111		80-120		
Xylene (Total)	60	65.12			109		80-120		
Batch number: Y200573AA	Sample number(s): 1251270,1251280								
Benzene	20	20.86	20	20.45	104	102	80-120	2	30
Ethylbenzene	20	21.26	20	20.79	106	104	80-120	2	30
Toluene	20	21.02	20	20.61	105	103	80-120	2	30
Xylene (Total)	60	62.85	60	61.72	105	103	80-120	2	30
Batch number: Y200641AA	Sample number(s): 1251272,1251282								
Benzene	20	20.02	20	20.38	100	102	80-120	2	30
Ethylbenzene	20	20.3	20	20.58	101	103	80-120	1	30
Toluene	20	19.96	20	20.28	100	101	80-120	2	30
Xylene (Total)	60	60.08	60	61.03	100	102	80-120	2	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 20038WAB026	Sample number(s): 1251263,1251273								
Acenaphthene	50	38.15	50	37.84	76	76	52-114	1	30
Acenaphthylene	50	39.65	50	39.04	79	78	56-127	2	30
Anthracene	50	41.45	50	39.44	83	79	67-116	5	30
Benzo(a)anthracene	50	44.68	50	48	89	96	68-123	7	30
Benzo(a)pyrene	50	42.43	50	45.89	85	92	71-117	8	30
Benzo(b)fluoranthene	50	45.24	50	48.79	90	98	69-121	8	30
Benzo(g,h,i)perylene	50	44.07	50	45.91	88	92	60-119	4	30
Benzo(k)fluoranthene	50	44.71	50	46.77	89	94	69-122	5	30

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 03/04/2020 18:07

Group Number: 2085852

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Chrysene	50	45.44	50	46.35	91	93	65-121	2	30
Dibenz(a,h)anthracene	50	45.96	50	47.28	92	95	63-128	3	30
Fluoranthene	50	46.42	50	43.81	93	88	63-122	6	30
Fluorene	50	40.46	50	40.08	81	80	56-115	1	30
Indeno(1,2,3-cd)pyrene	50	45.36	50	46.4	91	93	59-123	2	30
2-Methylnaphthalene	50	37.12	50	37.13	74	74	51-107	0	30
Naphthalene	50	35.91	50	34.46	72	69	51-102	4	30
Phenanthrene	50	43.46	50	42.68	87	85	65-113	2	30
Pyrene	50	43.14	50	44.77	86	90	65-115	4	30
Batch number: 20042WAB026      Sample number(s): 1251265,1251275									
Acenaphthene	50	45.35	50	42.85	91	86	52-114	6	30
Acenaphthylene	50	45.61	50	43.75	91	87	56-127	4	30
Anthracene	50	48.66	50	47.98	97	96	67-116	1	30
Benzo(a)anthracene	50	52.92	50	52.04	106	104	68-123	2	30
Benzo(a)pyrene	50	50.71	50	49.97	101	100	71-117	1	30
Benzo(b)fluoranthene	50	52.36	50	51.41	105	103	69-121	2	30
Benzo(g,h,i)perylene	50	52.29	50	50.57	105	101	60-119	3	30
Benzo(k)fluoranthene	50	53.63	50	51.15	107	102	69-122	5	30
Chrysene	50	50.94	50	50.1	102	100	65-121	2	30
Dibenz(a,h)anthracene	50	53.63	50	52.05	107	104	63-128	3	30
Fluoranthene	50	51.24	50	50.15	102	100	63-122	2	30
Fluorene	50	47.69	50	46.28	95	93	56-115	3	30
Indeno(1,2,3-cd)pyrene	50	50.83	50	49.75	102	100	59-123	2	30
2-Methylnaphthalene	50	41.79	50	38.02	84	76	51-107	9	30
Naphthalene	50	40.54	50	38.45	81	77	51-102	5	30
Phenanthrene	50	49.34	50	48.02	99	96	65-113	3	30
Pyrene	50	48.97	50	48.79	98	98	65-115	0	30
Batch number: 20048WAA026      Sample number(s): 1251267,1251277									
Acenaphthene	50	35.23	50	30.95	70	62	52-114	13	30
Acenaphthylene	50	38.56	50	33.41	77	67	56-127	14	30
Anthracene	50	46.18	50	39.71	92	79	67-116	15	30
Benzo(a)anthracene	50	52.81	50	45.23	106	90	68-123	15	30
Benzo(a)pyrene	50	51.77	50	43.46	104	87	71-117	17	30
Benzo(b)fluoranthene	50	52.73	50	44.62	105	89	69-121	17	30
Benzo(g,h,i)perylene	50	36.95	50	33.9	74	68	60-119	9	30
Benzo(k)fluoranthene	50	54.66	50	46.3	109	93	69-122	17	30
Chrysene	50	49.27	50	41.9	99	84	65-121	16	30
Dibenz(a,h)anthracene	50	43.29	50	37.1	87	74	63-128	15	30
Fluoranthene	50	50.13	50	42.99	100	86	63-122	15	30
Fluorene	50	39.2	50	34.67	78	69	56-115	12	30
Indeno(1,2,3-cd)pyrene	50	40.6	50	35.36	81	71	59-123	14	30
2-Methylnaphthalene	50	31.75	50	26.61	63	53	51-107	18	30
Naphthalene	50	33.92	50	28.73	68	57	51-102	17	30

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 03/04/2020 18:07

Group Number: 2085852

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Phenanthrene	50	45.22	50	39.15	90	78	65-113	14	30
Pyrene	50	48.09	50	41.06	96	82	65-115	16	30
Batch number: 20052WAB026	Sample number(s): 1251269,1251279								
Acenaphthene	50	36.44	50	42.89	73	86	52-114	16	30
Acenaphthylene	50	38.57	50	45.42	77	91	56-127	16	30
Anthracene	50	45.18	50	48.17	90	96	67-116	6	30
Benzo(a)anthracene	50	51.06	50	55.34	102	111	68-123	8	30
Benzo(a)pyrene	50	48.31	50	49.64	97	99	71-117	3	30
Benzo(b)fluoranthene	50	48.92	50	50.98	98	102	69-121	4	30
Benzo(g,h,i)perylene	50	42.1	50	43.3	84	87	60-119	3	30
Benzo(k)fluoranthene	50	49.87	50	51.41	100	103	69-122	3	30
Chrysene	50	49.81	50	53.38	100	107	65-121	7	30
Dibenz(a,h)anthracene	50	47.31	50	49.95	95	100	63-128	5	30
Fluoranthene	50	48.13	50	52.83	96	106	63-122	9	30
Fluorene	50	41.02	50	47.57	82	95	56-115	15	30
Indeno(1,2,3-cd)pyrene	50	42.61	50	44.25	85	89	59-123	4	30
2-Methylnaphthalene	50	34.68	50	40.37	69	81	51-107	15	30
Naphthalene	50	35.25	50	40.02	71	80	51-102	13	30
Phenanthrene	50	45.22	50	48.02	90	96	65-113	6	30
Pyrene	50	45.65	50	49.07	91	98	65-115	7	30
Batch number: 20057WAB026	Sample number(s): 1251271,1251281								
Acenaphthene	50	35.58	50	39.89	71	80	52-114	11	30
Acenaphthylene	50	37.37	50	41.84	75	84	56-127	11	30
Anthracene	50	41.04	50	46.18	82	92	67-116	12	30
Benzo(a)anthracene	50	48.66	50	53.32	97	107	68-123	9	30
Benzo(a)pyrene	50	43.78	50	47.11	88	94	71-117	7	30
Benzo(b)fluoranthene	50	45.53	50	49.25	91	99	69-121	8	30
Benzo(g,h,i)perylene	50	39.08	50	41.35	78	83	60-119	6	30
Benzo(k)fluoranthene	50	44.98	50	48.46	90	97	69-122	7	30
Chrysene	50	47.96	50	52.04	96	104	65-121	8	30
Dibenz(a,h)anthracene	50	40.88	50	43.36	82	87	63-128	6	30
Fluoranthene	50	44.86	50	50.54	90	101	63-122	12	30
Fluorene	50	38.45	50	43.81	77	88	56-115	13	30
Indeno(1,2,3-cd)pyrene	50	38.45	50	40.99	77	82	59-123	6	30
2-Methylnaphthalene	50	33.63	50	36.52	67	73	51-107	8	30
Naphthalene	50	33.92	50	36.48	68	73	51-102	7	30
Phenanthrene	50	41.83	50	47.07	84	94	65-113	12	30
Pyrene	50	42.89	50	45.8	86	92	65-115	7	30

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 03/04/2020 18:07

Group Number: 2085852

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 5200501AA	Sample number(s): 1251268,1251278 UNSPK: 1251268									
Benzene	N.D.	20	21.59	20	20.95	108	105	80-120	3	30
Ethylbenzene	N.D.	20	21.74	20	20.22	109	101	80-120	7	30
Toluene	0.293	20	21.8	20	20.45	108	101	80-120	6	30
Xylene (Total)	N.D.	60	65	60	60.64	108	101	80-120	7	30

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- 5ml Water by 8260C/D

Batch number: 5200501AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
1251268	97	104	98	97
1251278	97	99	98	100
Blank	101	99	99	97
LCS	101	101	100	102
LCSD	101	105	100	100
MS	94	100	100	102
MSD	92	101	100	101
Limits:	80-120	80-120	80-120	80-120

Analysis Name: VOCs- 5ml Water by 8260C/D

Batch number: E200491AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
1251276	99	99	97	96
Blank	102	102	98	96
LCS	104	102	98	95
Limits:	80-120	80-120	80-120	80-120

Analysis Name: VOCs- 5ml Water by 8260C/D

Batch number: W200482AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
1251266	101	106	98	92
Blank	101	105	100	96
LCS	101	104	102	101
LCSD	102	99	103	102

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 03/04/2020 18:07

Group Number: 2085852

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- 5ml Water by 8260C/D  
Batch number: W200482AA

Limits:	80-120	80-120	80-120	80-120
---------	--------	--------	--------	--------

Analysis Name: VOCs- 5ml Water by 8260C/D  
Batch number: Y200431AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
1251264	94	98	95	90
1251274	94	102	94	92
Blank	96	100	95	91
LCS	94	99	97	96
Limits:	80-120	80-120	80-120	80-120

Analysis Name: VOCs- 5ml Water by 8260C/D  
Batch number: Y200573AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
1251270	96	102	103	96
1251280	93	101	103	98
Blank	97	102	103	97
LCS	98	105	104	100
LCSD	99	101	104	100
Limits:	80-120	80-120	80-120	80-120

Analysis Name: VOCs- 5ml Water by 8260C/D  
Batch number: Y200641AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
1251272	98	105	101	96
1251282	97	102	102	100
Blank	99	103	102	97
LCS	100	101	102	100
LCSD	100	102	103	101
Limits:	80-120	80-120	80-120	80-120

Analysis Name: PAHs 8270D MINI  
Batch number: 20038WAB026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
1251263	66	60	58
1251273	67	67	64
Blank	67	60	65
LCS	79	67	79
LCSD	77	59	80

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 03/04/2020 18:07

Group Number: 2085852

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: PAHs 8270D MINI  
Batch number: 20038WAB026

Limits: 38-113 44-102 34-128

Analysis Name: PAHs 8270D MINI  
Batch number: 20042WAB026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
1251265	67	66	44
1251275	74	66	59
Blank	65	63	73
LCS	82	74	88
LCSD	82	79	84
Limits:	38-113	44-102	34-128

Analysis Name: PAHs 8270D MINI  
Batch number: 20048WAA026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
1251267	72	57	19*
1251277	70	58	57
Blank	84	68	81
LCS	82	71	90
LCSD	73	65	78
Limits:	38-113	44-102	34-128

Analysis Name: PAHs 8270D MINI  
Batch number: 20052WAB026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
1251269	78	63	52
1251279	72	63	57
Blank	76	65	78
LCS	85	69	85
LCSD	87	75	84
Limits:	38-113	44-102	34-128

Analysis Name: PAHs 8270D MINI  
Batch number: 20057WAB026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
1251271	87	79	79
1251281	84	73	58
Blank	73	66	73
LCS	81	67	78

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 03/04/2020 18:07

Group Number: 2085852

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: PAHs 8270D MINI

Batch number: 20057WAB026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
LCSD	86	76	78
Limits:	38-113	44-102	34-128

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Send Results to:	Contact & Company Name:	Telephone:		Preservative									<b>Keys</b> <b>Preservation Key:</b> A. H <sub>2</sub> SO <sub>4</sub> B. HCl C. HNO <sub>3</sub> D. NaOH E. None F. Other: _____ <b>G. Other:</b> _____ <b>H. Other:</b> _____ <b>Matrix Key:</b> SO - Soil W - Water T - Tissue SE - Sediment SL - Sludge A - Air NL - NAPL/Oil SW - Sample Wipe Other: _____
	Address:	Fax:		Filtered (✓)									
	City	State	Zip	E-mail Address:	# of Containers								
					Container Information								
Project Name/Location (City, State):				Project #:				<b>PARAMETER ANALYSIS &amp; METHOD</b> <i>monolith leaching 8260</i> <i>monolith leaching 8270</i> <i>SPLP-modified* 8260</i> <i>SPLP-modified* 8270</i>					
Sampler's Printed Name:				Sampler's Signature:									
Sample ID		Collection		Type (✓)		Matrix		<b>REMARKS</b> * SPLP-modified For unamended baseline leaching tests: Please leach exactly 35.840g of B-143 soil and 39.991g of B-144 soil for 8260 analysis. Please leach exactly 197.320g of B-143 soil and 280.210g of B-144 soil for 8270 analysis. Solidified monoliths will be leached for 20 cycles.					
		Date	Time	Comp	Grab								
Mix-2 (8260)	1/24/20	1200			SO	X							
Mix-5 (8260)					SO	X							
Mix-2 (8270)					SO		X						
Mix-5 (8270)					SO		X						
B-143 unamended baseline					SO			X	X				
B-144 unamended baseline					SO			X	X				
Special Instructions/Comments:													
Please call with any questions / Attn: Megan Moeller													
<input type="checkbox"/> Special QA/QC Instructions (✓):													
Laboratory Information and Receipt		Relinquished By		Received By		Relinquished By		Laboratory Received By					
Lab Name:	Cooler Custody Seal (✓)	Printed Name:		Printed Name:		Printed Name:		Printed Name:					
<input type="checkbox"/> Cooler packed with ice (✓)	<input type="checkbox"/> Intact <input type="checkbox"/> Not Intact	Signature:		Signature:		Signature:		Signature:					
Specify Turnaround Requirements:	Sample Receipt:	Firm:		Firm/Courier:		Firm/Courier:		Firm:					
Shipping Tracking #:	Condition/Cooler Temp:	Date/Time:		Date/Time:		Date/Time:		Date/Time:					



# Sample Administration Receipt Documentation Log

Doc Log ID: 274136



Group Number(s): 2085852

Client: ARCADIS

## Delivery and Receipt Information

Delivery Method:	<u>Fed Ex</u>	Arrival Date:	<u>01/31/2020</u>
Number of Packages:	<u>1</u>	Number of Projects:	<u>1</u>

## Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	Total Trip Blank Qty:	0
Samples Chilled:	No	Air Quality Samples Present:	No
Paperwork Enclosed:	Yes		
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Julissa Rivera-Santa*

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $> 40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.

Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

ARCADIS U.S., Inc.  
630 Plaza Drive  
Suite 600  
Highlands Ranch CO 80129

Report Date: February 13, 2020 13:32

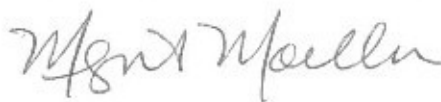
### Project: NG Rensselaer ISSS

Account #: 03074  
Group Number: 2085853  
SDG: RNL02  
PO Number: 30004017.00006  
State of Sample Origin: NY

Electronic Copy To Arcadis  
Electronic Copy To ExxonMobil c/o Arcadis

Attn: David Liles  
Attn: Andy Baumeister

Respectfully Submitted,



Megan A. Moeller  
Senior Specialist

(717) 556-7261

To view our laboratory's current scopes of accreditation please go to <https://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/certifications-and-accreditations-eurofins-lancaster-laboratories-environmental/> . Historical copies may be requested through your project manager.



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection</u> <u>Date/Time</u>	<u>ELLE#</u>
B-143 unamended baseline Soil	01/29/2020 12:00	1251283
B-143 unamended baseline Soil	01/29/2020 12:00	1251284
B-144 unamended baseline Soil	01/29/2020 12:00	1251285
B-144 unamended baseline Soil	01/29/2020 12:00	1251286

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Project Name: NG Rensselaer ISSS  
ELLE Group #: 2085853

**General Comments:**

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below.  
Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set.

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

**Analysis Specific Comments:**

No additional comments are necessary.

**Sample Description:** B-143 unamended baseline Soil  
SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251283  
ELLE Group #: 2085853  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL02-01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS</b>	<b>Semivolatiles</b>	<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	N.D.	0.1	0.5	1
14250	Acenaphthylene	208-96-8	N.D.	0.1	0.5	1
14250	Anthracene	120-12-7	N.D.	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	N.D.	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	N.D.	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	N.D.	0.1	0.5	1
14250	Fluorene	86-73-7	N.D.	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	N.D.	0.1	0.5	1
14250	Naphthalene	91-20-3	N.D.	0.1	0.5	1
14250	Phenanthrene	85-01-8	N.D.	0.1	0.5	1
14250	Pyrene	129-00-0	N.D.	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20038WAB026	02/10/2020 13:49	Kira N Beck	1
07807	BNA Water Extraction	SW-846 3510C	1	20038WAB026	02/07/2020 17:00	Oswaldo R Sanchez	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20036-16818-1567	02/05/2020 14:16	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** B-143 unamended baseline Soil  
SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251284  
ELLE Group #: 2085853  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL02-02

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	N.D.	0.4	1	1
11997	Toluene	108-88-3	N.D.	0.2	1	1
11997	Xylene (Total)	1330-20-7	N.D.	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	Y200431AA	02/12/2020 17:11	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y200431AA	02/12/2020 17:10	Anita M Dale	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20037-16818-8792	02/06/2020 14:30	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result



**Sample Description:** B-144 unamended baseline Soil  
SPLP NVE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251285  
ELLE Group #: 2085853  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submission Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL02-03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS</b>	<b>Semivolatiles</b>	<b>SW-846 8270D</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14250	Acenaphthene	83-32-9	6	0.1	0.5	1
14250	Acenaphthylene	208-96-8	0.3 J	0.1	0.5	1
14250	Anthracene	120-12-7	0.7	0.1	0.5	1
14250	Benzo(a)anthracene	56-55-3	0.1 J	0.1	0.5	1
14250	Benzo(a)pyrene	50-32-8	N.D.	0.1	0.5	1
14250	Benzo(b)fluoranthene	205-99-2	N.D.	0.1	0.5	1
14250	Benzo(g,h,i)perylene	191-24-2	N.D.	0.1	0.5	1
14250	Benzo(k)fluoranthene	207-08-9	N.D.	0.1	0.5	1
14250	Chrysene	218-01-9	N.D.	0.1	0.5	1
14250	Dibenz(a,h)anthracene	53-70-3	N.D.	0.1	0.5	1
14250	Fluoranthene	206-44-0	0.8	0.1	0.5	1
14250	Fluorene	86-73-7	2	0.1	0.5	1
14250	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.1	0.5	1
14250	2-Methylnaphthalene	91-57-6	1	0.1	0.5	1
14250	Naphthalene	91-20-3	2	0.1	0.5	1
14250	Phenanthrene	85-01-8	1	0.1	0.5	1
14250	Pyrene	129-00-0	2	0.1	0.5	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14250	PAHs 8270D MINI	SW-846 8270D	1	20038WAB026	02/10/2020 14:18	Kira N Beck	1
07807	BNA Water Extraction	SW-846 3510C	1	20038WAB026	02/07/2020 17:00	Oswaldo R Sanchez	1
01567	Synthetic Precipitation Leach	SW-846 1312	1	20036-16818-1567	02/05/2020 14:16	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

**Sample Description:** B-144 unamended baseline Soil  
SPLP ZHE  
NG Rensselaer ISSS

ARCADIS U.S., Inc.  
ELLE Sample #: TL 1251286  
ELLE Group #: 2085853  
Matrix: Soil

**Project Name:** NG Rensselaer ISSS

Submittal Date/Time: 01/31/2020 10:49  
Collection Date/Time: 01/29/2020 12:00  
SDG#: RNL02-04

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Volatiles</b>		<b>SW-846 8260C</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
11997	Benzene	71-43-2	N.D.	0.2	1	1
11997	Ethylbenzene	100-41-4	N.D.	0.4	1	1
11997	Toluene	108-88-3	N.D.	0.2	1	1
11997	Xylene (Total)	1330-20-7	N.D.	1	6	1

## Sample Comments

State of New York Certification No. 10670

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	VOCs- 5ml Water by 8260C/D	SW-846 8260C	1	Y200431AB	02/13/2020 11:28	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y200431AB	02/13/2020 11:27	Don V Viray	1
08792	SPLP Volatile Extraction	SW-846 1312	1	20037-16818-8792	02/06/2020 14:30	Brian Reed	n.a.

\*=This limit was used in the evaluation of the final result

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 02/13/2020 13:32

Group Number: 2085853

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL** ug/l	LOQ ug/l
Batch number: Y200431AA	Sample number(s): 1251284		
Benzene	N.D.	0.2	1
Ethylbenzene	N.D.	0.4	1
Toluene	N.D.	0.2	1
Xylene (Total)	N.D.	1	6
Batch number: Y200431AB	Sample number(s): 1251286		
Benzene	N.D.	0.2	1
Ethylbenzene	N.D.	0.4	1
Toluene	N.D.	0.2	1
Xylene (Total)	N.D.	1	6
Batch number: 20038WAB026	Sample number(s): 1251283,1251285		
Acenaphthene	N.D.	0.1	0.5
Acenaphthylene	N.D.	0.1	0.5
Anthracene	N.D.	0.1	0.5
Benzo(a)anthracene	N.D.	0.1	0.5
Benzo(a)pyrene	N.D.	0.1	0.5
Benzo(b)fluoranthene	N.D.	0.1	0.5
Benzo(g,h,i)perylene	N.D.	0.1	0.5
Benzo(k)fluoranthene	N.D.	0.1	0.5
Chrysene	N.D.	0.1	0.5
Dibenz(a,h)anthracene	N.D.	0.1	0.5
Fluoranthene	N.D.	0.1	0.5
Fluorene	N.D.	0.1	0.5
Indeno(1,2,3-cd)pyrene	N.D.	0.1	0.5
2-Methylnaphthalene	N.D.	0.1	0.5
Naphthalene	N.D.	0.1	0.5
Phenanthrene	N.D.	0.1	0.5
Pyrene	N.D.	0.1	0.5

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Y200431AA	Sample number(s): 1251284								
Benzene	20	22.66			113		80-120		

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 02/13/2020 13:32

Group Number: 2085853

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Ethylbenzene	20	22.02			110		80-120		
Toluene	20	22.21			111		80-120		
Xylene (Total)	60	65.12			109		80-120		
Batch number: Y200431AB	Sample number(s): 1251286								
Benzene	20	21.91			110		80-120		
Ethylbenzene	20	21.61			108		80-120		
Toluene	20	21.73			109		80-120		
Xylene (Total)	60	64.51			108		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 20038WAB026	Sample number(s): 1251283,1251285								
Acenaphthene	50	38.15	50	37.84	76	76	52-114	1	30
Acenaphthylene	50	39.65	50	39.04	79	78	56-127	2	30
Anthracene	50	41.45	50	39.44	83	79	67-116	5	30
Benzo(a)anthracene	50	44.68	50	48	89	96	68-123	7	30
Benzo(a)pyrene	50	42.43	50	45.89	85	92	71-117	8	30
Benzo(b)fluoranthene	50	45.24	50	48.79	90	98	69-121	8	30
Benzo(g,h,i)perylene	50	44.07	50	45.91	88	92	60-119	4	30
Benzo(k)fluoranthene	50	44.71	50	46.77	89	94	69-122	5	30
Chrysene	50	45.44	50	46.35	91	93	65-121	2	30
Dibenz(a,h)anthracene	50	45.96	50	47.28	92	95	63-128	3	30
Fluoranthene	50	46.42	50	43.81	93	88	63-122	6	30
Fluorene	50	40.46	50	40.08	81	80	56-115	1	30
Indeno(1,2,3-cd)pyrene	50	45.36	50	46.4	91	93	59-123	2	30
2-Methylnaphthalene	50	37.12	50	37.13	74	74	51-107	0	30
Naphthalene	50	35.91	50	34.46	72	69	51-102	4	30
Phenanthrene	50	43.46	50	42.68	87	85	65-113	2	30
Pyrene	50	43.14	50	44.77	86	90	65-115	4	30

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- 5ml Water by 8260C/D

Batch number: Y200431AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
1251284	97	101	96	91
Blank	96	100	95	91
LCS	94	99	97	96

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: ARCADIS U.S., Inc.  
Reported: 02/13/2020 13:32

Group Number: 2085853

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- 5ml Water by 8260C/D  
Batch number: Y200431AA

Limits:	80-120	80-120	80-120	80-120
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Analysis Name: VOCs- 5ml Water by 8260C/D  
Batch number: Y200431AB

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
1251286	95	103	96	90
Blank	95	98	97	93
LCS	94	100	96	92
Limits:	80-120	80-120	80-120	80-120

Analysis Name: PAHs 8270D MINI  
Batch number: 20038WAB026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
1251283	60	56	58
1251285	61	61	62
Blank	67	60	65
LCS	79	67	79
LCSD	77	59	80
Limits:	38-113	44-102	34-128

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.



Page 1 of 1

Lab Work Order #

**PINK – Retained by Arcadis**

# Sample Administration Receipt Documentation Log

Doc Log ID: 274136



Group Number(s): 2085853

Client: ARCADIS

## Delivery and Receipt Information

Delivery Method:	<u>Fed Ex</u>	Arrival Date:	<u>01/31/2020</u>
Number of Packages:	<u>1</u>	Number of Projects:	<u>1</u>

## Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	Total Trip Blank Qty:	0
Samples Chilled:	No	Air Quality Samples Present:	No
Paperwork Enclosed:	Yes		
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Julissa Rivera-Santa*

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $>40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.

Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

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