February 23, 2011

Mr. Richard Dana
Engineering Geologist 2
Division of Environmental Remediation
N.Y.S. Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7014

RE: Final Design Report, Former Fulton MGP Site, Fulton, New York, Site No. 738034
FILE: 1118/44581 #2

Dear Mr. Dana:

This letter transmits the Final Design Report for the Former Manufactured Gas Plant Site in Fulton, New York, which incorporates responses presented in the August 20, 2010 letter to the Department as approved by the Department's December 20, 2010 letter to O'Brien & Gere. The Final Design Report is being submitted on behalf of National Grid in accordance with Order on Consent Index No. A4-0473-0000 between National Grid and the New York State Department of Environmental Conservation and the New York State Department of Environmental Conservation approved Remedial Design Work Plan for this site.

Please contact Steven Stucker representing National Grid if you have any comments or questions.

Very truly yours,
O'BRIEN & GERE ENGINEERS, INC.

Stephen W. Anagnost, P.E.
Senior Managing Engineer

cc: Julia Kenney – New York State Department of Health
Steven Stucker, C.P.G. – National Grid
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Al Farrell, P.E. – O'Brien & Gere

REPORT

Final Design
Remedial Action
Former Fulton Manufactured Gas Plant Site
Fulton, New York
Site Number 738034

nationalgrid

Date February 2011

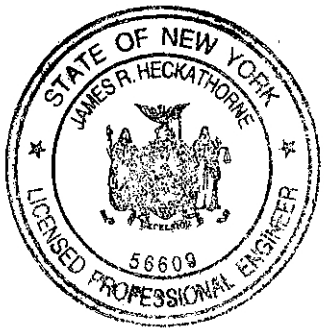
O'BRIEN & GERE

Final Design Report
Remedial Action

Former Fulton Manufactured Gas Plant Site
Fulton, New York
Site Number 738034

Prepared for:

nationalgrid



JAMES R. HECKATHORNE, P.E.
O'BRIEN & GERE ENGINEERS, INC.

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1. INTRODUCTION

1.1. GENERAL

This document is the Final Design Report (FDR) for the former Fulton Manufactured Gas Plant (MGP) Site (Site No. 738034). This FDR has been prepared on behalf of National Grid in accordance with an Order on Consent between National Grid and the New York State Department of Environmental Conservation (NYSDEC) (Order on Consent Index No. A4-0473-0000 effective November 2003).

1.2. SITE HISTORY

The Former MGP Site occupies approximately 1.04 acres in a residential section of the City of Fulton, Oswego County, New York (Figure 1). The Site operated as an MGP site producing manufactured gas from 1903 to 1932. The manufacturing process involved heating coal and petroleum products to produce combustible gas. The gas was cooled, purified and then piped to the end users. The former MGP facility included a gas holder, gas tank, oil tank, oil house, coke shed, tar well, and concentrator house (Figure 2). In general, Area 2 of the Fulton Site contained the gas production facilities and Area 1 contained facilities for storing and distributing the gas. As the gas was cooled and purified prior to distribution, a dark oily liquid known as coal tar condensed and accumulated in various gas plant structures. Tar leaking from the holders and other structures impacted soil and groundwater in the vicinity of the former MGP.

A Record of Decision (ROD) was issued by the NYSDEC in March 2009. As presented in the ROD, the remediation goals for the Site are to prevent, eliminate or reduce to the extent practicable:

- Ingestion/direct contact with contaminated soil;
- Inhalation of contaminants volatilizing from contaminated soil;
- Eliminate through removal, treatment and/or containment source areas in soil;
- Migration of contaminants into the adjacent surface water;
- Eliminate through removal, treatment and/or containment, the impact of soil to groundwater;
- Potential infiltration of chemicals of concern (COCs) into the storm sewer adjacent to Area 2 of the Site.

To meet these goals, the ROD presents the NYSDEC-selected remedy that includes the following elements:

- Implementation of a Remedial Design program.
- Excavation and removal to their full depth of all former MGP related structures and foundations in Areas 1 and 2 that contain MGP related contaminated materials. Impacted soil in the immediate vicinity of the structures will be removed to the extent practicable.
- Excavation of approximately 2,822 cubic yards of soil grossly contaminated with MGP wastes. Materials will be excavated to depths of up to 7 feet below ground surface (bgs) or to the extent practicable due to dewatering limitations. The material to be excavated will include soil containing visible coal tar or separate phase materials. The actual depth of removal will be based on visual observations in the field with the concurrence of the NYSDEC. A visible demarcation barrier will be installed at the bottom of the excavation to mark the extent of soil removal prior to backfilling.
- Excavation areas will be backfilled with clean soil from off-site locations that meet NYSDEC's backfill criteria for intended site use. Excavated soil may be used to backfill the lower portions of the excavation if they meet NYSDEC criteria.
- Installation and maintenance of a soil cover over Areas 1 and 2. The soil cover will consist of a minimum of 2 feet of clean material meeting NYSDEC's backfill criteria. National Grid may propose to use other cover materials such as asphalt or other paving material to meet the next intended use of the property subject to NYSDEC approval. The type and nature of soil cover to be installed will be determined pursuant to 6 NYCRR Part 375.

- Groundwater treatment through the introduction of oxygen (or other nutrients, if necessary) in Areas 1 and 2 to enhance aerobic biodegradation of contaminants in groundwater *in-situ*.
- Rehabilitation of the storm sewer adjacent to and west of Area 2 to reduce groundwater infiltration into the storm sewer and prevent off-site migration of impacted groundwater. Measures to reduce migration of groundwater through soil bedding under the sewer line will be implemented.
- Imposition of institutional controls in the form of an environmental easement.
- Development of a Site Management Plan (SMP).

The remainder of this section outlines the purpose and objectives of this FDR, and presents a Site description.

1.3. PURPOSE AND OBJECTIVES

This FDR performs the following functions:

- Presents a summary of the site investigations performed, including pre-design and design-phase investigations, to support the proposed Remedial Design. Appendix A provides pre-design boring logs and Appendix B provides baseline groundwater quality data. The baseline groundwater data is summarized in Table 1.
- Presents the basis for establishing the volume of material to be excavated.
- Describes the approach to excavation including anticipated methods for excavation support and on-site staging and testing. Requirements for using excavated material as backfill in the lower portions of the excavation are outlined.
- Presents the approach to assessing the need for enhanced *in situ* aerobic biodegradation of residual contaminants in groundwater.
- Describes the soil cover to be installed over Areas 1 and 2 following excavation and backfill.
- Presents the approach to rehabilitating the sewer and reducing migration of groundwater through the bedding.

Also, a Construction Quality Assurance Project Plan (CQAPP) outlining quality assurance procedures and protocols to be implemented during construction, and draft Site Management Plan (SMP) for post-construction activities are provided as appendices to the FDR.

1.4. SITE DESCRIPTION

The Site is bordered on the west by the Oswego River which, at this point, is also a branch of the New York State Barge Canal. South First Street passes through the Site dividing it into two parcels referred to as Area 1 and Area 2 lying to the east and west, respectively, of South First Street (Figure 2). Areas 1 and 2 are currently vacant and both are owned by National Grid.

1.4.1. Geology

Geology at the Site consists, from the surface down, of four primary geologic units:

- Fill
- Sand and silt
- Sand and gravel
- Till

Fill materials consist of sand, gravel and various debris such as brick fragments, asphalt pieces, cinders, glass and other material. In Area 1, fill materials range in thickness from 0.5 ft in the south central end to 8 ft in the northwest portion of Area 1. In Area 2, fill thickness ranges from 1.5 ft on the northwest side to 15 ft on the southwest Site boundary near the Oswego River. In general, fill thickness increases towards the river.

Review of historic maps and aerial photographs indicates that the Oswego Canal was filled sometime between 1911 and 1938. Evidence of the former Oswego Canal (e.g., canal bottom and/or walls) was not observed during drilling performed as part of the Remedial Investigation (O'Brien & Gere, 2009a). Some historic maps indicate that the canal structure ended just north of the Site, such that the segment of the canal adjacent to the Site was not contained within structural walls. It is speculated that the canal channel was filled with several types of material, some similar to native soils. Thus, there is not a distinct subsurface material indicative of canal fill. Dredge spoils were reportedly placed on Yelverton Island (located between the canal and the Oswego River) and these materials may have also been used for fill in the canal.

The unit underlying the fill is a series of discontinuous layers of silt, silt and fine sand, sand, clay, and gravel. The thickness of this unit and the individual layers varies across the Site. However, as the unit approaches the river, the composition becomes primarily silt with obvious clay lenses. This unit is the result of historical depositional environments, such as recent processes of the Oswego River or historic streambeds feeding into the river. As noted above, the deposits near the river may actually be local, native material that was placed in the former Oswego canal.

A glacial till unit, consisting primarily of sand with varying amounts of silt and gravel, overlies bedrock at the Site. The density of the till varies from loose at shallow depths to extremely dense with greater depth. The top of the till undulates and was observed from 5.3 ft on the northeast side of Area 1 to 26.2 ft near the river. Similarly, the top of the dense till is encountered at depths ranging from 12 ft on Area 1 and to 28.5 ft below land surface (bls) near the river. The top of the dense till layer slopes down toward the southwest and the river. The unit was fully penetrated in the center of Area 2 where bedrock was encountered at 36.5 ft below grade. At this location the dense till is 17.5 ft thick.

1.4.2. Hydrogeology

Shallow groundwater at the Site occurs between 1.5 ft below grade on Area 1 to 8 ft below grade to the southwest of Area 2. The resulting groundwater flow direction is to the south and west, ultimately discharging into the Oswego River. The local sand deposits have been designated as a Principal Aquifer by the NYSDEC. The aquifer is used by the City of Fulton for a public water supply but the nearest public supply wells are located approximately one mile upgradient (south) of the Site, outside the area subject to impact from the Site. There are no private water supply wells within that distance of the Site.

2. EXISTING INFORMATION

Evidence of past MGP practices was observed during field investigations performed at the Site between 1998 and 2005. Specifically, MGP-impacted material characterized by observations of odor, sheen, or blebs is noted in boring logs across the Site. Grossly impacted material, characterized by observations of non-aqueous phase liquid (NAPL) and NAPL-saturated soil, or a combination of heavy sheens and staining, was also noted in some borings at the Site. MGP-related constituents of concern (COCs) (benzene, toluene, ethylbenzene and xylene (BTEX), semivolatile organic compounds (SVOCs) summarized as total carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and total PAHs, and the inorganic compound cyanide) were detected in samples from various media at the Site.

The Feasibility Study Report (O'Brien & Gere, 2009b) presents a summary of the nature and extent of MGP-related material observed at the Site as summarized in this section. A detailed description of the nature and extent of contamination is presented in the Remedial Investigation (RI) Report (O'Brien & Gere, 2009a).

The remedy as discussed in the ROD and summarized in Section 1 includes removal of MGP-related structures and foundations determined to contain grossly impacted MGP related materials to their full depth and grossly impacted soil in the immediate vicinity of these structures to the extent practicable, excavation of additional grossly impacted soils to depths of up to 7 ft, excavation of selected surface soils containing constituents of concern above criteria, rehabilitation of the sewer line that crosses the western side of Area 2, and enhancement of the natural attenuation process for groundwater, if appropriate. Grossly impacted soils as identified in the ROD are those soils containing visible coal tar or separate-phase material. A graphic representation of the selected remedy is included as Figure 3.

2.1 PRE-DESIGN INVESTIGATION

A pre-design investigation was completed during October and November 2009 to further assess areas to be addressed by the remedy. The scope of the pre-design investigation was described in the Remedial Design Work Plan (RDWP) dated August 2009 (O'Brien & Gere, 2009c), which was approved by NYSDEC in a letter dated August 18, 2009. The pre-design efforts included:

- A ground-penetrating radar (GPR) survey completed to identify subsurface structures and utility lines present at the Site.
- Eleven borings (SB-49 to SB-59) completed on Areas 1 and 2 to evaluate potential impacts to soil and assess whether concrete slabs were present in potential structures identified by the GPR survey.
- Completion of a property boundary and topographic survey including locations of utilities and structures identified by the GPR and soil borings completed as part of the pre-design investigation.

The RDWP also described that pre-design investigation of the shallow soils would be conducted on the neighboring property to the northwest of Area 2 using shallow borings. This work was completed on September 13, 2010 after the owner granted access to the property, and is described separately in Section 2.4.

The GPR, soil borings, and survey activities completed in Areas 1 and 2 during 2009 were completed in accordance with the procedures outlined in the RDWP. Logs of the completed borings are included in Appendix A. Information obtained during the pre-design investigation was submitted to NYSDEC via email on January 27, 2010. The results of the pre-design investigation were discussed with NYSDEC in a conference call on February 4, 2010.

The following presents a summary of the media of concern at each of the two areas of the Site that have been identified in the ROD to be addressed during the remedial program. This summary is based on the information generated during the Remedial Investigation (O'Brien & Gere, 2009a) and the pre-design investigation.

2.2 AREA 1

2.2.1 Structures

There are several former MGP structures located on Area 1, including two circular holders and two sets of tank cradles that formerly supported horizontal above-ground storage tanks (ASTs). As shown on Figure 4, the GPR survey identified two angular anomalies that had not been identified previously. The angular shape and GPR signatures of these anomalies suggest that a solid surface such as a foundation slab might be present at a shallow depth.

To investigate whether the possible slab structures identified by the GPR survey are present and, if so, whether the structures have grossly impacted soils associated with them, borings SB-51, SB-52, SB-56, and SB-59 (Figure 4) were completed within the two angular slabs thought to be present on Area 1. No solid slab structure was encountered in any of these borings, so the GPR signature in these areas may represent more dense soil underlying the former AST cradles located in this area. Also, no visually impacted soil was identified in these borings.

2.2.2 Surface Soil

As described in the ROD, two surface soil samples located in Area 1, SS-01 and SS-02, were identified during the RI as containing total PAH and/or total cPAH (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)-fluoranthene, chrysene, dibenzo[a,h]anthracene, and ideno(1,2,3-cd)pyrene) at concentrations that were considered elevated in comparison to background concentrations. Soil in the vicinity of these samples will be addressed as part of the remedy (Figure 4).

In addition to PAHs, cyanide was detected in the 0 to 2-inch and 0 to 24-inch intervals of surface soil sample SS-02 at concentrations ranging from 11 mg/kg to 810 mg/kg. Further sampling in the vicinity of SS-02 indicated that the extent of cyanide is limited to the immediate vicinity of SS-02; however, concentrations of cyanide at SS-09 were found to be 60 mg/kg. These concentrations are above the Restricted Residential Soil Cleanup Objective of 27 mg/kg. As outlined in the ROD, the concentrations of cyanide at SS-02 and SS-09 from the surface to 24 inches bgs will be addressed during the remedy.

2.2.3 Subsurface soil

Both analytical and visual evidence of grossly impacted material was observed in subsurface soil at two locations within Area 1. One area is located around SB-40 where stained soil was observed in the upper 4 ft. The second area is located in the vicinity of the northeastern concrete gas holder pad as shown on Figure 4. Subsurface soil from the adjacent properties bordering Area 1 did not exhibit MGP-impacted material. However, because of the proximity of this area to the property boundary, additional borings were completed as part of the pre-design investigation.

Two borings were originally proposed as part of the pre-design investigation to evaluate the extent of grossly impacted soil to the northwest of the large holder pad on Area 1. Boring SB-50 encountered a cobble with a thin (1/4") lens of NAPL at 8 ft below grade and some visible, pin-sized blebs of NAPL with coal tar odors between 8 and 9.7 ft. This boring is located approximately 6.5 ft from the property boundary and 20 ft from SB-15, where sheens, stained soils and odors were noted from 6 ft to approximately 8 ft below grade. The second boring, SB-49, did not encounter any impacted soil and the material beginning at 2.2 ft was dense native silt with clay.

An additional boring, SB-57, was completed on Area 1 during the pre-design investigation to further evaluate the potential southwestern extent of grossly impacted soil identified for removal. This boring is located approximately 12 ft south of SB-50 and did not encounter impacted soil. The area identified for excavation as shown on Figure 4 was developed based on information generated during the RI and augmented by the information obtained from the pre-design borings.

2.3AREA 2

2.3.1 Structures

The main production area of the former MGP was located on Area 2. The foundations associated with these former structures are outlined on Figure 4. In addition, a building that most recently served as a church was

located on the southeast side of Area 2. This structure was demolished in 1992. However, the slab for this structure is still present and visible at the surface at the location shown in Figure 2.

The GPR survey identified portions of the foundation walls of the known former structures. However, the GPR signatures of the materials used for construction of the foundations were similar to that of the surrounding fill material such that the presence or absence of the individual structures could not be clearly confirmed in many instances. The survey did identify a deeper (approximately 10 ft) filled depression in the vicinity of the former tar well in the center of Area 2. In addition, the GPR survey identified one angular structure that was not previously known to have been present based on review of historical Sanborn maps. As shown on Figure 4, this structure is located on the west central portion of Area 2. As with the Area 1 structures, the GPR signature for this structure, as well as a small square area of a previously identified structure on the northwest corner of the area, suggested that a solid surface such as a foundation slab was present at a shallow depth.

Borings SB-53, SB-54, SB-55, and SB-58 were added to investigate the structures identified by the GPR survey as shown on Figure 4. The findings are as follows:

- SB-53 was completed on the western side of Area 2 near the exposed foundation wall where the GPR suggested a slab was present. This boring encountered crushed concrete and brick fill material with no visible impacts associated with MGP waste. A slab was not encountered.
- SB-54, completed in the area of the slab structure in the center of Area 2, encountered a 6-inch layer of concrete just below the asphalt. Concrete was also observed in boring SB-16 completed during the RI on the western end of the GPR anomaly, suggesting that this is a foundation with a slab. No visually impacted soil was encountered in SB-54 or SB-16.
- Borings SB-55 and SB-58 were completed in the vicinity of the suspected tar well based on the identification of a deeper, filled depression in the area during the GPR survey. NAPL-containing soil and associated sheens were encountered, however, no discrete pocket of NAPL or tar was observed.

2.3.2. Surface Soil

SS-4 is located adjacent to the pavement in Area 2 on the property owned by National Grid (Figure 4). This surface soil was found to contain cPAHs in excess of the background concentrations in the area and will be addressed during the remedy.

2.3.3 Subsurface soil

In Area 2, analytical and visual evidence of grossly MGP-impacted material was reported in subsurface soil in several areas. The observations generally begin 4 ft below grade and, in the southern corner of the area, extend to depths of up to at least 28 ft below grade. The widest zone of observed grossly MGP-impacted material was between 4 ft and 12 ft below grade. The MGP-impacted material extends off the National Grid property and onto the Canal Corporation property to the south, but was not observed adjacent to the Oswego River.

Impacted material was reported in subsurface soil in two additional off-site areas to the west of Area 2. One area, located west of the former Oswego Canal (vicinity of SB-43 and SB-44), was considered to be from cinders and other fill material known to be present and therefore, did not require remedial action. The second location was in the vicinity of the sewer line that runs along the southwestern side of Area 2 (vicinity of SB-14 and PZ-06). Although the materials observed were potentially MGP-related, the impacted materials may be associated with dredge spoils or canal sediments placed on, or relocated to, this area rather than migration of NAPL from Area 2, and therefore, were not identified as requiring remediation by the ROD.

2.4 NEIGHBORING PROPERTY NORTHWEST OF AREA 2

Pre-design field investigations were conducted on the neighboring property northwest of Area 2 in accordance with the RDWP (O'Brien & Gere, 2009c) on September 13, 2010, as documented in the September 27, 2010 letter to the NYSDEC. The fieldwork included six borings (SB-60 to SB-65) completed to a depth of 20 ft below grade at locations established in the field (Figure 5).

The subsurface geology encountered was consistent with that previously observed on the Fulton Former MGP Site and consists of fill, sand and silt, and sand and gravel. On average the bottom of the fill material was found between 1.5 and 4 feet below ground surface (bgs). No evidence of MGP impacts in the form of odors, sheen, staining, or NAPL was encountered in any of the borings completed on the adjacent property. Therefore, no remedial activities are necessary on the neighboring property.

2.5 GROUNDWATER

Concentrations of BTEX compounds, PAHs, and cyanide above the groundwater screening criteria (NYSDEC TOGS) are limited to the shallow groundwater beneath Area 2. Constituent concentrations in off-site wells, including those between Area 2 and the Oswego River, are below the screening criteria. Groundwater with constituent concentrations above the criteria is likely captured via seepage to the storm sewer located directly southwest of Area 2. Video inspection directly upstream and downstream of the Site did not indicate any visible Site-related impacts. Samples from storm sewer manholes located 400 ft upstream and 600 ft downstream of the Site indicated the presence of low concentrations of benzene, ethylbenzene, and total xylenes in the downstream storm water sample. It is unclear whether this is the result of contribution from the property or influent from storm water discharges from nearby roadways or other potential sources.

Groundwater downgradient of Area 1 (MW-02) is not impacted. Although a slight sheen was noted on the saturated soil samples in the area of SB-15 and the recent boring, SB-50 (Figure 4), the lack of constituents of concern in MW-02 suggests that soil impacts are localized and not mobile.

In accordance with the RDWP (O'Brien & Gere, 2009c), groundwater samples were collected from monitoring wells MW-2, and MW-3, MW-4, MW-5, MW-7, MW-11 and MW-12S which have been selected to represent conditions within and downgradient of Area 2, as part of the pre-design investigation to assess the potential for use of Oxygen Release Compound (ORC) or other additives, and to establish a baseline for comparing future groundwater data following the remedial action. The groundwater samples to establish the baseline were collected during May 2010 using low-flow sampling methods and analyzed for VOCs, SVOCs, and natural attenuation parameters including methane, iron and manganese (total and dissolved), nitrate, nitrite, sulfate, 5-day biological oxygen demand (BOD5), chemical oxygen demand (COD), dissolved organic carbon, and alkalinity (as $CaCO_3$). Sampling protocols and analytical methods were presented in the Sampling and Analysis Plan (SAP) included as Appendix A to the RDWP (O'Brien & Gere, 2009c). The results of the analyses are summarized in Table 1 and the laboratory reports provided as Appendix B.

3. REMEDIAL ACTIONS

This section describes the elements of the RD developed to meet the NYSDEC selected remedy described in the ROD. Design drawings are provided in Appendix C that graphically present the remedial action areas and components. These drawings identify the remedial construction work based on Alternative 2 of the ROD and the findings of the RI, and pre-design and design-phase investigations. Technical specifications to implement the RD that describe the conditions under which the work is to be constructed, the materials and equipment to be incorporated into the work, and the standards of acceptance for components of construction are included as Appendix D.

The ROD indicated that 2,822 cubic yards of grossly impacted material was anticipated to be removed during implementation of the remedy. Based on the defined areas presented on Design Drawings G-5 and G-6, it is estimated that there are approximately 7,110 cubic yards of grossly impacted soil and foundation material. This volume of material is generally consistent with the information presented in the ROD. The sources of the quantities are listed in the following table:

TABLE 2: ESTIMATED EXCAVATION VOLUMES

	Material Removed	Estimated Volume (cy)
AREA 1	Tank Slab (2 ft thick)	150
	Grossly Impacted Soil Areas (to limits as discussed)	550
	2 ft Soil Removal (required for soil cover)	1,350
AREA 2	Structures and Surrounding Grossly Impacted Soil (to 7 ft)	4,500
	2 ft Soil Removal (required for soil cover)	560
	TOTAL	**7,110**

The following sections describe the basis for execution of the physical elements of the remedy.

3.1 EXCAVATION AREAS

3.1.1 Area 1

Only one MGP-related structure is designated for removal on Area 1. This structure is the concrete pad associated with the former above-grade holder. Based on information obtained during the RI, grossly impacted soil is present under the northwest side of this structure. Based on the GPR survey completed as part of the pre-design investigation, structures relating to the smaller gas holder and the horizontal ASTs are not present. The holder structure is identified on Design Drawing G-6.

In addition to the structure, several areas of localized grossly impacted subsurface soil requiring removal in accordance with the ROD are also shown on the drawings. One of these areas is identified on the northwest side of the holder on Area 1. The pre-design investigation indicated that a lens of impacted soil was present at a depth of approximately 8 ft in SB-50. Although this is a thin lens and at a depth greater than the 7 ft identified in the ROD, it likely represents the endpoint of a lens that may originate in the main area of grossly impacted soil identified near the former holder pad. Therefore, the extent of excavation in this area has been expanded to include this boring location. A second area to be excavated is located southwest of the holder near the area where the former horizontal ASTs were located. Impacted soils are present to a depth of approximately 4 ft in this area.

Two smaller areas containing COCs above criteria in surface soil were also identified for removal in the ROD. As shown on Design Drawing G-6, one area is located northeast of the former holder pad. This soil contained cPAHs at concentrations that would require removal to a depth of 1 ft. However, since the cPAHs are at levels consistent with or lower than those to remain in subsurface soil, this area will be managed with the removal of the surficial 2 ft of soil that is needed prior to placement of the soil cover as discussed in Sections 3.4 and 3.5. This soil may be used as backfill into the deeper portions of the excavations as space allows.

The second area is located in the southwest corner of Area 1 and contains cyanide in excess of the criteria to a depth of 2 ft. Specifically, the cyanide concentration in the 0 to 2 ft depth at the SS-02 location is 810 mg/kg and the concentration of cyanide in the 0 to 2 ft depth at SS-02 is 60 mg/kg. These concentrations are higher than the Restricted Residential Soil Cleanup Objective of 27 mg/kg. Horizontal limits for the area containing cyanide that will be removed have been established by drawing a boundary approximately 5 ft from the two surface soil samples found to contain elevated concentrations. Soil from this area will be excavated to a depth of 2 ft and the excavated material will be disposed off-site.

3.1.2 Area 2

As shown on Design Drawing G-5 (Appendix C), there are several structures in Area 2 with some extending to or just beyond the property line onto land owned by the City of Fulton. Most of the structures were previously identified and presented within the area of excavation in the ROD. However, based on the pre-design investigation, the excavation area in Area 2 has been modified from that presented in the ROD as follows:

- One additional foundation, located on the western corner of the proposed excavation area, was discovered by the GPR survey.
- The suspected location of the former tar well area in the center of the Site was added to the excavation area. Although an intact structure was not observed, this area was included based on the observations of grossly impacted soil.
- As shown on Drawing G-5, the foundation located on the northwest end of Area 2 near the adjoining residence is not included in the area to be excavated as no impacted soil was found to be present and the westernmost wall of the foundation is within 4 ft of the residential structure. Since the soil in this area does not appear to be impacted, removal is not warranted.
- A tall power pole owned by National Grid is located on the northwest corner of Area 2. Due to stability considerations, an area 7 ft by 7 ft around the pole has been designated where excavation will not occur. Logs for borings SB-06 and PZ-01, located closest to the pole, indicate that impacted soil is not present at these locations, suggesting that grossly impacted soil is likely not present in the area surrounding the pole.
- It is unknown whether all of the structures within Area 2 contain grossly impacted MGP materials as defined in the ROD. Therefore, if grossly impacted materials are not identified during construction, the structures will be left in place. Decisions regarding the need for cleanout/removal of the structures will be made in the field during construction activities with concurrence by NYSDEC.

In addition to the structures, one surface soil sample collected southwest of the pavement in Area 2 contained cPAHs above NYSDEC criteria as shown on Design Drawing G-5 (Appendix C). Similar to Area 1, soil in this area will be managed by removing soil to facilitate placement of the soil cover as discussed in Sections 3.4 and 3.5.

3.2. EXCAVATION LIMITS

The surface soil from Area 1 and Area 2 will be excavated to a depth of 2 ft over the entire Site to accommodate placement of the soil cover described in Section 3.5. Horizontal limits for excavations to be made deeper than 2 ft bgs for those areas containing grossly impacted soil as defined in the ROD are shown on Design Drawings G-5 and G-6 (Appendix C). These limits were estimated based on borings drilled during site investigations (including the pre-design investigation). The actual horizontal limits will be based on field observations of grossly impacted soil as defined in the ROD made during excavation and with the concurrence of the NYSDEC. As previously discussed, the limits of excavation of the shallow soils containing elevated concentrations of cyanide will be based on verification sampling.

As outlined in the ROD, the deeper excavations will extend to 7 ft or to the extent practicable depending on groundwater encountered. No dewatering of the excavations will occur. The actual depth of removal will be based on field conditions, with the concurrence of the NYSDEC. The limits of the excavation will subsequently be surveyed to prepare Record Drawings.

3.3 EXCAVATION CONSIDERATIONS

Due to the anticipated depth of the excavations and the subsurface conditions encountered, it is not anticipated that excavation support systems will be necessary. Excavations utilizing conventional sloping and benching techniques in accordance with local, state and federal regulations should accommodate the anticipated excavation depths. In addition, foundations of the adjacent residences on the northern and southern sides of Area 2 are in close proximity to the excavation. The presence of overhead utility lines would also create difficulties for cranes or other sheeting/shoring equipment if utilized at the Site.

It may be necessary, however, for the Contractor to utilize trench boxes or similar methods at the perimeter of the excavation areas near the property boundaries. This would allow for the excavation to extend to the property boundaries while providing support for adjacent structures and/or utilities.

Because of the proximity of the excavation to neighboring residential properties, the contractor will be required to prepare a Vapor/Odor Management Plan that will detail methods to be implemented to control vapors and odors emanating from excavations and stockpiles, as identified in the Technical Specification Section 02242 – Tar Excavation and Off-Site Disposal (Appendix D). The primary measure to minimize the generation of vapors and odors will be to minimize, to the extent practical, the exposed surface of waste material and contaminated soil. Secondary measures will include the use of products such as RUSMAR Foaming Agents, as approved by National Grid and NYSDEC, to mask objectionable odors.

3.4. MANAGEMENT OF EXCAVATED MATERIALS

As outlined in the ROD, excavated MGP structures and the grossly impacted soil adjacent to them will be removed during the remedial program. The foundation materials and asphalt will be segregated and broken up as necessary to allow them to be transported to and received at a permitted construction debris (C&D) landfill. Prior to shipping the asphalt or concrete off-site, grossly contaminated soil adhering to the surface will be removed, as necessary, by scraping, brushing, or other means approved by the Engineer. Associated grossly impacted soil will be transported off-site for treatment (if necessary) and disposed of in accordance with applicable regulations.

As appropriate, separate stockpiles of soil will be established during the construction; those with soil containing visible coal tar or separate phase materials, and others with soil not exhibiting visible signs of NAPL. To the extent that space allows, surface soil removed for grading purposes and soil that does not contain visible coal tar or separate phase material may be reused on site as excavation backfill beneath the cover with concurrence of NYSDEC in accordance with the Waste Management Plan (WMP) prepared for the Site (Appendix E).

3.5. BACKFILL AND COVER

In general, the Site will be restored to the grades existing prior to the initiation of construction. As discussed in Section 3.4, soil excavated from the Site that is not visually contaminated will be used to fill the excavations at depths in excess of 2 ft below grade. If soil is brought in from an off-site source for use as backfill, it will meet NYSDEC criteria for restricted residential use as identified in Appendix 5 of the NYSDEC document Guidance for Site Investigation and Remediation (DER-10). Off-site fill material will be characterized for the parameters and frequency based on volume as identified in Table 5.4 of the DER-10. A visible demarcation layer will be placed on top of soils left in place.

As outlined in the ROD, a soil cover consisting of a minimum of 2 feet of clean material meeting the DER-10 criteria for restricted residential use will be placed over Areas 1 and 2. The final grade of the cover surface will approximate the current ground surface to maintain existing drainage patterns, as shown on Design Drawings G-9 and G-10. As described in Section 3.2, the current surface soil from Area 1 and Area 2 will be excavated to a depth of 2 ft over the entire Site to accommodate placement of the soil cover. The 2-ft thick cover will consist of 18 inches of soil satisfying the requirements for embankment material as specified in Technical Specification Section 02223 – Embankment (Appendix D), placed in lifts not greater than 6 inches and compacted to 90% maximum density, and 6 inches of topsoil satisfying the requirements specified in Technical Specification Section 02981 – Topsoil and Seeding (Appendix D). The final surface will be seeded with a mixture of quick growing annual and perennial grasses, of variety typical for the region, and fertilized.

3.6. GROUNDWATER TREATMENT

Groundwater within Area 2 was found to contain constituents of concern above groundwater criteria, but constituents of concern have not been observed in Area 1 nor off-site above the groundwater criteria. Although the groundwater samples collected from Area 1 did not contain constituents of concern at concentrations above groundwater criteria, sheens were observed in areas of Area 1 where impacted soil is present, suggesting that localized groundwater impacts may be present but plume development and migration is not occurring.

The ROD identifies that groundwater treatment through the introduction of oxygen (or other nutrients, if necessary) in Areas 1 and 2 will be completed as part of the remedy to enhance *in situ* aerobic biodegradation of contaminants in groundwater. The addition of oxygen will be completed by placing a slow-release oxygen compound, such as Regenesis's bioremediation product Oxygen Release Compound-Advance formulation (ORC Advanced™) or similar product, into the base of the excavations as part of the backfilling operations. Information about ORC Advanced™ is provided in Appendix F.

Groundwater sampling was conducted during May 2010 to evaluate groundwater characteristics as they relate to the potential for natural attenuation to be occurring. Based on the data summarized in Table 1 and included in Appendix B, it has been estimated by Regenesis that application of approximately 3,500 lbs of ORC Advanced™ across 1 to 3 feet of backfill at the bottom of the excavation would be appropriate to treat an area of approximately 12,500 SF. As an alternative, Regenesis identifies that application of a lesser amount of ORC (2,500 lbs) could be applied with RegenOx Part A (1,500 lbs) across the same interval to treat the target area.

The groundwater data was also reviewed for availability of nutrients, and the addition of nutrients should not be necessary for natural attenuation to occur.

3.7. STORM SEWER REHABILITATION

Shallow groundwater flows to the south and west across the Site. To the southwest of Area 2 the flow contours converge in the vicinity of the storm sewer line that crosses the area. This indicates that the sewer and/or its associated bedding intercepts shallow groundwater flowing across the Site. The location of the storm sewer is shown on Design Drawing G-8 - Sewer Rehabilitation Plan (Appendix C).

The storm sewer is approximately 24 inches in diameter, located between 18 ft and 25 ft below ground surface, and discharges to the Oswego River, approximately 0.4 miles north of the Site. A closed-circuit television (CCTV) inspection of the sewer was conducted during October 2005 but was only able to examine 500 ft of approximately 950 ft of sewer because of debris obstructing the camera travel beyond 418 ft from the downstream manhole and 90 ft from the upstream manhole. The partially completed inspection found the sewer pipe to be generally intact but revealed groundwater leaking into the sewer at the joints and some cracks. Analysis of water collected from the storm sewer also detected compounds that could be attributed to the former MGP site, although the same compounds might also be from roadway surface drainage.

To address the infiltration of groundwater, the existing 24-inch diameter storm sewer will be cleaned and relined in place between manholes labeled "A" and "B" on Design Drawing G-8, in accordance with the Technical Specification Section 02623 – Cured in Place Pipe (Appendix D). Since the sewer pipe is presently believed to be structurally sound, the relining will only serve to prevent infiltration and not to structurally support the pipe.

During the construction phase, the following sewer rehabilitation actions will be performed:

- The storm sewer will be cleared of debris, mineral deposits, and roots between manholes labeled "A" and "B" on Design Drawing G-8 (Appendix C).
- Once cleared of debris, the storm sewer will be examined by CCTV to document the existing condition of the storm sewer and verify its location and depth.
- A bypass will be installed, or the upstream contributing sewer will be temporarily plugged, to isolate the section of sewer pipe between manholes "A" and "B" during the installation and curing of the pipe-liner.
- The pipe-liner will be installed and cured. After curing, the sewer will be re-examined by CCTV to document the condition of the sewer following rehabilitation to verify that the installation of pipe-liner was successful.

- Once the work is accepted by the Engineer as being complete, the bypass or temporary plugs used during the rehabilitation will be removed and normal sewer flow allowed.

Design Drawing G-8 and Technical Specification Section 02623 – Cured in Place Pipe were provided for review to Mr. Ronald Edick of the City of Fulton Department of Public Works on October 26, 2010. Mr. Edick sent an email to O'Brien & Gere on November 2, 2010 indicating that the City of Fulton had no comments to provide, and that the plan and specification for the sewer relining were acceptable.

The potential for groundwater flow through the storm sewer bedding material will also be addressed at the downstream property line by jet grouting around the sewer. The purpose of this effort will be to reduce the transmissivity of bedding material to reduce the potential for preferential flow of groundwater along the utility. Multiple overlapping jet grouted columns will be installed in the storm sewer bedding. Jet grouting in this manner will minimize the potential for flow along the bedding of the sewer.

4. REMEDIAL DESIGN SUPPORT PLANS

4.1. STORMWATER POLLUTION PREVENTION PLAN

A Stormwater Pollution Prevention Plan (SWPPP) prepared in substantive compliance with Phase II of the NYSDEC State Pollutant Discharge Elimination System (SPDES), General Permit for Stormwater Discharges Associated with Construction Activity (Permit No. GP-0-10-001) is included as Appendix G. The SWPPP includes:

1. An erosion and sediment control plan and details prepared in accordance with the "New York Standards and Specifications for Erosion and Sediment Control" published by the NYSDEC (NYSDEC 2005).

2. Design of permanent stormwater management facilities in accordance with Chapter 9 "Redevelopment Projects" of the NYSDEC's "New York State Stormwater Management Design Manual", since the project involves site remediation and stabilization without a change in perviousness.

Neither a Notice of Intent nor MS4 SWPPP Acceptance Form is included because they are not required for projects under an Order on Consent.

4.2. CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN

A Construction Quality Assurance Project Plan (CQAPP) is included as Appendix H outlining quality assurance procedures and protocols to be implemented during construction, based on the detailed procedures presented in the specifications. The CQAPP presents the following:

- Responsibility and Authority: The responsibility and authority of organizations and key personnel involved in regulating, design, and construction of the remedial systems is presented. Appropriate lines of communication between involved parties are delineated.
- Construction Quality Assurance (CQA) Personnel Qualifications: The qualifications of the CQA officer and supporting CQA personnel are presented in the CQAPP in terms of training and experience. The CQA officer will be required to operate independently of the contractor.
- Sampling and Testing Methods: Sampling and testing methods, frequencies, acceptance and rejection criteria, and corrective measures are outlined.
- On-Site Observations: The observations and tests that will be used to document that the construction meets the design criteria, plans, and specifications are detailed. This information will be utilized to prepare the certification of the work.
- Record Drawings: The requirements to maintain records for the preparation of record drawings are presented.

4.3. SITE MANAGEMENT PLAN

A draft Site Management Plan is provided as Appendix I, recognizing that this Plan will be finalized following construction. The Site Management Plan includes:

- Requirements for management of the final cover system to restrict excavation,
- Procedures for soil characterization, handling, health and safety, and disposal in the event that excavation is necessary.
- A discussion of groundwater monitoring requirements. Samples will be periodically collected from monitoring wells MW-2 (background), MW-3, MW-4, MW-5, MW-7, MW-11 and MW-12S which have been selected to represent conditions within and downgradient of Area 2 to evaluate the effectiveness of natural attenuation following removal of materials from Area 2.
- Property use restrictions.
- An Operation and Maintenance Plan describing procedures to inspect and maintain the elements of the Remedial Action.

4.4. INSTITUTIONAL CONTROLS

The ROD calls for the imposition of an environmental easement requiring:

- Limiting the use and development of the property to restricted residential use (which also permits industrial use).
- Restricting the use of groundwater at the Site.
- Compliance with an approved Site Management Plan.
- Periodic certification by National Grid of the institutional and engineering controls.

National Grid will prepare the environmental easement and record it on the property deed filed with the local government offices as required.

REFERENCES

O'Brien & Gere Engineers, Inc., 1996, Preliminary Site Assessment Interim Remedial Measures (PSA/IRM) Study Report, May 1996.

O'Brien & Gere Engineers, Inc., 2007, Soil Vapor Sampling Report (letter), October 19, 2007.

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National Grid, 1996. Generic Quality Assurance Project Plan (GQAPP) for Site Investigations, June 1996.

National Grid, 2008. Statement of Work, National Grid, April 16, 2008.

NMPC, 2002. Niagara Mohawk Generic Field Sampling Plan for Site Investigations Manufactured Gas Plant, Niagara Mohawk Power Corporation, 2002.

NYSDEC, 1990. Guidance on Expediting Remedial Design and Remedial Action, New York State Department of Environmental Conservation, August 1990.

NYSDEC, 2009. Record of Decision, New York State Department of Environmental Conservation, March 2009.

USEPA, 1986. Superfund Remedial Design and Remedial Action Guidance, United States Environmental Protection Agency, June 1986.

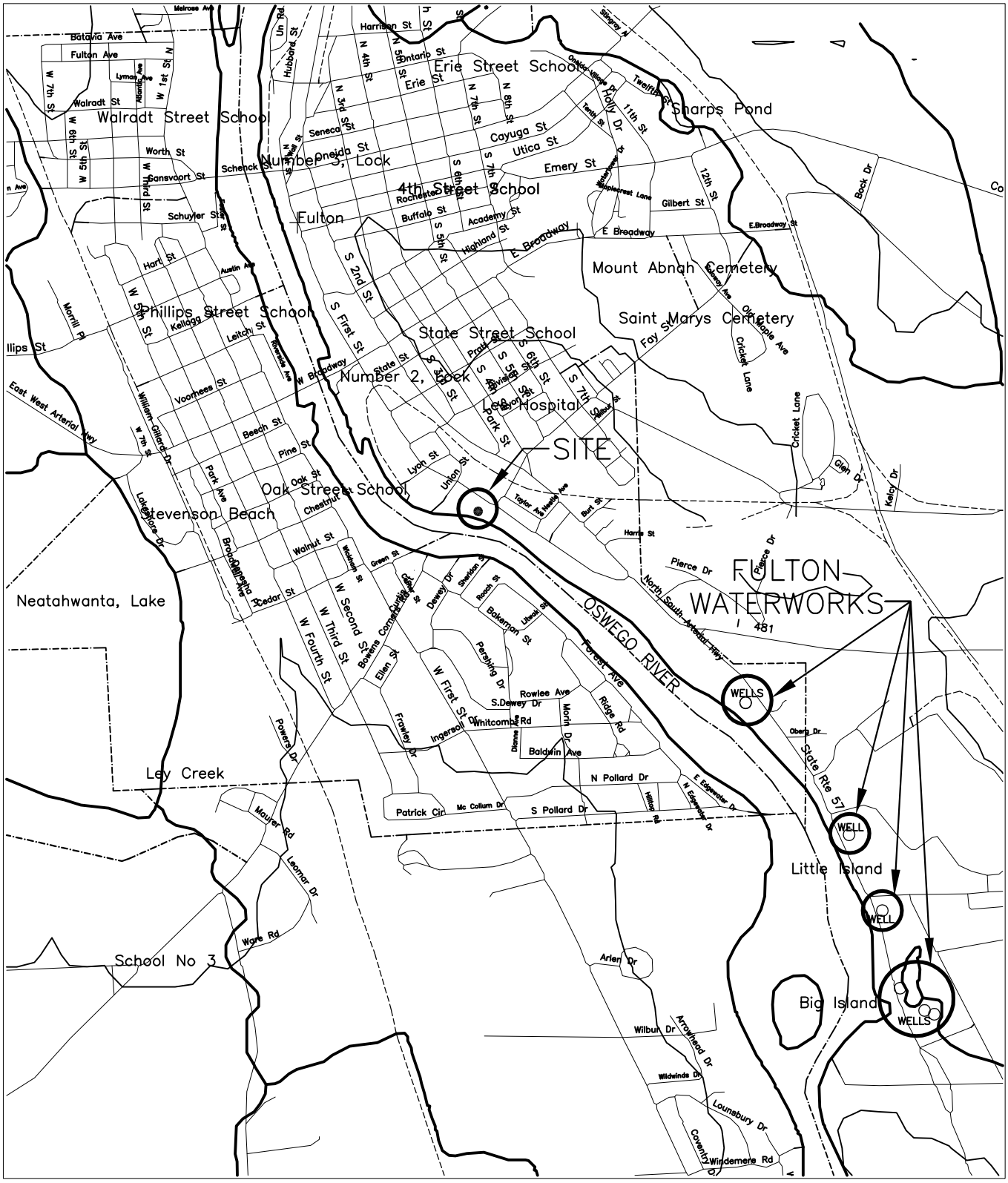
USEPA, 1990. Guidance on Oversight of Remedial Design and Remedial Actions performed by Potentially Responsible Parties, United States Environmental Protection Agency, April 1990.

Table 1 - Baseline MNA Analysis Results
South First St Fulton Site
National Grid

PARAMETER	MW-4	MW-5	MW-7	MW-3	MW-2	MW-12S	MW-11	MW-12S-Dup
VOCs (ug/L)								
M&P Xylene	283	368	<1	<1	<1	<1	<1	<1
o-Xylene	243	193	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	752	8.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methylcyclohexane	<10	12.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	79.4	11.4	<0.5	<0.5	<0.5	0.37	<0.5	0.41
Ethylbenzene	315	303	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes Total	526	561	<1	<1	<1	<1	<1	<1
Isopropylbenzene	8.8	97	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SVOCs (ug/L)								
2,4 Dimethylphenol	260	<10	<11	<10	<10	<11	<10	<10
2-methylnaphthalene	4.7	43	<11	<10	<10	<11	<10	<10
2-methylphenol	15	<10	<11	<10	<10	<11	<10	<10
Acenaphthene	45	40	<11	<10	<10	<11	<10	<10
Acenaphthylene	9	6.5	<11	<10	<10	<11	<10	<10
Anthracene	0.83	3.5	<11	<10	<10	<11	<10	<10
bis(2-ethylhexyl)phthalate	0.69	0.78	<11	0.57	0.47	0.46	<10	0.41
carbazole	19	4.7	<11	<10	<10	<11	<10	<10
Dibenzofuran	16	21	<11	<10	<10	<11	<10	<10
Fluoranthene	0.5	2	<11	<10	<10	<11	<10	<10
Fluorene	12	27	<11	<10	<10	<11	<10	<10
Naphthalene	850	960	<11	<10	<10	<11	<10	<10
Phenanthrene	3.5	31	<11	<10	<10	<11	<10	<10
Pyrene	0.53	1.6	<11	<10	<10	<11	<10	<10
OTHER (mg/L)								
Methane	1.9	0.63	1.6	<0.002	0.0015	<0.002	0.016	<0.002
Total Iron	73	26	14	0.66	4	3.7	6.2	4.4
Diss Iron	68	26	13	0.19	0.16	0.29	7.3	0.29
Total manganese	0.6	2.7	2.9	0.69	0.15	0.21	0.25	0.22
Diss Manganese	0.57	2.6	2.7	0.0038	0.02	0.052	0.26	0.055
Nitrate	<0.1	<0.1	<0.1	0.84	<0.1	0.23	<0.1	0.15
Nitirite	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sulfate (SO4)	4.4	1.2	<1	32	25	25	9.9	26
BOD5	<200	<80	<200	<200	<200	<200	<200	<200
COD	61	55	21	14	16	38	10	41
Diss Organic Carbon	11	18	6.4	6	4.4	5.7	5.3	4
Alkalinity (CaCO3)	380	230	250	260	270	300	180	310
FIELD MEASUREMENTS								
pH	6.33	6.32	6.76	6.72	6.77	6.71	6.46	na
ORP (mV)	-74.8	-74.8	-64.6	162.6	81.9	154.9	-51	na
DO (mg/L)	0	0	0.5	3	1	4	1	na
Diss Ferrous Iron (mg/L)	4	2	2.7	0	0	0	4	na
Diss manganese (mg/L)	0	0	2.4	0	0	0	0	na

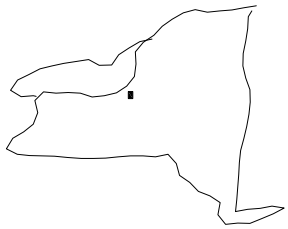
Notes: Samples collected May 3 to 5, 2010.

FIGURE 1



NATIONAL GRID
SOUTH FIRST STREET SITE
FULTON, NEW YORK

SITE LOCATION MAP



QUADRANGLE LOCATION

2000 0 2000

SCALE IN FEET

O'BRIEN & GERE ENGINEERS, INC.

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FIGURE 2

LEGEND

- SEWERLINE
- CONCRETE
- PROPERTY LINES
- CONTOUR
- APPROXIMATE CANAL
- OVERHEAD POWER LINE
- FORMER STRUCTURES
- CONCRETE PAD

NATIONAL GRID
SOUTH FIRST STREET
FULTON, NEW YORK

SITE PLAN

0 25 50 100
Feet

NOVEMBER 2010
1118.44581

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FIGURE 3

LEGEND

- EXISTING BUILDINGS
- SURFACE RESTORATION
- HISTORICAL BUILDINGS
- APPROXIMATE CANAL
- APPROXIMATE SEWERLINE LENGTH TO BE REHABILITATED
- APPROXIMATE SEWERLINE LENGTH TO BE REPLACED

MGP IMPACTED MATERIAL TO BE REMOVED

- 0-4 FT
- 0-7 FT
- SURFACE SOIL (TOTAL CPAH & PAH)
- 0-2 FT CYANIDE
- CONCRETE PAD
- MGP RELATED STRUCTURE (AND ADJACENT SOIL) TO BE REMOVED
- PAVED AREA
- CONTOUR
- PROPERTY LINE

Notes:
Alternative 2 consists of :
- Environmental easement and site management plan.
- Ground water monitoring.
- Excavation of MGP-material to the ground water table surface, to the extent practicable, at Area 1.
- Removal of MGP structures and foundations at Area 1 and Area 2 determined to contain MGP source materials to their full depth.
- Excavation and removal of soil containing visible coal tar or separate phase materials surrounding the structures and foundations in Areas 1 and 2 to depths up to 7 feet bgs, or to the extent practicable due to dewatering limitations.
- Rehabilitation of sewerline west of Area 2.
- Surface restoration at Area 2.
- Enhanced biological treatment considered at Area 1 and in vicinity of sewerline at Area 2.

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Soil vapor sample locations are approximate.

NATIONAL GRID
SOUTH FIRST STREET
FULTON, NEW YORK

ALTERNATIVE 2
LIMITED EXCAVATION COVER AND SEWER REHABILITATION

0 25 50 100
Feet

NOVEMBER 2010
1118.44581

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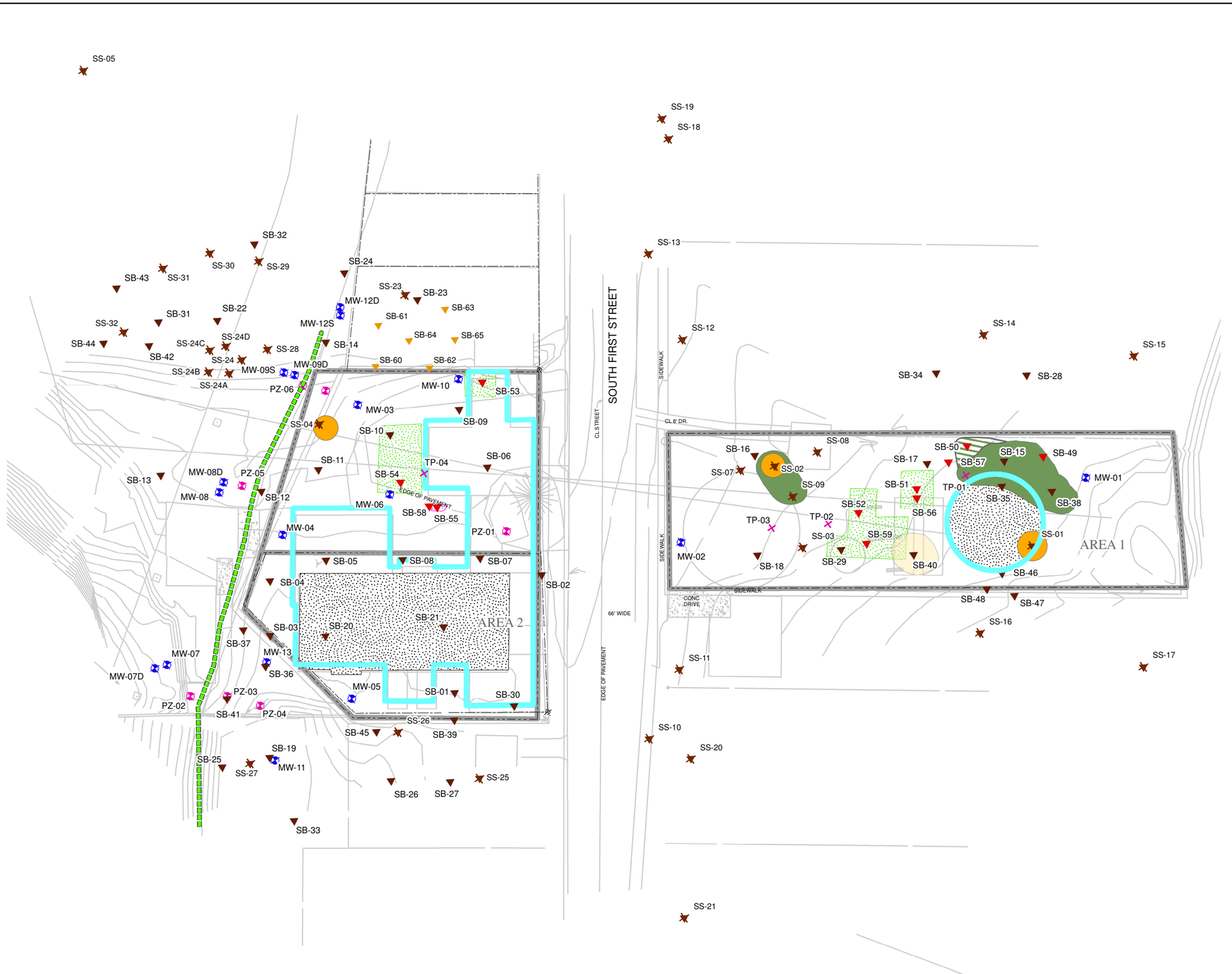
FIGURE 4



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LEGEND

SAMPLE LOCATIONS
- MONITORING WELL
- PIEZOMETER
- SOIL BORING
- SURFACE SOIL
- TEST PIT
- PRE-DESIGN SOIL BORING 2009
- PRE-DESIGN SOIL BORING 2010

MGP IMPACTED MATERIAL TO BE REMOVED
- 0-4 FT
- 0-7 FT
- ADDITIONAL IMPACTED MATERIAL
- SURFACE SOIL (TOTAL CPAH & PAH)

GPR SURVEY FEATURES
- POSSIBLE CONCRETE
- POSSIBLE TAR WELL

BASEMAP FEATURES
- SEWERLINE
- CONCRETE
- PROPERTY LINES
- CONTOURS
- APPROXIMATE CANAL
- OVERHEAD POWER LINE
- FORMER TANK LOCATIONS
- CONCRETE PAD
- MGP - RELATED STRUCTURE (AND ADJACENT SOIL) TO BE REMOVED (BASED ON ROD)

NATIONAL GRID
SOUTH FIRST STREET
FULTON, NEW YORK

PRE-DESIGN INVESTIGATION LOCATIONS

0 25 50 100
Feet

NOVEMBER 2010
1118.44581

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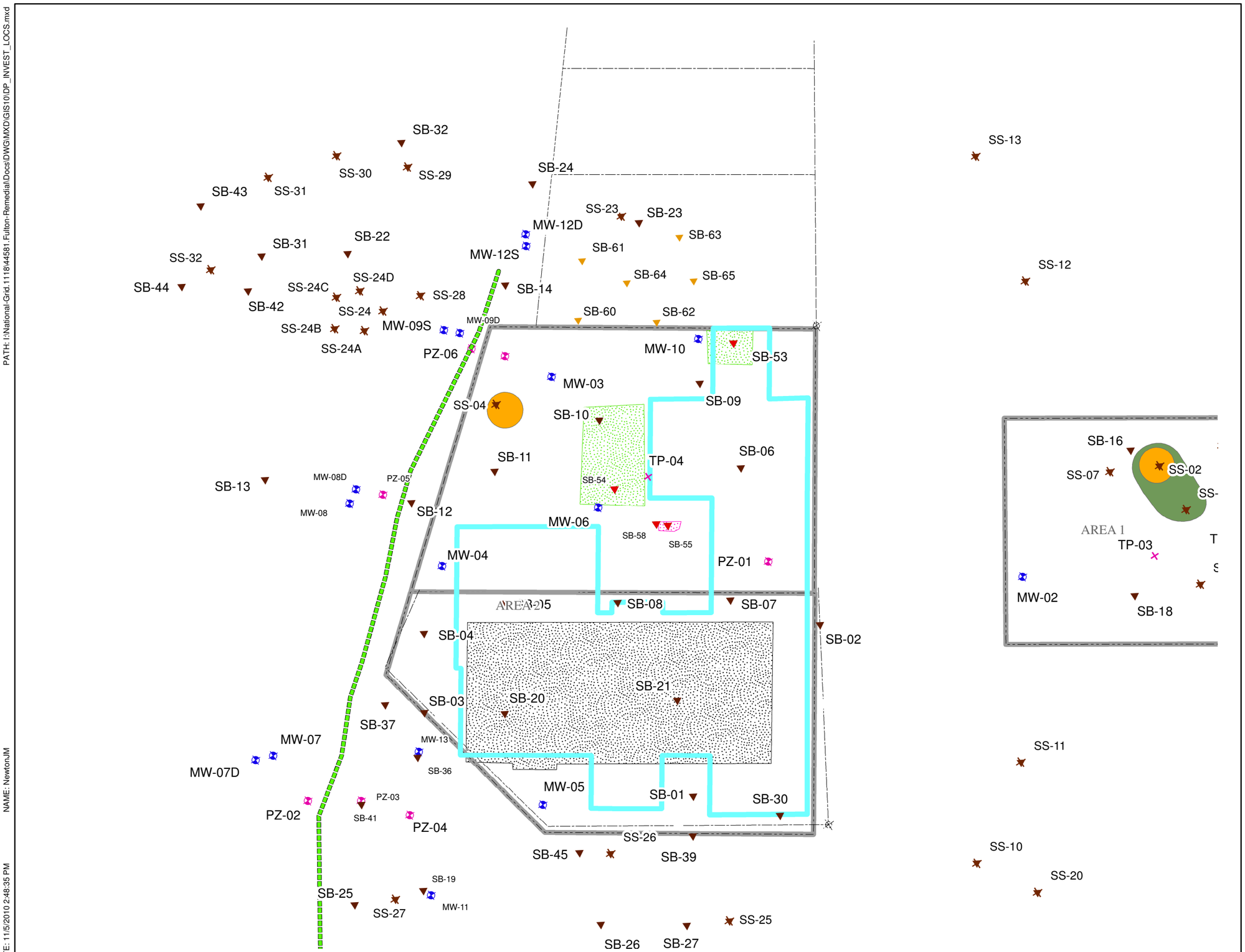
FIGURE 5



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LEGEND

SAMPLE LOCATIONS
- MONITORING WELL
- PIEZOMETER
- SOIL BORING
- SURFACE SOIL
- TEST PIT
- PRE-DESIGN SOIL BORING 2009
- PRE-DESIGN SOIL BORING 2010

MGP IMPACTED MATERIAL TO BE REMOVED
- 0-4 FT
- 0-7 FT
- ADDITIONAL IMPACTED MATERIAL
- SURFACE SOIL (TOTAL CPAH & PAH)

GPR SURVEY FEATURES
- POSSIBLE CONCRETE
- POSSIBLE TAR WELL

BASEMAP FEATURES
- SEWERLINE
- CONCRETE
- PROPERTY LINES
- PROPERTY-LINE
- MGP - RELATED STRUCTURE (AND ADJACENT SOIL) TO BE REMOVED (BASED ON ROD)

NATIONAL GRID
SOUTH FIRST STREET
FULTON, NEW YORK

DESIGN PHASE INVESTIGATION LOCATIONS

0 12.5 25 50
Feet

NOVEMBER 2010
1118.44581

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Pre-Design Boring Logs

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-49
Client: National Grid (South First Street Site) Proj. Loc: Fulton, NY File No.: 1118 / 44581	Sampler: 4' Macrocore Hammer: Auto Hammer Fall: NA	Location: South First Street Area 1 (West of MW-01) Start Date: 11/23/2009 End Date: 11/23/2009
Boring Company: Parratt-Wolff Foreman: Mickey OBG Geologist: Nate Vogan		Screen / Riser; Grout / Sand Pack / Bentonite

Depth Below Grade	Sample No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change / General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	3.5/4.0	NA	0-0.5 ft. TOPSOIL (PT); mostly silt and fine sand; moderate brown (5YR 4/4), moist, medium dense to dense, organic odor.			0.0	945
						0.5-1.2 ft. FINE SAND and SILT (SM); nonplastic, 50% fines, dark yellowish arange (10YR 6/6), little medium subrounded gravel, moist, medium dense, no odor.				
						1.2-1.4 ft. CRUSHED BRICK.				
						1.4-2.2 ft. SANDY SILT (ML); ~10% fine sand, little clay and root matter, dusky brown (5YR 2/2), organic odor.				
						2.2-3.5 ft. SILT (ML); ~20% clay, trace fine sand, dark yellowish orange (10YR 6/6), moist, very dense, stiff, no odor.				
4	2	8	NA	3.4/4.0	NA	0-4.0 ft. SILT (ML); ~20% clay, trace fine sand, dark yellowish orange (10YR 6/6), moist, very dense, stiff, no odor.			0.0	950
						End of Boring at 8 ft. Cuttings back filled and bentonite chipped to grade				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-50
Client: National Grid (South First Street Site) Proj. Loc: Fulton, NY File No.: 1118 / 44581	Sampler: 4' Macrocore Hammer: Auto Hammer Fall: NA	Location: South First Street Area 1 Start Date: 11/23/2009 End Date: 11/23/2009
Boring Company: Parratt-Wolff Foreman: Mickey OBG Geologist: Nate Vogan		Screen / Riser; Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	2.1/4.0	NA	0-0.9 ft. FINE SAND and SILT (SM); ~40% silt, little clay and crushed red brick, dark yellowish brown (10YR 6/2), moist, soft to medium dense, no odor.			0.0	1003
						0.9-1.1 ft. METAL SLAG and GRAVEL; partially cemented, black (N1), dry, very dense, no odor.				
						1.1-2.1 ft. SILT (ML); ~20% fine sand, little clay, trace crushed brick, moderate brown (5YR 3/4), moist, medium dense.				
4	2	8	NA	3.3/4.0	NA	0-4.0 ft. SILT (ML); ~15% clay, moderate yellowish brown (10YR 5/4), moist, dense, stiff. Rock lodged in nose of spoon with a small (1/4") coating of NAPL on rock surface, strong coal tar odor.			0.1	1005
8	3	10	NA	0.0/2.0	NA	No recovery, will resample down to 12 ft.			NA	1007
8	4	12	NA	4.0/4.0	NA	0-4.0 ft. FINE SAND (SP); ~30% medium sand, little silt, moderate brown (5YR 4/4), wet, medium dense to loose, soft. Sheen on outside of sample from 0-1.7 ft, some pin sized blebs of NAPL at 1.6 ft with coal tar odor.			0.6	1010
						End of Boring at 12 ft. Borehole backfilled with cuttings and bentonite chipped.				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-51
Client: National Grid (South First Street Site) Proj. Loc: Fulton, NY File No.: 1118 / 44581	Sampler: 4' Macrocore Hammer: Auto Hammer Fall: NA	Location: South First Street Area 1 Start Date: 11/23/2009 End Date: 11/23/2009
Boring Company: Parratt-Wolff Foreman: Mickey OBG Geologist: Nate Vogan		Screen / Riser; Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change / General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	4.0/4.0	NA	0-0.8 ft. SILT (ML); little clay, trace fine sand, moderate brown (5YR 3/4), moist, medium dense, stiff.			0.0	1015
						0.8-1.2 ft. MEDIUM SAND (SP); ~20% coarse sand, some silt, some metal slag, light brown (5YR 5/6) with a seam of dusky yellow green (5GY 5/6), no odor.				
						1.2-2.2 ft. SILT (ML); little clay, trace fine sand, moderate brown (5YR 3/4), moist, medium dense, stiff.				
						2.2-4.0 ft. SILT (ML); little clay, trace fine sand; dark yellowish orange (10YR 6/6) moist, dense, stiff, no odor.				
4	2	8	NA	3.0/4.0	NA	0-4.0 ft. SILT (ML); little clay, trace fine sand; dark yellowish orange (10YR 6/6) moist, dense, stiff, no odor.			0.0	1018
						End of Boring at 8 ft. Cuttings backfilled into borehole, chipped to grade.				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-52
Client: National Grid (South First Street Site) Proj. Loc: Fulton, NY File No.: 1118 / 44581	Sampler: 4' Macrocore Hammer: Auto Hammer Fall: NA	Location: South First Street Area 1 Start Date: 11/23/2009 End Date: 11/23/2009
Boring Company: Parratt-Wolff Foreman: Mickey OBG Geologist: Nate Vogan		Screen / Riser / Grout / Sand Pack / Bentonite

Depth Below Grade	Sample No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	2.7/4.0	NA	0-1.0 ft. FINE SAND (SM); ~40% silt, some medium and coarse subrounded gravel, some roots, moderate brown (5YR 4/4) moist, loose to medium dense, no odor.			0.0	1030
						1.0-2.7 ft. SILT (ML); ~40% fine sand, little brown vegetative pieces; dark yellowish orange (10YR 6/6), moist, dense, no odor.				
4	2	8	NA	4.0/4.0	NA	0-1.0 ft. SILT (ML); ~40% fine sand, little clay; dark yellowish orange (10YR 6/6), moist, dense, no odor.			0.0	1035
						1.0-4.0 ft. MEDIUM SAND (SP); ~20% coarse sand, little silt and subrounded fine gravel, trace coal tar odor.				
						End of boring at 8 ft. Cuttings backfilled into borehole, chipped to grade.				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-53
Client: National Grid (South First Street Site) Proj. Loc: Fulton, NY File No.: 1118 / 44581	Sampler: 4' Macrocore Hammer: Auto Hammer Fall: NA	Location: South First Street Area 2 Start Date: 11/23/2009 End Date: 11/23/2009
Boring Company: Parratt-Wolff Foreman: Mickey OBG Geologist: Nate Vogan		Screen / Riser; Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change / General Descript	Equip. installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	1.2/4.0	NA	FILL; crushed brick, concrete, and cemented pale yellowish orange (10YR 8/6) coarse sand, dry, loose, no odor.			0.0	1100
4	2	8	NA	3.1/4.0	NA	0-0.6 ft. FILL; crushed brick, concrete, and cemented pale yellowish orange (10YR 8/6) coarse sand, dry, loose, no odor.			0.0	1103
						0.6-3.1 ft. MEDIUM SAND (SP); little silt and fine sand, moderate yellowish brown (10 YR 5/4), wet, medium dense, soft, no odor.				
8	3	10	NA	1.6/2.0	NA	MEDIUM SAND (SP); little silt and fine sand, little coarse subrounded gravel, moderate yellowish brown (10 YR 5/4), wet, medium dense, soft, no odor.			0.0	1107
						End of Boring at 10 ft. Cuttings backfilled into borehole.				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-54
Client: National Grid (South First Street Site) Proj. Loc: Fulton, NY File No.: 1118 / 44581	Sampler: 4' Macrocore Hammer: Auto Hammer Fall: NA	Location: South First Street Area 2 Start Date: 11/23/2009 End Date: 11/23/2009
Boring Company: Parratt-Wolff Foreman: Mickey OBG Geologist: Nate Vogan		Screen / Riser; Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change / General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	1.4/4.0	NA	1 inch ASPHALT followed by 6 in CONCRETE, then METAL SLAG; black (N1), dry, loose, no odor.			0.0	1145
4	2	8	NA	2.2/4.0	NA	0-0.4 ft. ASPHALT and METAL SLAG; black (N1), dry, loose, no odor. 0.4-2.2 ft. FINE SAND (SM); some silt, moderate brown (5YR 4/4), some black mottling (seems organic), wet, medium dense, no odor.			0.0	1150
						End of boring at 8 ft. Cuttings backfilled into borehole.				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-55
Client: National Grid (South First Street Site) Proj. Loc: Fulton, NY File No.: 1118 / 44581	Sampler: 4' Macrocore Hammer: Auto Hammer Fall: NA	Location: South First Street Area 2 (Tar Well) Start Date: 11/23/2009 End Date: 11/23/2009
Boring Company: Parratt-Wolff Foreman: Mickey OBG Geologist: Nate Vogan		Screen = \ Grout Riser ▒ Sand Pack ■ Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change / General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	2.9/4.0	NA	0-2.1 ft. CRUSHED ASPHALT; trace crushed bricks and crushed rock, little metal slag, moist, dense.			0.0	1112
						2.1-2.9 ft. FINE SAND (SM); ~40% silt, trace clay, dark yellowish orange (10YR 6/6), wet, medium dense, faint coal tar odor. Seam of black metal slag at 2.6-2.8 ft.				
4	2	8	NA	3.8/4.0	NA	0-1.5 ft. FINE SAND (SM); ~20% silt, some fine subrounded gravel, wet, dense, dusky brown (5YR 2/2), some sheen, black staining with sheen, strong coal tar odor.			1.3	1116
						1.5-2.4 ft. FINE SAND (SM); ~20% silt, wet, dense, dusky brown (5YR 2/2), some sheen, black staining with sheen, strong coal tar odor.				
						2.4-3.8 ft. FINE SAND (SM); ~20% silt, moderate yellowish brown (10YR 5/4), some patches of black staining, wet, dense, coal tar odor.				
8	3	12	NA	3.8/4.0	NA	0-2.4 ft. FINE SAND (SM); ~20% silt, moderate yellowish brown (10YR 5/4), some patches of black staining, wet, dense, coal tar odor. Tar saturated material from 0-1.1 ft, likely sluff.			0.0	1120
						2.4-3.0 ft. MEDIUM SAND (SW); some subrounded gravel, light brown (5YR 6/4), wet, medium dense, coal tar odor.				
						Refusal at 11.5 ft. Cuttings backfilled into borehole.				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-56
Client: National Grid (South First Street Site) Proj. Loc: Fulton, NY File No.: 1118 / 44581	Sampler: 4' Macrocore Hammer: Auto Hammer Fall: NA	Location: South First Street Area 1 (Next to SB-51) Start Date: 11/23/2009 End Date: 11/23/2009
Boring Company: Parratt-Wolff Foreman: Mickey OBG Geologist: Nate Vogan		Screen = \ Grout Riser ▒ Sand Pack ■ Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	3.6/4.0	NA	0-2.0 ft. SILT (ML); little clay, trace fine sand, moderate brown (5YR 3/4), moist, medium dense, stiff. 2.0-3.6 ft. SILT (ML); little clay, trace fine sand; dark yellowish orange (10YR 6/6) moist, dense, stiff, no odor. End of Boring at 4 ft. Cuttings backfilled into borehole.			0.0	1200

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-57
Client: National Grid (South First Street Site) Proj. Loc: Fulton, NY File No.: 1118 / 44581	Sampler: 4' Macrocore Hammer: Auto Hammer Fall: NA	Location: South First Street Area 1 (Next to SB-50) Start Date: 11/23/2009 End Date: 11/23/2009
Boring Company: Parratt-Wolff Foreman: Mickey OBG Geologist: Nate Vogan		Screen / Riser; Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change / General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	3.1/4.0	NA	0-1.8 ft. FINE SAND (SM); ~25% silt, litle medium to fine subrounded gravel, race clay, moderate brown (5YR 4/4), moist, dense, no odor.			0.0	1205
						1.8-3.1 ft. SILT (ML); ~25% fine sand, trace clay, yellowish orange (10YR 6/6), moist, dense, no odor.				
4	2	8	NA	4.0/4.0	NA	0-2.6 ft. SILT (ML); ~25% fine sand, trace clay, yellowish orange (10YR 6/6), moist, dense, no odor.			0.0	1210
						2.6-4.0 ft. FINE SAND (SM); ~20% silt, trace fine gravel, light brown (5YR 6/4), wet dense, no odor.				
						End of boring at 8 ft. Cuttings backfilled into boring.				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-58
Client: National Grid (South First Street Site) Proj. Loc: Fulton, NY File No.: 1118 / 44581	Sampler: 4' Macrocore Hammer: Auto Hammer Fall: NA	Location: South First Street Area 2 (Tar Well) Start Date: 11/23/2009 End Date: 11/23/2009
Boring Company: Parratt-Wolff Foreman: Mickey OBG Geologist: Nate Vogan		Screen / Riser; Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change / General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	2.9/4.0	NA	0-1.3 ft. DRIED TAR and METAL SLAG; some crushed asphalt and stone, black (N1), dense to loose, dry, tar odor.			0.3	1220
						1.3-2.9 ft. MEDIUM SAND (SP); ~25% fine sand, some silt, light brown (5YR 5/6), moist, dense, faint coal tar odor.				
4	2	8	NA	3.5/4.0	NA	MEDIUM SAND (SP); ~25% fine sand, some silt, light brown (5YR 5/6), wet dense, black staining, sheen, and strong coal tar odor throughout. Some coarse metal slag and ciders saturated with NAPL from 1.1-1.6 ft.			0.9	1225
8	3	12	NA	2.6/4.0	NA	0-1.5 ft. MEDIUM SAND (SP); ~25% fine sand, loose, wet, NAPL saturated, strong sheen, and coal tar odor. Possible sluff.			11.7	1230
						1.5-2.6 ft. MEDIUM SAND (SP); ~25% fine sand, moderate brown (5YR 4/4), medium dense, wet, some black staining in upper 3 in., coal tar odor throughout.				
						Refusal at 11' Cuttings backfilled into borehole.				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-59
Client: National Grid (South First Street Site) Proj. Loc: Fulton, NY File No.: 1118 / 44581	Sampler: 4' Macrocore Hammer: Auto Hammer Fall: NA	Location: South First Street Area 1 (Next to SB-52) Start Date: 11/23/2009 End Date: 11/23/2009
Boring Company: Parratt-Wolff Foreman: Mickey OBG Geologist: Nate Vogan		Screen / Riser; Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change / General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	3.1/4.0	NA	0-1.2 ft. FINE SAND (SM); ~40% silt, some medium and coarse subrounded gravel, some roots, moderate brown (5YR 4/4) moist, loose to medium dense, no odor.			0.0	1245
						1.0-3.1 ft. SILT (ML); ~40% fine sand, little brown vegetative pieces; dark yellowish orange (10YR 6/6), moist, dense, no odor.				
						End of boring at 4 ft. Cuttings backfilled into borehole.				

Notes:

O'BRIEN & GERE ENGINEERS, INC.

SOIL BORING LOG

REPORT OF BORING
SB-60

Client: National Grid (South First Street Site)
Proj. Loc: Fulton, NY
File No.: 1118 / 44581

Sampler: 4' Macrocore
Hammer: Auto Hammer
Fall: NA

Location: South First Street Area 2
Start Date: 09/13/2010
End Date: 09/13/2010

Boring Company: Parratt-Wolff
Foreman: Jim Lansing
OBG Geologist: Nate Vogan

Screen = \ Grout
Riser Sand Pack
Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	1.4/4.0	NA	0-0.6 ft SILT (FILL); silt, some fine sand, trace clay and vegetation; moist, slightly cohesive, dark brown , no odor. 0.6-1.1 ft. SILT (FILL); silt, some crushed stone, little fine sand; moist to dry, medium dense, moderate reddish brown, no odor. 1.1-1.4 ft. SILT (FILL); silt, some fine sand; moist, medium dense, slightly cohesive, grayish brown, no odor.	Fill	\	0.0	
4	2	8	NA	2.2/4.0	NA	0-0.2 ft. CRUSHED BRICK (FILL); crushed brick; wet, loose, no odor. 0.2-2.2 ft. SILT (ML); silt, some clay, trace fine sand and organics; wet, dense, slightly cohesive, moderate brown to light orange brown, organics are found in moderate brown layers, no odor.	4.2'	\	0.0	
8	3	12	NA	3.7/4.0	NA	SILT (ML); silt, some fine sand, little clay; wet, dense, slightly cohesive, light olive gray to light brown, no odor.	Silt & Fine Sand	\	0.0	
12	4	16	NA	4.0/4.0	NA	SAND (SM); fine sand, some silt, trace fine rounded gravel; wet, medium dense to loose, moderate yellowish brown (10YR 5/4), no odor.	12'	\	0.0	
16	5	20	NA	4.0/4.0	NA	SAND (SM); fine sand, little fine to coarse subrounded to angular gravel; wet, loose, pale reddish brown (10R 5/4), no odor.	Fine Sand & Gravel	\	0.0	1000
						End of Boring at 20 ft bgs Bentonite chip to grade				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-61
Client: National Grid (South First Street Site) **Proj. Loc:** Fulton, NY **File No.:** 1118 / 44581	**Sampler:** 4' Macrocore **Hammer:** Auto Hammer **Fall:** NA	**Location:** South First Street Area 2 **Start Date:** 09/13/2010 **End Date:** 09/13/2010
Boring Company: Parratt-Wolff **Foreman:** Jim Lansing **OBG Geologist:** Nate Vogan		Screen = \ Grout Riser Sand Pack Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	1.9/4.0	NA	SAND (FILL); fine sand, some silt, little angular crushed stone; moist, medium dense, dark reddish brown (10R 3/4) to grayish brown (5YR 3/2), no odor.	Fill	\	0.0	
4	2	8	NA	1.8/4.0	NA	SILT (ML); silt, some fine sand, little coarse gravel, trace clay, trace woody fibers in nose of spoon; wet, medium dense, moderate brown (5YR 3/4) to grayish brown (5YR 3/2), no odor.	4'	\	0.0	
8	3	12	NA	3.9/4.0	NA	SILT (ML); silt, some clay, little fine sand; wet, dense, slightly cohesive, stiff, pale brown (5YR 5/2) to moderate yellowish brown (10YR 5/4), no odor.	Silt & Fine Sand	\	0.0	
12	4	16	NA	4.0/4.0	NA	SILT (ML); silt, some fine sand, little to trace clay; wet, dense, stiff, slightly cohesive, pale brown (5YR 5/2), no odor.	18.6'	\	0.0	
16	5	20	NA	3.4/4.0	NA	0-2.6 ft. SILT (ML); silt, some fine sand, little to trace clay; wet, dense, stiff, slightly cohesive, pale brown (5YR 5/2), no odor. 2.6-3.4 ft. SAND (SM); medium to fine sand, some coarse angular gravel; wet, loose to medium dense, pale reddish brown (10R 5/4), no odor.	Fine Sand & Gravel	\	0.0	1055
						End of boring at 20 ft bgs Bentonite chip to grade				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-62
Client: National Grid (South First Street Site) **Proj. Loc:** Fulton, NY **File No.:** 1118 / 44581	**Sampler:** 4' Macrocore **Hammer:** Auto Hammer **Fall:** NA	**Location:** South First Street Area 2 **Start Date:** 09/13/2010 **End Date:** 09/13/2010
Boring Company: Parratt-Wolff **Foreman:** Jim Lansing **OBG Geologist:** Nate Vogan		**Screen** = \ Grout **Riser** Sand Pack Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	1.6/4.0	NA	SILT (FILL); silt and fine sand, some crushed brick, little coal fragments; moist, medium dense, dusky brown (5YR 2/2), no odor.	Fill	\	0.0	
4	2	8	NA	3.8/4.0	NA	0-0.5 ft. SILT (FILL); silt and fine sand, some crushed brick, little coal fragments; moist, medium dense, dusky brown (5YR 2/2), no odor. 0.5-3.8 ft. SAND (SM); fine sand, some silt, little clay; wet, dense, light brown (5YR 5/6), no odor.	4.5'	\	0.0	
8	3	12	NA	4.0/4.0	NA	SILT (ML); silt, some fine sand, little clay; wet, dense, stiff, slightly cohesive, light brown (5YR 5/6) to moderate yellowish brown (10YR 5/4), no odor.	Silt & Fine Sand	\	0.0	
12	4	16	NA	4.0/4.0	NA	0-1.5 ft. SILT (ML); silt, some fine sand, little clay; wet, dense, stiff, slightly cohesive, light brown (5YR 5/6) to moderate yellowish brown (10YR 5/4), no odor. 1.5-4.0 ft. SAND (SP); fine sand, little coarse gravel; wet, loose, soft, pale reddish brown (10R 5/4), no odor.	13.5'	\	0.0	
16	5	20	NA	1.2/4.0	NA	Poor recovery. SILT (ML); silt, some fine sand, little clay; wet, dense, stiff, slightly cohesive, light brown (5YR 5/6) to moderate yellowish brown (10YR 5/4), no odor. 1.5-4.0 ft. SAND (SP); fine sand, little coarse gravel; wet, loose, soft, pale reddish brown (10R 5/4), no odor.	Fine Sand & Gravel	\	0.0	
						End of boring at 20 ft bgs Benonite chip to grade				

Notes:

O'BRIEN & GERE ENGINEERS, INC.

SOIL BORING LOG

REPORT OF BORING
SB-63

Client: National Grid (South First Street Site)
Proj. Loc: Fulton, NY
File No.: 1118 / 44581

Sampler: 4' Macrocore
Hammer: Auto Hammer
Fall: NA

Location: South First Street Area 2
Start Date: 09/13/2010
End Date: 09/13/2010

Boring Company: Parratt-Wolff
Foreman: Jim Lansing
OBG Geologist: Nate Vogan

Screen = \ Grout
Riser Sand Pack
Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	2.7/4.0	NA	0-1.3 ft. SILT (FILL); silt, some fine sand, little crushed stone and coal fragments; dry, loose, grayish brown (5YR 3/2), no odor. 1.3-2.7 ft. SAND (SM); fine sand, some silt, trace organics; moist, medium dense to loose, moderate brown (5YR 4/4), no odor.	Fill	\	0.0	1242
4	2	8	NA	2.5/4.0	NA	0-1.1 ft. SAND (SM); fine sand, some silt, trace organics; moist, medium dense to loose, moderate brown (5YR 4/4), no odor. 1.1-2.5 ft. SILT (ML); silt, little fine sand and clay, trace fine gravel in last 3 in.; wet, medium dense, moderate yellowish brown (10YR 5/4), no odor.	1.3'	\	0.0	
8	3	12	NA	3.8/4.0	NA	SAND (SP); fine sand, little medium to coarse angular gravel; wet, loose, soft, pale reddish brown (10R 5/4), no odor.	Fine Sand & Silt	\	0.0	
12	4	16	NA	2.6/4.0	NA	SAND (SP); fine sand, some medium to coarse angular gravel; wet, loose, soft, pale reddish brown (10R 5/4), no odor.	8'	\	0.0	
16	5	20	NA	2.8/4.0	NA	SAND (SP); fine sand, little rounded medium to coarse gravel; wet, very dense, pale reddish brown (10R 5/4), no odor.	Fine Sand & Gravel	\	0.0	1310
						End of boring at 20 ft bgs Benonite chip to grade				

Notes:

O'BRIEN & GERE ENGINEERS, INC.	SOIL BORING LOG	REPORT OF BORING SB-64
Client: National Grid (South First Street Site) **Proj. Loc:** Fulton, NY **File No.:** 1118 / 44581	**Sampler:** 4' Macrocore **Hammer:** Auto Hammer **Fall:** NA	**Location:** South First Street Area 2 **Start Date:** 09/13/2010 **End Date:** 09/13/2010
Boring Company: Parratt-Wolff **Foreman:** Jim Lansing **OBG Geologist:** Nate Vogan		**Screen** = \ Grout **Riser** Sand Pack Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	2.5/4.0	NA	SILT (FILL); silt, some fine sand, little crushed stone and coal fragments; moist, loose to medium dense, dusky brown (5YR 2/2), no odor.	Fill	\	0.0	1314
4	2	8	NA	3.1/4.0	NA	0-0.9 ft. SAND (SM); fine sand, little silt; wet, soft, moderate yellowish brown (10YR 5/4), no odor. 0.9-1.5 ft. SILT (ML); silt, some fine sand and organics; moist, medium dense, dusky brown (5YR 2/2), no odor. 1.5-3.1 ft. SILT (ML); silt, some clay; wet, dense, stiff, cohesive, light brown (5YR 5/6) with pale yellowish brown (10YR 6/2) mottling, no odor.	4'	\	0.0	
8	3	12	NA	3.0/4.0	NA	SILT (ML); silt, some clay, little medium to fine angular gravel; wet, dense, stiff, moderate yellowish brown (10YR 5/4), no odor.	Fine Sand & Silt	\	0.0	
12	4	16	NA	4.0/4.0	NA	0-0.3 ft. SILT (ML); silt, some clay, little medium to fine angular gravel; wet, dense, stiff, moderate yellowish brown (10YR 5/4), no odor. 0.3-4.0 ft. SAND (SP); fine sand, little coarse subrounded gravel; wet, medium dense to dense, pale reddish brown (10R 5/4), no odor.	12.3'	\	0.0	
16	5	20	NA	2.9/4.0	NA	SAND (SP); fine sand, little coarse subrounded to angular gravel; wet, soft to medium dense, pale reddish brown (10R 5/4), no odor.	Fine Sand & Gravel	\	0.0	1340
						End of boring at 20 ft bgs Benonite chip to grade				

Notes:

O'BRIEN & GERE ENGINEERS, INC.

SOIL BORING LOG

REPORT OF BORING SB-65

Client: National Grid (South First Street Site)
Proj. Loc: Fulton, NY
File No.: 1118 / 44581

Sampler: 4' Macrocore
Hammer: Auto Hammer
Fall: NA

Location: South First Street Area 2
Start Date: 09/13/2010
End Date: 09/13/2010

Boring Company: Parratt-Wolff
Foreman: Jim Lansing
OBG Geologist: Nate Vogan

Screen = \ Grout
Riser Sand Pack
Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery (in ft)	"N" Value	Sample Description	Stratum Change / General Descript	Equip. Installed	Field Testing PID (ppm)	Field Testing Time
0	1	4	NA	2.1/4.0	NA	0-1.2 ft. SILT (FILL); silt, some fine sand, little clay and crushed brick, trace organics; moist, medium dense, dusky brown (5YR 2/2), no odor. 1.2-2.1 ft. SAND (SM); fine sand, some silt; wet, medium dense, soft, moderate yellowish brown (10YR 5/4), no odor.	Fill	\	0.0	1415
4	2	8	NA	4.0/4.0	NA	0-1.8 ft. SILT (ML); silt, some fine sand, little organics; moist, soft, dusky brown (5YR 2/2), no odor. 1.8-3.2 ft. SAND (SP); fine sand, little medium to coarse angular gravel; wet, loose to medium dense, soft, moderate yellowish brown (5YR 4/4), no odor. 3.2-4.0 ft. SAND (SP); fine sand, little medium to coarse angular gravel; wet, loose to medium dense, soft, pale reddish brown (10R 5/4), no odor.	1.2'	\	0.0	
8	3	12	NA	0.0/4.0	NA	No recovery, flowing sand.	Fine Sand & Silt	\	0.0	
12	4	16	NA	1.6/4.0	NA	SAND (sp); fine sand, some medium to coarse angular to subrounded gravel; wet, loose, becoming dense in last 3 in., pale reddish brown (10R 5/4), no odor.	5.8'	\	0.0	
16	5	20	NA	4.0/4.0	NA	SAND (SP); fine sand, some coarse angular gravel; wet, very dense, pale reddish brown (10R 5/4), no odor.	Fine Sand & Gravel	\	0.0	1440
						End of boring at 20 ft bgs Benonite chip to grade				

Notes:

Groundwater Quality Laboratory Reports

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 **(315) 445-1105**

Friday, June 04, 2010

Deborah Wright
O'Brien & Gere Engineers, Inc.
5000 Brittonfield Parkway
PO Box 4873
Syracuse, NY 13221-4873

TEL: (315) 437-6100

Project: NATIONAL GRID - FULTON, NY
RE: Analytical Results

Order No.: K1005028, K1005034
K1005042

Dear Deborah Wright:

Life Science Laboratories, Inc. received sample(s) on 5/4/2010 and 5/5/2010 for the analyses presented in the following report. Sample results relate only to the samples as received by the laboratory.

Very truly yours,
Life Science Laboratories, Inc.

Pamela J. Titus
Project Manager

CC: Scott Tucker

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	K1005028-001A
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-4-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	MS01_11	**Sample Size** 10 mL	**PrepDate:**
ColumnID:	Rtx-VMS	**%Moisture:**	**BatchNo:** R19934
Revision:	05/18/10 5:57	**TestCode:** 8260W_OLM42	**FileID:** 1-SAMP-T9060.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
(m+p)-Xylene	283		20.0	4.00	µg/L	20	05/13/10 15:07
o-Xylene	243		10.0	2.00	µg/L	20	05/13/10 15:07
Dichlorodifluoromethane	ND		20.0	2.00	µg/L	20	05/13/10 15:07
Chloromethane	ND		20.0	6.60	µg/L	20	05/13/10 15:07
Vinyl chloride	ND		20.0	6.60	µg/L	20	05/13/10 15:07
Bromomethane	ND		20.0	6.60	µg/L	20	05/13/10 15:07
Chloroethane	ND		20.0	6.60	µg/L	20	05/13/10 15:07
Trichlorofluoromethane	ND		20.0	2.00	µg/L	20	05/13/10 15:07
1,1-Dichloroethene	ND		10.0	3.20	µg/L	20	05/13/10 15:07
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		10.0	2.00	µg/L	20	05/13/10 15:07
Acetone	ND		200	20.0	µg/L	20	05/13/10 15:07
Carbon disulfide	ND		10.0	2.20	µg/L	20	05/13/10 15:07
Methyl acetate	ND		100	20.0	µg/L	20	05/13/10 15:07
Methylene chloride	ND		40.0	3.20	µg/L	20	05/13/10 15:07
trans-1,2-Dichloroethene	ND		10.0	2.00	µg/L	20	05/13/10 15:07
Methyl tert-butyl ether	ND		20.0	3.20	µg/L	20	05/13/10 15:07
1,1-Dichloroethane	ND		10.0	2.00	µg/L	20	05/13/10 15:07
cis-1,2-Dichloroethene	ND		10.0	2.00	µg/L	20	05/13/10 15:07
2-Butanone	ND		200	20.0	µg/L	20	05/13/10 15:07
Chloroform	ND		10.0	2.00	µg/L	20	05/13/10 15:07
1,1,1-Trichloroethane	ND		10.0	2.00	µg/L	20	05/13/10 15:07
Cyclohexane	ND		10.0	2.00	µg/L	20	05/13/10 15:07
Carbon tetrachloride	ND		10.0	2.00	µg/L	20	05/13/10 15:07
Benzene	752		10.0	2.00	µg/L	20	05/13/10 15:07
1,2-Dichloroethane	ND		10.0	3.20	µg/L	20	05/13/10 15:07
Trichloroethene	ND		10.0	2.00	µg/L	20	05/13/10 15:07
Methylcyclohexane	ND		10.0	2.00	µg/L	20	05/13/10 15:07
1,2-Dichloropropane	ND		10.0	3.20	µg/L	20	05/13/10 15:07
Bromodichloromethane	ND		10.0	2.00	µg/L	20	05/13/10 15:07
cis-1,3-Dichloropropene	ND		10.0	3.20	µg/L	20	05/13/10 15:07
4-Methyl-2-pentanone	ND		100	20.0	µg/L	20	05/13/10 15:07
Toluene	79.4		10.0	2.00	µg/L	20	05/13/10 15:07
trans-1,3-Dichloropropene	ND		10.0	3.20	µg/L	20	05/13/10 15:07
1,1,2-Trichloroethane	ND		10.0	3.20	µg/L	20	05/13/10 15:07

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 6:03 508759 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005028-001A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***MW-4-050310***
W Order:	K1005028			**Collection Date:**	05/03/10 12:40
Matrix:	WATER			**Date Received:**	05/04/10 8:31
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19934
Revision:	05/18/10 5:57	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9060.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
Tetrachloroethene	ND		10.0	2.00	µg/L	20	05/13/10 15:07
Dibromochloromethane	ND		10.0	2.00	µg/L	20	05/13/10 15:07
1,2-Dibromoethane	ND		10.0	3.20	µg/L	20	05/13/10 15:07
Chlorobenzene	ND		10.0	2.00	µg/L	20	05/13/10 15:07
Ethylbenzene	315		10.0	2.00	µg/L	20	05/13/10 15:07
Xylenes (total)	526		20.0	6.00	µg/L	20	05/13/10 15:07
Styrene	ND		10.0	2.00	µg/L	20	05/13/10 15:07
Bromoform	ND		20.0	6.60	µg/L	20	05/13/10 15:07
Isopropylbenzene	8.80	J	10.0	2.00	µg/L	20	05/13/10 15:07
1,1,2,2-Tetrachloroethane	ND		10.0	2.00	µg/L	20	05/13/10 15:07
1,3-Dichlorobenzene	ND		10.0	2.00	µg/L	20	05/13/10 15:07
1,4-Dichlorobenzene	ND		10.0	3.20	µg/L	20	05/13/10 15:07
1,2-Dichlorobenzene	ND		10.0	2.00	µg/L	20	05/13/10 15:07
1,2-Dibromo-3-chloropropane	ND		100	20.0	µg/L	20	05/13/10 15:07
1,2,4-Trichlorobenzene	ND		20.0	2.00	µg/L	20	05/13/10 15:07
Surr: 1,2-Dichloroethane-d4	100		75-128	3.20	%REC	20	05/13/10 15:07
Surr: Toluene-d8	100		75-125	2.00	%REC	20	05/13/10 15:07
Surr: 4-Bromofluorobenzene	99		75-125	2.00	%REC	20	05/13/10 15:07

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005028-002A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***MW-5-050310***
W Order:	K1005028			**Collection Date:**	05/03/10 15:20
Matrix:	WATER			**Date Received:**	05/04/10 8:31
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19934
Revision:	05/18/10 5:57	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9061.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
(m+p)-Xylene	368		20.0	4.00	µg/L	20	05/13/10 15:40
o-Xylene	193		10.0	2.00	µg/L	20	05/13/10 15:40
Dichlorodifluoromethane	ND		20.0	2.00	µg/L	20	05/13/10 15:40
Chloromethane	ND		20.0	6.60	µg/L	20	05/13/10 15:40
Vinyl chloride	ND		20.0	6.60	µg/L	20	05/13/10 15:40
Bromomethane	ND		20.0	6.60	µg/L	20	05/13/10 15:40
Chloroethane	ND		20.0	6.60	µg/L	20	05/13/10 15:40
Trichlorofluoromethane	ND		20.0	2.00	µg/L	20	05/13/10 15:40
1,1-Dichloroethene	ND		10.0	3.20	µg/L	20	05/13/10 15:40
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		10.0	2.00	µg/L	20	05/13/10 15:40
Acetone	ND		200	20.0	µg/L	20	05/13/10 15:40
Carbon disulfide	ND		10.0	2.20	µg/L	20	05/13/10 15:40
Methyl acetate	ND		100	20.0	µg/L	20	05/13/10 15:40
Methylene chloride	ND		40.0	3.20	µg/L	20	05/13/10 15:40
trans-1,2-Dichloroethene	ND		10.0	2.00	µg/L	20	05/13/10 15:40
Methyl tert-butyl ether	ND		20.0	3.20	µg/L	20	05/13/10 15:40
1,1-Dichloroethane	ND		10.0	2.00	µg/L	20	05/13/10 15:40
cis-1,2-Dichloroethene	ND		10.0	2.00	µg/L	20	05/13/10 15:40
2-Butanone	ND		200	20.0	µg/L	20	05/13/10 15:40
Chloroform	ND		10.0	2.00	µg/L	20	05/13/10 15:40
1,1,1-Trichloroethane	ND		10.0	2.00	µg/L	20	05/13/10 15:40
Cyclohexane	ND		10.0	2.00	µg/L	20	05/13/10 15:40
Carbon tetrachloride	ND		10.0	2.00	µg/L	20	05/13/10 15:40
Benzene	8.80	J	10.0	2.00	µg/L	20	05/13/10 15:40
1,2-Dichloroethane	ND		10.0	3.20	µg/L	20	05/13/10 15:40
Trichloroethene	ND		10.0	2.00	µg/L	20	05/13/10 15:40
Methylcyclohexane	12.2		10.0	2.00	µg/L	20	05/13/10 15:40
1,2-Dichloropropane	ND		10.0	3.20	µg/L	20	05/13/10 15:40
Bromodichloromethane	ND		10.0	2.00	µg/L	20	05/13/10 15:40
cis-1,3-Dichloropropene	ND		10.0	3.20	µg/L	20	05/13/10 15:40
4-Methyl-2-pentanone	ND		100	20.0	µg/L	20	05/13/10 15:40
Toluene	11.4		10.0	2.00	µg/L	20	05/13/10 15:40
trans-1,3-Dichloropropene	ND		10.0	3.20	µg/L	20	05/13/10 15:40
1,1,2-Trichloroethane	ND		10.0	3.20	µg/L	20	05/13/10 15:40

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005028-002A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***MW-5-050310***
W Order:	K1005028			**Collection Date:**	05/03/10 15:20
Matrix:	WATER			**Date Received:**	05/04/10 8:31
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19934
Revision:	05/18/10 5:57	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9061.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
Tetrachloroethene	ND		10.0	2.00	µg/L	20	05/13/10 15:40
Dibromochloromethane	ND		10.0	2.00	µg/L	20	05/13/10 15:40
1,2-Dibromoethane	ND		10.0	3.20	µg/L	20	05/13/10 15:40
Chlorobenzene	ND		10.0	2.00	µg/L	20	05/13/10 15:40
Ethylbenzene	303		10.0	2.00	µg/L	20	05/13/10 15:40
Xylenes (total)	561		20.0	6.00	µg/L	20	05/13/10 15:40
Styrene	ND		10.0	2.00	µg/L	20	05/13/10 15:40
Bromoform	ND		20.0	6.60	µg/L	20	05/13/10 15:40
Isopropylbenzene	97.0		10.0	2.00	µg/L	20	05/13/10 15:40
1,1,2,2-Tetrachloroethane	ND		10.0	2.00	µg/L	20	05/13/10 15:40
1,3-Dichlorobenzene	ND		10.0	2.00	µg/L	20	05/13/10 15:40
1,4-Dichlorobenzene	ND		10.0	3.20	µg/L	20	05/13/10 15:40
1,2-Dichlorobenzene	ND		10.0	2.00	µg/L	20	05/13/10 15:40
1,2-Dibromo-3-chloropropane	ND		100	20.0	µg/L	20	05/13/10 15:40
1,2,4-Trichlorobenzene	ND		20.0	2.00	µg/L	20	05/13/10 15:40
Surr: 1,2-Dichloroethane-d4	89		75-128	3.20	%REC	20	05/13/10 15:40
Surr: Toluene-d8	110		75-125	2.00	%REC	20	05/13/10 15:40
Surr: 4-Bromofluorobenzene	105		75-125	2.00	%REC	20	05/13/10 15:40

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 6:03 508760 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-003A**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***Trip Blank***
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER Q	**Date Received:**	05/04/10 8:31
Inst. ID:	MS01_11	**Sample Size:** 10 mL	**PrepDate:**
ColumnID	Rtx-VMS	**%Moisture:**	**BatchNo:** R19934
Revision:	06/04/10 13:49	**TestCode:** 8260W_OLM42	**FileID:** 1-SAMP-T9059.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
(m+p)-Xylene	ND		1.00	0.20	µg/L	1	05/13/10 14:34
o-Xylene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
Dichlorodifluoromethane	ND		1.00	0.10	µg/L	1	05/13/10 14:34
Chloromethane	ND		1.00	0.33	µg/L	1	05/13/10 14:34
Vinyl chloride	ND		1.00	0.33	µg/L	1	05/13/10 14:34
Bromomethane	ND		1.00	0.33	µg/L	1	05/13/10 14:34
Chloroethane	ND		1.00	0.33	µg/L	1	05/13/10 14:34
Trichlorofluoromethane	ND		1.00	0.10	µg/L	1	05/13/10 14:34
1,1-Dichloroethene	ND		0.50	0.16	µg/L	1	05/13/10 14:34
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50	0.10	µg/L	1	05/13/10 14:34
Acetone	ND		10.0	1.00	µg/L	1	05/13/10 14:34
Carbon disulfide	ND		0.50	0.11	µg/L	1	05/13/10 14:34
Methyl acetate	ND		5.00	1.00	µg/L	1	05/13/10 14:34
Methylene chloride	ND		2.00	0.16	µg/L	1	05/13/10 14:34
trans-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
Methyl tert-butyl ether	ND		1.00	0.16	µg/L	1	05/13/10 14:34
1,1-Dichloroethane	ND		0.50	0.10	µg/L	1	05/13/10 14:34
cis-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
2-Butanone	ND		10.0	1.00	µg/L	1	05/13/10 14:34
Chloroform	ND		0.50	0.10	µg/L	1	05/13/10 14:34
1,1,1-Trichloroethane	ND		0.50	0.10	µg/L	1	05/13/10 14:34
Cyclohexane	ND		0.50	0.10	µg/L	1	05/13/10 14:34
Carbon tetrachloride	ND		0.50	0.10	µg/L	1	05/13/10 14:34
Benzene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
1,2-Dichloroethane	ND		0.50	0.16	µg/L	1	05/13/10 14:34
Trichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
Methylcyclohexane	ND		0.50	0.10	µg/L	1	05/13/10 14:34
1,2-Dichloropropane	ND		0.50	0.16	µg/L	1	05/13/10 14:34
Bromodichloromethane	ND		0.50	0.10	µg/L	1	05/13/10 14:34
cis-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/13/10 14:34
4-Methyl-2-pentanone	ND		5.00	1.00	µg/L	1	05/13/10 14:34
Toluene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
trans-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/13/10 14:34

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-003A**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*Trip Blank*
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER Q	**Date Received:**	05/04/10 8:31
Inst. ID:	MS01_11	**Sample Size:** 10 mL	**PrepDate:**
ColumnID	Rtx-VMS	**%Moisture:**	**BatchNo:** R19934
Revision:	06/04/10 13:49	**TestCode:** 8260W_OLM42	**FileID:** 1-SAMP-T9059.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
1,1,2-Trichloroethane	ND		0.50	0.16	µg/L	1	05/13/10 14:34
Tetrachloroethene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
Dibromochloromethane	ND		0.50	0.10	µg/L	1	05/13/10 14:34
1,2-Dibromoethane	ND		0.50	0.16	µg/L	1	05/13/10 14:34
Chlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
Ethylbenzene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
Xylenes (total)	ND		1.00	0.30	µg/L	1	05/13/10 14:34
Styrene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
Bromoform	ND		1.00	0.33	µg/L	1	05/13/10 14:34
Isopropylbenzene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
1,1,2,2-Tetrachloroethane	ND		0.50	0.10	µg/L	1	05/13/10 14:34
1,3-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
1,4-Dichlorobenzene	ND		0.50	0.16	µg/L	1	05/13/10 14:34
1,2-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 14:34
1,2-Dibromo-3-chloropropane	ND		5.00	1.00	µg/L	1	05/13/10 14:34
1,2,4-Trichlorobenzene	ND		1.00	0.10	µg/L	1	05/13/10 14:34
Surr: 1,2-Dichloroethane-d4	99		75-128	0.16	%REC	1	05/13/10 14:34
Surr: Toluene-d8	103		75-125	0.10	%REC	1	05/13/10 14:34
Surr: 4-Bromofluorobenzene	101		75-125	0.10	%REC	1	05/13/10 14:34

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005034
Matrix: WATER
Inst. ID: MS01_11 **Sample Size** 10 mL
ColumnID: Rtx-VMS **%Moisture:**
Revision: 05/18/10 5:57 **TestCode:** 8260W_OLM42
Col Type:

Lab ID: K1005034-001A
Client Sample ID: *MW-7-050410*
Collection Date: 05/04/10 11:20
Date Received: 05/05/10 8:30
PrepDate:
BatchNo: R19934
FileID: 1-SAMP-T9062.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					SW8260B		
(m+p)-Xylene	ND		1.00	0.20	µg/L	1	05/13/10 16:14
o-Xylene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
Dichlorodifluoromethane	ND		1.00	0.10	µg/L	1	05/13/10 16:14
Chloromethane	ND		1.00	0.33	µg/L	1	05/13/10 16:14
Vinyl chloride	ND		1.00	0.33	µg/L	1	05/13/10 16:14
Bromomethane	ND		1.00	0.33	µg/L	1	05/13/10 16:14
Chloroethane	ND		1.00	0.33	µg/L	1	05/13/10 16:14
Trichlorofluoromethane	ND		1.00	0.10	µg/L	1	05/13/10 16:14
1,1-Dichloroethene	ND		0.50	0.16	µg/L	1	05/13/10 16:14
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50	0.10	µg/L	1	05/13/10 16:14
Acetone	1.80	J	10.0	1.00	µg/L	1	05/13/10 16:14
Carbon disulfide	ND		0.50	0.11	µg/L	1	05/13/10 16:14
Methyl acetate	ND		5.00	1.00	µg/L	1	05/13/10 16:14
Methylene chloride	ND		2.00	0.16	µg/L	1	05/13/10 16:14
trans-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
Methyl tert-butyl ether	ND		1.00	0.16	µg/L	1	05/13/10 16:14
1,1-Dichloroethane	ND		0.50	0.10	µg/L	1	05/13/10 16:14
cis-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
2-Butanone	ND		10.0	1.00	µg/L	1	05/13/10 16:14
Chloroform	ND		0.50	0.10	µg/L	1	05/13/10 16:14
1,1,1-Trichloroethane	ND		0.50	0.10	µg/L	1	05/13/10 16:14
Cyclohexane	ND		0.50	0.10	µg/L	1	05/13/10 16:14
Carbon tetrachloride	ND		0.50	0.10	µg/L	1	05/13/10 16:14
Benzene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
1,2-Dichloroethane	ND		0.50	0.16	µg/L	1	05/13/10 16:14
Trichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
Methylcyclohexane	ND		0.50	0.10	µg/L	1	05/13/10 16:14
1,2-Dichloropropane	ND		0.50	0.16	µg/L	1	05/13/10 16:14
Bromodichloromethane	ND		0.50	0.10	µg/L	1	05/13/10 16:14
cis-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/13/10 16:14
4-Methyl-2-pentanone	ND		5.00	1.00	µg/L	1	05/13/10 16:14
Toluene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
trans-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/13/10 16:14
1,1,2-Trichloroethane	ND		0.50	0.16	µg/L	1	05/13/10 16:14

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Value exceeds the instrument calibration range
- J Analyte detected below the PQL
- P Prim./Conf. column %D or RPD exceeds limit
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Practical Quantitation Limit (PQL)
- S Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 6:02 508761 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005034
Matrix: WATER
Inst. ID: MS01_11
ColumnID: Rtx-VMS
Revision: 05/18/10 5:57
Col Type:

Sample Size 10 mL
%Moisture:
TestCode: 8260W_OLM42

Lab ID: K1005034-001A
Client Sample ID: *MW-7-050410*
Collection Date: 05/04/10 11:20
Date Received: 05/05/10 8:30
PrepDate:
BatchNo: R19934
FileID: 1-SAMP-T9062.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					SW8260B		
Tetrachloroethene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
Dibromochloromethane	ND		0.50	0.10	µg/L	1	05/13/10 16:14
1,2-Dibromoethane	ND		0.50	0.16	µg/L	1	05/13/10 16:14
Chlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
Ethylbenzene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
Xylenes (total)	ND		1.00	0.30	µg/L	1	05/13/10 16:14
Styrene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
Bromoform	ND		1.00	0.33	µg/L	1	05/13/10 16:14
Isopropylbenzene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
1,1,2,2-Tetrachloroethane	ND		0.50	0.10	µg/L	1	05/13/10 16:14
1,3-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
1,4-Dichlorobenzene	ND		0.50	0.16	µg/L	1	05/13/10 16:14
1,2-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 16:14
1,2-Dibromo-3-chloropropane	ND		5.00	1.00	µg/L	1	05/13/10 16:14
1,2,4-Trichlorobenzene	ND		1.00	0.10	µg/L	1	05/13/10 16:14
Surr: 1,2-Dichloroethane-d4	97		75-128	0.16	%REC	1	05/13/10 16:14
Surr: Toluene-d8	100		75-125	0.10	%REC	1	05/13/10 16:14
Surr: 4-Bromofluorobenzene	99		75-125	0.10	%REC	1	05/13/10 16:14

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 6:02 508761 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.

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East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005034-002A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***MW-3-050410***
W Order:	K1005034			**Collection Date:**	05/04/10 13:50
Matrix:	WATER			**Date Received:**	05/05/10 8:30
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19934
Revision:	05/18/10 5:57	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9063.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
(m+p)-Xylene	ND		1.00	0.20	µg/L	1	05/13/10 16:47
o-Xylene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
Dichlorodifluoromethane	ND		1.00	0.10	µg/L	1	05/13/10 16:47
Chloromethane	ND		1.00	0.33	µg/L	1	05/13/10 16:47
Vinyl chloride	ND		1.00	0.33	µg/L	1	05/13/10 16:47
Bromomethane	ND		1.00	0.33	µg/L	1	05/13/10 16:47
Chloroethane	ND		1.00	0.33	µg/L	1	05/13/10 16:47
Trichlorofluoromethane	ND		1.00	0.10	µg/L	1	05/13/10 16:47
1,1-Dichloroethene	ND		0.50	0.16	µg/L	1	05/13/10 16:47
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50	0.10	µg/L	1	05/13/10 16:47
Acetone	1.37	J	10.0	1.00	µg/L	1	05/13/10 16:47
Carbon disulfide	ND		0.50	0.11	µg/L	1	05/13/10 16:47
Methyl acetate	ND		5.00	1.00	µg/L	1	05/13/10 16:47
Methylene chloride	ND		2.00	0.16	µg/L	1	05/13/10 16:47
trans-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
Methyl tert-butyl ether	ND		1.00	0.16	µg/L	1	05/13/10 16:47
1,1-Dichloroethane	ND		0.50	0.10	µg/L	1	05/13/10 16:47
cis-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
2-Butanone	ND		10.0	1.00	µg/L	1	05/13/10 16:47
Chloroform	ND		0.50	0.10	µg/L	1	05/13/10 16:47
1,1,1-Trichloroethane	ND		0.50	0.10	µg/L	1	05/13/10 16:47
Cyclohexane	ND		0.50	0.10	µg/L	1	05/13/10 16:47
Carbon tetrachloride	ND		0.50	0.10	µg/L	1	05/13/10 16:47
Benzene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
1,2-Dichloroethane	ND		0.50	0.16	µg/L	1	05/13/10 16:47
Trichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
Methylcyclohexane	ND		0.50	0.10	µg/L	1	05/13/10 16:47
1,2-Dichloropropane	ND		0.50	0.16	µg/L	1	05/13/10 16:47
Bromodichloromethane	ND		0.50	0.10	µg/L	1	05/13/10 16:47
cis-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/13/10 16:47
4-Methyl-2-pentanone	ND		5.00	1.00	µg/L	1	05/13/10 16:47
Toluene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
trans-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/13/10 16:47
1,1,2-Trichloroethane	ND		0.50	0.16	µg/L	1	05/13/10 16:47

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 6:02 508762 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-002A**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-3-050410***
W Order:	K1005034	**Collection Date:**	05/04/10 13:50
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	MS01_11	**Sample Size** 10 mL	**PrepDate:**
ColumnID:	Rtx-VMS	**%Moisture:**	**BatchNo:** R19934
Revision:	05/18/10 5:57	**TestCode:** 8260W_OLM42	**FileID:** 1-SAMP-T9063.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
Tetrachloroethene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
Dibromochloromethane	ND		0.50	0.10	µg/L	1	05/13/10 16:47
1,2-Dibromoethane	ND		0.50	0.16	µg/L	1	05/13/10 16:47
Chlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
Ethylbenzene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
Xylenes (total)	ND		1.00	0.30	µg/L	1	05/13/10 16:47
Styrene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
Bromoform	ND		1.00	0.33	µg/L	1	05/13/10 16:47
Isopropylbenzene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
1,1,2,2-Tetrachloroethane	ND		0.50	0.10	µg/L	1	05/13/10 16:47
1,3-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
1,4-Dichlorobenzene	ND		0.50	0.16	µg/L	1	05/13/10 16:47
1,2-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 16:47
1,2-Dibromo-3-chloropropane	ND		5.00	1.00	µg/L	1	05/13/10 16:47
1,2,4-Trichlorobenzene	ND		1.00	0.10	µg/L	1	05/13/10 16:47
Surr: 1,2-Dichloroethane-d4	100		75-128	0.16	%REC	1	05/13/10 16:47
Surr: Toluene-d8	101		75-125	0.10	%REC	1	05/13/10 16:47
Surr: 4-Bromofluorobenzene	101		75-125	0.10	%REC	1	05/13/10 16:47

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 6:02 508762 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.

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East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005034-003A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***MW-2-050410***
W Order:	K1005034			**Collection Date:**	05/04/10 15:30
Matrix:	WATER			**Date Received:**	05/05/10 8:30
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19934
Revision:	05/18/10 5:57	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9064.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
(m+p)-Xylene	ND		1.00	0.20	µg/L	1	05/13/10 17:21
o-Xylene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
Dichlorodifluoromethane	ND		1.00	0.10	µg/L	1	05/13/10 17:21
Chloromethane	ND		1.00	0.33	µg/L	1	05/13/10 17:21
Vinyl chloride	ND		1.00	0.33	µg/L	1	05/13/10 17:21
Bromomethane	ND		1.00	0.33	µg/L	1	05/13/10 17:21
Chloroethane	ND		1.00	0.33	µg/L	1	05/13/10 17:21
Trichlorofluoromethane	ND		1.00	0.10	µg/L	1	05/13/10 17:21
1,1-Dichloroethene	ND		0.50	0.16	µg/L	1	05/13/10 17:21
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50	0.10	µg/L	1	05/13/10 17:21
Acetone	2.79	J	10.0	1.00	µg/L	1	05/13/10 17:21
Carbon disulfide	ND		0.50	0.11	µg/L	1	05/13/10 17:21
Methyl acetate	ND		5.00	1.00	µg/L	1	05/13/10 17:21
Methylene chloride	ND		2.00	0.16	µg/L	1	05/13/10 17:21
trans-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
Methyl tert-butyl ether	ND		1.00	0.16	µg/L	1	05/13/10 17:21
1,1-Dichloroethane	ND		0.50	0.10	µg/L	1	05/13/10 17:21
cis-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
2-Butanone	ND		10.0	1.00	µg/L	1	05/13/10 17:21
Chloroform	ND		0.50	0.10	µg/L	1	05/13/10 17:21
1,1,1-Trichloroethane	ND		0.50	0.10	µg/L	1	05/13/10 17:21
Cyclohexane	ND		0.50	0.10	µg/L	1	05/13/10 17:21
Carbon tetrachloride	ND		0.50	0.10	µg/L	1	05/13/10 17:21
Benzene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
1,2-Dichloroethane	ND		0.50	0.16	µg/L	1	05/13/10 17:21
Trichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
Methylcyclohexane	ND		0.50	0.10	µg/L	1	05/13/10 17:21
1,2-Dichloropropane	ND		0.50	0.16	µg/L	1	05/13/10 17:21
Bromodichloromethane	ND		0.50	0.10	µg/L	1	05/13/10 17:21
cis-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/13/10 17:21
4-Methyl-2-pentanone	ND		5.00	1.00	µg/L	1	05/13/10 17:21
Toluene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
trans-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/13/10 17:21
1,1,2-Trichloroethane	ND		0.50	0.16	µg/L	1	05/13/10 17:21

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 6:02 508763 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005034-003A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***MW-2-050410***
W Order:	K1005034			**Collection Date:**	05/04/10 15:30
Matrix:	WATER			**Date Received:**	05/05/10 8:30
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19934
Revision:	05/18/10 5:57	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9064.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
Tetrachloroethene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
Dibromochloromethane	ND		0.50	0.10	µg/L	1	05/13/10 17:21
1,2-Dibromoethane	ND		0.50	0.16	µg/L	1	05/13/10 17:21
Chlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
Ethylbenzene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
Xylenes (total)	ND		1.00	0.30	µg/L	1	05/13/10 17:21
Styrene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
Bromoform	ND		1.00	0.33	µg/L	1	05/13/10 17:21
Isopropylbenzene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
1,1,2,2-Tetrachloroethane	ND		0.50	0.10	µg/L	1	05/13/10 17:21
1,3-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
1,4-Dichlorobenzene	ND		0.50	0.16	µg/L	1	05/13/10 17:21
1,2-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 17:21
1,2-Dibromo-3-chloropropane	ND		5.00	1.00	µg/L	1	05/13/10 17:21
1,2,4-Trichlorobenzene	ND		1.00	0.10	µg/L	1	05/13/10 17:21
Surr: 1,2-Dichloroethane-d4	91		75-128	0.16	%REC	1	05/13/10 17:21
Surr: Toluene-d8	111		75-125	0.10	%REC	1	05/13/10 17:21
Surr: 4-Bromofluorobenzene	106		75-125	0.10	%REC	1	05/13/10 17:21

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 6:02 508763 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005034-004A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***Trip Blank***
W Order:	K1005034			**Collection Date:**	05/04/10 15:30
Matrix:	WATER Q			**Date Received:**	05/05/10 8:30
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19935
Revision:	05/18/10 8:16	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9082.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
(m+p)-Xylene	ND		1.00	0.20	µg/L	1	05/14/10 9:33
o-Xylene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
Dichlorodifluoromethane	ND		1.00	0.10	µg/L	1	05/14/10 9:33
Chloromethane	ND		1.00	0.33	µg/L	1	05/14/10 9:33
Vinyl chloride	ND		1.00	0.33	µg/L	1	05/14/10 9:33
Bromomethane	ND		1.00	0.33	µg/L	1	05/14/10 9:33
Chloroethane	ND		1.00	0.33	µg/L	1	05/14/10 9:33
Trichlorofluoromethane	ND		1.00	0.10	µg/L	1	05/14/10 9:33
1,1-Dichloroethene	ND		0.50	0.16	µg/L	1	05/14/10 9:33
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50	0.10	µg/L	1	05/14/10 9:33
Acetone	ND		10.0	1.00	µg/L	1	05/14/10 9:33
Carbon disulfide	ND		0.50	0.11	µg/L	1	05/14/10 9:33
Methyl acetate	ND		5.00	1.00	µg/L	1	05/14/10 9:33
Methylene chloride	ND		2.00	0.16	µg/L	1	05/14/10 9:33
trans-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
Methyl tert-butyl ether	ND		1.00	0.16	µg/L	1	05/14/10 9:33
1,1-Dichloroethane	ND		0.50	0.10	µg/L	1	05/14/10 9:33
cis-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
2-Butanone	ND		10.0	1.00	µg/L	1	05/14/10 9:33
Chloroform	ND		0.50	0.10	µg/L	1	05/14/10 9:33
1,1,1-Trichloroethane	ND		0.50	0.10	µg/L	1	05/14/10 9:33
Cyclohexane	ND		0.50	0.10	µg/L	1	05/14/10 9:33
Carbon tetrachloride	ND		0.50	0.10	µg/L	1	05/14/10 9:33
Benzene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
1,2-Dichloroethane	ND		0.50	0.16	µg/L	1	05/14/10 9:33
Trichloroethene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
Methylcyclohexane	ND		0.50	0.10	µg/L	1	05/14/10 9:33
1,2-Dichloropropane	ND		0.50	0.16	µg/L	1	05/14/10 9:33
Bromodichloromethane	ND		0.50	0.10	µg/L	1	05/14/10 9:33
cis-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/14/10 9:33
4-Methyl-2-pentanone	ND		5.00	1.00	µg/L	1	05/14/10 9:33
Toluene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
trans-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/14/10 9:33
1,1,2-Trichloroethane	ND		0.50	0.16	µg/L	1	05/14/10 9:33

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 8:19 508787 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-004A**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***Trip Blank***
W Order:	K1005034	**Collection Date:**	05/04/10 15:30
Matrix:	WATER Q	**Date Received:**	05/05/10 8:30
Inst. ID:	MS01_11	**Sample Size** 10 mL	**PrepDate:**
ColumnID:	Rtx-VMS	**%Moisture:**	**BatchNo:** R19935
Revision:	05/18/10 8:16	**TestCode:** 8260W_OLM42	**FileID:** 1-SAMP-T9082.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
Tetrachloroethene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
Dibromochloromethane	ND		0.50	0.10	µg/L	1	05/14/10 9:33
1,2-Dibromoethane	ND		0.50	0.16	µg/L	1	05/14/10 9:33
Chlorobenzene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
Ethylbenzene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
Xylenes (total)	ND		1.00	0.30	µg/L	1	05/14/10 9:33
Styrene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
Bromoform	ND		1.00	0.33	µg/L	1	05/14/10 9:33
Isopropylbenzene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
1,1,2,2-Tetrachloroethane	ND		0.50	0.10	µg/L	1	05/14/10 9:33
1,3-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
1,4-Dichlorobenzene	ND		0.50	0.16	µg/L	1	05/14/10 9:33
1,2-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/14/10 9:33
1,2-Dibromo-3-chloropropane	ND		5.00	1.00	µg/L	1	05/14/10 9:33
1,2,4-Trichlorobenzene	ND		1.00	0.10	µg/L	1	05/14/10 9:33
Surr: 1,2-Dichloroethane-d4	108		75-128	0.16	%REC	1	05/14/10 9:33
Surr: Toluene-d8	98		75-125	0.10	%REC	1	05/14/10 9:33
Surr: 4-Bromofluorobenzene	100		75-125	0.10	%REC	1	05/14/10 9:33

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-001A**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-125-050510***
W Order:	K1005042	**Collection Date:**	05/05/10 10:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	MS01_11	**Sample Size** 10 mL	**PrepDate:**
ColumnID:	Rtx-VMS	**%Moisture:**	**BatchNo:** R19935
Revision:	05/18/10 8:16	**TestCode:** 8260W_OLM42	**FileID:** 1-SAMP-T9084.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
(m+p)-Xylene	ND		1.00	0.20	µg/L	1	05/14/10 10:39
o-Xylene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
Dichlorodifluoromethane	ND		1.00	0.10	µg/L	1	05/14/10 10:39
Chloromethane	ND		1.00	0.33	µg/L	1	05/14/10 10:39
Vinyl chloride	ND		1.00	0.33	µg/L	1	05/14/10 10:39
Bromomethane	ND		1.00	0.33	µg/L	1	05/14/10 10:39
Chloroethane	ND		1.00	0.33	µg/L	1	05/14/10 10:39
Trichlorofluoromethane	ND		1.00	0.10	µg/L	1	05/14/10 10:39
1,1-Dichloroethene	ND		0.50	0.16	µg/L	1	05/14/10 10:39
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50	0.10	µg/L	1	05/14/10 10:39
Acetone	3.20	J	10.0	1.00	µg/L	1	05/14/10 10:39
Carbon disulfide	ND		0.50	0.11	µg/L	1	05/14/10 10:39
Methyl acetate	ND		5.00	1.00	µg/L	1	05/14/10 10:39
Methylene chloride	ND		2.00	0.16	µg/L	1	05/14/10 10:39
trans-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
Methyl tert-butyl ether	ND		1.00	0.16	µg/L	1	05/14/10 10:39
1,1-Dichloroethane	ND		0.50	0.10	µg/L	1	05/14/10 10:39
cis-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
2-Butanone	ND		10.0	1.00	µg/L	1	05/14/10 10:39
Chloroform	ND		0.50	0.10	µg/L	1	05/14/10 10:39
1,1,1-Trichloroethane	ND		0.50	0.10	µg/L	1	05/14/10 10:39
Cyclohexane	ND		0.50	0.10	µg/L	1	05/14/10 10:39
Carbon tetrachloride	ND		0.50	0.10	µg/L	1	05/14/10 10:39
Benzene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
1,2-Dichloroethane	ND		0.50	0.16	µg/L	1	05/14/10 10:39
Trichloroethene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
Methylcyclohexane	ND		0.50	0.10	µg/L	1	05/14/10 10:39
1,2-Dichloropropane	ND		0.50	0.16	µg/L	1	05/14/10 10:39
Bromodichloromethane	ND		0.50	0.10	µg/L	1	05/14/10 10:39
cis-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/14/10 10:39
4-Methyl-2-pentanone	ND		5.00	1.00	µg/L	1	05/14/10 10:39
Toluene	0.37	J	0.50	0.10	µg/L	1	05/14/10 10:39
trans-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/14/10 10:39
1,1,2-Trichloroethane	ND		0.50	0.16	µg/L	1	05/14/10 10:39

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005042-001A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***MW-125-050510***
W Order:	K1005042			**Collection Date:**	05/05/10 10:30
Matrix:	WATER			**Date Received:**	05/05/10 16:18
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19935
Revision:	05/18/10 8:16	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9084.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
Tetrachloroethene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
Dibromochloromethane	ND		0.50	0.10	µg/L	1	05/14/10 10:39
1,2-Dibromoethane	ND		0.50	0.16	µg/L	1	05/14/10 10:39
Chlorobenzene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
Ethylbenzene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
Xylenes (total)	ND		1.00	0.30	µg/L	1	05/14/10 10:39
Styrene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
Bromoform	ND		1.00	0.33	µg/L	1	05/14/10 10:39
Isopropylbenzene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
1,1,2,2-Tetrachloroethane	ND		0.50	0.10	µg/L	1	05/14/10 10:39
1,3-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
1,4-Dichlorobenzene	ND		0.50	0.16	µg/L	1	05/14/10 10:39
1,2-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/14/10 10:39
1,2-Dibromo-3-chloropropane	ND		5.00	1.00	µg/L	1	05/14/10 10:39
1,2,4-Trichlorobenzene	ND		1.00	0.10	µg/L	1	05/14/10 10:39
Surr: 1,2-Dichloroethane-d4	104		75-128	0.16	%REC	1	05/14/10 10:39
Surr: Toluene-d8	117		75-125	0.10	%REC	1	05/14/10 10:39
Surr: 4-Bromofluorobenzene	98		75-125	0.10	%REC	1	05/14/10 10:39

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/19/10 13:16 508788 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005042-002A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***MW-11-050510***
W Order:	K1005042			**Collection Date:**	05/05/10 12:30
Matrix:	WATER			**Date Received:**	05/05/10 16:18
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19949
Revision:	05/19/10 13:15	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9109.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
(m+p)-Xylene	ND		1.00	0.20	µg/L	1	05/18/10 12:33
o-Xylene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
Dichlorodifluoromethane	ND		1.00	0.10	µg/L	1	05/18/10 12:33
Chloromethane	ND		1.00	0.33	µg/L	1	05/18/10 12:33
Vinyl chloride	ND		1.00	0.33	µg/L	1	05/18/10 12:33
Bromomethane	ND		1.00	0.33	µg/L	1	05/18/10 12:33
Chloroethane	ND		1.00	0.33	µg/L	1	05/18/10 12:33
Trichlorofluoromethane	ND		1.00	0.10	µg/L	1	05/18/10 12:33
1,1-Dichloroethene	ND		0.50	0.16	µg/L	1	05/18/10 12:33
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50	0.10	µg/L	1	05/18/10 12:33
Acetone	1.35	J	10.0	1.00	µg/L	1	05/18/10 12:33
Carbon disulfide	ND		0.50	0.11	µg/L	1	05/18/10 12:33
Methyl acetate	ND		5.00	1.00	µg/L	1	05/18/10 12:33
Methylene chloride	ND		2.00	0.16	µg/L	1	05/18/10 12:33
trans-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
Methyl tert-butyl ether	ND		1.00	0.16	µg/L	1	05/18/10 12:33
1,1-Dichloroethane	ND		0.50	0.10	µg/L	1	05/18/10 12:33
cis-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
2-Butanone	ND		10.0	1.00	µg/L	1	05/18/10 12:33
Chloroform	ND		0.50	0.10	µg/L	1	05/18/10 12:33
1,1,1-Trichloroethane	ND		0.50	0.10	µg/L	1	05/18/10 12:33
Cyclohexane	ND		0.50	0.10	µg/L	1	05/18/10 12:33
Carbon tetrachloride	ND		0.50	0.10	µg/L	1	05/18/10 12:33
Benzene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
1,2-Dichloroethane	ND		0.50	0.16	µg/L	1	05/18/10 12:33
Trichloroethene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
Methylcyclohexane	ND		0.50	0.10	µg/L	1	05/18/10 12:33
1,2-Dichloropropane	ND		0.50	0.16	µg/L	1	05/18/10 12:33
Bromodichloromethane	ND		0.50	0.10	µg/L	1	05/18/10 12:33
cis-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/18/10 12:33
4-Methyl-2-pentanone	ND		5.00	1.00	µg/L	1	05/18/10 12:33
Toluene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
trans-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/18/10 12:33
1,1,2-Trichloroethane	ND		0.50	0.16	µg/L	1	05/18/10 12:33

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005042-002A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***MW-11-050510***
W Order:	K1005042			**Collection Date:**	05/05/10 12:30
Matrix:	WATER			**Date Received:**	05/05/10 16:18
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19949
Revision:	05/19/10 13:15	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9109.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
Tetrachloroethene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
Dibromochloromethane	ND		0.50	0.10	µg/L	1	05/18/10 12:33
1,2-Dibromoethane	ND		0.50	0.16	µg/L	1	05/18/10 12:33
Chlorobenzene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
Ethylbenzene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
Xylenes (total)	ND		1.00	0.30	µg/L	1	05/18/10 12:33
Styrene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
Bromoform	ND		1.00	0.33	µg/L	1	05/18/10 12:33
Isopropylbenzene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
1,1,2,2-Tetrachloroethane	ND		0.50	0.10	µg/L	1	05/18/10 12:33
1,3-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
1,4-Dichlorobenzene	ND		0.50	0.16	µg/L	1	05/18/10 12:33
1,2-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/18/10 12:33
1,2-Dibromo-3-chloropropane	ND		5.00	1.00	µg/L	1	05/18/10 12:33
1,2,4-Trichlorobenzene	ND		1.00	0.10	µg/L	1	05/18/10 12:33
Surr: 1,2-Dichloroethane-d4	107		75-128	0.16	%REC	1	05/18/10 12:33
Surr: Toluene-d8	96		75-125	0.10	%REC	1	05/18/10 12:33
Surr: 4-Bromofluorobenzene	100		75-125	0.10	%REC	1	05/18/10 12:33

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/19/10 13:16 509156 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-003A**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***X-1-050510***
W Order:	K1005042	**Collection Date:**	05/05/10 0:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	MS01_11	**Sample Size** 10 mL	**PrepDate:**
ColumnID:	Rtx-VMS	**%Moisture:**	**BatchNo:** R19949
Revision:	05/19/10 13:15	**TestCode:** 8260W_OLM42	**FileID:** 1-SAMP-T9110.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
(m+p)-Xylene	ND		1.00	0.20	µg/L	1	05/18/10 13:06
o-Xylene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
Dichlorodifluoromethane	ND		1.00	0.10	µg/L	1	05/18/10 13:06
Chloromethane	ND		1.00	0.33	µg/L	1	05/18/10 13:06
Vinyl chloride	ND		1.00	0.33	µg/L	1	05/18/10 13:06
Bromomethane	ND		1.00	0.33	µg/L	1	05/18/10 13:06
Chloroethane	ND		1.00	0.33	µg/L	1	05/18/10 13:06
Trichlorofluoromethane	ND		1.00	0.10	µg/L	1	05/18/10 13:06
1,1-Dichloroethene	ND		0.50	0.16	µg/L	1	05/18/10 13:06
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50	0.10	µg/L	1	05/18/10 13:06
Acetone	1.47	J	10.0	1.00	µg/L	1	05/18/10 13:06
Carbon disulfide	ND		0.50	0.11	µg/L	1	05/18/10 13:06
Methyl acetate	ND		5.00	1.00	µg/L	1	05/18/10 13:06
Methylene chloride	ND		2.00	0.16	µg/L	1	05/18/10 13:06
trans-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
Methyl tert-butyl ether	ND		1.00	0.16	µg/L	1	05/18/10 13:06
1,1-Dichloroethane	ND		0.50	0.10	µg/L	1	05/18/10 13:06
cis-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
2-Butanone	ND		10.0	1.00	µg/L	1	05/18/10 13:06
Chloroform	ND		0.50	0.10	µg/L	1	05/18/10 13:06
1,1,1-Trichloroethane	ND		0.50	0.10	µg/L	1	05/18/10 13:06
Cyclohexane	ND		0.50	0.10	µg/L	1	05/18/10 13:06
Carbon tetrachloride	ND		0.50	0.10	µg/L	1	05/18/10 13:06
Benzene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
1,2-Dichloroethane	ND		0.50	0.16	µg/L	1	05/18/10 13:06
Trichloroethene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
Methylcyclohexane	ND		0.50	0.10	µg/L	1	05/18/10 13:06
1,2-Dichloropropane	ND		0.50	0.16	µg/L	1	05/18/10 13:06
Bromodichloromethane	ND		0.50	0.10	µg/L	1	05/18/10 13:06
cis-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/18/10 13:06
4-Methyl-2-pentanone	ND		5.00	1.00	µg/L	1	05/18/10 13:06
Toluene	0.41	J	0.50	0.10	µg/L	1	05/18/10 13:06
trans-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/18/10 13:06
1,1,2-Trichloroethane	ND		0.50	0.16	µg/L	1	05/18/10 13:06

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005042-003A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***X-1-050510***
W Order:	K1005042			**Collection Date:**	05/05/10 0:00
Matrix:	WATER			**Date Received:**	05/05/10 16:18
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19949
Revision:	05/19/10 13:15	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9110.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
Tetrachloroethene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
Dibromochloromethane	ND		0.50	0.10	µg/L	1	05/18/10 13:06
1,2-Dibromoethane	ND		0.50	0.16	µg/L	1	05/18/10 13:06
Chlorobenzene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
Ethylbenzene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
Xylenes (total)	ND		1.00	0.30	µg/L	1	05/18/10 13:06
Styrene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
Bromoform	ND		1.00	0.33	µg/L	1	05/18/10 13:06
Isopropylbenzene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
1,1,2,2-Tetrachloroethane	ND		0.50	0.10	µg/L	1	05/18/10 13:06
1,3-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
1,4-Dichlorobenzene	ND		0.50	0.16	µg/L	1	05/18/10 13:06
1,2-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/18/10 13:06
1,2-Dibromo-3-chloropropane	ND		5.00	1.00	µg/L	1	05/18/10 13:06
1,2,4-Trichlorobenzene	ND		1.00	0.10	µg/L	1	05/18/10 13:06
Surr: 1,2-Dichloroethane-d4	104		75-128	0.16	%REC	1	05/18/10 13:06
Surr: Toluene-d8	94		75-125	0.10	%REC	1	05/18/10 13:06
Surr: 4-Bromofluorobenzene	103		75-125	0.10	%REC	1	05/18/10 13:06

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-004A**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***Drum-050510***
W Order:	K1005042	**Collection Date:**	05/05/10 14:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	MS01_11	**Sample Size:** 10 mL	**PrepDate:**
ColumnID	Rtx-VMS	**%Moisture:**	**BatchNo:** R19949
Revision:	05/24/10 14:41	**TestCode:** 8260W_OLM42	**FileID:** 1-SAMP-T9108.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
Benzene	29.0		5.00	1.00	µg/L	10	05/18/10 12:01
Toluene	4.40	J	5.00	1.00	µg/L	10	05/18/10 12:01
Ethylbenzene	22.9		5.00	1.00	µg/L	10	05/18/10 12:01
Xylenes (total)	41.4		10.0	3.00	µg/L	10	05/18/10 12:01
Surr: 1,2-Dichloroethane-d4	107		75-128	1.60	%REC	10	05/18/10 12:01
Surr: Toluene-d8	100		75-125	1.00	%REC	10	05/18/10 12:01
Surr: 4-Bromofluorobenzene	93		75-125	1.00	%REC	10	05/18/10 12:01

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005042-005A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***Trip Blank***
W Order:	K1005042			**Collection Date:**	05/05/10 10:30
Matrix:	WATER Q			**Date Received:**	05/05/10 16:18
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19934
Revision:	05/18/10 5:57	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9066.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
(m+p)-Xylene	ND		1.00	0.20	µg/L	1	05/13/10 18:28
o-Xylene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
Dichlorodifluoromethane	ND		1.00	0.10	µg/L	1	05/13/10 18:28
Chloromethane	ND		1.00	0.33	µg/L	1	05/13/10 18:28
Vinyl chloride	ND		1.00	0.33	µg/L	1	05/13/10 18:28
Bromomethane	ND		1.00	0.33	µg/L	1	05/13/10 18:28
Chloroethane	ND		1.00	0.33	µg/L	1	05/13/10 18:28
Trichlorofluoromethane	ND		1.00	0.10	µg/L	1	05/13/10 18:28
1,1-Dichloroethene	ND		0.50	0.16	µg/L	1	05/13/10 18:28
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50	0.10	µg/L	1	05/13/10 18:28
Acetone	1.03	J	10.0	1.00	µg/L	1	05/13/10 18:28
Carbon disulfide	ND		0.50	0.11	µg/L	1	05/13/10 18:28
Methyl acetate	ND		5.00	1.00	µg/L	1	05/13/10 18:28
Methylene chloride	0.16	J	2.00	0.16	µg/L	1	05/13/10 18:28
trans-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
Methyl tert-butyl ether	ND		1.00	0.16	µg/L	1	05/13/10 18:28
1,1-Dichloroethane	ND		0.50	0.10	µg/L	1	05/13/10 18:28
cis-1,2-Dichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
2-Butanone	ND		10.0	1.00	µg/L	1	05/13/10 18:28
Chloroform	ND		0.50	0.10	µg/L	1	05/13/10 18:28
1,1,1-Trichloroethane	ND		0.50	0.10	µg/L	1	05/13/10 18:28
Cyclohexane	ND		0.50	0.10	µg/L	1	05/13/10 18:28
Carbon tetrachloride	ND		0.50	0.10	µg/L	1	05/13/10 18:28
Benzene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
1,2-Dichloroethane	ND		0.50	0.16	µg/L	1	05/13/10 18:28
Trichloroethene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
Methylcyclohexane	ND		0.50	0.10	µg/L	1	05/13/10 18:28
1,2-Dichloropropane	ND		0.50	0.16	µg/L	1	05/13/10 18:28
Bromodichloromethane	ND		0.50	0.10	µg/L	1	05/13/10 18:28
cis-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/13/10 18:28
4-Methyl-2-pentanone	ND		5.00	1.00	µg/L	1	05/13/10 18:28
Toluene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
trans-1,3-Dichloropropene	ND		0.50	0.16	µg/L	1	05/13/10 18:28
1,1,2-Trichloroethane	ND		0.50	0.16	µg/L	1	05/13/10 18:28

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Value exceeds the instrument calibration range
- J Analyte detected below the PQL
- P Prim./Conf. column %D or RPD exceeds limit
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Practical Quantitation Limit (PQL)
- S Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

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East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005042-005A**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***Trip Blank***
W Order:	K1005042			**Collection Date:**	05/05/10 10:30
Matrix:	WATER Q			**Date Received:**	05/05/10 16:18
Inst. ID:	MS01_11	**Sample Size**	10 mL	**PrepDate:**	
ColumnID:	Rtx-VMS	**%Moisture:**		**BatchNo:**	R19934
Revision:	05/18/10 5:57	**TestCode:**	8260W_OLM42	**FileID:**	1-SAMP-T9066.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8260B**		
Tetrachloroethene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
Dibromochloromethane	ND		0.50	0.10	µg/L	1	05/13/10 18:28
1,2-Dibromoethane	ND		0.50	0.16	µg/L	1	05/13/10 18:28
Chlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
Ethylbenzene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
Xylenes (total)	ND		1.00	0.30	µg/L	1	05/13/10 18:28
Styrene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
Bromoform	ND		1.00	0.33	µg/L	1	05/13/10 18:28
Isopropylbenzene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
1,1,2,2-Tetrachloroethane	ND		0.50	0.10	µg/L	1	05/13/10 18:28
1,3-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
1,4-Dichlorobenzene	ND		0.50	0.16	µg/L	1	05/13/10 18:28
1,2-Dichlorobenzene	ND		0.50	0.10	µg/L	1	05/13/10 18:28
1,2-Dibromo-3-chloropropane	ND		5.00	1.00	µg/L	1	05/13/10 18:28
1,2,4-Trichlorobenzene	ND		1.00	0.10	µg/L	1	05/13/10 18:28
Surr: 1,2-Dichloroethane-d4	102		75-128	0.16	%REC	1	05/13/10 18:28
Surr: Toluene-d8	101		75-125	0.10	%REC	1	05/13/10 18:28
Surr: 4-Bromofluorobenzene	101		75-125	0.10	%REC	1	05/13/10 18:28

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/19/10 13:16 508765 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005028
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:** 980 mL
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005028-001B
Client Sample ID: *MW-4-050310*
Collection Date: 05/03/10 12:40
Date Received: 05/04/10 8:31
PrepDate: 05/05/10 12:00
BatchNo: 11176/R19855
FileID: 1-SAMP-K7423.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
1,2,4-Trichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 9:29
1,2-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 9:29
1,3-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 9:29
1,4-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 9:29
2,4,5-Trichlorophenol	ND		51	0.41	µg/L	1	05/07/10 9:29
2,4,6-Trichlorophenol	ND		10	0.41	µg/L	1	05/07/10 9:29
2,4-Dichlorophenol	ND		10	0.41	µg/L	1	05/07/10 9:29
2,4-Dimethylphenol	250	E	10	0.41	µg/L	1	05/07/10 9:29
2,4-Dinitrophenol	ND		51	20	µg/L	1	05/07/10 9:29
2,4-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 9:29
2,6-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 9:29
2-Chloronaphthalene	ND		10	0.41	µg/L	1	05/07/10 9:29
2-Chlorophenol	ND		10	0.41	µg/L	1	05/07/10 9:29
2-Methylnaphthalene	4.7	J	10	0.41	µg/L	1	05/07/10 9:29
2-Methylphenol	15		10	0.41	µg/L	1	05/07/10 9:29
2-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 9:29
2-Nitrophenol	ND		10	0.41	µg/L	1	05/07/10 9:29
3,3´-Dichlorobenzidine	ND		20	0.41	µg/L	1	05/07/10 9:29
3-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 9:29
4,6-Dinitro-2-methylphenol	ND		10	2.0	µg/L	1	05/07/10 9:29
4-Bromophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 9:29
4-Chloro-3-methylphenol	ND		10	0.41	µg/L	1	05/07/10 9:29
4-Chloroaniline	ND		10	0.41	µg/L	1	05/07/10 9:29
4-Chlorophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 9:29
4-Methylphenol	ND		10	0.41	µg/L	1	05/07/10 9:29
4-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 9:29
4-Nitrophenol	ND		51	2.0	µg/L	1	05/07/10 9:29
Acenaphthene	45		10	0.41	µg/L	1	05/07/10 9:29
Acenaphthylene	9.0	J	10	0.41	µg/L	1	05/07/10 9:29
Anthracene	0.83	J	10	0.41	µg/L	1	05/07/10 9:29
Benzo[a]anthracene	ND		10	0.41	µg/L	1	05/07/10 9:29
Benzo[a]pyrene	ND		10	0.41	µg/L	1	05/07/10 9:29
Benzo[b]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 9:29
Benzo[g,h,i]perylene	ND		10	0.41	µg/L	1	05/07/10 9:29

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:18 507598 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-001B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-4-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	MS06_40	**Sample Size:** 980 mL	**PrepDate:** 05/05/10 12:00
ColumnID:	DB-5MS	**%Moisture:**	**BatchNo:** 11176/R19855
Revision:	05/10/10 13:18	**TestCode:** 8270W_TCL	**FileID:** 1-SAMP-K7423.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Benzo[k]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 9:29
bis(2-Chloroethoxy)methane	ND		10	0.41	µg/L	1	05/07/10 9:29
bis(2-chloroethyl)ether	ND		10	0.41	µg/L	1	05/07/10 9:29
bis(2-chloroisopropyl)ether	ND		10	0.41	µg/L	1	05/07/10 9:29
bis(2-Ethylhexyl)phthalate	0.69	J	10	0.41	µg/L	1	05/07/10 9:29
Butyl benzyl phthalate	ND		10	0.41	µg/L	1	05/07/10 9:29
Carbazole	19		10	0.41	µg/L	1	05/07/10 9:29
Chrysene	ND		10	0.41	µg/L	1	05/07/10 9:29
Di-n-butyl phthalate	ND		10	1.2	µg/L	1	05/07/10 9:29
Di-n-octyl phthalate	ND		10	0.41	µg/L	1	05/07/10 9:29
Dibenz[a,h]anthracene	ND		10	0.41	µg/L	1	05/07/10 9:29
Dibenzofuran	16		10	0.41	µg/L	1	05/07/10 9:29
Diethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 9:29
Dimethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 9:29
Fluoranthene	0.50	J	10	0.41	µg/L	1	05/07/10 9:29
Fluorene	12		10	0.41	µg/L	1	05/07/10 9:29
Hexachlorobenzene	ND		10	0.41	µg/L	1	05/07/10 9:29
Hexachlorobutadiene	ND		10	5.1	µg/L	1	05/07/10 9:29
Hexachlorocyclopentadiene	ND		51	10	µg/L	1	05/07/10 9:29
Hexachloroethane	ND		10	2.0	µg/L	1	05/07/10 9:29
Indeno[1,2,3-cd]pyrene	ND		10	0.41	µg/L	1	05/07/10 9:29
Isophorone	ND		10	0.41	µg/L	1	05/07/10 9:29
N-Nitroso-di-n-propylamine	ND		10	0.41	µg/L	1	05/07/10 9:29
Naphthalene	1300	E	10	0.41	µg/L	1	05/07/10 9:29
Nitrobenzene	ND		10	0.41	µg/L	1	05/07/10 9:29
Pentachlorophenol	ND		51	2.0	µg/L	1	05/07/10 9:29
Phenanthrene	3.5	J	10	0.41	µg/L	1	05/07/10 9:29
Phenol	ND		10	0.41	µg/L	1	05/07/10 9:29
Pyrene	0.53	J	10	0.41	µg/L	1	05/07/10 9:29
Surr: 2,4,6-Tribromophenol	167	S	46-149	0.41	%REC	1	05/07/10 9:29
Surr: 2-Fluorobiphenyl	105		42-130	0.41	%REC	1	05/07/10 9:29
Surr: 2-Fluorophenol	96		26-130	0.41	%REC	1	05/07/10 9:29
Surr: Nitrobenzene-d5	84		42-130	0.41	%REC	1	05/07/10 9:29
Surr: Phenol-d5	90		21-134	0.41	%REC	1	05/07/10 9:29

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:18 507598 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-001B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-4-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	MS06_40	**Sample Size:** 980 mL	**PrepDate:** 05/05/10 12:00
ColumnID:	DB-5MS	**%Moisture:**	**BatchNo:** 11176/R19855
Revision:	05/10/10 13:18	**TestCode:** 8270W_TCL	**FileID:** 1-SAMP-K7423.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Surr: Terphenyl-d14	104		24-147	0.41	%REC	1	05/07/10 9:29

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:18 507598 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005028
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:** 980 mL
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005028-001BDL
Client Sample ID: *MW-4-050310*
Collection Date: 05/03/10 12:40
Date Received: 05/04/10 8:31
PrepDate: 05/05/10 12:00
BatchNo: 11176/R19855
FileID: 1-DL-K7435.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
1,2,4-Trichlorobenzene	ND		260	10	µg/L	25	05/07/10 17:12
1,2-Dichlorobenzene	ND		260	10	µg/L	25	05/07/10 17:12
1,3-Dichlorobenzene	ND		260	10	µg/L	25	05/07/10 17:12
1,4-Dichlorobenzene	ND		260	10	µg/L	25	05/07/10 17:12
2,4,5-Trichlorophenol	ND		1300	10	µg/L	25	05/07/10 17:12
2,4,6-Trichlorophenol	ND		260	10	µg/L	25	05/07/10 17:12
2,4-Dichlorophenol	ND		260	10	µg/L	25	05/07/10 17:12
2,4-Dimethylphenol	260		260	10	µg/L	25	05/07/10 17:12
2,4-Dinitrophenol	ND		1300	510	µg/L	25	05/07/10 17:12
2,4-Dinitrotoluene	ND		260	10	µg/L	25	05/07/10 17:12
2,6-Dinitrotoluene	ND		260	10	µg/L	25	05/07/10 17:12
2-Chloronaphthalene	ND		260	10	µg/L	25	05/07/10 17:12
2-Chlorophenol	ND		260	10	µg/L	25	05/07/10 17:12
2-Methylnaphthalene	ND		260	10	µg/L	25	05/07/10 17:12
2-Methylphenol	ND		260	10	µg/L	25	05/07/10 17:12
2-Nitroaniline	ND		1300	10	µg/L	25	05/07/10 17:12
2-Nitrophenol	ND		260	10	µg/L	25	05/07/10 17:12
3,3´-Dichlorobenzidine	ND		510	10	µg/L	25	05/07/10 17:12
3-Nitroaniline	ND		1300	10	µg/L	25	05/07/10 17:12
4,6-Dinitro-2-methylphenol	ND		260	51	µg/L	25	05/07/10 17:12
4-Bromophenyl phenyl ether	ND		260	10	µg/L	25	05/07/10 17:12
4-Chloro-3-methylphenol	ND		260	10	µg/L	25	05/07/10 17:12
4-Chloroaniline	ND		260	10	µg/L	25	05/07/10 17:12
4-Chlorophenyl phenyl ether	ND		260	10	µg/L	25	05/07/10 17:12
4-Methylphenol	ND		260	10	µg/L	25	05/07/10 17:12
4-Nitroaniline	ND		1300	10	µg/L	25	05/07/10 17:12
4-Nitrophenol	ND		1300	51	µg/L	25	05/07/10 17:12
Acenaphthene	38	J	260	10	µg/L	25	05/07/10 17:12
Acenaphthylene	ND		260	10	µg/L	25	05/07/10 17:12
Anthracene	ND		260	10	µg/L	25	05/07/10 17:12
Benzo[a]anthracene	ND		260	10	µg/L	25	05/07/10 17:12
Benzo[a]pyrene	ND		260	10	µg/L	25	05/07/10 17:12
Benzo[b]fluoranthene	ND		260	10	µg/L	25	05/07/10 17:12
Benzo[g,h,i]perylene	ND		260	10	µg/L	25	05/07/10 17:12

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:18 507606 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005028
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:** 980 mL
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005028-001BDL
Client Sample ID: *MW-4-050310*
Collection Date: 05/03/10 12:40
Date Received: 05/04/10 8:31
PrepDate: 05/05/10 12:00
BatchNo: 11176/R19855
FileID: 1-DL-K7435.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Benzo[k]fluoranthene	ND		260	10	µg/L	25	05/07/10 17:12
bis(2-Chloroethoxy)methane	ND		260	10	µg/L	25	05/07/10 17:12
bis(2-chloroethyl)ether	ND		260	10	µg/L	25	05/07/10 17:12
bis(2-chloroisopropyl)ether	ND		260	10	µg/L	25	05/07/10 17:12
bis(2-Ethylhexyl)phthalate	ND		260	10	µg/L	25	05/07/10 17:12
Butyl benzyl phthalate	ND		260	10	µg/L	25	05/07/10 17:12
Carbazole	18	J	260	10	µg/L	25	05/07/10 17:12
Chrysene	ND		260	10	µg/L	25	05/07/10 17:12
Di-n-butyl phthalate	ND		260	31	µg/L	25	05/07/10 17:12
Di-n-octyl phthalate	ND		260	10	µg/L	25	05/07/10 17:12
Dibenz[a,h]anthracene	ND		260	10	µg/L	25	05/07/10 17:12
Dibenzofuran	14	J	260	10	µg/L	25	05/07/10 17:12
Diethyl phthalate	ND		260	10	µg/L	25	05/07/10 17:12
Dimethyl phthalate	ND		260	10	µg/L	25	05/07/10 17:12
Fluoranthene	ND		260	10	µg/L	25	05/07/10 17:12
Fluorene	11	J	260	10	µg/L	25	05/07/10 17:12
Hexachlorobenzene	ND		260	10	µg/L	25	05/07/10 17:12
Hexachlorobutadiene	ND		260	130	µg/L	25	05/07/10 17:12
Hexachlorocyclopentadiene	ND		1300	260	µg/L	25	05/07/10 17:12
Hexachloroethane	ND		260	51	µg/L	25	05/07/10 17:12
Indeno[1,2,3-cd]pyrene	ND		260	10	µg/L	25	05/07/10 17:12
Isophorone	ND		260	10	µg/L	25	05/07/10 17:12
N-Nitroso-di-n-propylamine	ND		260	10	µg/L	25	05/07/10 17:12
Naphthalene	850		260	10	µg/L	25	05/07/10 17:12
Nitrobenzene	ND		260	10	µg/L	25	05/07/10 17:12
Pentachlorophenol	ND		1300	51	µg/L	25	05/07/10 17:12
Phenanthrene	ND		260	10	µg/L	25	05/07/10 17:12
Phenol	ND		260	10	µg/L	25	05/07/10 17:12
Pyrene	ND		260	10	µg/L	25	05/07/10 17:12
Surr: 2,4,6-Tribromophenol	135		46-149	10	%REC	25	05/07/10 17:12
Surr: 2-Fluorobiphenyl	84		42-130	10	%REC	25	05/07/10 17:12
Surr: 2-Fluorophenol	76		26-130	10	%REC	25	05/07/10 17:12
Surr: Nitrobenzene-d5	88		42-130	10	%REC	25	05/07/10 17:12
Surr: Phenol-d5	80		21-134	10	%REC	25	05/07/10 17:12

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:18 507606 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-001BDL**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-4-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	MS06_40	**Sample Size:** 980 mL	**PrepDate:** 05/05/10 12:00
ColumnID:	DB-5MS	**%Moisture:**	**BatchNo:** 11176/R19855
Revision:	05/10/10 13:18	**TestCode:** 8270W_TCL	**FileID:** 1-DL-K7435.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Surr: Terphenyl-d14	80		24-147	10	%REC	25	05/07/10 17:12

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:18 507606 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005028
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:** 980 mL
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005028-002B
Client Sample ID: *MW-5-050310*
Collection Date: 05/03/10 15:20
Date Received: 05/04/10 8:31
PrepDate: 05/05/10 12:00
BatchNo: 11176/R19855
FileID: 1-SAMP-K7424.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
1,2,4-Trichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 10:07
1,2-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 10:07
1,3-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 10:07
1,4-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 10:07
2,4,5-Trichlorophenol	ND		51	0.41	µg/L	1	05/07/10 10:07
2,4,6-Trichlorophenol	ND		10	0.41	µg/L	1	05/07/10 10:07
2,4-Dichlorophenol	ND		10	0.41	µg/L	1	05/07/10 10:07
2,4-Dimethylphenol	ND		10	0.41	µg/L	1	05/07/10 10:07
2,4-Dinitrophenol	ND		51	20	µg/L	1	05/07/10 10:07
2,4-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 10:07
2,6-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 10:07
2-Chloronaphthalene	ND		10	0.41	µg/L	1	05/07/10 10:07
2-Chlorophenol	ND		10	0.41	µg/L	1	05/07/10 10:07
2-Methylnaphthalene	43		10	0.41	µg/L	1	05/07/10 10:07
2-Methylphenol	ND		10	0.41	µg/L	1	05/07/10 10:07
2-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 10:07
2-Nitrophenol	ND		10	0.41	µg/L	1	05/07/10 10:07
3,3´-Dichlorobenzidine	ND		20	0.41	µg/L	1	05/07/10 10:07
3-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 10:07
4,6-Dinitro-2-methylphenol	ND		10	2.0	µg/L	1	05/07/10 10:07
4-Bromophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 10:07
4-Chloro-3-methylphenol	ND		10	0.41	µg/L	1	05/07/10 10:07
4-Chloroaniline	ND		10	0.41	µg/L	1	05/07/10 10:07
4-Chlorophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 10:07
4-Methylphenol	ND		10	0.41	µg/L	1	05/07/10 10:07
4-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 10:07
4-Nitrophenol	ND		51	2.0	µg/L	1	05/07/10 10:07
Acenaphthene	40		10	0.41	µg/L	1	05/07/10 10:07
Acenaphthylene	6.5	J	10	0.41	µg/L	1	05/07/10 10:07
Anthracene	3.5	J	10	0.41	µg/L	1	05/07/10 10:07
Benzo[a]anthracene	ND		10	0.41	µg/L	1	05/07/10 10:07
Benzo[a]pyrene	ND		10	0.41	µg/L	1	05/07/10 10:07
Benzo[b]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 10:07
Benzo[g,h,i]perylene	ND		10	0.41	µg/L	1	05/07/10 10:07

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:18 507599 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005028
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:** 980 mL
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005028-002B
Client Sample ID: *MW-5-050310*
Collection Date: 05/03/10 15:20
Date Received: 05/04/10 8:31
PrepDate: 05/05/10 12:00
BatchNo: 11176/R19855
FileID: 1-SAMP-K7424.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Benzo[k]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 10:07
bis(2-Chloroethoxy)methane	ND		10	0.41	µg/L	1	05/07/10 10:07
bis(2-chloroethyl)ether	ND		10	0.41	µg/L	1	05/07/10 10:07
bis(2-chloroisopropyl)ether	ND		10	0.41	µg/L	1	05/07/10 10:07
bis(2-Ethylhexyl)phthalate	0.78	J	10	0.41	µg/L	1	05/07/10 10:07
Butyl benzyl phthalate	ND		10	0.41	µg/L	1	05/07/10 10:07
Carbazole	4.7	J	10	0.41	µg/L	1	05/07/10 10:07
Chrysene	ND		10	0.41	µg/L	1	05/07/10 10:07
Di-n-butyl phthalate	ND		10	1.2	µg/L	1	05/07/10 10:07
Di-n-octyl phthalate	ND		10	0.41	µg/L	1	05/07/10 10:07
Dibenz[a,h]anthracene	ND		10	0.41	µg/L	1	05/07/10 10:07
Dibenzofuran	21		10	0.41	µg/L	1	05/07/10 10:07
Diethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 10:07
Dimethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 10:07
Fluoranthene	2.0	J	10	0.41	µg/L	1	05/07/10 10:07
Fluorene	27		10	0.41	µg/L	1	05/07/10 10:07
Hexachlorobenzene	ND		10	0.41	µg/L	1	05/07/10 10:07
Hexachlorobutadiene	ND		10	5.1	µg/L	1	05/07/10 10:07
Hexachlorocyclopentadiene	ND		51	10	µg/L	1	05/07/10 10:07
Hexachloroethane	ND		10	2.0	µg/L	1	05/07/10 10:07
Indeno[1,2,3-cd]pyrene	ND		10	0.41	µg/L	1	05/07/10 10:07
Isophorone	ND		10	0.41	µg/L	1	05/07/10 10:07
N-Nitroso-di-n-propylamine	ND		10	0.41	µg/L	1	05/07/10 10:07
Naphthalene	1400	E	10	0.41	µg/L	1	05/07/10 10:07
Nitrobenzene	ND		10	0.41	µg/L	1	05/07/10 10:07
Pentachlorophenol	ND		51	2.0	µg/L	1	05/07/10 10:07
Phenanthrene	31		10	0.41	µg/L	1	05/07/10 10:07
Phenol	ND		10	0.41	µg/L	1	05/07/10 10:07
Pyrene	1.6	J	10	0.41	µg/L	1	05/07/10 10:07
Surr: 2,4,6-Tribromophenol	166	S	46-149	0.41	%REC	1	05/07/10 10:07
Surr: 2-Fluorobiphenyl	104		42-130	0.41	%REC	1	05/07/10 10:07
Surr: 2-Fluorophenol	116		26-130	0.41	%REC	1	05/07/10 10:07
Surr: Nitrobenzene-d5	74		42-130	0.41	%REC	1	05/07/10 10:07
Surr: Phenol-d5	81		21-134	0.41	%REC	1	05/07/10 10:07

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:18 507599 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-002B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-5-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 15:20
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	MS06_40	**Sample Size:** 980 mL	**PrepDate:** 05/05/10 12:00
ColumnID:	DB-5MS	**%Moisture:**	**BatchNo:** 11176/R19855
Revision:	05/10/10 13:18	**TestCode:** 8270W_TCL	**FileID:** 1-SAMP-K7424.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Surr: Terphenyl-d14	92		24-147	0.41	%REC	1	05/07/10 10:07

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:18 507599 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005028
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:** 980 mL
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005028-002BDL
Client Sample ID: *MW-5-050310*
Collection Date: 05/03/10 15:20
Date Received: 05/04/10 8:31
PrepDate: 05/05/10 12:00
BatchNo: 11176/R19855
FileID: 1-DL-K7436.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
1,2,4-Trichlorobenzene	ND		260	10	µg/L	25	05/07/10 17:51
1,2-Dichlorobenzene	ND		260	10	µg/L	25	05/07/10 17:51
1,3-Dichlorobenzene	ND		260	10	µg/L	25	05/07/10 17:51
1,4-Dichlorobenzene	ND		260	10	µg/L	25	05/07/10 17:51
2,4,5-Trichlorophenol	ND		1300	10	µg/L	25	05/07/10 17:51
2,4,6-Trichlorophenol	ND		260	10	µg/L	25	05/07/10 17:51
2,4-Dichlorophenol	ND		260	10	µg/L	25	05/07/10 17:51
2,4-Dimethylphenol	ND		260	10	µg/L	25	05/07/10 17:51
2,4-Dinitrophenol	ND		1300	510	µg/L	25	05/07/10 17:51
2,4-Dinitrotoluene	ND		260	10	µg/L	25	05/07/10 17:51
2,6-Dinitrotoluene	ND		260	10	µg/L	25	05/07/10 17:51
2-Chloronaphthalene	ND		260	10	µg/L	25	05/07/10 17:51
2-Chlorophenol	ND		260	10	µg/L	25	05/07/10 17:51
2-Methylnaphthalene	43	J	260	10	µg/L	25	05/07/10 17:51
2-Methylphenol	ND		260	10	µg/L	25	05/07/10 17:51
2-Nitroaniline	ND		1300	10	µg/L	25	05/07/10 17:51
2-Nitrophenol	ND		260	10	µg/L	25	05/07/10 17:51
3,3´-Dichlorobenzidine	ND		510	10	µg/L	25	05/07/10 17:51
3-Nitroaniline	ND		1300	10	µg/L	25	05/07/10 17:51
4,6-Dinitro-2-methylphenol	ND		260	51	µg/L	25	05/07/10 17:51
4-Bromophenyl phenyl ether	ND		260	10	µg/L	25	05/07/10 17:51
4-Chloro-3-methylphenol	ND		260	10	µg/L	25	05/07/10 17:51
4-Chloroaniline	ND		260	10	µg/L	25	05/07/10 17:51
4-Chlorophenyl phenyl ether	ND		260	10	µg/L	25	05/07/10 17:51
4-Methylphenol	ND		260	10	µg/L	25	05/07/10 17:51
4-Nitroaniline	ND		1300	10	µg/L	25	05/07/10 17:51
4-Nitrophenol	ND		1300	51	µg/L	25	05/07/10 17:51
Acenaphthene	37	J	260	10	µg/L	25	05/07/10 17:51
Acenaphthylene	ND		260	10	µg/L	25	05/07/10 17:51
Anthracene	ND		260	10	µg/L	25	05/07/10 17:51
Benzo[a]anthracene	ND		260	10	µg/L	25	05/07/10 17:51
Benzo[a]pyrene	ND		260	10	µg/L	25	05/07/10 17:51
Benzo[b]fluoranthene	ND		260	10	µg/L	25	05/07/10 17:51
Benzo[g,h,i]perylene	ND		260	10	µg/L	25	05/07/10 17:51

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005028
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:** 980 mL
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005028-002BDL
Client Sample ID: *MW-5-050310*
Collection Date: 05/03/10 15:20
Date Received: 05/04/10 8:31
PrepDate: 05/05/10 12:00
BatchNo: 11176/R19855
FileID: 1-DL-K7436.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Benzo[k]fluoranthene	ND		260	10	µg/L	25	05/07/10 17:51
bis(2-Chloroethoxy)methane	ND		260	10	µg/L	25	05/07/10 17:51
bis(2-chloroethyl)ether	ND		260	10	µg/L	25	05/07/10 17:51
bis(2-chloroisopropyl)ether	ND		260	10	µg/L	25	05/07/10 17:51
bis(2-Ethylhexyl)phthalate	ND		260	10	µg/L	25	05/07/10 17:51
Butyl benzyl phthalate	ND		260	10	µg/L	25	05/07/10 17:51
Carbazole	ND		260	10	µg/L	25	05/07/10 17:51
Chrysene	ND		260	10	µg/L	25	05/07/10 17:51
Di-n-butyl phthalate	ND		260	31	µg/L	25	05/07/10 17:51
Di-n-octyl phthalate	ND		260	10	µg/L	25	05/07/10 17:51
Dibenz[a,h]anthracene	ND		260	10	µg/L	25	05/07/10 17:51
Dibenzofuran	19	J	260	10	µg/L	25	05/07/10 17:51
Diethyl phthalate	ND		260	10	µg/L	25	05/07/10 17:51
Dimethyl phthalate	ND		260	10	µg/L	25	05/07/10 17:51
Fluoranthene	ND		260	10	µg/L	25	05/07/10 17:51
Fluorene	24	J	260	10	µg/L	25	05/07/10 17:51
Hexachlorobenzene	ND		260	10	µg/L	25	05/07/10 17:51
Hexachlorobutadiene	ND		260	130	µg/L	25	05/07/10 17:51
Hexachlorocyclopentadiene	ND		1300	260	µg/L	25	05/07/10 17:51
Hexachloroethane	ND		260	51	µg/L	25	05/07/10 17:51
Indeno[1,2,3-cd]pyrene	ND		260	10	µg/L	25	05/07/10 17:51
Isophorone	ND		260	10	µg/L	25	05/07/10 17:51
N-Nitroso-di-n-propylamine	ND		260	10	µg/L	25	05/07/10 17:51
Naphthalene	960		260	10	µg/L	25	05/07/10 17:51
Nitrobenzene	ND		260	10	µg/L	25	05/07/10 17:51
Pentachlorophenol	ND		1300	51	µg/L	25	05/07/10 17:51
Phenanthrene	27	J	260	10	µg/L	25	05/07/10 17:51
Phenol	ND		260	10	µg/L	25	05/07/10 17:51
Pyrene	ND		260	10	µg/L	25	05/07/10 17:51
Surr: 2,4,6-Tribromophenol	122		46-149	10	%REC	25	05/07/10 17:51
Surr: 2-Fluorobiphenyl	80		42-130	10	%REC	25	05/07/10 17:51
Surr: 2-Fluorophenol	66		26-130	10	%REC	25	05/07/10 17:51
Surr: Nitrobenzene-d5	84		42-130	10	%REC	25	05/07/10 17:51
Surr: Phenol-d5	71		21-134	10	%REC	25	05/07/10 17:51

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:18 507607 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-002BDL**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-5-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 15:20
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	MS06_40 **Sample Size:** 980 mL	**PrepDate:**	05/05/10 12:00
ColumnID:	DB-5MS **%Moisture:**	**BatchNo:**	11176/R19855
Revision:	05/10/10 13:18 **TestCode:** 8270W_TCL	**FileID:**	1-DL-K7436.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Surr: Terphenyl-d14	71		24-147	10	%REC	25	05/07/10 17:51

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:18 507607 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005034
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:** 950 mL
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005034-001B
Client Sample ID: *MW-7-050410*
Collection Date: 05/04/10 11:20
Date Received: 05/05/10 8:30
PrepDate: 05/05/10 12:00
BatchNo: 11176/R19855
FileID: 1-SAMP-K7425.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
1,2,4-Trichlorobenzene	ND		11	0.42	µg/L	1	05/07/10 10:46
1,2-Dichlorobenzene	ND		11	0.42	µg/L	1	05/07/10 10:46
1,3-Dichlorobenzene	ND		11	0.42	µg/L	1	05/07/10 10:46
1,4-Dichlorobenzene	ND		11	0.42	µg/L	1	05/07/10 10:46
2,4,5-Trichlorophenol	ND		53	0.42	µg/L	1	05/07/10 10:46
2,4,6-Trichlorophenol	ND		11	0.42	µg/L	1	05/07/10 10:46
2,4-Dichlorophenol	ND		11	0.42	µg/L	1	05/07/10 10:46
2,4-Dimethylphenol	ND		11	0.42	µg/L	1	05/07/10 10:46
2,4-Dinitrophenol	ND		53	21	µg/L	1	05/07/10 10:46
2,4-Dinitrotoluene	ND		11	0.42	µg/L	1	05/07/10 10:46
2,6-Dinitrotoluene	ND		11	0.42	µg/L	1	05/07/10 10:46
2-Chloronaphthalene	ND		11	0.42	µg/L	1	05/07/10 10:46
2-Chlorophenol	ND		11	0.42	µg/L	1	05/07/10 10:46
2-Methylnaphthalene	ND		11	0.42	µg/L	1	05/07/10 10:46
2-Methylphenol	ND		11	0.42	µg/L	1	05/07/10 10:46
2-Nitroaniline	ND		53	0.42	µg/L	1	05/07/10 10:46
2-Nitrophenol	ND		11	0.42	µg/L	1	05/07/10 10:46
3,3´-Dichlorobenzidine	ND		21	0.42	µg/L	1	05/07/10 10:46
3-Nitroaniline	ND		53	0.42	µg/L	1	05/07/10 10:46
4,6-Dinitro-2-methylphenol	ND		11	2.1	µg/L	1	05/07/10 10:46
4-Bromophenyl phenyl ether	ND		11	0.42	µg/L	1	05/07/10 10:46
4-Chloro-3-methylphenol	ND		11	0.42	µg/L	1	05/07/10 10:46
4-Chloroaniline	ND		11	0.42	µg/L	1	05/07/10 10:46
4-Chlorophenyl phenyl ether	ND		11	0.42	µg/L	1	05/07/10 10:46
4-Methylphenol	ND		11	0.42	µg/L	1	05/07/10 10:46
4-Nitroaniline	ND		53	0.42	µg/L	1	05/07/10 10:46
4-Nitrophenol	ND		53	2.1	µg/L	1	05/07/10 10:46
Acenaphthene	ND		11	0.42	µg/L	1	05/07/10 10:46
Acenaphthylene	ND		11	0.42	µg/L	1	05/07/10 10:46
Anthracene	ND		11	0.42	µg/L	1	05/07/10 10:46
Benzo[a]anthracene	ND		11	0.42	µg/L	1	05/07/10 10:46
Benzo[a]pyrene	ND		11	0.42	µg/L	1	05/07/10 10:46
Benzo[b]fluoranthene	ND		11	0.42	µg/L	1	05/07/10 10:46
Benzo[g,h,i]perylene	ND		11	0.42	µg/L	1	05/07/10 10:46

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:23 507600 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005034
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:** 950 mL
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005034-001B
Client Sample ID: *MW-7-050410*
Collection Date: 05/04/10 11:20
Date Received: 05/05/10 8:30
PrepDate: 05/05/10 12:00
BatchNo: 11176/R19855
FileID: 1-SAMP-K7425.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Benzo[k]fluoranthene	ND		11	0.42	µg/L	1	05/07/10 10:46
bis(2-Chloroethoxy)methane	ND		11	0.42	µg/L	1	05/07/10 10:46
bis(2-chloroethyl)ether	ND		11	0.42	µg/L	1	05/07/10 10:46
bis(2-chloroisopropyl)ether	ND		11	0.42	µg/L	1	05/07/10 10:46
bis(2-Ethylhexyl)phthalate	ND		11	0.42	µg/L	1	05/07/10 10:46
Butyl benzyl phthalate	ND		11	0.42	µg/L	1	05/07/10 10:46
Carbazole	ND		11	0.42	µg/L	1	05/07/10 10:46
Chrysene	ND		11	0.42	µg/L	1	05/07/10 10:46
Di-n-butyl phthalate	ND		11	1.3	µg/L	1	05/07/10 10:46
Di-n-octyl phthalate	ND		11	0.42	µg/L	1	05/07/10 10:46
Dibenz[a,h]anthracene	ND		11	0.42	µg/L	1	05/07/10 10:46
Dibenzofuran	ND		11	0.42	µg/L	1	05/07/10 10:46
Diethyl phthalate	ND		11	0.42	µg/L	1	05/07/10 10:46
Dimethyl phthalate	ND		11	0.42	µg/L	1	05/07/10 10:46
Fluoranthene	ND		11	0.42	µg/L	1	05/07/10 10:46
Fluorene	ND		11	0.42	µg/L	1	05/07/10 10:46
Hexachlorobenzene	ND		11	0.42	µg/L	1	05/07/10 10:46
Hexachlorobutadiene	ND		11	5.3	µg/L	1	05/07/10 10:46
Hexachlorocyclopentadiene	ND		53	11	µg/L	1	05/07/10 10:46
Hexachloroethane	ND		11	2.1	µg/L	1	05/07/10 10:46
Indeno[1,2,3-cd]pyrene	ND		11	0.42	µg/L	1	05/07/10 10:46
Isophorone	ND		11	0.42	µg/L	1	05/07/10 10:46
N-Nitroso-di-n-propylamine	ND		11	0.42	µg/L	1	05/07/10 10:46
Naphthalene	ND		11	0.42	µg/L	1	05/07/10 10:46
Nitrobenzene	ND		11	0.42	µg/L	1	05/07/10 10:46
Pentachlorophenol	ND		53	2.1	µg/L	1	05/07/10 10:46
Phenanthrene	ND		11	0.42	µg/L	1	05/07/10 10:46
Phenol	ND		11	0.42	µg/L	1	05/07/10 10:46
Pyrene	ND		11	0.42	µg/L	1	05/07/10 10:46
Surr: 2,4,6-Tribromophenol	148		46-149	0.42	%REC	1	05/07/10 10:46
Surr: 2-Fluorobiphenyl	102		42-130	0.42	%REC	1	05/07/10 10:46
Surr: 2-Fluorophenol	84		26-130	0.42	%REC	1	05/07/10 10:46
Surr: Nitrobenzene-d5	92		42-130	0.42	%REC	1	05/07/10 10:46
Surr: Phenol-d5	81		21-134	0.42	%REC	1	05/07/10 10:46

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:23 507600 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-001B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-7-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 11:20
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	MS06_40 **Sample Size:** 950 mL	**PrepDate:**	05/05/10 12:00
ColumnID:	DB-5MS **%Moisture:**	**BatchNo:**	11176/R19855
Revision:	05/10/10 13:18 **TestCode:** 8270W_TCL	**FileID:**	1-SAMP-K7425.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Surr: Terphenyl-d14	117		24-147	0.42	%REC	1	05/07/10 10:46

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:23 507600 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-002B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-3-050410***
W Order:	K1005034	**Collection Date:**	05/04/10 13:50
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	MS06_40 **Sample Size:** 980 mL	**PrepDate:**	05/05/10 12:00
ColumnID:	DB-5MS **%Moisture:**	**BatchNo:**	11176/R19855
Revision:	05/10/10 13:18 **TestCode:** 8270W_TCL	**FileID:**	1-SAMP-K7426.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
1,2,4-Trichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 11:24
1,2-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 11:24
1,3-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 11:24
1,4-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 11:24
2,4,5-Trichlorophenol	ND		51	0.41	µg/L	1	05/07/10 11:24
2,4,6-Trichlorophenol	ND		10	0.41	µg/L	1	05/07/10 11:24
2,4-Dichlorophenol	ND		10	0.41	µg/L	1	05/07/10 11:24
2,4-Dimethylphenol	ND		10	0.41	µg/L	1	05/07/10 11:24
2,4-Dinitrophenol	ND		51	20	µg/L	1	05/07/10 11:24
2,4-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 11:24
2,6-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 11:24
2-Chloronaphthalene	ND		10	0.41	µg/L	1	05/07/10 11:24
2-Chlorophenol	ND		10	0.41	µg/L	1	05/07/10 11:24
2-Methylnaphthalene	ND		10	0.41	µg/L	1	05/07/10 11:24
2-Methylphenol	ND		10	0.41	µg/L	1	05/07/10 11:24
2-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 11:24
2-Nitrophenol	ND		10	0.41	µg/L	1	05/07/10 11:24
3,3´-Dichlorobenzidine	ND		20	0.41	µg/L	1	05/07/10 11:24
3-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 11:24
4,6-Dinitro-2-methylphenol	ND		10	2.0	µg/L	1	05/07/10 11:24
4-Bromophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 11:24
4-Chloro-3-methylphenol	ND		10	0.41	µg/L	1	05/07/10 11:24
4-Chloroaniline	ND		10	0.41	µg/L	1	05/07/10 11:24
4-Chlorophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 11:24
4-Methylphenol	ND		10	0.41	µg/L	1	05/07/10 11:24
4-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 11:24
4-Nitrophenol	ND		51	2.0	µg/L	1	05/07/10 11:24
Acenaphthene	ND		10	0.41	µg/L	1	05/07/10 11:24
Acenaphthylene	ND		10	0.41	µg/L	1	05/07/10 11:24
Anthracene	ND		10	0.41	µg/L	1	05/07/10 11:24
Benzo[a]anthracene	ND		10	0.41	µg/L	1	05/07/10 11:24
Benzo[a]pyrene	ND		10	0.41	µg/L	1	05/07/10 11:24
Benzo[b]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 11:24
Benzo[g,h,i]perylene	ND		10	0.41	µg/L	1	05/07/10 11:24

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:23 507601 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005034
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:** 980 mL
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005034-002B
Client Sample ID: *MW-3-050410*
Collection Date: 05/04/10 13:50
Date Received: 05/05/10 8:30
PrepDate: 05/05/10 12:00
BatchNo: 11176/R19855
FileID: 1-SAMP-K7426.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Benzo[k]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 11:24
bis(2-Chloroethoxy)methane	ND		10	0.41	µg/L	1	05/07/10 11:24
bis(2-chloroethyl)ether	ND		10	0.41	µg/L	1	05/07/10 11:24
bis(2-chloroisopropyl)ether	ND		10	0.41	µg/L	1	05/07/10 11:24
bis(2-Ethylhexyl)phthalate	0.57	J	10	0.41	µg/L	1	05/07/10 11:24
Butyl benzyl phthalate	ND		10	0.41	µg/L	1	05/07/10 11:24
Carbazole	ND		10	0.41	µg/L	1	05/07/10 11:24
Chrysene	ND		10	0.41	µg/L	1	05/07/10 11:24
Di-n-butyl phthalate	ND		10	1.2	µg/L	1	05/07/10 11:24
Di-n-octyl phthalate	ND		10	0.41	µg/L	1	05/07/10 11:24
Dibenz[a,h]anthracene	ND		10	0.41	µg/L	1	05/07/10 11:24
Dibenzofuran	ND		10	0.41	µg/L	1	05/07/10 11:24
Diethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 11:24
Dimethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 11:24
Fluoranthene	ND		10	0.41	µg/L	1	05/07/10 11:24
Fluorene	ND		10	0.41	µg/L	1	05/07/10 11:24
Hexachlorobenzene	ND		10	0.41	µg/L	1	05/07/10 11:24
Hexachlorobutadiene	ND		10	5.1	µg/L	1	05/07/10 11:24
Hexachlorocyclopentadiene	ND		51	10	µg/L	1	05/07/10 11:24
Hexachloroethane	ND		10	2.0	µg/L	1	05/07/10 11:24
Indeno[1,2,3-cd]pyrene	ND		10	0.41	µg/L	1	05/07/10 11:24
Isophorone	ND		10	0.41	µg/L	1	05/07/10 11:24
N-Nitroso-di-n-propylamine	ND		10	0.41	µg/L	1	05/07/10 11:24
Naphthalene	ND		10	0.41	µg/L	1	05/07/10 11:24
Nitrobenzene	ND		10	0.41	µg/L	1	05/07/10 11:24
Pentachlorophenol	ND		51	2.0	µg/L	1	05/07/10 11:24
Phenanthrene	ND		10	0.41	µg/L	1	05/07/10 11:24
Phenol	ND		10	0.41	µg/L	1	05/07/10 11:24
Pyrene	ND		10	0.41	µg/L	1	05/07/10 11:24
Surr: 2,4,6-Tribromophenol	123		46-149	0.41	%REC	1	05/07/10 11:24
Surr: 2-Fluorobiphenyl	101		42-130	0.41	%REC	1	05/07/10 11:24
Surr: 2-Fluorophenol	62		26-130	0.41	%REC	1	05/07/10 11:24
Surr: Nitrobenzene-d5	86		42-130	0.41	%REC	1	05/07/10 11:24
Surr: Phenol-d5	67		21-134	0.41	%REC	1	05/07/10 11:24

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:23 507601 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-002B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-3-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 13:50
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	MS06_40	**Sample Size:** 980 mL	**PrepDate:** 05/05/10 12:00
ColumnID:	DB-5MS	**%Moisture:**	**BatchNo:** 11176/R19855
Revision:	05/10/10 13:18	**TestCode:** 8270W_TCL	**FileID:** 1-SAMP-K7426.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Surr: Terphenyl-d14	124		24-147	0.41	%REC	1	05/07/10 11:24

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:23 507601 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-003B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-2-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 15:30
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	MS06_40	**Sample Size:** 970 mL	**PrepDate:** 05/05/10 12:00
ColumnID:	DB-5MS	**%Moisture:**	**BatchNo:** 11176/R19855
Revision:	05/10/10 13:18	**TestCode:** 8270W_TCL	**FileID:** 1-SAMP-K7427.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
1,2,4-Trichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 12:03
1,2-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 12:03
1,3-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 12:03
1,4-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 12:03
2,4,5-Trichlorophenol	ND		52	0.41	µg/L	1	05/07/10 12:03
2,4,6-Trichlorophenol	ND		10	0.41	µg/L	1	05/07/10 12:03
2,4-Dichlorophenol	ND		10	0.41	µg/L	1	05/07/10 12:03
2,4-Dimethylphenol	ND		10	0.41	µg/L	1	05/07/10 12:03
2,4-Dinitrophenol	ND		52	21	µg/L	1	05/07/10 12:03
2,4-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 12:03
2,6-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 12:03
2-Chloronaphthalene	ND		10	0.41	µg/L	1	05/07/10 12:03
2-Chlorophenol	ND		10	0.41	µg/L	1	05/07/10 12:03
2-Methylnaphthalene	ND		10	0.41	µg/L	1	05/07/10 12:03
2-Methylphenol	ND		10	0.41	µg/L	1	05/07/10 12:03
2-Nitroaniline	ND		52	0.41	µg/L	1	05/07/10 12:03
2-Nitrophenol	ND		10	0.41	µg/L	1	05/07/10 12:03
3,3´-Dichlorobenzidine	ND		21	0.41	µg/L	1	05/07/10 12:03
3-Nitroaniline	ND		52	0.41	µg/L	1	05/07/10 12:03
4,6-Dinitro-2-methylphenol	ND		10	2.1	µg/L	1	05/07/10 12:03
4-Bromophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 12:03
4-Chloro-3-methylphenol	ND		10	0.41	µg/L	1	05/07/10 12:03
4-Chloroaniline	ND		10	0.41	µg/L	1	05/07/10 12:03
4-Chlorophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 12:03
4-Methylphenol	ND		10	0.41	µg/L	1	05/07/10 12:03
4-Nitroaniline	ND		52	0.41	µg/L	1	05/07/10 12:03
4-Nitrophenol	ND		52	2.1	µg/L	1	05/07/10 12:03
Acenaphthene	ND		10	0.41	µg/L	1	05/07/10 12:03
Acenaphthylene	ND		10	0.41	µg/L	1	05/07/10 12:03
Anthracene	ND		10	0.41	µg/L	1	05/07/10 12:03
Benzo[a]anthracene	ND		10	0.41	µg/L	1	05/07/10 12:03
Benzo[a]pyrene	ND		10	0.41	µg/L	1	05/07/10 12:03
Benzo[b]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 12:03
Benzo[g,h,i]perylene	ND		10	0.41	µg/L	1	05/07/10 12:03

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005034
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:** 970 mL
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005034-003B
Client Sample ID: *MW-2-050410*
Collection Date: 05/04/10 15:30
Date Received: 05/05/10 8:30
PrepDate: 05/05/10 12:00
BatchNo: 11176/R19855
FileID: 1-SAMP-K7427.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Benzo[k]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 12:03
bis(2-Chloroethoxy)methane	ND		10	0.41	µg/L	1	05/07/10 12:03
bis(2-chloroethyl)ether	ND		10	0.41	µg/L	1	05/07/10 12:03
bis(2-chloroisopropyl)ether	ND		10	0.41	µg/L	1	05/07/10 12:03
bis(2-Ethylhexyl)phthalate	0.47	J	10	0.41	µg/L	1	05/07/10 12:03
Butyl benzyl phthalate	ND		10	0.41	µg/L	1	05/07/10 12:03
Carbazole	ND		10	0.41	µg/L	1	05/07/10 12:03
Chrysene	ND		10	0.41	µg/L	1	05/07/10 12:03
Di-n-butyl phthalate	ND		10	1.2	µg/L	1	05/07/10 12:03
Di-n-octyl phthalate	ND		10	0.41	µg/L	1	05/07/10 12:03
Dibenz[a,h]anthracene	ND		10	0.41	µg/L	1	05/07/10 12:03
Dibenzofuran	ND		10	0.41	µg/L	1	05/07/10 12:03
Diethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 12:03
Dimethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 12:03
Fluoranthene	ND		10	0.41	µg/L	1	05/07/10 12:03
Fluorene	ND		10	0.41	µg/L	1	05/07/10 12:03
Hexachlorobenzene	ND		10	0.41	µg/L	1	05/07/10 12:03
Hexachlorobutadiene	ND		10	5.2	µg/L	1	05/07/10 12:03
Hexachlorocyclopentadiene	ND		52	10	µg/L	1	05/07/10 12:03
Hexachloroethane	ND		10	2.1	µg/L	1	05/07/10 12:03
Indeno[1,2,3-cd]pyrene	ND		10	0.41	µg/L	1	05/07/10 12:03
Isophorone	ND		10	0.41	µg/L	1	05/07/10 12:03
N-Nitroso-di-n-propylamine	ND		10	0.41	µg/L	1	05/07/10 12:03
Naphthalene	ND		10	0.41	µg/L	1	05/07/10 12:03
Nitrobenzene	ND		10	0.41	µg/L	1	05/07/10 12:03
Pentachlorophenol	ND		52	2.1	µg/L	1	05/07/10 12:03
Phenanthrene	ND		10	0.41	µg/L	1	05/07/10 12:03
Phenol	ND		10	0.41	µg/L	1	05/07/10 12:03
Pyrene	ND		10	0.41	µg/L	1	05/07/10 12:03
Surr: 2,4,6-Tribromophenol	148		46-149	0.41	%REC	1	05/07/10 12:03
Surr: 2-Fluorobiphenyl	101		42-130	0.41	%REC	1	05/07/10 12:03
Surr: 2-Fluorophenol	80		26-130	0.41	%REC	1	05/07/10 12:03
Surr: Nitrobenzene-d5	91		42-130	0.41	%REC	1	05/07/10 12:03
Surr: Phenol-d5	78		21-134	0.41	%REC	1	05/07/10 12:03

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:23 507602 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-003B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-2-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 15:30
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	MS06_40 **Sample Size:** 970 mL	**PrepDate:**	05/05/10 12:00
ColumnID:	DB-5MS **%Moisture:**	**BatchNo:**	11176/R19855
Revision:	05/10/10 13:18 **TestCode:** 8270W_TCL	**FileID:**	1-SAMP-K7427.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Surr: Terphenyl-d14	121		24-147	0.41	%REC	1	05/07/10 12:03

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:23 507602 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
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Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005042
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:**
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005042-001B
Client Sample ID: *MW-125-050510*
Collection Date: 05/05/10 10:30
Date Received: 05/05/10 16:18
PrepDate: 05/06/10 14:45
BatchNo: 11183/R19855
FileID: 1-SAMP-K7428.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
1,2,4-Trichlorobenzene	ND		11	0.43	µg/L	1	05/07/10 12:42
1,2-Dichlorobenzene	ND		11	0.43	µg/L	1	05/07/10 12:42
1,3-Dichlorobenzene	ND		11	0.43	µg/L	1	05/07/10 12:42
1,4-Dichlorobenzene	ND		11	0.43	µg/L	1	05/07/10 12:42
2,4,5-Trichlorophenol	ND		53	0.43	µg/L	1	05/07/10 12:42
2,4,6-Trichlorophenol	ND		11	0.43	µg/L	1	05/07/10 12:42
2,4-Dichlorophenol	ND		11	0.43	µg/L	1	05/07/10 12:42
2,4-Dimethylphenol	ND		11	0.43	µg/L	1	05/07/10 12:42
2,4-Dinitrophenol	ND		53	21	µg/L	1	05/07/10 12:42
2,4-Dinitrotoluene	ND		11	0.43	µg/L	1	05/07/10 12:42
2,6-Dinitrotoluene	ND		11	0.43	µg/L	1	05/07/10 12:42
2-Chloronaphthalene	ND		11	0.43	µg/L	1	05/07/10 12:42
2-Chlorophenol	ND		11	0.43	µg/L	1	05/07/10 12:42
2-Methylnaphthalene	ND		11	0.43	µg/L	1	05/07/10 12:42
2-Methylphenol	ND		11	0.43	µg/L	1	05/07/10 12:42
2-Nitroaniline	ND		53	0.43	µg/L	1	05/07/10 12:42
2-Nitrophenol	ND		11	0.43	µg/L	1	05/07/10 12:42
3,3´-Dichlorobenzidine	ND		21	0.43	µg/L	1	05/07/10 12:42
3-Nitroaniline	ND		53	0.43	µg/L	1	05/07/10 12:42
4,6-Dinitro-2-methylphenol	ND		11	2.1	µg/L	1	05/07/10 12:42
4-Bromophenyl phenyl ether	ND		11	0.43	µg/L	1	05/07/10 12:42
4-Chloro-3-methylphenol	ND		11	0.43	µg/L	1	05/07/10 12:42
4-Chloroaniline	ND		11	0.43	µg/L	1	05/07/10 12:42
4-Chlorophenyl phenyl ether	ND		11	0.43	µg/L	1	05/07/10 12:42
4-Methylphenol	ND		11	0.43	µg/L	1	05/07/10 12:42
4-Nitroaniline	ND		53	0.43	µg/L	1	05/07/10 12:42
4-Nitrophenol	ND		53	2.1	µg/L	1	05/07/10 12:42
Acenaphthene	ND		11	0.43	µg/L	1	05/07/10 12:42
Acenaphthylene	ND		11	0.43	µg/L	1	05/07/10 12:42
Anthracene	ND		11	0.43	µg/L	1	05/07/10 12:42
Benzo[a]anthracene	ND		11	0.43	µg/L	1	05/07/10 12:42
Benzo[a]pyrene	ND		11	0.43	µg/L	1	05/07/10 12:42
Benzo[b]fluoranthene	ND		11	0.43	µg/L	1	05/07/10 12:42
Benzo[g,h,i]perylene	ND		11	0.43	µg/L	1	05/07/10 12:42

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:28 507603 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005042
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:**
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005042-001B
Client Sample ID: *MW-125-050510*
Collection Date: 05/05/10 10:30
Date Received: 05/05/10 16:18
PrepDate: 05/06/10 14:45
BatchNo: 11183/R19855
FileID: 1-SAMP-K7428.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Benzo[k]fluoranthene	ND		11	0.43	µg/L	1	05/07/10 12:42
bis(2-Chloroethoxy)methane	ND		11	0.43	µg/L	1	05/07/10 12:42
bis(2-chloroethyl)ether	ND		11	0.43	µg/L	1	05/07/10 12:42
bis(2-chloroisopropyl)ether	ND		11	0.43	µg/L	1	05/07/10 12:42
bis(2-Ethylhexyl)phthalate	0.46	J	11	0.43	µg/L	1	05/07/10 12:42
Butyl benzyl phthalate	ND		11	0.43	µg/L	1	05/07/10 12:42
Carbazole	ND		11	0.43	µg/L	1	05/07/10 12:42
Chrysene	ND		11	0.43	µg/L	1	05/07/10 12:42
Di-n-butyl phthalate	ND		11	1.3	µg/L	1	05/07/10 12:42
Di-n-octyl phthalate	ND		11	0.43	µg/L	1	05/07/10 12:42
Dibenz[a,h]anthracene	ND		11	0.43	µg/L	1	05/07/10 12:42
Dibenzofuran	ND		11	0.43	µg/L	1	05/07/10 12:42
Diethyl phthalate	ND		11	0.43	µg/L	1	05/07/10 12:42
Dimethyl phthalate	ND		11	0.43	µg/L	1	05/07/10 12:42
Fluoranthene	ND		11	0.43	µg/L	1	05/07/10 12:42
Fluorene	ND		11	0.43	µg/L	1	05/07/10 12:42
Hexachlorobenzene	ND		11	0.43	µg/L	1	05/07/10 12:42
Hexachlorobutadiene	ND		11	5.3	µg/L	1	05/07/10 12:42
Hexachlorocyclopentadiene	ND		53	11	µg/L	1	05/07/10 12:42
Hexachloroethane	ND		11	2.1	µg/L	1	05/07/10 12:42
Indeno[1,2,3-cd]pyrene	ND		11	0.43	µg/L	1	05/07/10 12:42
Isophorone	ND		11	0.43	µg/L	1	05/07/10 12:42
N-Nitroso-di-n-propylamine	ND		11	0.43	µg/L	1	05/07/10 12:42
Naphthalene	ND		11	0.43	µg/L	1	05/07/10 12:42
Nitrobenzene	ND		11	0.43	µg/L	1	05/07/10 12:42
Pentachlorophenol	ND		53	2.1	µg/L	1	05/07/10 12:42
Phenanthrene	ND		11	0.43	µg/L	1	05/07/10 12:42
Phenol	ND		11	0.43	µg/L	1	05/07/10 12:42
Pyrene	ND		11	0.43	µg/L	1	05/07/10 12:42
Surr: 2,4,6-Tribromophenol	149		46-149	0.43	%REC	1	05/07/10 12:42
Surr: 2-Fluorobiphenyl	110		42-130	0.43	%REC	1	05/07/10 12:42
Surr: 2-Fluorophenol	90		26-130	0.43	%REC	1	05/07/10 12:42
Surr: Nitrobenzene-d5	97		42-130	0.43	%REC	1	05/07/10 12:42
Surr: Phenol-d5	85		21-134	0.43	%REC	1	05/07/10 12:42

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:28 507603 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005042-001B**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	*MW-125-050510*
W Order:	K1005042			**Collection Date:**	05/05/10 10:30
Matrix:	WATER			**Date Received:**	05/05/10 16:18
Inst. ID:	MS06_40	**Sample Size:**		**PrepDate:**	05/06/10 14:45
ColumnID:	DB-5MS	**%Moisture:**		**BatchNo:**	11183/R19855
Revision:	05/10/10 13:18	**TestCode:**	8270W_TCL	**FileID:**	1-SAMP-K7428.D
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Surr: Terphenyl-d14	88		24-147	0.43	%REC	1	05/07/10 12:42

Qualifiers:	*	Value exceeds Maximum Contaminant Level		B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range		H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL		ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit		S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:28 507603 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-002B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-11-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 12:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	MS06_40 **Sample Size:**	**PrepDate:**	05/06/10 14:45
ColumnID:	DB-5MS **%Moisture:**	**BatchNo:**	11183/R19855
Revision:	05/10/10 13:18 **TestCode:** 8270W_TCL	**FileID:**	1-SAMP-K7429.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
1,2,4-Trichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 13:20
1,2-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 13:20
1,3-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 13:20
1,4-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 13:20
2,4,5-Trichlorophenol	ND		51	0.41	µg/L	1	05/07/10 13:20
2,4,6-Trichlorophenol	ND		10	0.41	µg/L	1	05/07/10 13:20
2,4-Dichlorophenol	ND		10	0.41	µg/L	1	05/07/10 13:20
2,4-Dimethylphenol	ND		10	0.41	µg/L	1	05/07/10 13:20
2,4-Dinitrophenol	ND		51	20	µg/L	1	05/07/10 13:20
2,4-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 13:20
2,6-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 13:20
2-Chloronaphthalene	ND		10	0.41	µg/L	1	05/07/10 13:20
2-Chlorophenol	ND		10	0.41	µg/L	1	05/07/10 13:20
2-Methylnaphthalene	ND		10	0.41	µg/L	1	05/07/10 13:20
2-Methylphenol	ND		10	0.41	µg/L	1	05/07/10 13:20
2-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 13:20
2-Nitrophenol	ND		10	0.41	µg/L	1	05/07/10 13:20
3,3´-Dichlorobenzidine	ND		20	0.41	µg/L	1	05/07/10 13:20
3-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 13:20
4,6-Dinitro-2-methylphenol	ND		10	2.0	µg/L	1	05/07/10 13:20
4-Bromophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 13:20
4-Chloro-3-methylphenol	ND		10	0.41	µg/L	1	05/07/10 13:20
4-Chloroaniline	ND		10	0.41	µg/L	1	05/07/10 13:20
4-Chlorophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 13:20
4-Methylphenol	ND		10	0.41	µg/L	1	05/07/10 13:20
4-Nitroaniline	ND		51	0.41	µg/L	1	05/07/10 13:20
4-Nitrophenol	ND		51	2.0	µg/L	1	05/07/10 13:20
Acenaphthene	ND		10	0.41	µg/L	1	05/07/10 13:20
Acenaphthylene	ND		10	0.41	µg/L	1	05/07/10 13:20
Anthracene	ND		10	0.41	µg/L	1	05/07/10 13:20
Benzo[a]anthracene	ND		10	0.41	µg/L	1	05/07/10 13:20
Benzo[a]pyrene	ND		10	0.41	µg/L	1	05/07/10 13:20
Benzo[b]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 13:20
Benzo[g,h,i]perylene	ND		10	0.41	µg/L	1	05/07/10 13:20

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005042
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:**
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005042-002B
Client Sample ID: *MW-11-050510*
Collection Date: 05/05/10 12:30
Date Received: 05/05/10 16:18
PrepDate: 05/06/10 14:45
BatchNo: 11183/R19855
FileID: 1-SAMP-K7429.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Benzo[k]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 13:20
bis(2-Chloroethoxy)methane	ND		10	0.41	µg/L	1	05/07/10 13:20
bis(2-chloroethyl)ether	ND		10	0.41	µg/L	1	05/07/10 13:20
bis(2-chloroisopropyl)ether	ND		10	0.41	µg/L	1	05/07/10 13:20
bis(2-Ethylhexyl)phthalate	ND		10	0.41	µg/L	1	05/07/10 13:20
Butyl benzyl phthalate	ND		10	0.41	µg/L	1	05/07/10 13:20
Carbazole	ND		10	0.41	µg/L	1	05/07/10 13:20
Chrysene	ND		10	0.41	µg/L	1	05/07/10 13:20
Di-n-butyl phthalate	ND		10	1.2	µg/L	1	05/07/10 13:20
Di-n-octyl phthalate	ND		10	0.41	µg/L	1	05/07/10 13:20
Dibenz[a,h]anthracene	ND		10	0.41	µg/L	1	05/07/10 13:20
Dibenzofuran	ND		10	0.41	µg/L	1	05/07/10 13:20
Diethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 13:20
Dimethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 13:20
Fluoranthene	ND		10	0.41	µg/L	1	05/07/10 13:20
Fluorene	ND		10	0.41	µg/L	1	05/07/10 13:20
Hexachlorobenzene	ND		10	0.41	µg/L	1	05/07/10 13:20
Hexachlorobutadiene	ND		10	5.1	µg/L	1	05/07/10 13:20
Hexachlorocyclopentadiene	ND		51	10	µg/L	1	05/07/10 13:20
Hexachloroethane	ND		10	2.0	µg/L	1	05/07/10 13:20
Indeno[1,2,3-cd]pyrene	ND		10	0.41	µg/L	1	05/07/10 13:20
Isophorone	ND		10	0.41	µg/L	1	05/07/10 13:20
N-Nitroso-di-n-propylamine	ND		10	0.41	µg/L	1	05/07/10 13:20
Naphthalene	ND		10	0.41	µg/L	1	05/07/10 13:20
Nitrobenzene	ND		10	0.41	µg/L	1	05/07/10 13:20
Pentachlorophenol	ND		51	2.0	µg/L	1	05/07/10 13:20
Phenanthrene	ND		10	0.41	µg/L	1	05/07/10 13:20
Phenol	ND		10	0.41	µg/L	1	05/07/10 13:20
Pyrene	ND		10	0.41	µg/L	1	05/07/10 13:20
Surr: 2,4,6-Tribromophenol	155	S	46-149	0.41	%REC	1	05/07/10 13:20
Surr: 2-Fluorobiphenyl	100		42-130	0.41	%REC	1	05/07/10 13:20
Surr: 2-Fluorophenol	86		26-130	0.41	%REC	1	05/07/10 13:20
Surr: Nitrobenzene-d5	91		42-130	0.41	%REC	1	05/07/10 13:20
Surr: Phenol-d5	80		21-134	0.41	%REC	1	05/07/10 13:20

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:28 507604 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-002B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-11-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 12:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	MS06_40 **Sample Size:**	**PrepDate:**	05/06/10 14:45
ColumnID:	DB-5MS **%Moisture:**	**BatchNo:**	11183/R19855
Revision:	05/10/10 13:18 **TestCode:** 8270W_TCL	**FileID:**	1-SAMP-K7429.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Surr: Terphenyl-d14	122		24-147	0.41	%REC	1	05/07/10 13:20

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:28 507604 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT: O'Brien & Gere Engineers, Inc.
Project: National Grid - Fulton, NY
W Order: K1005042
Matrix: WATER
Inst. ID: MS06_40 **Sample Size:**
ColumnID: DB-5MS **%Moisture:**
Revision: 05/10/10 13:18 **TestCode:** 8270W_TCL
Col Type:

Lab ID: K1005042-003B
Client Sample ID: *X-1-050510*
Collection Date: 05/05/10 0:00
Date Received: 05/05/10 16:18
PrepDate: 05/06/10 13:01
BatchNo: 11183/R19855
FileID: 1-SAMP-K7430.D

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
1,2,4-Trichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 13:59
1,2-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 13:59
1,3-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 13:59
1,4-Dichlorobenzene	ND		10	0.41	µg/L	1	05/07/10 13:59
2,4,5-Trichlorophenol	ND		52	0.41	µg/L	1	05/07/10 13:59
2,4,6-Trichlorophenol	ND		10	0.41	µg/L	1	05/07/10 13:59
2,4-Dichlorophenol	ND		10	0.41	µg/L	1	05/07/10 13:59
2,4-Dimethylphenol	ND		10	0.41	µg/L	1	05/07/10 13:59
2,4-Dinitrophenol	ND		52	21	µg/L	1	05/07/10 13:59
2,4-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 13:59
2,6-Dinitrotoluene	ND		10	0.41	µg/L	1	05/07/10 13:59
2-Chloronaphthalene	ND		10	0.41	µg/L	1	05/07/10 13:59
2-Chlorophenol	ND		10	0.41	µg/L	1	05/07/10 13:59
2-Methylnaphthalene	ND		10	0.41	µg/L	1	05/07/10 13:59
2-Methylphenol	ND		10	0.41	µg/L	1	05/07/10 13:59
2-Nitroaniline	ND		52	0.41	µg/L	1	05/07/10 13:59
2-Nitrophenol	ND		10	0.41	µg/L	1	05/07/10 13:59
3,3´-Dichlorobenzidine	ND		21	0.41	µg/L	1	05/07/10 13:59
3-Nitroaniline	ND		52	0.41	µg/L	1	05/07/10 13:59
4,6-Dinitro-2-methylphenol	ND		10	2.1	µg/L	1	05/07/10 13:59
4-Bromophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 13:59
4-Chloro-3-methylphenol	ND		10	0.41	µg/L	1	05/07/10 13:59
4-Chloroaniline	ND		10	0.41	µg/L	1	05/07/10 13:59
4-Chlorophenyl phenyl ether	ND		10	0.41	µg/L	1	05/07/10 13:59
4-Methylphenol	ND		10	0.41	µg/L	1	05/07/10 13:59
4-Nitroaniline	ND		52	0.41	µg/L	1	05/07/10 13:59
4-Nitrophenol	ND		52	2.1	µg/L	1	05/07/10 13:59
Acenaphthene	ND		10	0.41	µg/L	1	05/07/10 13:59
Acenaphthylene	ND		10	0.41	µg/L	1	05/07/10 13:59
Anthracene	ND		10	0.41	µg/L	1	05/07/10 13:59
Benzo[a]anthracene	ND		10	0.41	µg/L	1	05/07/10 13:59
Benzo[a]pyrene	ND		10	0.41	µg/L	1	05/07/10 13:59
Benzo[b]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 13:59
Benzo[g,h,i]perylene	ND		10	0.41	µg/L	1	05/07/10 13:59

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:28 507605 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-003B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*X-1-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 0:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	MS06_40 **Sample Size:**	**PrepDate:**	05/06/10 13:01
ColumnID:	DB-5MS **%Moisture:**	**BatchNo:**	11183/R19855
Revision:	05/10/10 13:18 **TestCode:** 8270W_TCL	**FileID:**	1-SAMP-K7430.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Benzo[k]fluoranthene	ND		10	0.41	µg/L	1	05/07/10 13:59
bis(2-Chloroethoxy)methane	ND		10	0.41	µg/L	1	05/07/10 13:59
bis(2-chloroethyl)ether	ND		10	0.41	µg/L	1	05/07/10 13:59
bis(2-chloroisopropyl)ether	ND		10	0.41	µg/L	1	05/07/10 13:59
bis(2-Ethylhexyl)phthalate	0.41	J	10	0.41	µg/L	1	05/07/10 13:59
Butyl benzyl phthalate	ND		10	0.41	µg/L	1	05/07/10 13:59
Carbazole	ND		10	0.41	µg/L	1	05/07/10 13:59
Chrysene	ND		10	0.41	µg/L	1	05/07/10 13:59
Di-n-butyl phthalate	ND		10	1.2	µg/L	1	05/07/10 13:59
Di-n-octyl phthalate	ND		10	0.41	µg/L	1	05/07/10 13:59
Dibenz[a,h]anthracene	ND		10	0.41	µg/L	1	05/07/10 13:59
Dibenzofuran	ND		10	0.41	µg/L	1	05/07/10 13:59
Diethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 13:59
Dimethyl phthalate	ND		10	0.41	µg/L	1	05/07/10 13:59
Fluoranthene	ND		10	0.41	µg/L	1	05/07/10 13:59
Fluorene	ND		10	0.41	µg/L	1	05/07/10 13:59
Hexachlorobenzene	ND		10	0.41	µg/L	1	05/07/10 13:59
Hexachlorobutadiene	ND		10	5.2	µg/L	1	05/07/10 13:59
Hexachlorocyclopentadiene	ND		52	10	µg/L	1	05/07/10 13:59
Hexachloroethane	ND		10	2.1	µg/L	1	05/07/10 13:59
Indeno[1,2,3-cd]pyrene	ND		10	0.41	µg/L	1	05/07/10 13:59
Isophorone	ND		10	0.41	µg/L	1	05/07/10 13:59
N-Nitroso-di-n-propylamine	ND		10	0.41	µg/L	1	05/07/10 13:59
Naphthalene	ND		10	0.41	µg/L	1	05/07/10 13:59
Nitrobenzene	ND		10	0.41	µg/L	1	05/07/10 13:59
Pentachlorophenol	ND		52	2.1	µg/L	1	05/07/10 13:59
Phenanthrene	ND		10	0.41	µg/L	1	05/07/10 13:59
Phenol	ND		10	0.41	µg/L	1	05/07/10 13:59
Pyrene	ND		10	0.41	µg/L	1	05/07/10 13:59
Surr: 2,4,6-Tribromophenol	114		46-149	0.41	%REC	1	05/07/10 13:59
Surr: 2-Fluorobiphenyl	106		42-130	0.41	%REC	1	05/07/10 13:59
Surr: 2-Fluorophenol	83		26-130	0.41	%REC	1	05/07/10 13:59
Surr: Nitrobenzene-d5	96		42-130	0.41	%REC	1	05/07/10 13:59
Surr: Phenol-d5	80		21-134	0.41	%REC	1	05/07/10 13:59

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:28 507605 **Project Supervisor:** Pamela J. Titus

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5854 Butternut Drive
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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-003B**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*X-1-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 0:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	MS06_40 **Sample Size:**	**PrepDate:**	05/06/10 13:01
ColumnID:	DB-5MS **%Moisture:**	**BatchNo:**	11183/R19855
Revision:	05/10/10 13:18 **TestCode:** 8270W_TCL	**FileID:**	1-SAMP-K7430.D
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS					**SW8270C**		**(SW3520C)**
Surr: Terphenyl-d14	98		24-147	0.41	%REC	1	05/07/10 13:59

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/10/10 13:28 507605 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-001E**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-4-050310***
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	GCOS_17E	**Sample Size:** 32 mL	**PrepDate:** 05/12/10 12:43
ColumnID:	Alumina	**%Moisture:**	**BatchNo:** 11219/R19902
Revision:	05/13/10 15:26	**TestCode:** 8015W_RSK175	**FileID:** 1-SAMP-E:\Osimay10\E051205.
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
DISSOLVED GASES BY GC/FID					**8015M/RSK175M (RSK 175)**		
Methane	1.9		0.20	0.14	mg/L	100	05/12/10 15:06

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/13/10 15:28 508225 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.			**Lab ID:**	**K1005028-002E**
Project:	National Grid - Fulton, NY			**Client Sample ID:**	***MW-5-050310***
W Order:	K1005028			**Collection Date:**	05/03/10 15:20
Matrix:	WATER			**Date Received:**	05/04/10 8:31
Inst. ID:	GCOS_17E	**Sample Size:**	32 mL	**PrepDate:**	05/12/10 12:43
ColumnID:	Alumina	**%Moisture:**		**BatchNo:**	11219/R19902
Revision:	05/13/10 15:26	**TestCode:**	8015W_RSK175	**FileID:**	1-SAMP-E:\Osimay10\E051207.
Col Type:					

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
DISSOLVED GASES BY GC/FID					**8015M/RSK175M**		**(RSK 175)**
Methane	0.63		0.020	0.014	mg/L	10	05/12/10 15:28

Qualifiers:					
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/13/10 15:28 508226 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-001E**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-7-050410***
W Order:	K1005034	**Collection Date:**	05/04/10 11:20
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	GCOS_17E	**Sample Size:** 32 mL	**PrepDate:** 05/12/10 12:43
ColumnID:	Alumina	**%Moisture:**	**BatchNo:** 11219/R19902
Revision:	05/13/10 15:26	**TestCode:** 8015W_RSK175	**FileID:** 1-SAMP-E:\Osimay10\E051209.
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
DISSOLVED GASES BY GC/FID					**8015M/RSK175M**		**(RSK 175)**
Methane	1.6		0.20	0.14	mg/L	100	05/12/10 15:50

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/13/10 15:29 508227 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-002E**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-3-050410***
W Order:	K1005034	**Collection Date:**	05/04/10 13:50
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	GCOS_17E	**Sample Size:** 32 mL	**PrepDate:** 05/12/10 12:43
ColumnID:	Alumina	**%Moisture:**	**BatchNo:** 11219/R19902
Revision:	05/13/10 15:26	**TestCode:** 8015W_RSK175	**FileID:** 1-SAMP-E:\Osimay10\E051210.
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
DISSOLVED GASES BY GC/FID					**8015M/RSK175M (RSK 175)**		
Methane	ND		0.0020	0.0014	mg/L	1	05/12/10 16:02

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/13/10 15:29 508228 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-003E**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-2-050410***
W Order:	K1005034	**Collection Date:**	05/04/10 15:30
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	GCOS_17E	**Sample Size:** 32 mL	**PrepDate:** 05/12/10 12:43
ColumnID:	Alumina	**%Moisture:**	**BatchNo:** 11219/R19902
Revision:	05/13/10 15:26	**TestCode:** 8015W_RSK175	**FileID:** 1-SAMP-E:\Osimay10\E051211.
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
DISSOLVED GASES BY GC/FID					**8015M/RSK175M**		**(RSK 175)**
Methane	0.0015	J	0.0020	0.0014	mg/L	1	05/12/10 16:26

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/13/10 15:29 508229 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-001E**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-125-050510***
W Order:	K1005042	**Collection Date:**	05/05/10 10:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	GCOS_17E	**Sample Size:** 32 mL	**PrepDate:** 05/12/10 12:43
ColumnID:	Alumina	**%Moisture:**	**BatchNo:** 11219/R19903
Revision:	05/13/10 15:27	**TestCode:** 8015W_RSK175	**FileID:** 1-SAMP-E:\Osimay10\E051302.
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
DISSOLVED GASES BY GC/FID					**8015M/RSK175M**		**(RSK 175)**
Methane	ND		0.0020	0.0014	mg/L	1	05/13/10 11:26

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/13/10 15:30 508230 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-002E**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-11-050510***
W Order:	K1005042	**Collection Date:**	05/05/10 12:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	GCOS_17E	**Sample Size:** 32 mL	**PrepDate:** 05/12/10 12:43
ColumnID:	Alumina	**%Moisture:**	**BatchNo:** 11219/R19903
Revision:	05/13/10 15:27	**TestCode:** 8015W_RSK175	**FileID:** 1-SAMP-E:\Osimay10\E051303.
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
DISSOLVED GASES BY GC/FID					**8015M/RSK175M**		**(RSK 175)**
Methane	0.16		0.0020	0.0014	mg/L	1	05/13/10 11:36

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/13/10 15:30 508231 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-003E**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*X-1-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 0:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	GCOS_17E	**Sample Size:** 32 mL	**PrepDate:** 05/12/10 12:43
ColumnID:	Alumina	**%Moisture:**	**BatchNo:** 11219/R19903
Revision:	05/13/10 15:27	**TestCode:** 8015W_RSK175	**FileID:** 1-SAMP-E:\Osimay10\E051304.
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
DISSOLVED GASES BY GC/FID					**8015M/RSK175M**		**(RSK 175)**
Methane	ND		0.0020	0.0014	mg/L	1	05/13/10 11:46

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/13/10 15:30 508232 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-001C**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-4-050310***
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID:		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131051
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	73		0.050	0.010	mg/L	1	05/14/10 15:37
Manganese	0.60		0.050	0.0010	mg/L	1	05/14/10 15:37

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/19/10 10:18 508636 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-001D**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-4-050310 (FF)***
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID:		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131056
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	68		0.050	0.010	mg/L	1	05/14/10 15:55
Manganese	0.57		0.050	0.0010	mg/L	1	05/14/10 15:55

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-002C**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-5-050310***
W Order:	K1005028	**Collection Date:**	05/03/10 15:20
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID:		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131057
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	26		0.050	0.010	mg/L	1	05/14/10 16:01
Manganese	2.7		0.050	0.0010	mg/L	1	05/14/10 16:01

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-002D**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-5-050310 (FF)***
W Order:	K1005028	**Collection Date:**	05/03/10 15:20
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID:		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131058
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	26		0.050	0.010	mg/L	1	05/14/10 16:05
Manganese	2.6		0.050	0.0010	mg/L	1	05/14/10 16:05

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-001C**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-7-050410***
W Order:	K1005034	**Collection Date:**	05/04/10 11:20
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID:		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131059
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	14		0.050	0.010	mg/L	1	05/14/10 16:08
Manganese	2.9		0.050	0.0010	mg/L	1	05/14/10 16:08

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 12:25 508644 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-001D**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-7-050410 (FF)***
W Order:	K1005034	**Collection Date:**	05/04/10 11:20
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID:		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131063
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	13		0.050	0.010	mg/L	1	05/14/10 16:23
Manganese	2.7		0.050	0.0010	mg/L	1	05/14/10 16:23

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-002C**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-3-050410***
W Order:	K1005034	**Collection Date:**	05/04/10 13:50
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID:		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131064
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	0.66		0.050	0.010	mg/L	1	05/14/10 16:27
Manganese	0.69		0.050	0.0010	mg/L	1	05/14/10 16:27

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 12:25 508649 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-002D**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-3-050410 (FF)***
W Order:	K1005034	**Collection Date:**	05/04/10 13:50
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID:		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131065
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	0.19		0.050	0.010	mg/L	1	05/14/10 16:31
Manganese	0.0038	J	0.050	0.0010	mg/L	1	05/14/10 16:31

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 12:25 508650 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-003C**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-2-050410***
W Order:	K1005034	**Collection Date:**	05/04/10 15:30
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID:		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131066
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	4.0		0.050	0.010	mg/L	1	05/14/10 16:34
Manganese	0.15		0.050	0.0010	mg/L	1	05/14/10 16:34

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 12:25 508651 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-003D**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-2-050410 (FF)*
W Order:	K1005034	**Collection Date:**	05/04/10 15:30
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID:		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131067
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	0.16		0.050	0.010	mg/L	1	05/14/10 16:38
Manganese	0.020	J	0.050	0.0010	mg/L	1	05/14/10 16:38

Qualifiers:					
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 05/18/10 12:25 508652 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-001C**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-125-050510***
W Order:	K1005042	**Collection Date:**	05/05/10 10:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131068
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	3.7		0.050	0.010	mg/L	1	05/14/10 16:42
Manganese	0.21		0.050	0.0010	mg/L	1	05/14/10 16:42

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/04/10 14:26 508653 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-001D**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-125-050510 (FF)***
W Order:	K1005042	**Collection Date:**	05/05/10 10:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131069
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	0.29		0.050	0.010	mg/L	1	05/14/10 16:45
Manganese	0.052		0.050	0.0010	mg/L	1	05/14/10 16:45

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/04/10 14:26 508654 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-002C**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-11-050510***
W Order:	K1005042	**Collection Date:**	05/05/10 12:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131070
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	6.2		0.050	0.010	mg/L	1	05/14/10 16:49
Manganese	0.25		0.050	0.0010	mg/L	1	05/14/10 16:49

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/04/10 14:26 508655 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-002D**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-11-050510 (FF)***
W Order:	K1005042	**Collection Date:**	05/05/10 12:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131071
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	7.3		0.050	0.010	mg/L	1	05/14/10 16:53
Manganese	0.26		0.050	0.0010	mg/L	1	05/14/10 16:53

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/04/10 14:26 508656 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-003C**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***X-1-050510***
W Order:	K1005042	**Collection Date:**	05/05/10 0:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131072
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	4.4		0.050	0.010	mg/L	1	05/14/10 16:57
Manganese	0.22		0.050	0.0010	mg/L	1	05/14/10 16:57

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/04/10 14:26 508657 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-003D**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***X-1-050510 (FF)***
W Order:	K1005042	**Collection Date:**	05/05/10 0:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	ICAP 61E	**Sample Size:** 50 mL	**PrepDate:** 05/06/10 0:00
ColumnID		**%Moisture:**	**BatchNo:** 11184/R19912
Revision:	05/17/10 16:19	**TestCode:** 6010W05	**FileID:** 1-SAMP-131076
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
TOTAL METALS BY ICP					**SW6010B**		**(SW3005A)**
Iron	0.29		0.050	0.010	mg/L	1	05/14/10 17:11
Manganese	0.055		0.050	0.0010	mg/L	1	05/14/10 17:11

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-001F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-4-050310***
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	Dionex IC2	**Sample Size:** NA	**PrepDate:**
ColumnID:		**%Moisture:**	**BatchNo:** R20005
Revision:	05/24/10 14:13	**TestCode** 300.0W	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
INORGANIC ANIONS BY IC				**EPA 300.0**		
Nitrate (as N)	ND		0.10	mg/L	1	05/04/10 15:30
Nitrite (as N)	ND		0.10	mg/L	1	05/04/10 15:30
Sulfate (as SO4)	4.4		1.0	mg/L	1	05/04/10 15:30

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-001F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-4-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	DO Meter	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19930
Revision:	06/03/10 12:19	**TestCode:** BODSM5210B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
BIOCHEMICAL OXYGEN DEMAND (BOD5)					**SM 18-20 5210 B**		
Biochemical oxygen demand (BOD5)	ND		200	2.0	mg/L	1	05/05/10 10:40

NOTES:

This result should be considered an estimate due to low oxygen depletion.*As per NELAC regulation disclosure of the following condition is required; The result of the laboratory control sample was less than the established limit.

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/03/10 12:41 508718 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-001G**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-4-050310***
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	HACH4000 **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R19849
Revision:	05/26/10 9:43 **TestCode** COD410.4	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
COD				**EPA 410.4**		
Chemical Oxygen Demand	61		10	mg/L	1	05/07/10 17:04

Qualifiers:					
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-001H**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-4-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	TOC-5000A **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R20035
Revision:	05/26/10 11:56 **TestCode** DOC5310B	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
DISSOLVED ORGANIC CARBON (DOC)				**SM 18-20 5310 B**		
Dissolved organic carbon (DOC)	11		1.0	mg/L	1	05/26/10 8:51

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-001I**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-4-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 12:40
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	Buret Type A	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19848
Revision:	06/03/10 14:33	**TestCode:** ALKT 2320B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
ALKALINITY, AS CACO3					**SM 18-20 2320 B**		
Alkalinity, as CaCO3	380		10	10	mg/L	1	05/07/10

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/03/10 14:35 507514 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-002F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-5-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 15:20
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	Dionex IC2 **Sample Size:** NA	**PrepDate:**	
ColumnID:	**%Moisture:**	**BatchNo:**	R20005
Revision:	05/24/10 14:13 **TestCode** 300.0W	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
INORGANIC ANIONS BY IC				**EPA 300.0**		
Nitrate (as N)	ND		0.10	mg/L	1	05/04/10 15:44
Nitrite (as N)	ND		0.10	mg/L	1	05/04/10 15:44
Sulfate (as SO4)	1.2		1.0	mg/L	1	05/04/10 15:44

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-002F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-5-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 15:20
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	DO Meter	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19930
Revision:	06/03/10 12:19	**TestCode:** BODSM5210B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
BIOCHEMICAL OXYGEN DEMAND (BOD5)					**SM 18-20 5210 B**		
Biochemical oxygen demand (BOD5)	ND		80	2.0	mg/L	1	05/05/10 10:40

NOTES:

This result should be considered an estimate due to low oxygen depletion. *As per NELAC regulation disclosure of the following condition is required; The result of the laboratory control sample was less than the established limit.

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/03/10 12:41 508719 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-002G**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-5-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 15:20
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	HACH4000	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19849
Revision:	05/26/10 9:43	**TestCode** COD410.4	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
COD				**EPA 410.4**		
Chemical Oxygen Demand	55		10	mg/L	1	05/07/10 17:04

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-002H**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-5-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 15:20
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	TOC-5000A **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R20035
Revision:	05/26/10 11:56 **TestCode** DOC5310B	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
DISSOLVED ORGANIC CARBON (DOC)				**SM 18-20 5310 B**		
Dissolved organic carbon (DOC)	18		1.0	mg/L	1	05/26/10 9:00

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005028-002I**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-5-050310*
W Order:	K1005028	**Collection Date:**	05/03/10 15:20
Matrix:	WATER	**Date Received:**	05/04/10 8:31
Inst. ID:	Buret Type A	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19848
Revision:	06/03/10 14:33	**TestCode:** ALKT 2320B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
ALKALINITY, AS CACO3					**SM 18-20 2320 B**		
Alkalinity, as CaCO3	230		10	10	mg/L	1	05/07/10

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/03/10 14:35 507515 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-001F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-7-050410***
W Order:	K1005034	**Collection Date:**	05/04/10 11:20
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	Dionex IC2	**Sample Size:** NA	**PrepDate:**
ColumnID:		**%Moisture:**	**BatchNo:** R20005
Revision:	05/24/10 14:13	**TestCode** 300.0W	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
INORGANIC ANIONS BY IC				**EPA 300.0**		
Nitrate (as N)	ND		0.10	mg/L	1	05/05/10 11:15
Nitrite (as N)	ND		0.10	mg/L	1	05/05/10 11:15
Sulfate (as SO4)	ND		1.0	mg/L	1	05/05/10 11:15

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-001F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-7-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 11:20
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	DO Meter	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19930
Revision:	06/03/10 12:19	**TestCode:** BODSM5210B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
BIOCHEMICAL OXYGEN DEMAND (BOD5)					**SM 18-20 5210 B**		
Biochemical oxygen demand (BOD5)	ND		200	200	mg/L	1	05/05/10 10:40

NOTES:

This result should be considered an estimate due to low oxygen depletion. *As per NELAC regulation disclosure of the following condition is required; The result of the laboratory control sample was less than the established limit.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/03/10 14:53 508720 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-001G**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-7-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 11:20
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	HACH4000	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19849
Revision:	06/03/10 12:23	**TestCode:** COD410.4	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
COD					**EPA 410.4**		
Chemical Oxygen Demand	21		10	5.0	mg/L	1	05/07/10 17:05

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/03/10 12:25 507540 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-001H**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-7-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 11:20
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	TOC-5000A	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R20035
Revision:	05/26/10 11:56	**TestCode** DOC5310B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
DISSOLVED ORGANIC CARBON (DOC)				**SM 18-20 5310 B**		
Dissolved organic carbon (DOC)	6.4		1.0	mg/L	1	05/26/10 9:12

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-001I**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-7-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 11:20
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	Buret Type A	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19848
Revision:	06/03/10 14:33	**TestCode:** ALKT 2320B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
ALKALINITY, AS CACO3					**SM 18-20 2320 B**		
Alkalinity, as CaCO3	250		10	10	mg/L	1	05/07/10

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/03/10 14:55 507516 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-002F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	***MW-3-050410***
W Order:	K1005034	**Collection Date:**	05/04/10 13:50
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	Dionex IC2	**Sample Size:** NA	**PrepDate:**
ColumnID:		**%Moisture:**	**BatchNo:** R20005
Revision:	05/24/10 14:13	**TestCode** 300.0W	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
INORGANIC ANIONS BY IC				**EPA 300.0**		
Nitrate (as N)	0.84		0.10	mg/L	1	05/05/10 11:30
Nitrite (as N)	ND		0.10	mg/L	1	05/05/10 11:30
Sulfate (as SO4)	32		1.0	mg/L	1	05/05/10 11:30

Qualifiers:	* Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-002F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-3-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 13:50
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	DO Meter	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19930
Revision:	06/03/10 12:19	**TestCode:** BODSM5210B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
BIOCHEMICAL OXYGEN DEMAND (BOD5)					**SM 18-20 5210 B**		
Biochemical oxygen demand (BOD5)	ND		200	200	mg/L	1	05/05/10 10:40

NOTES:

This result should be considered an estimate due to low oxygen depletion. *As per NELAC regulation disclosure of the following condition is required; The result of the laboratory control sample was less than the established limit.

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/03/10 14:54 508721 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-002G**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-3-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 13:50
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	HACH4000 **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R19849
Revision:	05/26/10 9:43 **TestCode** COD410.4	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
COD				**EPA 410.4**		
Chemical Oxygen Demand	14		10	mg/L	1	05/07/10 17:05

Qualifiers:					
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-002H**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-3-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 13:50
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	TOC-5000A **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R20035
Revision:	05/26/10 11:56 **TestCode** DOC5310B	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
DISSOLVED ORGANIC CARBON (DOC)				**SM 18-20 5310 B**		
Dissolved organic carbon (DOC)	6.0		1.0	mg/L	1	05/26/10 9:23

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-002I**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-3-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 13:50
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	Buret Type A	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19848
Revision:	06/03/10 14:33	**TestCode:** ALKT 2320B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
ALKALINITY, AS CACO3					**SM 18-20 2320 B**		
Alkalinity, as CaCO3	260		10	10	mg/L	1	05/07/10

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/03/10 14:55 507517 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-003F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-2-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 15:30
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	Dionex IC2	**Sample Size:** NA	**PrepDate:**
ColumnID:		**%Moisture:**	**BatchNo:** R20005
Revision:	05/24/10 14:13	**TestCode** 300.0W	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
INORGANIC ANIONS BY IC				**EPA 300.0**		
Nitrate (as N)	ND		0.10	mg/L	1	05/04/10 11:45
Nitrite (as N)	ND		0.10	mg/L	1	05/04/10 11:45
Sulfate (as SO4)	25		1.0	mg/L	1	05/04/10 11:45

Qualifiers:					
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-003F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-2-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 15:30
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	DO Meter	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19930
Revision:	06/03/10 12:19	**TestCode:** BODSM5210B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
BIOCHEMICAL OXYGEN DEMAND (BOD5)					**SM 18-20 5210 B**		
Biochemical oxygen demand (BOD5)	ND		200	200	mg/L	1	05/05/10 10:40

NOTES:

This result should be considered an estimate due to low oxygen depletion. *As per NELAC regulation disclosure of the following condition is required; The result of the laboratory control sample was less than the established limit.

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/03/10 14:54 508722 **Project Supervisor:** Pamela J. Titus

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-003G**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-2-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 15:30
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	HACH4000	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19849
Revision:	05/26/10 9:43	**TestCode** COD410.4	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
COD				**EPA 410.4**		
Chemical Oxygen Demand	16		10	mg/L	1	05/07/10 17:05

Qualifiers:					
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-003H**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-2-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 15:30
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	TOC-5000A	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R20035
Revision:	05/26/10 11:56	**TestCode** DOC5310B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
DISSOLVED ORGANIC CARBON (DOC)				**SM 18-20 5310 B**		
Dissolved organic carbon (DOC)	4.4		1.0	mg/L	1	05/26/10 9:46

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005034-003I**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-2-050410*
W Order:	K1005034	**Collection Date:**	05/04/10 15:30
Matrix:	WATER	**Date Received:**	05/05/10 8:30
Inst. ID:	Buret Type A	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19848
Revision:	06/03/10 14:33	**TestCode:** ALKT 2320B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	MDL	Units	DF	Date Analyzed
ALKALINITY, AS CACO3					**SM 18-20 2320 B**		
Alkalinity, as CaCO3	270		10	10	mg/L	1	05/07/10

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Print Date: 06/03/10 14:55 507518 **Project Supervisor:** Pamela J. Titus

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-001F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-125-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 10:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	Dionex IC2	**Sample Size:** NA	**PrepDate:**
ColumnID:		**%Moisture:**	**BatchNo:** R20005
Revision:	05/24/10 14:13	**TestCode** 300.0W	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
INORGANIC ANIONS BY IC				**EPA 300.0**		
Nitrate (as N)	0.23		0.10	mg/L	1	05/06/10 12:56
Nitrite (as N)	ND		0.10	mg/L	1	05/06/10 12:56
Sulfate (as SO4)	25		1.0	mg/L	1	05/06/10 12:56

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-001F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-125-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 10:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	DO Meter **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R20008
Revision:	05/27/10 11:23 **TestCode** BODSM5210B	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
BIOCHEMICAL OXYGEN DEMAND (BOD5)				**SM 18-20 5210 B**		
Biochemical oxygen demand (BOD5)	ND		200	mg/L	1	05/07/10 8:01

NOTES:
This result should be considered an estimate due to low oxygen depletion.

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-001G**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-125-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 10:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	HACH4000 **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R19849
Revision:	05/26/10 9:43 **TestCode** COD410.4	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
COD				**EPA 410.4**		
Chemical Oxygen Demand	38		10	mg/L	1	05/07/10 17:08

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

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East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-001H**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-125-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 10:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	TOC-5000A **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R20035
Revision:	05/26/10 11:56 **TestCode** DOC5310B	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
DISSOLVED ORGANIC CARBON (DOC)				**SM 18-20 5310 B**		
Dissolved organic carbon (DOC)	5.7		1.0	mg/L	1	05/26/10 9:54

Qualifiers:	* Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-001I**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-125-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 10:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	Buret Type A	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19848
Revision:	05/10/10 8:45	**TestCode** ALKT 2320B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
ALKALINITY, AS CACO3				**SM 18-20 2320 B**		
Alkalinity, as CaCO3	300		10	mg/L	1	05/07/10

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.
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East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-002F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-11-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 12:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	Dionex IC2	**Sample Size:** NA	**PrepDate:**
ColumnID:		**%Moisture:**	**BatchNo:** R20005
Revision:	05/24/10 14:13	**TestCode** 300.0W	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
INORGANIC ANIONS BY IC				**EPA 300.0**		
Nitrate (as N)	ND		0.10	mg/L	1	05/06/10 13:10
Nitrite (as N)	ND		0.10	mg/L	1	05/06/10 13:10
Sulfate (as SO4)	9.9		1.0	mg/L	1	05/06/10 13:10

Qualifiers:	* Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.
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East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-002F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-11-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 12:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	DO Meter **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R20008
Revision:	05/27/10 11:23 **TestCode** BODSM5210B	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
BIOCHEMICAL OXYGEN DEMAND (BOD5)				**SM 18-20 5210 B**		
Biochemical oxygen demand (BOD5)	ND		200	mg/L	1	05/07/10 8:03

NOTES:
This result should be considered an estimate due to low oxygen depletion.

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-002G**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-11-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 12:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	HACH4000 **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R19849
Revision:	05/26/10 9:43 **TestCode** COD410.4	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
COD				**EPA 410.4**		
Chemical Oxygen Demand	10		10	mg/L	1	05/07/10 17:09

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-002H**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-11-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 12:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	TOC-5000A **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R20035
Revision:	05/26/10 11:56 **TestCode** DOC5310B	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
DISSOLVED ORGANIC CARBON (DOC)				**SM 18-20 5310 B**		
Dissolved organic carbon (DOC)	5.3		1.0	mg/L	1	05/26/10 10:08

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

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Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-002I**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*MW-11-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 12:30
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	Buret Type A	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R19848
Revision:	05/10/10 8:45	**TestCode** ALKT 2320B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
ALKALINITY, AS CACO3				**SM 18-20 2320 B**		
Alkalinity, as CaCO3	180		10	mg/L	1	05/07/10

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

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East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT:	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-003F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*X-1-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 0:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	Dionex IC2	**Sample Size:** NA	**PrepDate:**
ColumnID:		**%Moisture:**	**BatchNo:** R20005
Revision:	05/24/10 14:13	**TestCode** 300.0W	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
INORGANIC ANIONS BY IC				**EPA 300.0**		
Nitrate (as N)	0.15		0.10	mg/L	1	05/06/10 13:24
Nitrite (as N)	ND		0.10	mg/L	1	05/06/10 13:24
Sulfate (as SO4)	26		1.0	mg/L	1	05/06/10 13:24

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-003F**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*X-1-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 0:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	DO Meter	**Sample Size:** NA	**PrepDate:**
ColumnID		**%Moisture:**	**BatchNo:** R20008
Revision:	05/27/10 11:23	**TestCode** BODSM5210B	**FileID:** 1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
BIOCHEMICAL OXYGEN DEMAND (BOD5)				**SM 18-20 5210 B**		
Biochemical oxygen demand (BOD5)	ND		200	mg/L	1	05/07/10 8:05

NOTES:
This result should be considered an estimate due to low oxygen depletion.

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-003G**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*X-1-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 0:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	HACH4000 **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R19849
Revision:	05/26/10 9:43 **TestCode** COD410.4	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
COD				**EPA 410.4**		
Chemical Oxygen Demand	41		10	mg/L	1	05/07/10 17:10

Qualifiers:					
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

5854 Butternut Drive

East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-003H**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*X-1-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 0:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	TOC-5000A **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R20035
Revision:	05/26/10 11:56 **TestCode** DOC5310B	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
DISSOLVED ORGANIC CARBON (DOC)				**SM 18-20 5310 B**		
Dissolved organic carbon (DOC)	4.0		1.0	mg/L	1	05/26/10 10:19

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.

5854 Butternut Drive
East Syracuse, NY 13057 (315) 445-1105

Analytical Results

StateCertNo: 10248

CLIENT	O'Brien & Gere Engineers, Inc.	**Lab ID:**	**K1005042-003I**
Project:	National Grid - Fulton, NY	**Client Sample ID:**	*X-1-050510*
W Order:	K1005042	**Collection Date:**	05/05/10 0:00
Matrix:	WATER	**Date Received:**	05/05/10 16:18
Inst. ID:	Buret Type A **Sample Size:** NA	**PrepDate:**	
ColumnID	**%Moisture:**	**BatchNo:**	R19848
Revision:	05/10/10 8:45 **TestCode** ALKT 2320B	**FileID:**	1-SAMP-
Col Type:			

Analyte	Result	Qual	PQL	Units	DF	Date Analyzed
ALKALINITY, AS CACO3				**SM 18-20 2320 B**		
Alkalinity, as CaCO3	310		10	mg/L	1	05/07/10

Qualifiers:					
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value exceeds the instrument calibration range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the PQL	ND	Not Detected at the Practical Quantitation Limit (PQL)
	P	Prim./Conf. column %D or RPD exceeds limit	S	Spike Recovery outside accepted recovery limits

Life Science Laboratories, Inc.
Central Lab

5854 Butternut Drive
East Syracuse, New York 13057
(315) 445-1105

Chain of Custody

Client: O'BRIEN & GERE INC.
Project: National Grid, Fulton, NY
Sampled by: CVV
Client Contact: Deb Wright Phone # 437-6100

Sample Description

Sample Location	Date Collected	Time Collected	Sample Matrix	Comp. or Grab	No. of Containers	Analysis/Method: VOCs	SVOCs	Metals, Total & Dissolved	Methane, Ethane, Ethene	COD, TOC	TKN		Comments
MW-4-050310	5-3-10	1240	water	G	11	X	X	X	X	X	X		dissolved Metals + TOC Filtered
MW-5-050310	5-3-10	1520	water	G	11	X	X	X	X	X	X		dissolved Metals + TOC Filtered
Trip blank	5-3-10	-	water	-	1	X							

Relinquished by: C. Vvri Kelle	Date: 5-3-10	Time: 1730	Received by: Scott Tucker
Relinquished by: Scott Tucker	Date: 5/4/10	Time: 0831	Received by:
Relinquished by:	Date:	Time:	Received by Lab:
Shipment Method:			Airbill Number:

Date: 5/4/10 Time: 0813
Date: Time:
Date: Time:
05-04-10 08:31 RCVD

Turnaround Time Required:
Routine X
Rush

Cooler Temperature: 2.2° C on ice

Comments:

Original - Laboratory
Copy - Client

Life Science Laboratories, Inc.

Sample Receipt Checklist

Client Name: **OBG-MS**

Date and Time Received: **5/4/2010 8:31:00 AM**

Work Order Number: **K1005028**

Received by: ads

Checklist completed by: _____ 5/4/10 (Initials / Date)

Reviewed by: _____ 5/4/10 (Initials / Date)

Delivery Method: Hand Delivered

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Applicable ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

pH	Preservative	pH Acceptable	Sample ID	Volume of Preservative added in Lab.
>12	NaOH	Yes ☐ N ☐ NA ☑		
<2	HNO3	Yes ☑ N ☐ NA ☐		
<2	HSO4	Yes ☑ N ☐ NA ☐		
<2	1:1 HCL	Yes ☑ N ☐ NA ☐	TOC	
5-9	Pest/PCBs (608/8081)	Yes ☐ N ☐ NA ☑		

Comments:

Corrective Action:

Life Science Laboratories, Inc.
Central Lab

5854 Butternut Drive
East Syracuse, New York 13057
(315) 445-1105

Chain of Custody

Client: O'BRIEN & GERE INC

Project: National Grid

Sampled by:

Client Contact: Phone #

Sample Description

Sample Location	Date Collected	Time Collected	Sample Matrix	Comp. or Grab	No. of Containers	VOCs	SVOCs	Metals Total & Dissolved	Methane, Ethane, Ethene, NO3, NO2	COD, TOC	TALK		Comments
MW-7-050410	5-4-10	1120	WATER	G	11	X	X	X	X	X	X		Dissolved Metal & TOC Filtered
MW-3-050410	5-4-10	1350	WATER	G	11	X	X	X	X	X	X		11
MW-2-050410	5-4-10	1530	WATER	G	11	X	X	X	X	X	X		11
Trip blank	5-4-10	-	WATER	-	1	X							

Relinquished by: G. Yuri Vecia	Date: 5-4-10 Time: 1730	Received by:	Date: 5/5/10 Time: 0813
Relinquished by:	Date: 5/5/10 Time: 0830	Received by:	Date: Time:
Relinquished by:	Date: Time:	Received by Lab:	Date: Time: 05-05-10 08:30
Shipment Method:		Airbill Number: 10C	

Turnaround Time Required:
Routine X
Rush

Comments:

Cooler Temperature:

Original - Laboratory
Copy - Client

Life Science Laboratories, Inc.

Sample Receipt Checklist

Client Name: **OBG-MS**

Date and Time Received: **5/5/2010 8:30:00 AM**

Work Order Number: **K1005034**

Received by: hg

Checklist completed by: _____ 5/5/10
Initials Date

Reviewed by: _____ 5/5/10
Initials Date

Delivery Method: Hand Delivered

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Applicable ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

pH	Preservative	pH Acceptable	Sample ID	Volume of Preservative added in Lab.
>12	NaOH	Yes ☐ N ☐ NA ☑		
<2	HNO3	Yes ☑ N ☐ NA ☐		
<2	HSO4	Yes ☑ N ☐ NA ☐		
<2	1:1 HCL	Yes ☑ N ☐ NA ☐	TOC	
5-9	Pest/PCBs (608/8081)	Yes ☐ N ☐ NA ☑		

Comments:

Corrective Action:

Life Science Laboratories, Inc.
Central Lab

5854 Butternut Drive
East Syracuse, New York 13057
(315) 445-1105

Chain of Custody

Client: O'BRIEN & GERE INC
Project: National Grid
Sampled by: CVV
Client Contact: Deb Wright Phone # 437-6100

Sample Description

Sample Location	Date Collected	Time Collected	Sample Matrix	Comp. or Grab	No. of Containers	VOCs	SVOCs	Metals dissolved & Total	Methane BOD, SO4, NO3, NO2	COD, TOC	TALK		Comments
MW-12S-050510	5-5-10	1030	WATER	G	11	X	X	X	X	X	X		Dissolved Metals & TOC Filtered
MW-11-050510	5-5-10	1230	"	"	11	X	X	X	X	X	X		"
X-1-050510	5-5-10	-	"	"	11	X	X	X	X	X	X		"
Drum-050510	5-5-10	1400	"	"	2	X							BTEX ONLY
Trip blank	5-5-10	-	↓	↓	2	X							

Relinquished by: C. Yuri Veliz Date: 5-5-10 Time: 1600
Relinquished by: Date: Time:
Relinquished by: Date: Time:
Shipment Method:

Received by: Date: Time:
Received by: Date: Time:
Received by Lab: Date: 5-05-10 Time: 16:18 RCVD
Airbill Number:

Turnaround Time Required:
Routine ✓
Rush

Comments:

Cooler Temperature: 13.2°C ON ICE

Original - Laboratory
Copy - Client

Life Science Laboratories, Inc.

Sample Receipt Checklist

Client Name: **OBG-MS**

Date and Time Received: **5/5/2010 4:18:00 PM**

Work Order Number: **K1005042**

Received by: ads

Checklist completed by: _____ Initials 5/6/10 Date

Reviewed by: _____ Initials 5/6/10 Date

Delivery Method: Hand Delivered

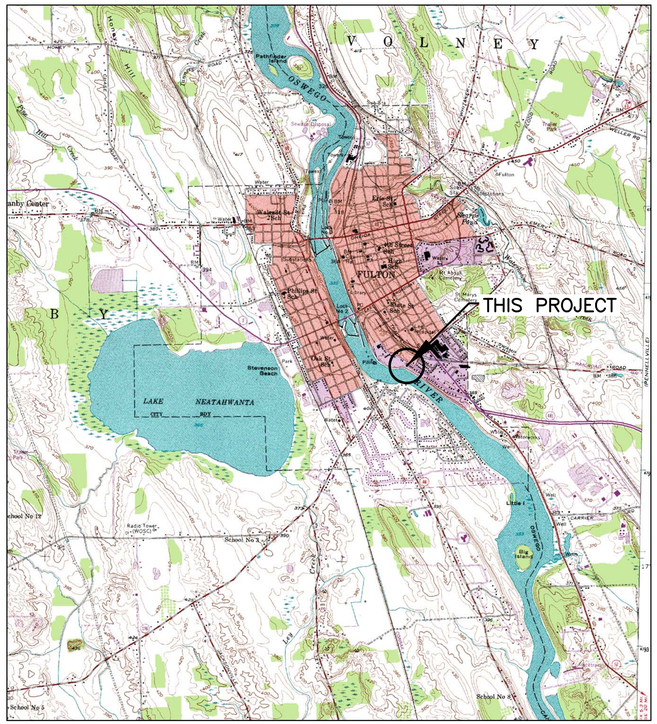
Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Applicable ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

pH	Preservative	pH Acceptable	Sample ID	Volume of Preservative added in Lab.
>12	NaOH	Yes ☐ N ☐ NA ☑		
<2	HNO3	Yes ☑ N ☐ NA ☐		
<2	HSO4	Yes ☑ N ☐ NA ☐		
<2	1:1 HCL	Yes ☑ N ☐ NA ☐	TOC	
5-9	Pest/PCBs (608/8081)	Yes ☐ N ☐ NA ☑		

Comments:

Corrective Action:

Final Design Drawings



PROJECT LOCATION PLAN

NOT TO SCALE

Final Design Drawings

FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK

SITE NO. 738034

REMEDIAL DESIGN

nationalgrid

FULTON, NEW YORK

FEBRUARY 2011

O'BRIEN & GERE
ENGINEERS INC.

PRELIMINARY
NOT FOR
CONSTRUCTION
DATE: 2/25/11

IT IS A VIOLATION OF LAW FOR ANY PERSON UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

INDEX TO DRAWINGS

1118.44581.004

I:\NATIONAL-GRID.1118\44581.FULTON-REMEDIAL\DOCS\DWG\CONTRACT DRAWINGS\44581-004-TSG1.DWG

WELL DATA TABLE/SCHEDULE

Well No.	Ground Elevation (ft)	Top of PVC Casing Elevation (ft)	Well Depth (ft bgs)	Screen interval (ft bgs)	Sump interval (ft bgs)
WELLS TO BE MAINTAINED OR REPLACED					
MW-1	367.20	369.69	17	5 - 15	15 - 17
MW-2	361.00	360.80	15	2.5 - 12.5	13 - 15
MW-3	358.70	361.13	16	4 - 14	14 - 16
MW-4	360.00	359.74	16	4 - 14	14 - 16
MW-5	359.70	359.51	16	4 - 14	14 - 16
MW-10	359.51	359.15	15	5 - 15	NI
PZ-7	357.8	359.67	16	6 - 16	NI
WELLS TO BE ABANDONED					
MW-6	359.39	359.00	37	27 - 37	NI
PZ-1	360.19	359.88	16	3.5 - 13.5	NI
WELLS TO BE INSTALLED					
MW-14	TBD	TBD	17	5 - 15	15 - 17
WELLS NOT TO BE DISTURBED					
MW-7	359.00	361.33	14	4 - 14	NI
MW-7D	358.10	360.13	28	23 - 28	NI
MW-8	358.70	360.78	16	6 - 16	NI
MW-8D	358.60	360.14	33	28 - 33	NI
MW-9	356.10	357.04	16	6 - 16	NI
MW-9D	356.40	358.21	30	20 - 30	NI
MW-11	flush	354.41	12.5	2.5 - 12.5	NI
MW-12S	flush	353.91	16	6 - 16	NI
MW-12D	flush	353.34	28	23 - 28	NI
MW-13	flush	359.46	26	19 - 24	24 - 26
PZ-2	flush	358.3	14	4 - 14	NI
PZ-3	flush	359.06	14	4 - 14	NI
PZ-4	flush	359.02	14	4 - 14	NI
PZ-5	358.3	360.49	14	4 - 14	NI
PZ-6	357.2	359.16	16	6 - 16	NI

Notes: NI - Not installed

Notes: TBD - To Be Determined after installation

NOTES:

1. WELLS TO BE MAINTAINED OR REPLACED – REFER TO "MONITORING WELL RESTORATION DETAIL" SHT. G–7 AND SPECIFICATION 02151 "GROUNDWATER MONITORING WELL REPAIR AND REPLACEMENT" FOR RESTORATION OF MONITORING WELLS DISTURBED DURING CONSTRUCTION SCHEDULED TO BE MAINTAINED.
2. WELLS TO BE ABANDONED – REFER TO SPECIFICATION 02145 "GROUNDWATER MONITORING WELL ABANDONEMENT" FOR MONITORING WELL ABANDONMENT REQUIREMENTS.
3. WELLS TO BE INSTALLED – REFER TO "WELL DATA TABLE/SCHEDULE" SHOWN HERE, "MONITORING WELL RESTORATION DETAIL" SHT. G–7 AND SPECIFICATION 02151 "GROUNDWATER MONITORING WELL REPAIR AND REPLACEMENT" FOR MONITORING WELL INSTALLATION REQUIREMENTS.
4. WELLS NOT TO BE DISTURBED – REFER TO "MONITORING WELL RESTORATION DETAIL" SHT. G–7 AND SPECIFICATION 02151 "GROUNDWATER MONITORING WELL REPAIR REPLACEMENT" FOR RESTORATION REQUIREMENTS FOR WELLS DISTURBED DURING CONSTRUCTION.
5. ALL WELLS DAMAGED, DESTROYED OR DISTURBED DURING CONSTRUCTION ACTIVITIES NOT SCHEDULED TO BE ABANDONED, SHALL BE REPAIRED OR REPLACED PER SPECIFICATION 02151 AT NO COST TO THE OWNER.
6. REFER TO DRAWING G–2 FOR ALL MONITORING WELL LOCATIONS.

SURVEY BENCHMARK TABLE

Point	Northing	Easting	Elevation	Description
1	1207031.214	866964.745	359.23	N-1
2	1206843.159	867231.2619	365.34	HYD-2 Top of spindle
265	1206936.569	866967.2	359.13	N-265
279	1207207.192	866652.533	357.99	HYD-279 Top of spindle
1412	1206847.766	866883.2126	358.9	MN-1412

SURVEY NOTES:

1. THE HORIZONTAL AND VERTICAL DATUMS ARE NAD 1983 AND NAVD 1988.
2. THE BOUNDARY SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF AN ABSTRACT OF TITLE.

GENERAL NOTES – ALL DRAWINGS:

1. EXISTING SITE SURVEY INFORMATION PRESENTED HERE WAS ADOPTED FROM A SURVEY MAP ENTITLED "LANDS OF NATIONAL GRID, N/F PART OF BLOCKS 157 AND 158, CITY OF FULTON, OSWEGO COUNTY, NEW YORK" DATED DECEMBER 2, 2009 PREPARED BY RICHARD M. RYBINSKI, L.S. 8236 INDIAN HILL ROAD MANLIUS, NEW YORK 13104 (315) 682–4852.
2. EXACT DIMENSIONS AND LOCATIONS OF ALL STRUCTURES AND UTILITIES ARE CONSIDERED APPROXIMATE ONLY AND SHALL BE VERIFIED AS REQUIRED IN THE FIELD BY THE CONTRACTOR.
3. OTHER UTILITIES MAY EXIST, THE LOCATIONS, DEPTHS AND EXTENT OF WHICH ARE UNKNOWN. THE CONTRACTOR SHALL DETERMINE THE LOCATION AND ELEVATION OF ALL UTILITIES IN THE FIELD AS IT MAY PERTAIN TO THE CONTRACTORS WORK PRIOR TO CONSTRUCTION.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UNDER AND ABOVE GROUND UTILITIES DURING CONSTRUCTION UNLESS OTHERWISE NOTED.
5. FOR INFORMATION: DIG SAFELY NEW YORK PHONE NUMBER: 1–800–962–7962. WEBSITE: WWW.DIGSAFELYNEWYORK.COM
6. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR THE TEMPORARY DE–ENERGIZING, OR INTERRUPTION OF SERVICE, REMOVAL, RELOCATION, REPLACEMENT OF ANY UTILITIES POLES, GUY WIRES, UNDERGROUND UTILITIES AND/OR OVERHEAD WIRES WITHIN THE LIMITS OF WORK, OR THAT COULD OTHERWISE INTERFERE WITH THE CONSTRUCTION.
7. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF DIFFERENCES BETWEEN THE BASE MAP INFORMATION PROVIDED AND ACTUAL SITE CONDITIONS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SURVEY CONTROL DURING THE PERFORMANCE OF WORK AND VERIFYING EXISTING GRADES. THE OWNER WILL PROVIDE THE CONTRACTOR WITH THE CONTRACT DRAWINGS IN ELECTRONIC FORMAT FOR THE CONTRACTORS USE.
9. THE CONTRACTOR SHALL FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, PROVIDE ALL TRENCH SHORING, SCAFFOLDING, SHIELDING, DUST/FUME PROTECTION, MECHANICAL/ELECTRICAL PROTECTION, SPECIAL GROUNDING, SAFETY RAILINGS, BARRIERS, OR OTHER SAFETY FEATURES REQUIRED.
10. THE CONTRACTOR SHALL RESTORE TO PRECONSTRUCTION CONDITIONS, OR BETTER, ALL SUPPORT AREAS THAT ARE IMPACTED BY REMEDIAL ACTIVITIES, INCLUDING BUT NOT LIMITED TO, EQUIPMENT AND MATERIAL STORAGE AREAS, MATERIAL LOADING AND STAGING AREAS, PARKING AREAS, AND LOCATIONS OF OFFICE TRAILERS, UNLESS OTHERWISE NOTED.
11. ALL SURFACES DAMAGED OR DESTROYED AS A RESULT OF WORK PERFORMED BY THE CONTRACTOR SHALL BE RESTORED TO PRECONSTRUCTION CONDITIONS OR BETTER IN A TIMELY MANNER AND PRIOR TO CONTRACTOR DEMOBILIZATION.
12. ALL EQUIPMENT OPERATED WITHIN THE LIMITS OF WORK SHALL BE CLEANED IN ACCORDANCE WITH SPECIFICATION 02241 "OFF–SITE TRANSPORTATION AND DISPOSAL" PRIOR TO TRANSPORT OFFSITE AND/OR TRANSPORTING/HANDLING CLEAN BACKFILL MATERIALS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILIZATION, CHARACTERIZATION, LOADING, TRANSPORTATION, AND OFFSITE DISPOSAL OF WASTE MATERIAL GENERATED AS A RESULT OF EXCAVATION ACTIVITIES AT A DISPOSAL FACILITY APPROVED BY THE OWNER.
14. THE CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE CHANNELS AT ALL TIMES. WORK SHALL BE CONDUCTED IN SUBSTANTIVE COMPLIANCE WITH NYSDEC SPDES GP–0–10–001 AND PURSUANT TO THE PROJECT STORMWATER POLLUTION PREVENTION PLAN, EROSION AND SEDIMENT CONTROL PLAN, AND SPECIFICATION 02270 "EROSION AND SEDIMENT CONTROL. DRAINAGE SHALL BE MAINTAINED AT ALL TIMES.
15. ALL INTRUSIVE GROUND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND NATIONAL GRID'S "PART 753 PROTECTION OF UNDERGROUND FACILITIES".
16. ROADWAYS ARE TO REMAIN OPEN AT ALL TIMES.

LEGEND:

- GAS – GAS LINE
- UG/EL – UNDERGROUND ELECTRIC
- OH/EL – OVERHEAD ELECTRIC
- EL ROW – ELECTRIC RIGHT OF WAY
- W – WATER
- SAN – SANITARY SEWER
- ST – STORM SEWER
- PROPERTY BOUNDARY
- 355 – EXIST. CONTOUR ELEVATION
- 355 – PROPOSED FINAL CONTOUR ELEVATION
- UTILITY POLE
- SB–55 – SOIL BORING
- MW–02 – EXISTING MONITORING WELL
- MW–14 – PROPOSED MONITORING WELL
- FORMER MGP STRUCTURE
- SF – SILT FENCE
- ASPHALT PAVEMENT
- LIMITS OF WORK
- AREA 2 – AREA DESIGNATION
- N–1 – SURVEY BENCHMARK

NO.	DATE	REVISION	INIT.
C	2/25/11	ISSUED FOR NYSDEC REVIEW	
B	4/30/10	ISSUED FOR NYSDEC REVIEW	
A	4/16/10	ISSUED FOR CLIENT REVIEW	

NOT TO SCALE

PRELIMINARY NOT FOR CONSTRUCTION

DATE: 2/25/11

O'BRIEN & GERE ENGINEERS INC.

NATIONAL GRID – FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK
SITE NO. 738034

REMEDIAL DESIGN

GENERAL

GENERAL NOTES AND LEGEND

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

FILE NO. 1118.44581.005

DATE FEBRUARY 2011

G–1

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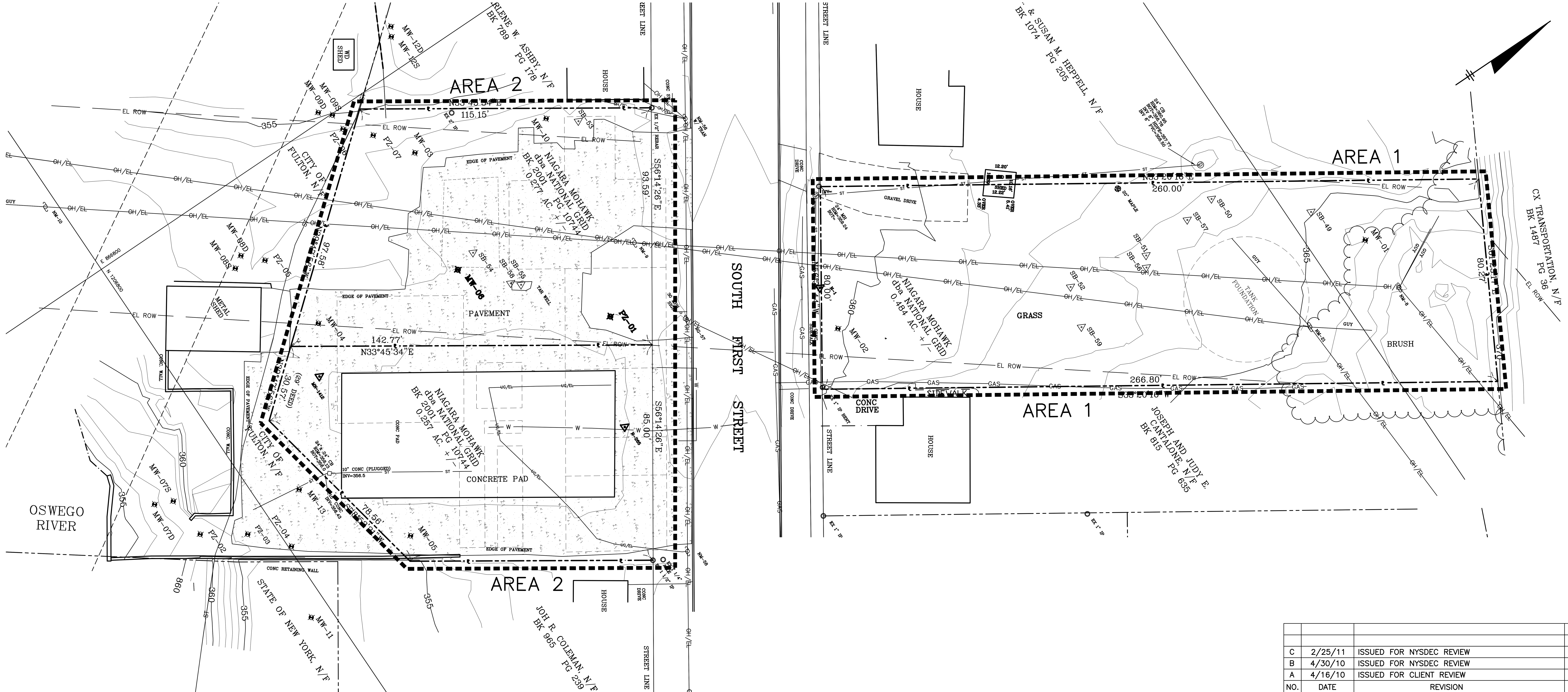

DRAWING NOTES:

1. REFER TO "WELL DATA TABLE/SCHEDULE" SHT. G–1 FOR MONITORING WELL STATUS.

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER THIS DOCUMENT.

PRELIMINARY NOT FOR CONSTRUCTION

DATE: 2/25/11

NO.	DATE	REVISION	INIT.
C	2/25/11	ISSUED FOR NYSDEC REVIEW	
B	4/30/10	ISSUED FOR NYSDEC REVIEW	
A	4/16/10	ISSUED FOR CLIENT REVIEW	

1"=20' 20 0 20 40

O'BRIEN & GERE ENGINEERS INC.

NATIONAL GRID – FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK
SITE NO. 738034

REMEDIAL DESIGN

GENERAL

EXISTING SITE PLAN

IN CHARGE OF ____

DESIGNED BY ____ CHECKED BY ____

DRAWN BY ____

FILE NO. 1118.44581.006

DATE FEBRUARY 2011

G–2

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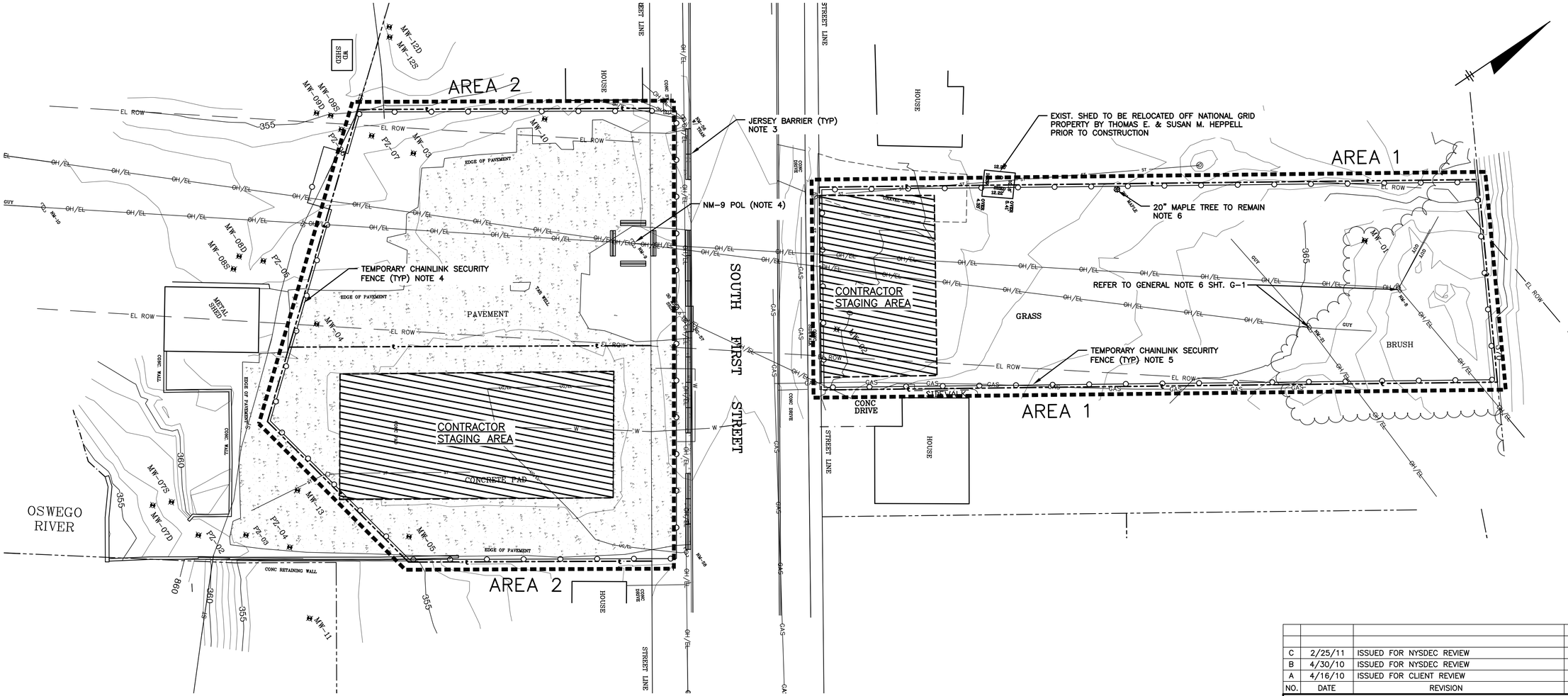

DRAWING NOTES:

1. CONTRACTOR STAGING AREA'S SHOWN HERE ARE FOR REFERENCE PURPOSES ONLY. THE CONTRACTOR SHALL ESTABLISH STAGING AREAS AS REQUIRED TO PERFORM THE WORK AND INCLUDE THEM IN THE STAGING PLAN.
2. PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR SHALL DEVELOP AND SUBMIT A STAGING PLAN DETAILING METHODS AND SEQUENCING OF ALL INTENDED OPERATIONS. THE STAGING PLAN SHALL INCLUDE, BUT NOT BE LIMITED TO, METHODS, PLANS, AND DRAWINGS NECESSARY FOR STAGING TRAILERS, EQUIPMENT, MATERIALS, PARKING, DESIGNATED WORK ZONE AREAS AND REQUIREMENTS FOR ALL CONSTRUCTION ACTIVITIES. CONSTRUCTION ACTIVITIES SHALL NOT BE INITIATED UNTIL THE METHODS AND SEQUENCING OF ALL OPERATIONS ARE REVIEWED BY THE ENGINEER.
3. EXCAVATION ACTIVITIES WILL TAKE PLACE IN CLOSE PROXIMITY TO SOUTH FIRST STREET. THE CONTRACTOR SHALL COORDINATE WITH, AND SEEK APPROVAL FROM, THE CITY OF FULTON ON THE CONTRACTOR'S EXCAVATION ACTIVITIES IN THIS AREA. AT A MINIMUM THE CONTRACTOR SHALL PLACE JERSEY BARRIERS AS SHOWN TO PROTECT THE SITE FROM TRAFFIC FLOW.
4. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE PROTECTION OF THE NM-9 POLE SHOWN HERE. AT A MINIMUM THE CONTRACTOR SHALL PLACE JERSEY BARRIERS AS SHOWN. THIS IS ALSO A NO DIG ZONE AND IS DEPICTED ON SHT. G-5.
5. THE CONTRACTOR SHALL PROVIDE TEMPORARY CHAINLINK SECURITY FENCE AND GATES WITH PRIVACY PANELS AROUND THE ENTIRE LIMITS OF WORK IN AREAS 1 AND 2.
6. CLEARING AND GRUBBING SHALL BE PERFORMED ON AREAS 1 AND 2 IN ACCORDANCE WITH SPECIFICATION 02211 "CLEARING AND GRUBBING", WITH THE EXCEPTION OF THE 20" MAPLE TREE WHICH IS TO REMAIN. THE 20" MAPLE TREE SHOWN HERE SHALL BE PROTECTED IN ACCORDANCE WITH SPECIFICATION 02211 "CLEARING AND GRUBBING". REFER TO DRAWING G-6 FOR LIMITS OF NO DIG ZONE.

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER THIS DOCUMENT.

PRELIMINARY NOT FOR CONSTRUCTION

DATE: 2/25/11

NO.	DATE	REVISION	INIT.
C	2/25/11	ISSUED FOR NYSDEC REVIEW	
B	4/30/10	ISSUED FOR NYSDEC REVIEW	
A	4/16/10	ISSUED FOR CLIENT REVIEW	

1"=20' 20 0 20 40

O'BRIEN & GERE ENGINEERS INC.

NATIONAL GRID – FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK
SITE NO. 738034

REMEDIAL DESIGN

GENERAL

SITE PREPARATION PLAN

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

FILE NO. 1118.44581.007
DATE FEBRUARY 2011

G-3

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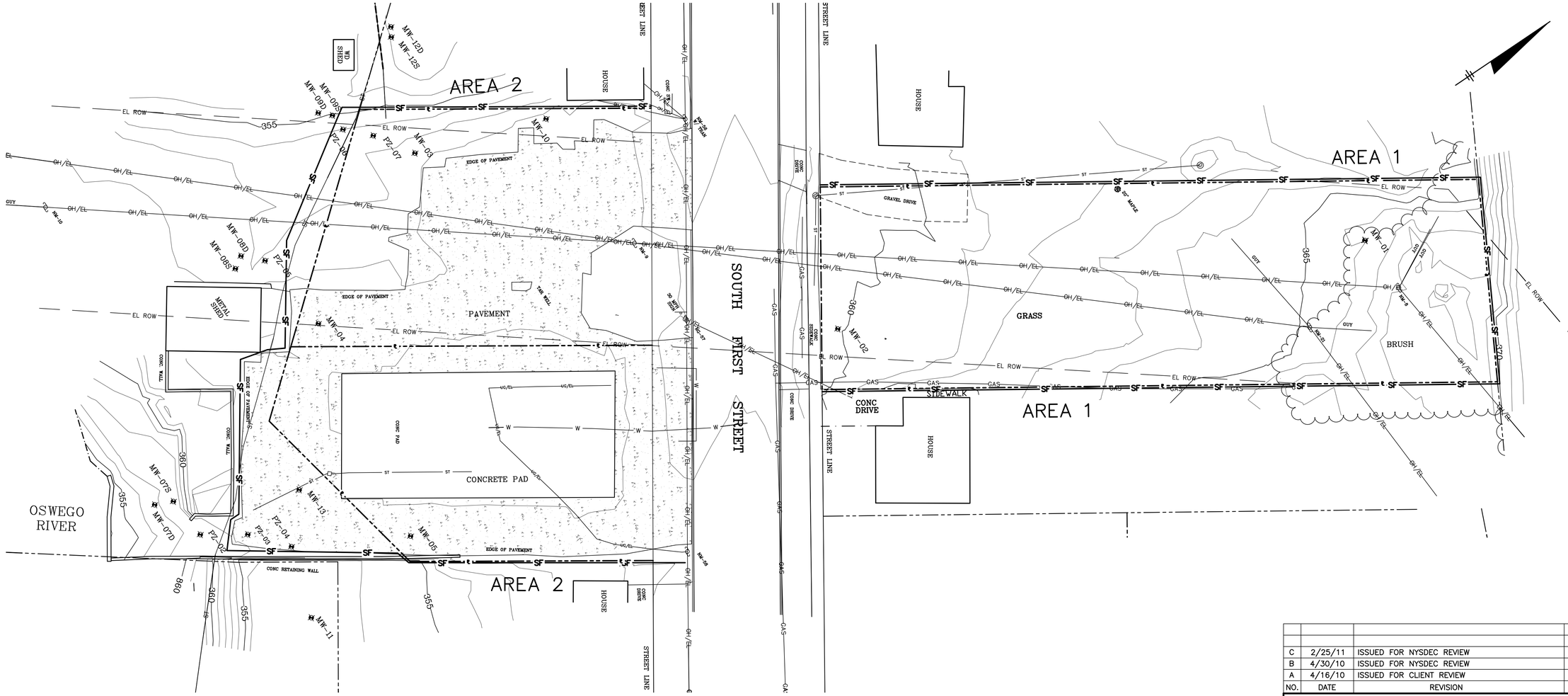

DRAWING NOTES:

1. SILT FENCE SHOWN HERE IS SHOWN OFF-SET FOR CLARITY. SILT FENCE SHALL BE INSTALLED WITHIN THE LIMITS OF THE PROPERTY BOUNDARY WITHIN AREA #1. SILT FENCE SHALL BE INSTALLED AS REQUIRED TO PERFORM THE WORK WITHIN AREA #2.
2. ALL SILT FENCE LOCATIONS SHOWN HERE ARE APPROXIMATE ONLY AND SHALL BE PROVIDED AT A MINIMUM. SEE SILT FENCE DETAIL SHEET G-7.
3. THE CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE CHANNELS AT ALL TIMES. WORK SHALL BE CONDUCTED IN SUBSTANTIVE COMPLIANCE WITH NYSDEC SPDES GP-0-10-001 AND PURSUANT TO THE PROJECT STORMWATER POLLUTION PREVENTION PLAN, EROSION AND SEDIMENT CONTROL PLAN, AND SPECIFICATION 02270 "EROSION AND SEDIMENT CONTROL. DRAINAGE SHALL BE MAINTAINED AT ALL TIMES.

PRELIMINARY NOT FOR CONSTRUCTION

DATE: 2/25/11

NO.	DATE	REVISION	INIT.
C	2/25/11	ISSUED FOR NYSDEC REVIEW	
B	4/30/10	ISSUED FOR NYSDEC REVIEW	
A	4/16/10	ISSUED FOR CLIENT REVIEW	

1"=20' 20 0 20 40

O'BRIEN & GERE ENGINEERS INC.

NATIONAL GRID – FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK
SITE NO. 738034

REMEDIAL DESIGN

GENERAL

EROSION & SEDIMENT CONTROL PLAN

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

FILE NO. 1118.44581.008
DATE FEBRUARY 2011

G-4

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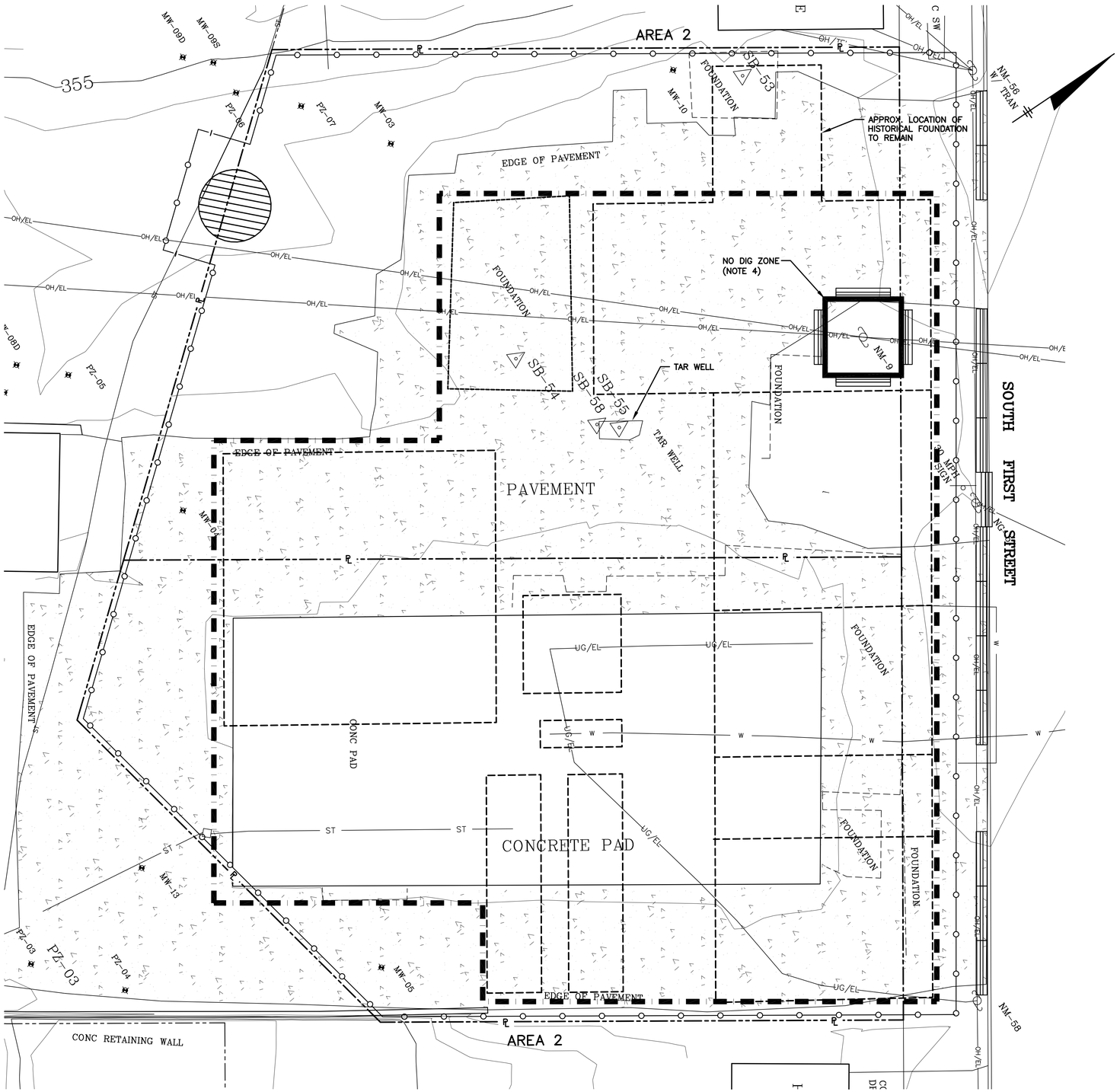

DRAWING NOTES:

1. ALL LIMITS OF EXCAVATIONS SHOWN HERE ARE APPROXIMATE ONLY AND SHALL BE VERIFIED IN THE FIELD IN CONSULTATION WITH THE ON–SITE ENGINEER. LIMITS OF EXCAVATION SHALL BE AS IDENTIFIED IN NOTES 5 & 6 BELOW UNLESS OTHERWISE NOTED.
2. ALL INTRUSIVE WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND NATIONAL GRID'S "PART 753 PROTECTION OF UNDERGROUND FACILITIES".
3. ALL EXISTING INACTIVE UNDERGROUND UTILITIES, WITHIN THE LIMITS OF EXCAVATION, SHALL BE REMOVED. THE CONTRACTOR SHALL COORDINATE ALL REMOVAL ACTIVITIES WITH THE APPROPRIATE UTILITY COMPANY. ALL UTILITY REMOVAL ACTIVITIES SHALL BE DONE IN STRICT ACCORDANCE WITH THE APPROPRIATE UTILITY COMPANY, AND ALL STATE, LOCAL AND FEDERAL REGULATIONS.
4. DUE TO STABILITY CONSIDERATIONS OF THE EXISTING POWER POLE, EXCAVATION ACTIVITIES SHALL NOT OCCUR WITHIN THE 7 FT BY 7 FT AREA SHOWN HERE.
5. THE CONTRACTOR SHALL REMOVE THE TOP TWO FEET OF MATERIAL FROM WITHIN THE ENTIRE LIMITS OF THE PROPERTY BOUNDARIES, UNLESS OTHERWISE NOTED.
   - SOIL NOT CONTAINING MGP RELATED CONTAINMENTS/COAL TAR SHALL BE STOCKPILED AND RE–USED AS BACKFILL AS DIRECTED BY THE ENGINEER WITH THE CONCURRENCE OF THE NYSDEC. MATERIAL DETERMINED TO CONTAIN MGP RELATED CONTAMINANTS/COAL TAR SHALL BE REMOVED AND DISPOSED OF OFF–SITE.
   - ASPHALT PAVEMENT SHALL BE REMOVED AND DISPOSED OF OFF–SITE IN ACCORDANCE WITH SPECIFICATION 02241 "OFF–SITE TRANSPORTATION AND DISPOSAL".
   - CONCRETE PADS SHALL BE REMOVED, BROKEN UP INTO SIZES ACCEPTABLE FOR OFF–SITE TRANSPORTATION AND DISPOSAL AND DISPOSED OFF OFF–SITE IN ACCORDANCE WITH SPECIFICATION 02241 "OFF–SITE TRANSPORTATION AND DISPOSAL".
6. THE CONTRACTOR SHALL REMOVE ALL FORMER MGP STRUCTURES AND FOUNDATIONS DETERMINED TO CONTAIN MGP RELATED CONTAMINANTS/COAL TAR TO THEIR FULL DEPTH.
   - CONCRETE STRUCTURES AND FOUNDATION MATERIAL SHALL BE DISPOSED OF OFF–SITE. PRIOR TO DISPOSAL ALL CONTAMINATED SOIL ADHERING TO THE SURFACE SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF SEPARATELY OFF–SITE.
   - IMPACTED SOIL IN THE IMMEDIATE VICINITY OF THE STRUCTURES SHALL BE REMOVED TO DEPTHS OF UP TO SEVEN FEET BELOW GRADE OR TO THE EXTENT PRACTICAL DUE TO DEWATERING LIMITATIONS. WATER ENTERING THE EXCAVATIONS SHALL NOT BE REMOVED. THE ACTUAL DEPTH OF REMOVAL WILL BE BASED ON VISUAL OBSERVATIONS IN THE FIELD, AS DIRECTED BY THE ENGINEER WITH THE CONCURRENCE OF THE NYSDEC.
   - THE CONTRACTOR SHALL INSTALL A VISIBLE DEMARCATION BARRIER (MIRAFI 160N) AND APPLY A OXYGEN RELEASING COMPOUND AT THE BASE OF THE EXCAVATION. SEE "TYPICAL EXCAVATION BACKFILL DETAIL" SHT. G–7 FOR DETAILS.

LEGEND:

- 0–2 FT SURFACE SOIL TO BE REMOVED CPAH AREA
- FORMER MGP STRUCTURE OR FOUNDATION TO BE REMOVED
- NO DIG ZONE (NOTE 4)
- APPROX. LIMITS OF FORMER MGP STRUCTURE OR FOUNDATION TO BE REMOVED (NOTE 6)
- ASPHALT PAVING

NO.	DATE	REVISION	INIT.
C	2/25/11	ISSUED FOR NYSDEC REVIEW	
B	4/30/10	ISSUED FOR NYSDEC REVIEW	
A	4/16/10	ISSUED FOR CLIENT REVIEW	

1"=10' 10 0 10 20

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PRELIMINARY NOT FOR CONSTRUCTION

DATE: 2/25/11

O'BRIEN & GERE ENGINEERS INC.

NATIONAL GRID – FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK
SITE NO. 738034

REMEDIAL DESIGN

GENERAL
AREA 2

EXCAVATION PLAN

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

FILE NO. 1118.44581.009
DATE FEBRUARY 2011

G–5

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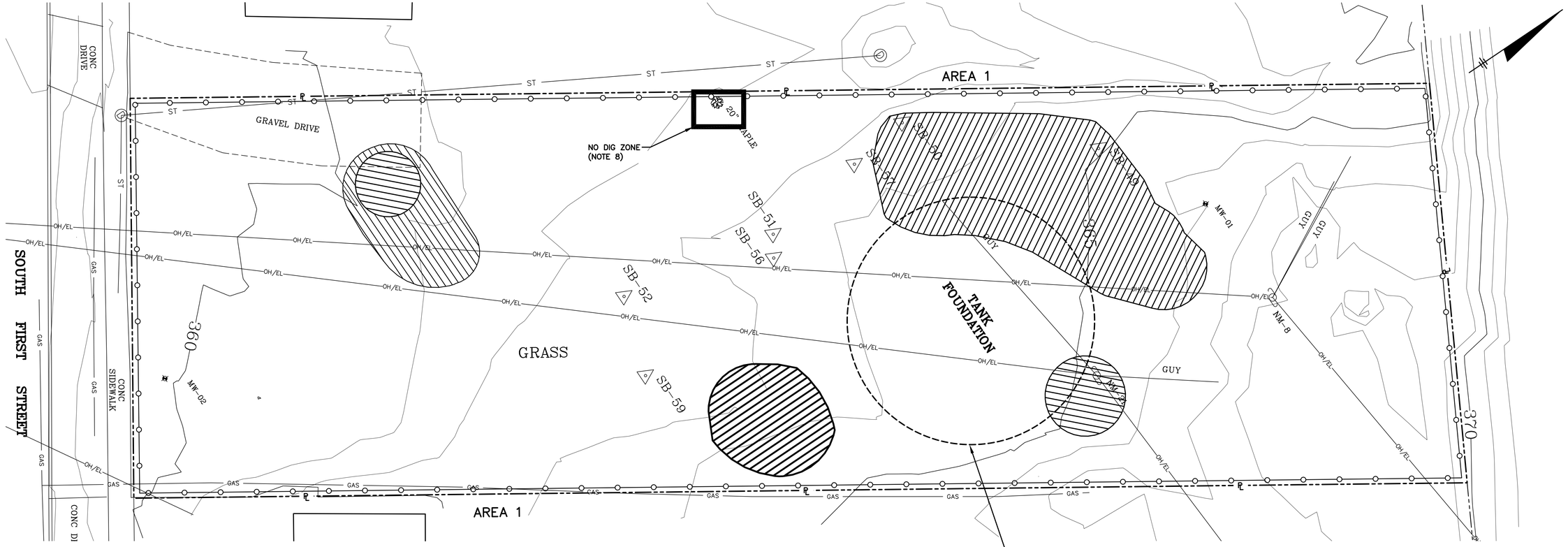

DRAWING NOTES:

1. ALL LIMITS OF EXCAVATIONS SHOWN HERE ARE APPROXIMATE ONLY AND SHALL BE VERIFIED IN THE FIELD IN CONSULTATION WITH THE ON-SITE ENGINEER. LIMITS OF EXCAVATION SHALL BE AS IDENTIFIED IN NOTES 3 & 4 BELOW UNLESS OTHERWISE NOTED.
2. ALL INTRUSIVE WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND NATIONAL GRID'S "PART 753 PROTECTION OF UNDERGROUND FACILITIES".
3. ALL EXISTING INACTIVE UNDERGROUND UTILITIES, WITHIN THE LIMITS OF EXCAVATION, SHALL BE REMOVED. THE CONTRACTOR SHALL COORDINATE ALL REMOVAL ACTIVITIES WITH THE APPROPRIATE UTILITY COMPANY. ALL UTILITY REMOVAL ACTIVITIES SHALL BE DONE IN STRICT ACCORDANCE WITH THE APPROPRIATE UTILITY COMPANY, AND ALL STATE, LOCAL AND FEDERAL REGULATIONS.
4. THE CONTRACTOR SHALL REMOVE THE TOP TWO FEET OF MATERIAL FROM WITHIN THE ENTIRE LIMITS OF THE PROPERTY BOUNDARIES, UNLESS OTHERWISE NOTED.
   - SOIL NOT CONTAINING MGP RELATED CONTAMINANTS/COAL TAR SHALL BE STOCKPILED AND RE-USED AS BACKFILL AS DIRECTED BY THE ENGINEER WITH THE CONCURRENCE OF THE NYSDEC. EXCESS SOIL NOT CONTAINING MGP RELATED CONTAINMENTS/COAL TAR SHALL BE RE-USED AS BACKFILL IN AREA 2 AS DIRECTED BY THE ENGINEER WITH THE CONCURRENCE OF THE NYSDEC.
   - MATERIAL DETERMINED TO CONTAIN MGP RELATED CONTAMINANTS/COAL TAR SHALL BE REMOVED AND DISPOSED OF OFF-SITE.
5. THE CONTRACTOR SHALL REMOVE ALL FORMER MGP STRUCTURES AND FOUNDATIONS DETERMINED TO CONTAIN MGP RELATED CONTAMINANTS/COAL TAR TO THEIR FULL DEPTH.
   - CONCRETE STRUCTURES AND FOUNDATION MATERIAL SHALL BE DISPOSED OF OFF-SITE. PRIOR TO DISPOSAL ALL CONTAMINATED SOIL ADHERING TO THE SURFACE SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF SEPARATELY OFF-SITE.
   - IMPACTED SOIL IN THE IMMEDIATE VICINITY OF THE STRUCTURES SHALL BE REMOVED TO DEPTHS OF UP TO SEVEN FEET BELOW GRADE OR TO THE EXTENT PRACTICAL DUE TO DEWATERING LIMITATIONS. WATER ENTERING THE EXCAVATIONS SHALL NOT BE REMOVED. THE ACTUAL DEPTH OF REMOVAL WILL BE BASED ON VISUAL OBSERVATIONS IN THE FIELD, AS DIRECTED BY THE ENGINEER WITH THE CONCURRENCE OF THE NYSDEC.
6. CROSS HATCHED EXCAVATION AREAS SHOWN HERE SHALL BE EXCAVATED TO THE LIMITS AND DEPTHS SHOWN AND DISPOSED OF OFF-SITE. SEE "TYPICAL EXCAVATION BACKFILL DETAIL" SHT. G-7 FOR DETAILS.
7. NO DIG ZONE SHOWN HERE IS PROVIDED TO PROTECT THE 20" MAPLE TREE.
8. THE CONTRACTOR SHALL INSTALL A VISIBLE DEMARCATION BARRIER (MIRAFI 160N) AND APPLY A OXYGEN RELEASING COMPOUND AT THE BASE OF THE EXCAVATIONS IN ACCORDANCE WITH NOTES 5 & 6. SEE "TYPICAL EXCAVATION BACKFILL DETAIL" SHT. G-7 FOR DETAILS.

LEGEND:

- 0-2 FT EXCAVATION DEPTH OF SOIL TO BE REMOVED CYANIDE AREA
- 0-4 FT EXCAVATION DEPTH OF SOIL TO BE REMOVED
- 0-7 FT EXCAVATION DEPTH OF SOIL TO BE REMOVED
- 0-2 FT SURFACE SOIL TO BE REMOVED CPAH AREA
- FORMER MGP STRUCTURE OR FOUNDATION TO BE REMOVED

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PRELIMINARY NOT FOR CONSTRUCTION

DATE: 2/25/11

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B	4/30/10	ISSUED FOR NYSDEC REVIEW	
A	4/16/10	ISSUED FOR CLIENT REVIEW	

1"=10' 10 0 10 20

O'BRIEN & GERE ENGINEERS INC.

NATIONAL GRID – FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK
SITE NO. 738034

REMEDIAL DESIGN

GENERAL
AREA 1

EXCAVATION PLAN

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

FILE NO. 1118.44581.010
DATE FEBRUARY 2011

G-6

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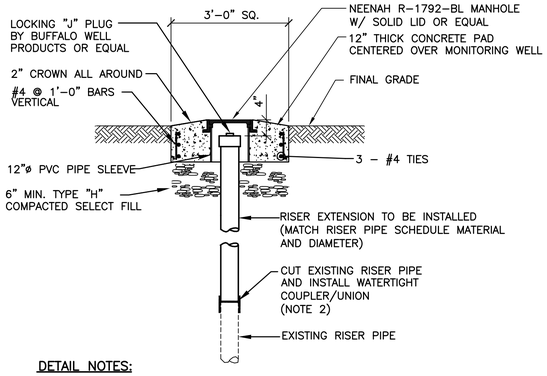
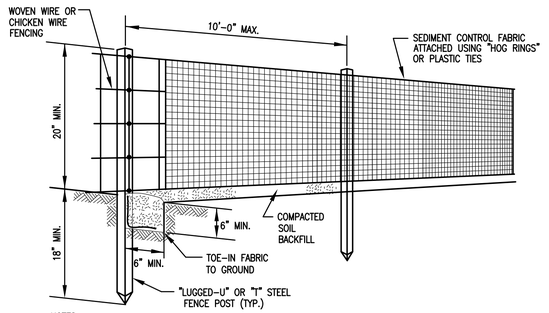


DETAIL NOTES:

1. DETAIL SHOWN HERE DEPICTS MONITORING WELL RESTORATION.
2. THE CONTRACTOR SHALL CUT THE EXISTING RISER PIPE AT A DEPTH REQUIRED TO PERFORM THE WORK SHOWN HERE OR AS DIRECTED BY THE ENGINEER.

MONITORING WELL RESTORATION DETAIL

NOT TO SCALE



NOTES:

1. SILT FENCE SHALL BE PLACED AS INDICATED ON THE EROSION CONTROL PLAN AND AS DESCRIBED IN THE PROJECT SWPPP.
2. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
4. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER- LAPPED BY SIX INCHES AND FOLDED.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
6. FENCE TO BE ALIGNED ALONG CONTOUR AS CLOSELY AS POSSIBLE.
7. FENCE SHALL BE DOUBLED AT THE TOE OF ALL SLOPES GREATER THAN 15 PERCENT, AND ADJACENT TO WATER BODIES.

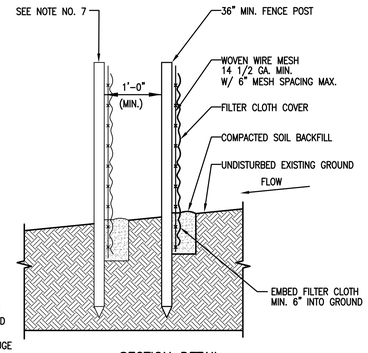
POSTS : STEEL EITHER T OR U TYPE OR 2" HARDWOOD

FENCE : WOVEN WIRE 14.5 GAUGE 6" MAX. MESH OPENING

FILTER CLOTH : MINIMUM TENSILE STRENGTH OF 120 LBS. (ASTM D-16826)

PREFABRICATED UNIT : MIRAFI ENVIROFENCE, OR APPROVED EQUAL

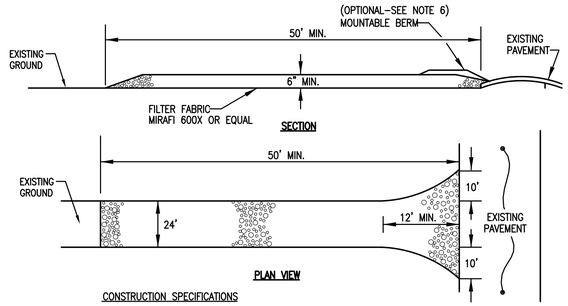
STANDARD SYMBOL —— SF —— SF



SECTION DETAIL

SILT FENCE DETAIL

NOT TO SCALE

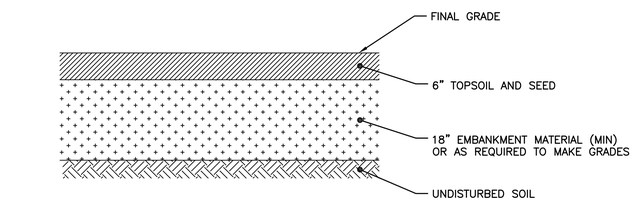


CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - AS REQUIRED, BUT NOT LESS THAN 50 FEET
3. THICKNESS - NOT LESS THAN SIX (6) INCHES
4. WIDTH-(24) TWENTY-FOUR FEET MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE EGRESS OCCURS.
5. FILTER FABRIC (MIRAFI 600X OR EQUAL) - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARDS CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS NOT POSSIBLE, A MOUNTABLE BERM 3' WIDE (MIN.) WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCES SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO ADJACENT SEDIMENT BASINS.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED IN ACCORDANCE WITH THE PROJECT STORM WATER POLUTION PREVENTION PLAN.

STABILIZED CONSTRUCTION ENTRANCE DETAIL

NOT TO SCALE

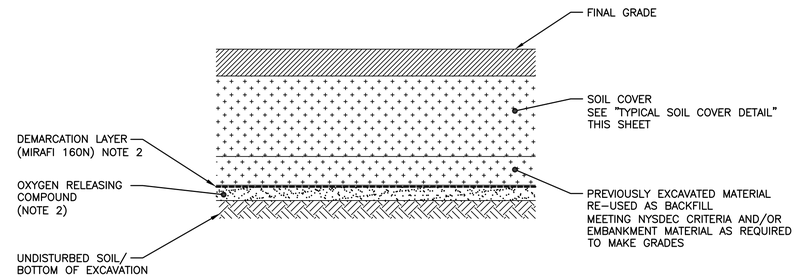


DETAIL NOTES:

1. SOIL COVER DETAIL SHOWN HERE SHALL BE APPLIED TO THE ENTIRE DISTURBED AREA AS DEPICTED ON SHEET'S G-5 AND G-6.

TYPICAL SOIL COVER DETAIL

NOT TO SCALE



DETAIL NOTES:

1. DETAIL SHOWN HERE PERTAINS TO ALL EXCAVATION AREAS AS DEPICTED ON SHT. G-5 AND G-6.
2. AN OXYGEN RELEASING COMPOUND (ORC ADVANCED) AS MANUFACTURED BY REGENESIS (OR EQUAL) SHALL BE APPLIED AS RECOMMENDED BY THE MANUFACTURER PRIOR TO PLACING THE DEMARCATION LAYER.

TYPICAL EXCAVATION BACKFILL DETAIL

NOT TO SCALE

PRELIMINARY NOT FOR CONSTRUCTION

DATE: 2/25/11

NO.	DATE	REVISION	INIT.
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B	4/30/10	ISSUED FOR NYSDEC REVIEW	
A	4/16/10	ISSUED FOR CLIENT REVIEW	

1"=10' 10 0 10 20

O'BRIEN & GERE ENGINEERS INC.

NATIONAL GRID - FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK
SITE NO. 738034

REMEDIAL DESIGN

GENERAL

MISCELLANEOUS DETAILS

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

FILE NO. 1118.44581.011
DATE FEBRUARY 2011

G-7

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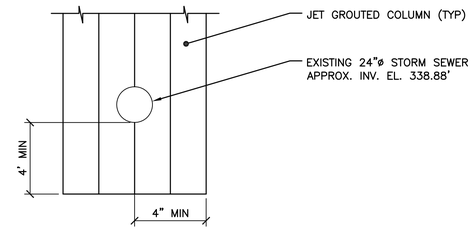
DRAWING NOTES:

1. INFORMATION SHOWN HERE IS CONSIDERED APPROXIMATE ONLY AND IS NOT THE RESULT OF AN INSTRUMENT SURVEY. THE CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION AS REQUIRED TO PERFORM THE WORK.
2. EXISTING STORM SEWER SHALL BE REHABILATATED FROM MH–A TO MH–B AS SHOWN HERE, IN ACCORDANCE WITH SPECIFICATION 02623 "CURED–IN–PLACE PIPE".
3. THE CONTRACTOR SHALL COORDINATE ALL STORM SEWER REHABILATION WORK WITH THE CITY OF FULTON.
4. THE STORM SEWER WILL BE CLEARED OF DEBRIS, MINERAL DEPOSITS, AND ROOTS BETWEEN MANHOLES LABELED "A" AND "B".
5. ONCE CLEARED OF DEBRIS, THE STORM SEWER WILL BE EXAMINED BY CCTV TO DOCUMENT THE EXISTING CONDITION OF THE STORM SEWER AND VERIFY ITS LOCATION AND DEPTH.
6. A BYPASS WILL BE INSTALLED, OR THE UPSTREAM CONTRIBUTING SEWER WILL BE TEMPORARILY PLUGGED, TO ISOLATE THE SECTION OF SEWER PIPE BETWEEN MANHOLES "A" AND "B" DURING THE INSTALLATION AND CURING OF THE PIPE–LINER.
7. THE PIPE–LINER WILL BE INSTALLED AND CURED. AFTER CURING, THE SEWER WILL BE RE–EXAMINED BY CCTV TO DOCUMENT THE CONDITION OF THE SEWER FOLLOWING REHABILITATION TO VERIFY THAT THE INSTALLATION OF PIPE–LINER WAS SUCCESSFUL.
8. ONCE THE WORK IS ACCEPTED BY THE ENGINEER AS BEING COMPLETE, THE BYPASS OR TEMPORARY PLUGS USED DURING THE REHABILITATION WILL BE REMOVED AND NORMAL SEWER FLOW ALLOWED.
9. THE CONTRACTOR SHALL VERIFY THE LOCATION OF AND PERFORM JET GROUTING AROUND THE 24"ø STORM SEWER AT THE LOCATION SHOWN HERE IN ORDER TO ELIMINATE THE POTENTIAL FOR GROUNDWATER FLOW THROUGH THE STORM SEWER BEDDING. REFER TO "JET GROUTED BARRIER DETAIL" THIS SHEET FOR DETAILS.



DETAIL NOTES:

1. JET GROUTING SHALL BE INSTALLED SUCH THAT IT EXTENDS A MINIMUM OF FOUR FEET IN ALL DIRECTIONS FROM THE EXISTING 24"ø STORM SEWER.
2. THE APPROXIMATE INVERT ELEVATION OF THE EXISTING 24"ø STORM SEWER IS 338.88'.
3. JET GROUTING SHALL BE INSTALLED IN ACCORDANCE WITH SPECIFICATION 02402 "JET GROUTING".

JET GROUTED BARRIER DETAIL

NOT TO SCALE

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C	2/25/11	ISSUED FOR NYSDEC REVIEW	
B	4/30/10	ISSUED FOR NYSDEC REVIEW	
A	4/16/10	ISSUED FOR CLIENT REVIEW	

1"=50' 50 0 50 100

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DATE: 2/25/11

O'BRIEN & GERE ENGINEERS INC.

NATIONAL GRID – FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK
SITE NO. 738034

REMEDIAL DESIGN

GENERAL

SEWER REHABILITATION PLAN

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

FILE NO. 1118.44581.012
DATE FEBRUARY 2011

G–8

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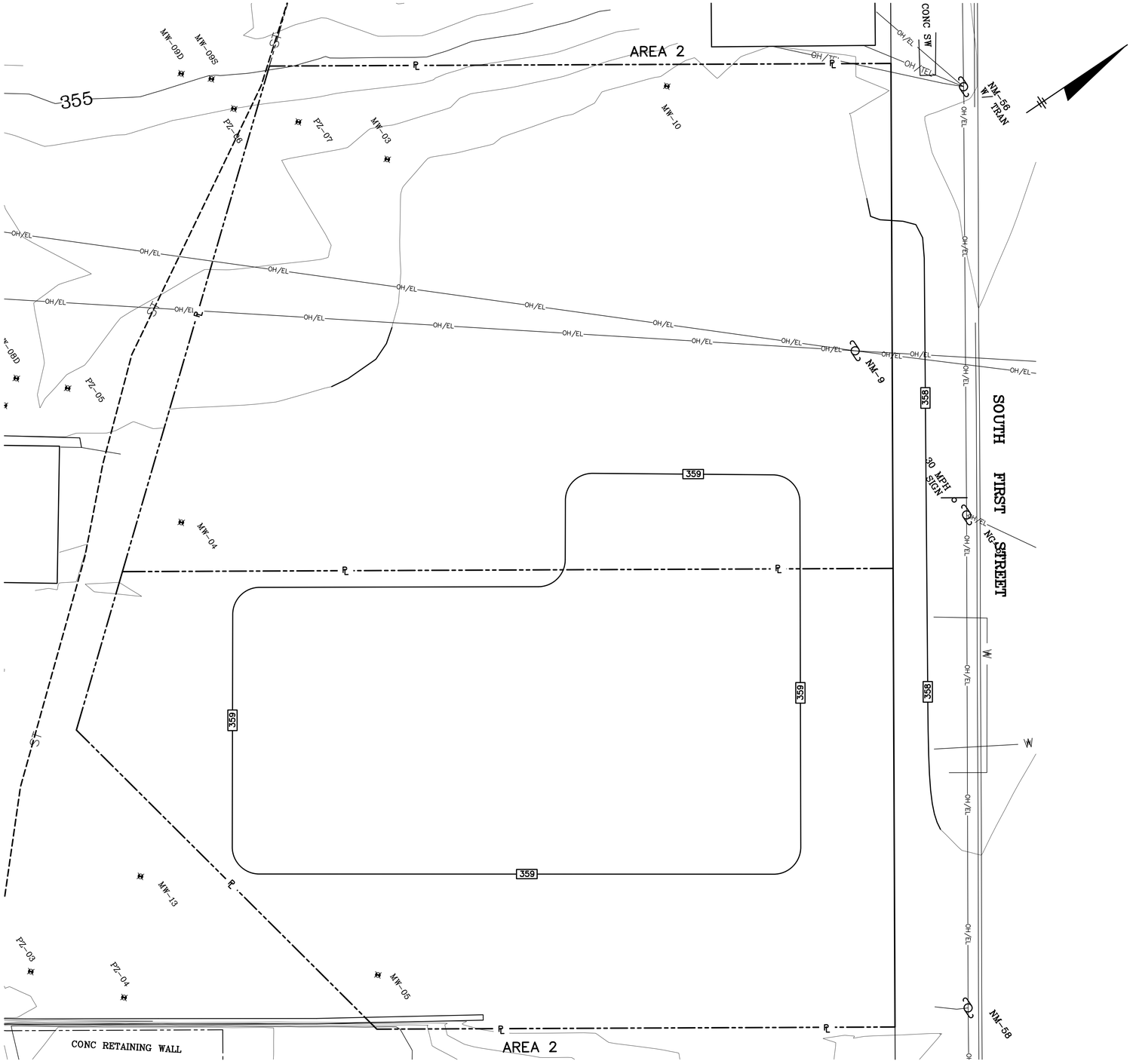

DRAWING NOTES:

1. ALL AREAS PREVIOUSLY EXCAVATED OR OTHERWISE DISTURBED SHALL BE RESTORED WITH TOPSOIL AND SEED. REFER TO "SOIL COVER DETAIL" SHT. G-7 FOR RESTORATION OF AREAS WITHIN THE LIMITS OF THE PROPERTY. REFER TO SPECIFICATION 02503 "RESTORATION OF SURFACES" FOR ALL OTHER AREAS DISTURBED.
2. REFER TO "MONITORING WELL RESTORATION DETAIL" SHT. G-7 FOR WELL RESTORATION DETAILS.

NO.	DATE	REVISION	INIT.
C	2/25/11	ISSUED FOR NYSDEC REVIEW	
B	4/30/10	ISSUED FOR NYSDEC REVIEW	
A	4/16/10	ISSUED FOR CLIENT REVIEW	

1"=10' 10 0 10 20

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PRELIMINARY NOT FOR CONSTRUCTION

DATE: 2/25/11

O'BRIEN & GERE ENGINEERS INC.

NATIONAL GRID – FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK
SITE NO. 738034

REMEDIAL DESIGN

GENERAL
AREA 2
FINAL SITE RESTORATION PLAN

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

FILE NO. 1118.44581.013
DATE FEBRUARY 2011

G-9

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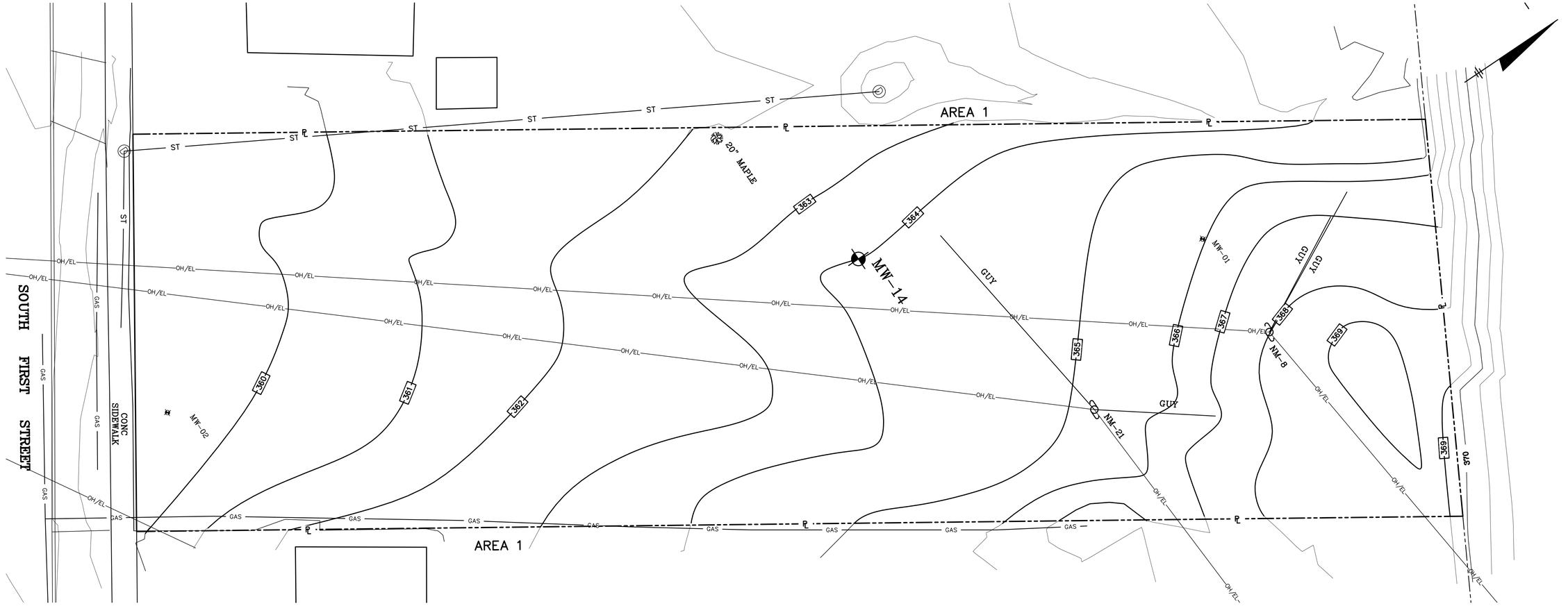

DRAWING NOTES:

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2. MONITORING WELL MW-14 SHOWN HERE SHALL BE INSTALLED IN ACCORDANCE WITH THE WELL DATA TABLE/SCHEDULE SHOWN ON SHT. G-1 AND SPECIFICATION 02151 "GROUNDWATER MONITORING WELL REPAIR AND REPLACEMENT.
3. REFER TO "MONITORING WELL RESTORATION DETAIL" SHT. G-7 FOR WELL RESTORATION DETAILS.

PRELIMINARY NOT FOR CONSTRUCTION

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1"=10' (10 0 10 20)

O'BRIEN & GERE ENGINEERS INC.

NATIONAL GRID – FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK
SITE NO. 738034

REMEDIAL DESIGN

GENERAL
AREA 1
FINAL SITE RESTORATION PLAN

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

FILE NO. 1118.44581.014
DATE FEBRUARY 2011

G-10

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Technical Specifications

SPECIAL PROVISIONS

SP-1 General Construction Sequence
SP-2 Work Schedule
SP-3 Contract Work Area Security
SP-4 Notices
SP-5 NYSDEC Review
SP-6 Odor Control
SP-7 Progress and Coordination Meetings
SP-8 Emergency Calls
SP-9 Existing Utilities
SP-10 Dust Monitoring and Control Program
SP-11 Contractor's Construction Quality Control Plan
SP-12 Borrow Materials
SP-13 Retention of Records
SP-14 Reporting Requirements
SP-15 Emergency Response
SP-16 Staging Plan
SP-17 Utilization of On-Site Materials
SP-18 Supplemental Information
SP-19 Construction Water Management
SP-20 Potential to Treat by Low Temperature Thermal Desorption
SP-21 Pre-Construction Inspection
SP-22 Noise Control

TECHNICAL SPECIFICATIONS

DIVISION 1 – GENERAL REQUIREMENTS

Section 01300 Surveys
Section 01700 Health and Safety

DIVISION 2 – SITEWORK

Section 02003 Field Office Trailer
Section 02007 Perimeter Air Monitoring and Dust Control Plan
Section 02009 Project Photographs
Section 02110 Storm Water Pollution Prevention
Section 02141 Construction Water Management
Section 02145 Groundwater Monitoring Well Abandonment
Section 02151 Groundwater Monitoring Well Repair and Replacement
Section 02211 Clearing and Grubbing
Section 02221 Earthwork
Section 02223 Embankment
Section 02225 Structural Excavation, Backfill, and Compaction
Section 02229 Rock Removal
Section 02231 Select Fill
Section 02241 Off-Site Transportation and Disposal
Section 02242 Tar Excavation and Off-Site Disposal
Section 02278 Geotextile Filter Fabric

DIVISION 2 – SITEWORK - CON'T

SPECIAL PROVISIONS

SP-1 GENERAL CONSTRUCTION SEQUENCE

A. Prior to commencement of work, the Contractor shall develop and submit methods and sequence of all intended operations, hereafter referred to as the Staging Plan. The Staging Plan shall include, but not be limited to, methods, plans, and drawings necessary for staging trailers, equipment, materials, parking, designated work zones areas and requirements for all construction activities. Construction activities shall not be initiated until the methods and sequencing of all operations are reviewed by the Engineer.

B. The Contractor will be solely responsible for scheduling and coordinating completion of the Work in an effective and efficient manner, and for protecting the work completed by them or others during the project, in accordance with the requirements of the Contract Documents. However, in general it is anticipated that construction of the work will be completed in the following sequence:

1. The Contractor shall set up temporary office facilities, soil stockpile and equipment staging areas, erosion and sediment controls, and other apparatus required for the execution of the work.

2. The Contractor shall commence excavation activities to the limits shown on the Contract Drawings or as specified by the Engineer.

3. Backfill of excavations and restoration of surfaces as shown on the Contract Drawings or as specified by the Engineer.

4. On completing all the work required to be performed under the Contract, the Contractor shall demobilize their equipment and facilities from the Site. At the Contractor's own expense, the areas outside the excavations altered or damaged as a consequence of their actions shall be restored to a condition equivalent to those existing prior to the work.

SP-2 WORK SCHEDULE

A. The work of this Contract shall be scheduled in a manner mutually acceptable to the owner, owner's representative, engineer and the contractor. Unless otherwise especially permitted, no work shall be done between the hours of 5:00 p.m. and 7:00 a.m., nor on Sundays, July 4 (or designated holiday for July 4); Thanksgiving Day and the day after; and the Monday designated holidays for Memorial Day and Labor Day, except as necessary for the proper care and protection of work already performed. The Contractor will be allowed to work on Saturdays only with approval from the Owner and Engineer. If it shall become absolutely necessary to perform work at night, the Engineer shall be informed a reasonable time in advance of the beginning of performance of such work. Only such work shall be done at night as can be done satisfactorily and in a safe manner. Good lighting and all other necessary facilities for carrying out and inspecting the work shall be provided and maintained at all points where such work is being done. Minimum permissible illumination intensities are identified in 29 CFR 1910.120. All

Contractor requests to perform night, Saturday, Sunday or Holiday work shall be made in writing to the Engineer.

SP-3 CONTRACT WORK AREA SECURITY

A. The Contractor shall provide all elements of work area security necessary to prevent the unauthorized entry of persons onto the site, including but not limited to providing a 6-ft tall temporary chain link fence around the perimeters of Area 1 and Area 2 (collectively making the "Site") and including areas designated for excavation where extending off-site. Gates for access to the Site shall be installed as deemed appropriate by the Contractor to complete the work, but minimally shall include a 24-ft wide vehicle/equipment access gate to each Area, the locations of which shall be selected by the Contractor and identified in their Staging Plan. The fence shall include provision of a visual barrier (slot strips or fabric) to shield view of the Site from the public.

B. All roads entering and adjacent to the Site shall be kept open at all times unless prior arrangements for temporary closing are made with the appropriate authorities. The Contractor shall be responsible for all cost associated with installation, maintenance and removal of:

1. A stabilized construction entrance and decontamination pad for each access point to the Site,

2. Jersey barriers parallel to the public right-of-way of South First Street on the border of Area 2,

3. Work area security measures instituted during the various phases of construction.

SP-4 NOTICES

A. Whenever, under the terms of this Contract, written notice is required to be given by the Contractor to the Owner, it shall be directed to:

Steven Stucker, CPG
National Grid Corporation
300 Erie Boulevard West
Syracuse, New York 13202
Attention: Steven Stucker

A copy shall be provided to the Engineer as well.

SP-5 NYSDEC REVIEW

A. The Contractor's Staging Plan, Community Air Monitoring Plan (CAMP) including a Particulate Emission Response Plan, Health and Safety Plan (HASP), Erosion and Sediment Control Plan (ESCP) in order to comply with the Stormwater Pollution Prevention Plan (SWPPP) prepared by the Engineer and approved by the NYSDEC, Odor Control Plan, and Quality Assurance Project Plan (QAPP) may be subject to the review of the NYSDEC prior to acceptance by

the Engineer. The Contractor is advised that they should allow up to 20 days time for review and comment on each draft of the CAMP including Particulate Emission Response Plan, HASP, ESCP, Odor Control Plan, and QAPP submitted for review. No additional payment or extension of time shall be provided to the Contractor for failure by the Contractor to satisfactorily address specified requirements.

B. An electronic PDF copy of each of the documents (Staging Plan, Particulate Emission Response Plan, HASP, ESCP, Odor Control Plan, and QAPP) shall be provided to the Engineer. After review and approval by the Engineer, a final PDF copy and three printed copies shall be provided to the Engineer.

C. No work shall be started until the Staging Plan, Particulate Emission Response Plan, HASP, ESCP, Odor Control Plan, and QAPP have been reviewed and accepted by the Engineer. If conditions change during construction, the Contractor may be required to submit a revised document for review as directed by the Engineer.

D. The Health and Safety Plan and the CAMP shall be submitted to the NYSDEC for review.

E. Daily site perimeter air monitoring readings shall be submitted to the agencies via e-mail during construction.

SP-6 ODOR CONTROL

A. The Contractor shall prepare an Odor Control Plan that describes provisions that will be implemented to control odor emanating from excavations and stockpiles of MGP waste material and contaminated soil. Primary measures shall be implemented to minimize generation of odor by minimizing, to extent practicable, exposed surface of waste material and contaminated soil. Secondary measures shall include use of products, approved by the Engineer, to mask objectionable odors. The Engineer shall be the sole judge as to whether or not an odor is perceptible and objectionable and requires control measures. No additional payment shall be made to the Contractor to control odors from the excavations or waste material stockpiles.

B. Depending upon specific circumstances, field observations, and air monitoring results, the following dust and odor control measures may be used:

- Odor suppression foams
- Bio-Solve
- Water Spray
- Polyethylene sheeting (for covering excavation faces, material stockpiles, etc.)

Minimally, the Contractor shall have immediately available on site the following items to minimize odor, and to reduce odor in the event that additional odor control is deemed necessary by the Owner's Representative:

1. An adequate supply of 20 mil LLDPE liner to cover all Contractor

stockpiles each day. All stockpiles shall be covered by the Contractor at the conclusion of each work day, or whenever a stockpile is not actively being worked during a given day.

2. Bio-Solve and equipment to spray it on surfaces emitting odor.

3. One fully operational Rusmar foam (or equivalent) machine including operator for use during removal of material with high odors. Minimally, Rusmar foam (or equivalent) shall be sprayed in excavations made deeper than 2 ft bgs where NAPL or MGP tar is present and the Owner's Representative deems it necessary to mitigate odor at the end of each work day and on weekends to minimize the potential for objectionable odor from the open excavation. Rusmar foam polymer shall be available on site.

SP-7 PROGRESS AND COORDINATION MEETINGS

A. Progress and coordination meetings shall be held every week, or as otherwise directed by the Owner's Representative, with the Contractor's supervisory representatives, with decision-making authority, in attendance. Representatives of the Owner, NYSDEC, and the Engineer may also attend the progress and coordination meetings.

B. Meeting minutes will be prepared by the Owner's Representative and distributed to all attendees and others affected by decisions or actions from each meeting.

SP-8 EMERGENCY CALLS

A. The Contractor shall provide the Owner with the phone numbers of at least three (3) responsible persons, to be used during non-working hours and weekends, who shall be in a position to dispatch personnel and equipment to the project in the event of an emergency.

SP-9 EXISTING UTILITIES

A. Special precautions shall be observed to not cause interference or damage to any existing utilities, unless the existing utility is to be abandoned as shown on the Contract Drawings or specified. Where an existing utility is to be abandoned, the Contractor shall complete the work in accordance with the technical specifications and requirements of the owning Utility.

B. The Contractor shall notify the proper utility companies at least seventy-two (72) hours before construction is started adjacent to such utilities. Proof of such notification shall be filed with the Engineer. Failure to provide such proof shall be cause for an automatic cessation of the work. Utilities shall be protected in the manner prescribed by the utility company. No additional compensation other than stated in the Payment Items will be made for coordination or requirements of others relative to existing utilities.

SP-10 DUST MONITORING AND CONTROL PROGRAM

A. Control of fugitive dust created as a result of this project shall be the obligation of the Contractor. Notwithstanding the requirements of the Contract Documents, the Contractor shall also comply with the requirements of OSHA 29 CFR 1910.1000. A Dust Monitoring and Control Program shall be prepared and implemented by the Contractor and shall include, but not be limited to, the following:

(1) Preparation of a Dust Monitoring and Control Plan including mitigation measures, control of operations, emergency measures to be used, monitoring requirements, action levels, etc.

(2) Required particulate monitoring.

(3) Implementation of mitigation efforts, including reasonable suppression techniques.

(4) Proposed remedial actions when particulate action levels are breached.

(5) Quality assurance/quality control (QA/QC) to assure accuracy of monitoring program.

B. The Plan may be subject to review by the NYSDEC prior to acceptance by the Engineer or Owner.

C. The results of monitoring for dust shall be provided to the Engineer on a daily basis.

SP-11 CONTRACTOR'S CONSTRUCTION QUALITY CONTROL PLAN

A. The Contractor shall prepare and implement a Construction Quality Control (CQC) Plan for the work of this Contract. The plan shall include, as a minimum, the following:

(1) Description of the CQC organization, including chart showing lines of authority and acknowledgment that the CQC staff shall be in addition to the job supervisory staff.

(2) Names, qualifications, duties, responsibilities and authorities of each person assigned a CQC function.

B. The Contractor's CQC Geotechnical Laboratory shall be an independent laboratory not owned by the Contractor and/or subcontractors or owned by a subsidiary or affiliate of the Contractor and/or his subcontractors. The Geotechnical Laboratory shall have an internal QC plan to confirm that laboratory procedures conform to applicable standards. The laboratory shall follow the internal QC procedures. The laboratory shall allow National Grid, NYSDEC, Engineer, and Installer to observe sample preparation, testing procedures, record-keeping procedures, and some or all tests at any time, either announced or unannounced.

C. The Contractor's CQC Analytical Laboratory shall be an independent laboratory not owned by the Contractor and/or subcontractors or owned by a subsidiary or affiliate of the Contractor and/or subcontractors. The Analytical Laboratory shall have an internal QC plan to confirm that laboratory procedures conform to applicable standards. The laboratory shall follow the internal QC procedures. The laboratory shall allow National Grid, NYSDEC, Engineer, and Installer to observe sample preparation, testing procedures, record-keeping procedures, and some or all tests at any time, either announced or unannounced.

D. The Contractor's CQC Plan shall be subject to acceptance by the Engineer prior to commencement of construction activities. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Engineer shall reserve the right to require the Contractor to make changes to his CQC Plan and operations as necessary to obtain the quality specified.

E. Following acceptance of the CQC Plan, the Contractor shall notify the Engineer in writing of any proposed changes. Proposed changes are subject to acceptance by the Engineer.

SP-12 BORROW MATERIALS

A. Contractor shall submit an affidavit from the owner of the source of each type of borrow material stating that to the best of their knowledge, the site of the source material was never used as a dump site for chemical, toxic, hazardous or radioactive materials and it is not now nor ever has been listed as a suspected depository for chemical, toxic, hazardous or radioactive materials by any Federal, State or governmental agency, department, or bureau.

B. The Contractor shall sample each different type of off-site material incorporated into the work at the location or locations identified by the Engineer. The Contractor shall perform analyses for Target Analyte List (TAL) volatile organic compounds (VOCs), TAL semi-volatile organic compounds (SVOCs), TAL metals, cyanide (total and amenable), PCBs, herbicides and pesticides for one composite sample of each source. Laboratory data shall be submitted to the Engineer for review, on Owner’s behalf, immediately upon receipt and prior to use of the material on-site. The Engineer shall be the sole judge as to what constitutes each different type of material; however the definition of “different” shall include, but is not necessarily limited to, variances in the physical properties of the same material, as well as the same material derived from separate borrow sources or separate areas in the same borrow pit. The analytical results will be compared to the cleanup objectives set forth in 6 NYCRR Part 375 and must satisfy the soil cleanup objectives for the lower of the protection of groundwater or the protection of public health - residential. If the materials are found to be unacceptable by the Engineer, the Contractor shall remove and properly dispose of the materials in accordance with all applicable Federal, State and local laws and regulations at the Contractor’s expense and liability.

SP-13 RETENTION OF RECORDS

A. Contractor and its agents and subcontractors shall preserve all documents, records,

and information of whatever kind, nature or description relating to the performance of the Work for ten (10) years after Substantial Completion, as defined in the Contract Documents.

SP-14 REPORTING REQUIREMENTS

A. Contractor shall submit to Engineer and Owner written progress reports, monthly or less frequently if less frequent submission is approved in writing by the Owner that: (a) describe the Work that has been performed during the previous month; (b) include a summary of all results of sampling and tests and all other data received or generated by Contractor or its subcontractors or agents in the previous month; (c) identify all work plans, plans and other deliverables completed and submitted during the previous month; (d) describe all actions, including, but not limited to, data collection and implementation of work plans, which are scheduled for the next six weeks and provide other information relating to the progress of construction, including but not limited to bar charts; (e) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays; and (f) include any modifications to the work plans or other schedules that O'Brien & Gere or the Owner has proposed to NYSDEC or that have been approved by NYSDEC. Contractor shall submit these progress reports to the Owner by the fifth day of every month following the commencement of the Work.

B. Contractor shall notify Engineer and the Owner of any change in the schedule described in the monthly progress report for the performance of any activity, including, but not limited to, data collection and implementation of work plans, no later than twelve days prior to the performance of the activity.

SP-15 EMERGENCY RESPONSE

A. In the event of any action or occurrence during the performance of the Work which causes or threatens a release of waste material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Contractor shall immediately take all appropriate action to prevent, abate, or minimize such release or threat of release and shall immediately notify the Engineer, Owner, and NYSDEC's Project Coordinator. The term "waste material" as used in this section shall mean: (1) any "hazardous substance" under Section 101(14) of CERCLA. 42 U.S.C. §9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA. 42 U.S.C. §9601(33); and (3) any "solid waste" under Section 1004(27) of RCRA. 42 U.S.C. §6903(27).

SP-16 STAGING PLAN

A. Prior to commencement of work, the Contractor shall develop and submit methods and sequencing of all intended operations hereinafter referred to as the Staging Plan. The Staging Plan shall include, but not be limited to, methods, plans, and drawings necessary for staging trailers and equipment, stockpiling materials, and designating work zones, temporary construction access roads and parking, and requirements for other construction activities. Construction activities

shall not be initiated until the methods and sequencing of all operations has been reviewed and approved by the Engineer.

SP-17 UTILIZATION OF ON-SITE MATERIALS

A. The Contractor is not permitted to utilize on-site material for purposes of meeting Contractor's material requirements, unless written approval to do so is first provided by the Engineer based on the acceptance by the Owner of the Contractor's proposed use of uncontaminated material.

SP-18 SUPPLEMENTAL INFORMATION

A. Certain site and chemical information may be shown on separate sheets or made available by the Owner or Engineer to Bidders, Contractors, and other interested parties. Neither such information nor the documents on which it may be shown shall be considered a part of the Contract Documents or Contract Drawings, it being understood that such information is made available only as a convenience, without express or implied representation, assurance, or guarantee that the information is adequate, complete, or correct, that it represents a true picture of the site and chemical conditions to be encountered, or that all pertinent site and chemical data in the possession of the Owner or Engineer has been furnished.

B. It shall be the Contractor's responsibility to satisfy the Contractor as to the nature, character, quality and quantity of conditions likely to be encountered. Any reliance upon the site information and chemical data available shall be at the Contractor's risk. The Contractor agrees that he shall neither have nor assert against the Owner or Engineer any claim for damages for extra work or otherwise or for relief from any obligation for this Contract based upon the failure by the Owner or Engineer to obtain or to furnish all site or chemical information in the Owner's or Engineer's possession or based upon any inadequacy or inaccuracy of the information furnished; provided, however that the Contractor may be entitled to an adjustment in the contract price under the circumstances and to the extent provided in the Contract.

SP-19 CONSTRUCTION WATER MANAGEMENT

A. No dewatering of excavations below the static groundwater level shall be required. However, the Contractor is responsible for management of Construction Water that may enter the excavation (above the static groundwater level) or which may drain from or otherwise come into contact with MGP-impacted soils removed from the excavation.

1. Construction Water shall be defined as the following:

a. Surface water resulting from precipitation during construction which has come in contact with potentially contaminated soils, fill, or debris.

b. Water or other liquids drained from or which have come into contact with potentially contaminated soils or debris, in addition to that resulting from precipitation.

c. Equipment and vehicle decontamination liquid.

d. Exempt from the definition of Construction Water for the Fulton Street MGP project is groundwater collected from below the static groundwater level.

2. Minimization of Construction Water

a. The Contractor shall make every effort to minimize the generation of Construction Water and associated sediments and sludges. Methods to minimize generation of Construction Water include, but are not limited to:

1) Erection of temporary berms to prevent surface water entering the excavations.

2) Use of low permeability tarpaulin or suitable means to cover exposed contaminated areas and materials.

3) Limiting the amount of exposed contaminated areas.

4) Grading to control run-on and run-off.

5) Engineering controls on construction activities to minimize contact of personnel and equipment with contaminated areas thus minimizing the amount of decontamination required and other appropriate methods.

3. Treatment and/or Disposal of Construction Water

a. The Contractor shall collect, treat and dispose all Construction Water in accordance with the Technical Specification Section 02141 - Construction Water Management.

B. The Contractor shall perform excavation activities to the depths as shown, directed or until contact with groundwater takes place, at which time excavation activities will cease unless directed otherwise by the Owner's Representative.

SP-20 POTENTIAL TO TREAT BY LOW TEMPERATURE THERMAL DESORPTION

A. Dependent on the results of the waste characterization activities, the soil excavated from the Site may be treated/disposed in a manner consistent with the NYSDEC program policy, Technical and Administrative Guidance Memorandum (TAGM) 4061, *Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants* (NYSDEC, 2002). The policy outlines criteria wherein soil that has been contaminated with coal tar waste from MGPs exhibiting only the hazardous waste toxicity characteristic for benzene (D018) may be excluded from the requirements of 6 NYCRR Parts 370-374 and 376 when they are destined for permanent thermal treatment.

B. In the event that any characterization results or field observations indicate that certain soils are unsuitable for off-site low temperature thermal desorption (LTTD) treatment/disposal, as determined by the Owner or Engineer, in consultation with the treatment facility, the Contractor shall arrange for off-site incineration and/or disposal at a National Grid-approved facility in accordance with applicable rules and regulations. The Contractor shall coordinate with the facility prior to initiating excavation activities to minimize potential work delays if such material is encountered.

SP-21 PRE - CONSTRUCTION INSPECTION

A. Prior to the start of any construction activities, the Contractor and the Engineer shall make a joint condition survey of the structures adjacent to the property to document the condition of the structures prior to construction. The condition survey shall be performed using a video camera in DVD format and digital photography. During the video survey, the Construction Manager and Contractor and Engineer will verbally document any pre-existing damage and the location of the damage as well as provide a drawing with conditions identified. Damage includes cracks, spalling, signs of settlement, flooding and leaking.

SP-22 NOISE CONTROL

A. It shall be the responsibility of the Contractor to take adequate measures for keeping noise levels, as produced by construction equipment, to safe and tolerable limits as set forth by the Occupational Safety and Health Administration (OSHA), and as set forth by other applicable federal, state, and local regulations. All Contractor machinery and equipment presenting a potential noise nuisance, as determined by the Engineer, shall be provided with noise muffling devices or be replaced at no additional cost to the Owner.

B. The Contractor shall submit a Noise Minimization and Monitoring Plan describing the means and methods to be utilized for the monitoring of noise to adjacent property owners during construction activities. The Construction activities associated with any activity that may induce vibrations to the soils shall not be initiated until the Noise Minimization and Monitoring Plan is reviewed and accepted by the Owner and the Engineer.

* * * * *

SECTION 01300

SURVEYS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes furnishing all labor, material, and equipment required to perform and provide complete surveys, as specified herein or as specified by the Engineer.

1.2 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. Surveyor Qualifications: Prior to the start of any survey work, submit the name, address, State registration number, and telephone number of the surveyor and other persons proposed for survey-related duties to the Engineer for approval.

2. All project submittals shall be signed by a surveyor licensed in New York State.

3. Provide periodic survey calculations required to support requests for payments and verification of volumes and areas.

4. Record Drawings

A. Topographic maps – prepare and submit:

1. Prior to disturbance of site.

2. After excavation showing excavation depths (elevation data) and horizontal limits of each excavation.

3. After backfill and replacement of topsoil, asphalt and site features, and prior to final inspection.

5. Submit the following with each record drawing submittal.

A. Records

1. AutoCad 2002 (or newer) electronic files on CD-ROM

2. Field Data

3. Coordinate List

1.3 QUALITY ASSURANCE

A. All work in this section shall be performed by a surveyor licensed in New York State.

B. Mapping shall conform to the National Map Accuracy Specifications and shall bear the seal of a licensed land surveyor registered in New York State. The surveyor shall also have a minimum of two years experience in construction surveying, and layout and maintenance of record construction drawings, with a record of performing horizontal and vertical control requirements as stated in this section.

PART 2 PRODUCTS

2.1 SUPPLEMENTAL RECORD DRAWINGS

A. Contractor shall provide a reproducible base map at a scale of 1 inch = 40 ft with 1-ft elevation contours upon which the Contractor shall plot the required survey information for each required submittal.

B. Map shall contain a title block with the name and address of the Contractor and the signature of the registered surveyor.

C. Drawings shall include:

1. Labeled contour lines
2. Property line locations
3. Horizontal grid systems
4. Cross sections and details modified to show “as-built” conditions
5. Utility pipe invert elevations and locations
6. Details and cross sections not on original drawings
7. Field changes of elevations, dimensions, and details

D. Indicate on drawings locations of all physical features on site, including utilities, buildings, roadways, catch basins, manholes, utility poles, fences, gates, drainage ditches, monitoring wells, light poles, trees, and bench marks.

E. Indicate excavation limits on drawings for both the proposed limits (based on Contract Drawings) and completed limits.

2.2 FIELD DATA

A. Field survey notes

1. Copy of field notes, notations, and descriptions or total station electronic files used and compiled during the field survey

2.3 COORDINATE LIST

A. Final coordinate list of all survey points with specific coordinates and elevations.

PART 3 EXECUTION

3.1 INSPECTION

A. The surveyor/Contractor shall verify site conditions within the project area and locations of site reference and survey control points prior to starting work. The surveyor/Contractor shall promptly notify the Engineer of any discrepancies discovered.

B. The surveyor/Contractor shall locate all utilities in the work area. The surveyor/Contractor shall verify the elevations of existing piping, utilities, and any type of underground obstruction not indicated or specified to be removed but indicated or discovered during work.

3.2 HORIZONTAL AND VERTICAL CONTROL

A. The Contractor shall take all reasonable measures to protect site reference points prior to starting and during site work.

B. Immediately notify the Engineer of loss, damage, or destruction of any reference point, or any relocation required because of changes in grade or other reasons.

C. X, Y, and Z coordinates of bench marks and control points shall be determined and recorded with a maximum permissible error of 0.01 ft vertical and 0.001 ft horizontal.

D. The Contractor shall provide control points at each location of work using closed traverse and leveling loops.

E. The Contractor shall provide grade and offset stakes to control the location and depth of excavation and backfill.

F. The Contractor shall survey the location and elevation of all excavation and backfill limits to document the areas remediated.

G. The Contractor shall provide survey control as required to properly complete and document the work.

H. Lack of adequate survey control or improperly maintained “as-builts” will be the basis for rejection of the Contractor’s application for payment until corrected.

3.3 COORDINATE LIST

A. The Contractor shall compute the coordinates of each surveyed point on the New York State Plane Coordinate System using the 1983 North American Datum (NAD).

B. The elevations shall be on the National Geodetic Vertical Datum (NGVD) 1927.

3.4 SURVEY NOTES

A. The Contractor shall record all fieldwork in a clear, legible, and complete manner.

B. The Field Survey Book(s) shall contain a complete description of the nature and location of the new and existing points. The record shall also include a sketch of the point locations, and the monument witness points.

C. The Contractor shall maintain survey notes on-site for review and use by Engineer.

3.5 UTILITIES

A. The Contractor shall locate all utilities in the work area.

B. The Contractor shall verify the elevations of existing piping, utilities, and any type of underground obstruction not indicated or specified to be removed but indicated or discovered during work.

C. The Contractor shall record elevations of all encountered buried piping and utilities exposed, and all structures left in place during the course of the project for incorporation in the project record documents.

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SECTION 01700

HEALTH AND SAFETY

I. PART GENERAL

1.1 SUMMARY

A. Contractor shall be solely responsible for the protection of the personnel working on the site and the residents living in the vicinity of the site from exposure to on-site contaminants generated or released as a result of the Contractor's work on site.

B. Contractor shall prepare, submit to Engineer, and implement a site-specific health and safety plan (HASP) to protect the personnel working on the site and the residents living in the vicinity of the site from exposure to on-site contaminants encountered, generated, or released as a result of the Contractor's work on site.

C. Contractor shall subcontract a third-party firm, independent from the Contractor, to monitor compliance with the Community Air Monitoring Plan (CAMP) and site-specific HASP prepared by the Contractor. The third-party firm shall have a qualified health and safety professional present on site each workday to perform worker health and safety surveillance, community air monitoring, conduct toolbox safety meetings, and document compliance with the HASP. The health and safety professional shall have no other assignment other than monitoring compliance with the CAMP and HASP, and performing air monitoring.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02007 – Perimeter Air Monitoring and Dust Control

1.3 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. National Institute for Occupational Safety and Health (NIOSH), United States Department of Health and Human Services

a. 85-115 - Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

b. NIOSH Manual of Analytical Methods - analysis for total particulate (ug/m^3) method 0500

2. Code of Federal Regulations (CFR)

a. 29 CFR 1910 and 1926 - OSHA Safety and Health Standards, and citations adopted by reference

b. OSHA Analytical Methods Manual, Part I, Volume 3, Methods 55 - 80 for Polynuclear Aromatic Hydrocarbons

c. 49 CFR Parts 171-178 - Department of Transportation (DOT) Hazardous Materials Regulations

3. Unites States Environmental Protection Agency (USEPA)

a. Standard Operating Safety Guides

b. EPA Analytical Method TO-15 (mini cans)

4. American Conference of Governmental Industrial Hygienists (ACGIH)

a. ACGIH Threshold Limit Values and Biological Exposure Indices

5. New York State Department of Health Generic Community Air Monitoring Plan (Appendix 1A to DER-10)

6. Health and Safety Plan prepared for Pre-Design Field Investigation at Former Manufactured Gas Plant Site in Fulton, NY dated August 2009.

1.4 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. Site Specific Health and Safety Plan including, but not limited to:

a. Contractor Organizational Chart

b. Results of Health and Safety Risk Analysis performed by the Contractor

c. Employee and Community Protection Plan

d. Employee and Community Air Monitoring Plan

e. Vapor Emission Response Plan

f. Employee Training and Experience

g. Summary of Medical Surveillance Program

h. List of Standard Operating Procedures incorporated into the HASP

i. A method to monitor entry and exit from the work site

j. Personnel and Equipment Decontamination Procedures

k. A Spill Containment Program

l. Emergency Response Plan and Emergency Reporting Procedures

m. Fire Emergency Protection Plan

n. Confined Space Entry Procedures

2. Certificates of completion of Health and Safety Training as required by 29 CFR 1910.120(e).

3. Resumes of the Contractor's Project Manager, Field Supervisor, and of the health and safety staff expected to work at this site.

4. Evidence of coordination for emergency response with local police, fire, medical, and hazardous materials responders.

5. Air monitoring results.

6. Name and location of proposed permitted off-site disposal facility for used personal protective equipment (PPE).

PART 2 PRODUCTS

2.1 GENERAL

A. The responsibility for development, implementation, and enforcement of the Health and Safety Plan (HASP) lies with the Contractor and his health and safety personnel.

B. Prior to commencement of on-site activities, the Contractor shall prepare a site-specific HASP, which shall be implemented during performance of the work. The HASP shall be prepared and administered by a Certified Industrial Hygienist (C.I.H.). All pertinent aspects of applicable regulations shall be addressed. The protective measures in the HASP shall be consistent with applicable protocols and provisions of the OSHA regulations and other applicable regulations. The HASP developed by the Contractor shall include, but not be limited to, employee air monitoring, programs for accident prevention, personnel protection, and emergency response/contingency planning. A corporate safety and health manual may be furnished along with the HASP but this shall not satisfy the site-specific HASP requirement.

C. At least one copy of the HASP shall be present at the site at all times

PART 3 EXECUTION

3.1 ORGANIZATIONAL RESPONSIBILITIES

A. Key Personnel and Organizational Chart. The lines of authority, responsibility and communication shall be presented in the HASP. The Contractor must provide an organization chart and resumes of the Contractor's key personnel involved in all phases of the Site construction activities. This chart must include Senior-Level Management, Project Manager, CIH, third-party Site Health and Safety Officer (HSO), Field Supervisor, and Foreman Personnel. Resumes are required for the Project Manager, Field Supervisor, Health and Safety Officer, and Health and Safety Staff.

B. Site Health and Safety Officer (HSO). The Contractor's C.I.H. must identify and subcontract an independent third-party Site Health and Safety Officer (HSO) for the project. That individual must be responsible to the Contractor's C.I.H. and have the authority and knowledge necessary to implement the site Health and Safety Plan (HASP) and verify compliance with applicable safety and health requirements.

1. The HSO shall have the following responsibilities and authority to perform the following functions:

a. Be present during site operations.

b. Have the authority to enforce the HASP and stop operations if personnel safety and health may be jeopardized.

c. Evaluate health monitoring data and make necessary field decisions regarding safety and health.

d. Initiate evacuation of the site if necessary.

2. The HSO shall meet the following minimum qualifications:

a. HSO shall possess a sound working knowledge of State and Federal occupational safety and health regulations and shall have formal educational training in occupational safety and health. Documentation shall be provided that the HSO has completed the 40 hr. OSHA Training Course, the 8 hr. OSHA Supervisor's Training Course and met the field experience requirements.

b. Have documented experience that the HSO has worked on two (2) projects similar in nature to this one.

3.2 RISK ANALYSIS

A. Health and Safety Evaluation. The Contractor shall perform and provide in the HASP the results of a health and safety risk analysis for each location and operation to be performed.

B. The risk analysis shall be based upon the best information available regarding the contaminants and conditions present at the site as well as the practices and tools to be applied in the operation and shall include but not be limited to the following:

1. Overview of the following information:

a. Location, site topography, accessibility, and size of the site.

b. Description of the site operation and tasks to be performed.

c. Approximate duration of the operation and of each task.

d. Chemical and physical properties of the known or suspected hazardous substances and health hazards.

e. Known or potential safety hazards associated with each task.

f. Known or suspected pathways of hazardous substance dispersion pertinent to the operation and tasks performed.

2. An evaluation of the known or suspected contaminants and conditions that may pose inhalation, skin absorption/contact or ingestion hazards. A copy of the Material Safety Data Sheet (MSDS), chemical fact sheet, or other relevant information shall be included in the Site-specific HASP prepared by the Contractor.

3. An evaluation of known or potential safety and health hazards associated with each task on the site.

4. An evaluation of engineering and work practice controls to be applied to minimize potential harm to the community and employees on site from hazardous substances and activities during completion of the task.

a. Engineering and Work Practice Controls. The Contractor must consider the need to apply engineering and/or work practice controls as a means of protecting the community and personnel in the performance of site specific tasks.

1) When practicable, engineering controls shall be implemented to reduce and maintain community and employee exposures to or below acceptable levels for those tasks with known or suspected hazards.

2) Work practice controls shall be applied when engineering controls are deemed impractical and shall be incorporated as site-specific standard operating procedures (SOP) for personal precautions and routine operations.

5. An evaluation of the status and capabilities of emergency response teams.

3.3 MEANS TO CONTROL EMPLOYEE AND COMMUNITY EXPOSURE

A. Employee and Community Protection Plan

1. The Contractor shall prepare and implement an Employee and Community Protection Plan (ECPP) in accordance with 29 CFR 1910.120(h). The ECPP shall be developed to specify and evaluate the engineering and work practice controls to be implemented to minimize exposure of employees working on the site, residents living in the vicinity of the site, and the environment to contaminants generated or released as a result of work on the site. The ECPP shall be incorporated into the site HASP as a separate section of that document.

B. Employee and Community Air Monitoring Plan

1. The Contractor shall prepare and implement an Employee and Community Air Monitoring Plan (ECAMP) to identify times of elevated airborne contaminant concentrations, to determine the level of the concentrations relative to background, and to respond to elevated levels. The Contractor shall provide the personnel, instruments, and materials necessary to perform such air monitoring and to implement the response. The identity of the individual responsible for administering the program shall be included in the site organization chart. In addition to the odor control requirements specified in the Special Provisions, the Contractor shall define specific air monitoring methods, sampling media, and sample analyses to be implemented during construction of the remedial action at the Site. The ECAMP shall include proposed responses to levels above the Contractor's action levels. The ECAMP shall be incorporated into the site HASP as a separate section of that document.

2. When work is performed within 20 feet of potentially exposed populations or occupied structures, the Contractor shall continuously monitor the location for VOCs. Any particulates must represent the nearest potentially exposed individual and the location of ventilation system intakes for occupied structures. The Contractor shall use special ventilation devices or controls, when advised to do so by the Engineer, in order to control dust and odors and to prevent exposure from work related activities.

3. The level of particulate matter less than 10 micrometers in diameter, (PM-10), leaving the downwind side of the site shall be maintained below 150 $\mu g/m^3$ above the upwind particulate level, based on a 15 minute averaging period.

4. The level of volatile organic compounds (VOCs) leaving the downwind side of the site shall be maintained below 5 ppm above background.

5. The Contractor shall, at a minimum, perform the following items and address these items in the ECAMP:

   a. Daily monitoring of wind direction and velocity for each day that soil handling or excavation activities occur.

   b. Real-time continuous monitoring for VOCs (i.e. photoionization detector) and for particulate (i.e. real time aerosol monitor) within the work zone, and at three locations on the perimeter of the exclusion zone of the work zone (one upwind, two downwind) during all ground intrusive activities. Ground intrusive activities include, but are not limited to soil/waste excavation and handling, test pitting or trenching.

   c. Periodic monitoring for VOCs during non-intrusive activities (i.e., such as the collection of soil) shall be addressed.

   d. Combustible gas monitoring within the work zone using an oxygen and explosive gas meter. Lower explosive limit (LEL) percent shall not exceed 1% of the LEL prior to initiating work activities and shall not exceed 10% of the LEL during work activities.

   e. Establish VOC and particulate response levels and subsequent actions to be taken if exceeded.

   f. Other additional sampling and analyses necessary to minimize exposure of employees working on the site and residents living in the vicinity of the site from the airborne particulate and vapor hazards of the site.

6. Air monitoring results shall be recorded daily in a logbook and available for review by Owner, Engineer, and New York State Department of Environmental Conservation (NYSDEC).

C. Vapor Emission Response Plan

1. The Contractor shall prepare and implement a Vapor Emission Response Plan (VERP) to identify VOC levels that may pose a threat to the health and safety of the surrounding population. The VERP shall be incorporated into the site ECAMP as a separate section of that document and shall, at a minimum, address the following:

   a. VOC levels exceeding 5 ppm above background at the perimeter of the work area will require that work activities be halted, and actions initiated to reduce the VOC emissions from the work area. At that time, air monitoring shall be implemented to measure the vapor emission levels in the work zone and at 200 feet downwind of the

work area or at half the distance to the nearest residential or commercial structure. If VOC levels in the work zone or downwind location are below or decrease to below 5 ppm over background, work activities can resume with continued monitoring.

b. If the VOC level at the perimeter of the work area is above 25 ppm, activities must be shutdown and actions taken to reduce VOC levels at the perimeter of the work zone to below 5 ppm above background.

c. If efforts to abate the emission source do not lower the VOC levels below 5 ppm at the downwind sampling location or if elevated levels persist for more than 30 minutes within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone), a Major Vapor Emission Response Plan shall be implemented.

D. Particulate Emission Response Plan

1. The Contractor shall prepare and implement a Particulate Emission Response Plan (PERP) to identify particulate levels that may pose a threat to the health and safety of the surrounding population. The PERP shall be incorporated into the site ECAMP as a separate section of that document and shall, at a minimum, address the following:

a. Particulate levels exceeding 150 ug/m^3 above the upwind particulate level (*e.g*. background) at the perimeter of the work area will require that work activities be halted, and actions initiated to reduce the particulate emissions from the work area. At that time, air monitoring shall be implemented to measure the particulate emission levels in the work zone and at 200 feet downwind of the work area or at half the distance to the nearest residential or commercial structure. If particulate levels in the work zone or downwind location are below or decrease to below 150 ug/m^3 over background, work activities can resume with continued monitoring.

b. If efforts to abate the emission source do not lower the particulate levels below 150 ug/m^3 200 feet downwind of the work area, or if elevated levels persist for more than 30 minutes within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone), a Major Particulate Emission Response Plan shall be implemented.

E. Major Vapor Emission Response Plan

1. The Contractor shall specify and implement a Major Vapor Emission Response Plan (MVERP) to identify responses to downwind VOC levels above the action levels specified in Section 3.3.C. The MVERP shall be

incorporated into the site ECAMP as a separate section of that document and shall, at a minimum, include the following:

a. Provisions for contacting emergency response personnel to advise them of the vapor situation.

b. Provisions for coordinating with local officials to arrange for notification and evacuation, if required, of the surrounding community.

c. Provisions for conducting air monitoring at 30 minute intervals within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone).

F. Major Particulate Emission Response Plan

1. The Contractor shall specify and implement a Major Particulate Emission Response Plan (MPERP) to identify responses to downwind particulate levels above the action levels specified in Section 3.3.D. The MPERP shall be incorporated into the site ECAMP as a separate section of that document and shall, at a minimum, include the following:

a. Provisions for contacting emergency response personnel to advise them of the particulate emission situation.

b. Provisions for coordinating with local officials to arrange for notification and evacuation, if required, of the surrounding community.

c. Provisions for conducting air monitoring at 30 minute intervals within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone).

3.4 TRAINING

A. Training Requirements for On-Site Personnel

1. The Contractor will ensure that all employees engaged in on-site activities which expose or potentially expose them to hazardous substances and/or health hazards have satisfied the general and site specific training requirements of 29 CFR 1910.120 prior to the start of the employee's activities at the site.

2. Employees who have not received the required training prior to the start of the employee's site operations are not to engage in site operations until such training has been completed.

3. The Contractor shall provide written certification of completed training and acquired experience for all employees requiring training and/or experience. Such certification shall be supplied prior to the start of the employee's site operations.

B Personal Protective Equipment and Levels of Protection (LOP)

1. The Contractor shall provide and use, under each item of work requiring such protection, personal protective equipment (PPE) under the provisions of 29 CFR 1910.132 and 29 CFR 1910.120.

2. The Contractor shall include in the HASP a list of components for each protective ensemble, the LOP selected for each task, the rationale for each task-specific selection, any contaminant action levels to be followed in LOP decision making.

3. All used PPE shall be properly disposed of by the Contractor at a permitted off-site facility approved by Owner. Used PPE shall not be disposed of on Site nor shall it be burned. The Contractor shall be responsible for characterizing used PPE, decontamination (as necessary), temporary storage, transportation, and disposal of used PPE in accordance with applicable Federal, State, and local regulations.

3.5 MEDICAL SURVEILLANCE

A. Medical Surveillance Program. The Contractor shall show evidence of a medical surveillance program (MSP) for employees engaged in on-site operations, consistent with 29 CFR 1910.120(f).

1. The MSP shall include physical examinations supervised or administered by a board certified physician familiar with occupational medicine. The Contractor shall include the name and business address of the certified physician in the HASP.

2. The Contractor shall address the need for personal exposure monitoring and post exposure medical screening in the HASP and include a summary of applicable monitoring and screening.

B. Personnel Certification

1. The Contractor shall provide written approval by a certified physician of the medical fitness for work of all employees designated to engage in on-site operations, prior to the employee's start of those operations.

C. Employee Heat and Cold Stress Prevention

1. As dictated by seasonal conditions, the Contractor shall implement an employee heat or cold stress prevention program during site operations and shall incorporate the program into the site HASP.

3.6 SITE STANDARD OPERATING PROCEDURES

A. The Contractor shall be responsible for developing and implementing necessary standard operating procedures (SOP) for site operations.

3.7 SITE CONTROL

A. Work Zones

1. The Contractor shall be responsible for conducting operations at the site in such a controlled fashion as to minimize the possibility of employee and community contact with contaminants present on the site and to prevent the removal of contaminants generated on the site by personnel or equipment leaving the site.

2. The Contractor shall delineate work zones in which specific operations or tasks will occur and shall institute specific site entry, and decontamination procedures at Contractor designated control points in accordance with provisions set forth in 29 CFR 1910.120 and HWR 89-4031. At a minimum, three (3) work zones will be established to perform this work - an exclusion/contamination zone, a contamination reduction zone, and a support/clean zone. A map or diagram showing the work zones and a description of the site control plan shall be included in the HASP.

B. Routine and Emergency Communications

1. The Contractor shall incorporate plans for routine and emergency communications appropriate for the site and project in the HASP.

C. Daily Visitor Log

1. The Contractor, in accordance with his security plan shall keep a daily visitor log, copies to be provided to Owner/Engineer upon request. A time clock shall be used to record the arrival and departure times. This log shall include:

a. Person visiting the site

b. Affiliation

c. Date

d. Arrival time

e. Departure time

f. Purpose of visit

D. Personnel

1. The Contractor shall provide Owner and Engineer a list of all Contractor and subcontractor personnel who are authorized to enter the site prior to the start of operations, updating the list as necessary. No unauthorized persons shall be permitted to enter the site.

E. Other

1 The Contractor shall be responsible for conducting operations in accordance with Federal, State and local regulations and requirements for storage of the Contractor's hazardous materials (*i.e*. gasoline, lube oils, etc.) on-site, including locating staging areas, labeling/signage, etc.

2. The Contractor shall use a "buddy system" as required.

3.8 DECONTAMINATION

A. The Contractor shall develop and implement personnel and equipment decontamination procedures appropriate for site specific locations and activities and include those procedures in the HASP. The procedures shall include, but not necessarily be limited to, the necessary equipment and personnel and the steps to achieve contractor's specified level of decontamination, provisions for any personnel protection, and a discussion or diagram outlining the steps or stations in the procedures. The procedures must include containment and removal of any decontamination solutions and spent disposable protective apparel.

B. Decontamination shall be conducted in accordance with 29 CFR 1910.120 (k) and shall minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances as well as minimize off-site transport of contamination. The Contractor shall clean roadways as necessary to prevent contamination being transported from the work areas into other parts of the plant or off-site by construction or plant traffic.

C. The Contractor shall provide provisions to facilitate personal hygiene at breaks and following daily operations.

3.9 SPILL CONTAINMENT

A. The Contractor shall incorporate a spill containment program prepared in accordance with 29 CFR 1910.120 in the HASP.

3.10 CONTINGENCY PLANNING

A. Emergency Response Plan. Prior to the start of site operations, the Contractor shall develop and implement an emergency response plan (ERP) to handle potential on-site emergencies. The ERP shall be incorporated into the site HASP as a separate

section of that document and shall be periodically reviewed and, as necessary, amended to keep it current with new or changing site conditions or information.

1. The Contractor shall address the following requirements:

   a. Prior to the start of site operations, the Contractor shall attend any and all meetings necessary with local officials and/or those responsible for local emergency management and public safety (to include fire, police, hazardous material response teams, hospitals, and local health officials) for the purpose of coordinating the site-specific ERP with any emergency response efforts that would be performed by such agencies.

   b. The Contractor shall contact the local medical facility selected for inclusion into the HASP and the ERP to ensure that said facility is willing and is capable of providing that medical support necessary to satisfy those anticipated hazards and emergencies detailed in the HASP and the ERP. Written verification of such contact, including the name of the individual contacted, shall be furnished to Owner and Engineer prior to the start of site operations.

B. Accident and Exposure Reports

1. The Contractor shall notify the Engineer of all on-site accidents at the time of occurrence and follow up in writing within 24 hours. This notification shall include, but not be limited to, the date, time and identity of individual(s) involved in the accident, witnesses to the accident, the nature of the accident, the actions taken to treat the victim(s), and the steps taken to prevent recurrence.

2. The Contractor shall notify the Engineer of all person(s) exposed at levels exceeding OSHA standards at the time of occurrence or determination and follow up in writing within 24 hours. This notification shall include, but not be limited to, the date, time, and identity of individual(s) involved in the exposure, witnesses to the exposure, the nature of the exposure episode, what the individual(s) were exposed to, the personal protective equipment worn during the exposure, and the steps taken to prevent recurrence.

3. The Contractor shall notify the Engineer of all environmental air measurements exceeding NYSDEC standards. This notification shall include, but not be limited to, the date, time, and identity of individual(s) involved in the exposure, witnesses to the exposure, the nature of the exposure episode, what the individual(s) were exposed to, the personal protective equipment worn during the exposure, and the steps taken to prevent recurrence.

3.11 FIRE PREVENTION AND PROTECTION

A. The Contractor shall develop procedures for handling and responding to small and large fires. This Fire Protection Plan (FPP) shall be included in the HASP as a separate document. The FPP shall include procedures for requesting emergency

assistance and notifying Owner and Engineer of the incident. The Contractor shall insure that fire traffic lanes are available (not blocked) and all fire exits are properly marked.

3.12 CONFINED SPACE OPERATIONS

A. Standard Operating Procedures

1. Should site operations include activities within confined spaces, the Contractor shall develop and implement SOPs in accordance with 29 CFR 1910.146 and shall incorporate them in the HASP as a separate section of that document.

3.13 DRUM AND CONTAINER HANDLING OPERATIONS

A. Standard Operating Procedures

1. Should site operations include activities requiring the handling of drums and containers, (both encountered on-site and brought on-site), the Contractor shall develop and implement SOP's in accordance with 29 CFR 1910.120(j) and incorporate them in the HASP.

3.14 OPERATIONS WITHIN AND ADJACENT TO POWER LINES

A. Standard Operating Procedures

1. Should site operations include activities requiring the operation of cranes or derricks within or adjacent to power lines, the Contractor shall develop and implement SOP's in accordance with 29 CFR 1926.550(a) - Cranes and Derricks and incorporate them in the HASP.

3.15 OPERATIONS NEAR EXISTING UTILITIES

A. Standard Operating Procedures

1. In advance of the work, the Contractor shall identify and locate buried utilities in the area of work.

2. Special precautions shall be observed to not cause interference or damage to any existing utilities.

3. The Contractor shall notify the proper utility companies at least seventy-two (72) hours before construction is started adjacent to such utilities. Utilities shall be protected in the manner prescribed by the utility company.

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SECTION 02003

FIELD OFFICE TRAILER

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of a separate field office trailer for the exclusive use of the Engineer and his assistants, as specified herein, or as directed by the Engineer.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02503 – Restoration of Surfaces

1.3 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. Proposed layout of the trailer

2. Proposed method of furnishing the utilities

PART 2 PRODUCTS

2.1 GENERAL

A. The field office trailer shall be not less than 8 feet by 20 feet.

1. Built-in Items

a. Full width double desk on each end with two-drawer file cabinets, pencil drawers and overhead shelves

b. Drafting table, minimum 36 inch by 72 inch double storage below

c. Forced air heat

d. One air conditioning unit - not less than 8,000 BTU

e. Storage closet

2. Movable Items

a. Four office chairs

b. Two large waste baskets

c. One drafting stool

d. One four-drawer, fire-proof, legal size, filing cabinet with lock

e. One eight place plan rack

B. Telephone Service

1. Install an individual direct line telephone for the exclusive use of the Engineer.

2. Include the cost of all local and long distance calls necessary to the work.

PART 3 EXECUTION

3.1 INSTALLATION

A. The trailer shall be located on an approved site convenient to the work.

1. The field office trailer shall be ready for occupancy prior to starting work in the field.

2. The office shall be furnished and maintained until the acceptance of the Contract.

3. Relocate once, if directed, during the period of the Contract.

4. Upon the completion and acceptance of the Contract, the Contractor shall remove the field office trailer and restore the area in accordance with the Section “Restoration of Surfaces.”

3.2 MAINTENANCE

A. The maintenance of the trailer shall include but not be limited to:

1. Adequate heating and cooling including a continual supply of fuel

2. Electric power and lights

3. Water supply and sewer service

4. Telephone service

5. Snow removal in winter

6. Janitorial services not less than weekly

B. Should sanitary and potable water services not be available on or near the site, portable facilities shall be provided by the Contractor.

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SECTION 02007

PERIMETER AIR MONITORING AND DUST CONTROL PLAN

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, and equipment required in the preparation, submission, and implementation of an acceptable Perimeter Air Monitoring and Dust Control Plan as part of the Community Air Monitoring Plan (CAMP), as specified herein and in accordance with all provisions of the Contract Document.

B. Contractor shall subcontract a third-party firm, independent from the Contractor, to monitor compliance with the CAMP including perimeter air monitoring and dust control plan. The third-party firm shall have a qualified health and safety professional present on site each workday to perform community air monitoring and document compliance with the CAMP including perimeter air monitoring and dust control plan. The health and safety professional shall have no other assignment other than monitoring compliance with the CAMP and Health and Safety Plan (HASP), and performing air monitoring.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 01700 – Health and Safety

1.3 APPLICABLE PUBLICATIONS, CODES, STANDARDS, AND SPECIFICATIONS

A. 29 CFR 1910.1000, Air Contaminants

B. New York State Department of Health Generic Community Air Monitoring Plan (Appendix 1A of DER-10)

C. New York State Fugitive Dust and Particulate Monitoring Plan (Appendix 1B of DER-10)

1.4 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. Perimeter Air Monitoring and Dust Control Plan

2. Shop Drawings for Air Monitoring Equipment

PART 2 PRODUCTS

2.1 GENERAL

A. Perimeter Air Monitoring and Dust Control Plan

1. The Perimeter Air Monitoring and Dust Control Plan shall describe in detail the Contractor's plan of operation, means and methods of construction, proposed locations, air monitoring instruments, record keeping procedures and response procedures.

2. The Perimeter Air Monitoring and Dust Control Plan shall describe in detail the Contractor's plan for implementing volatile organic compound (VOC) and dust control measures should the action levels specified herein be exceeded.

B. Number and Location of Stations

1. At a minimum, four air monitoring stations (three downwind and one upwind) of each Area shall be established by the Contractor to collect data to document the amount, if any, of VOCs and particulate matter less than 10 microns in diameter (PM10) leaving the former manufactured gas plant (MGP) Site (the Site). Each of the perimeter air monitoring stations shall be located so that it is not shielded or otherwise obstructed from collecting samples representative of the air leaving the Site. The perimeter air monitoring stations shall be established upwind, at, and downwind of the active work area.

C. Duration of Perimeter Air Monitoring

1. Air monitoring shall be continuous during activities in the active work area. Air monitoring shall begin at least 30 minutes before work begins in the active work area and continue for at least 60 minutes after work ceases. These times are intended to allow for background levels to be established before generation of potential air contaminants and for materials generated during active work to reach the sampling locations.

D. Equipment

1. Air monitoring at each station shall be conducted with direct reading instruments for particulates.

a. Air monitoring particulate detecting instruments shall be a portable aerosol monitor (TSI 8520 DustTrak or equivalent) equipped with a cyclone adapter to evaluate the presence and concentration of airborne dusts during Site activities.

b. Real-time continuous monitoring for VOCs (i.e. photoionization detector)

c. Combustible air monitoring within the work area shall be performed using an oxygen and explosive gas meter in accordance with Technical Specification 01700 Health and Safety.

2. One wind direction monitoring and recording device shall be maintained on the work area. The device shall include a wind direction indicator (wind sock or weathervane) that is visible from all positions of the site or active work area.

3. If the Contractor does not provide an AC power source to air monitoring stations and the wind direction station, the Contractor shall maintain a sufficient supply of charged spare batteries or charged spare units, such that a minimum of three perimeter stations are always in service.

E. Records

1. The readings of the air monitoring instruments shall be recorded at least every 30 minutes during instrument operation. The record of the monitoring shall be available for inspection by the Engineer, the Owner and NYSDEC at the end of the monitoring period.

2. Records of calibration, according to the instrument manufacturer's instructions, shall be maintained by the Contractor and shall be available for inspection by the Engineer, the Owner and NYSDEC.

2.2 ACTION LEVELS

A. If the downwind PM10 level exceeds 150 micrograms above background of PM10 per cubic meter of air (150 $\mu g/m^3$) for more than 15 minutes, dust control activities at the active site shall be initiated to reduce the level at the perimeter to below 100 $\mu g/m^3$ within 15 minutes.

B. The level of volatile organic compounds (VOCs) leaving the downwind side of the site shall be maintained below 5 ppm above background.

PART 3 EXECUTION

3.1 GENERAL

A. The Contractor shall implement the Perimeter Air Monitoring and Dust Control Plan.

B. The Contractor shall make every effort to minimize the generation of VOC emissions and dust. Appropriate methods to minimize the generation of VOC emissions, odor, and dust include, but are not limited to:

1. Use of tarpaulin, foam or other suitable means to cover exposed contaminated areas and materials.

2. Use embankment material to cover exposed contaminated areas.

3. Limiting the amount of exposed contaminated areas.

4. Water spray. If water spray is used, run-off must be collected and managed as Construction Water if it comes into contact with relocated soils.

5. The use of chloride or petroleum containing compounds for dust control is prohibited.

C. The Contractor shall update the accepted Perimeter Air Monitoring and Dust Control Plan as necessary to incorporate changes in site conditions, equipment and potentially hazardous materials identified during site activities. The Contractor's Perimeter Air Monitoring and Dust Control Plan shall include alternate monitoring locations and relocation procedures to accommodate site construction activities.

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SECTION 02009

PROJECT PHOTOGRAPHS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, materials, and equipment as required to provide the services of a professional photographer to provide color photographs of the progress of the project.

PART 2 PRODUCTS

2.1 GENERAL

A. The photographs shall be printed as 4" x 6" and four (4) sets of each taking shall be furnished to the Engineer within two (2) weeks.

1. All photographs and negatives shall be consecutively numbered.

2. Each print shall have the photograph number, date taken, project name and number and photographer's name clearly marked on the back.

PART 3 EXECUTION

3.1 GENERAL

A. Twenty four photographs shall be taken each month for the duration of the Contract at the time and locations as directed by the Engineer.

1. Only a one day notice shall be required for any photographs to be taken.

B. A minimum of 48 photographs shall be taken of preconstruction and final construction. The final photographs shall be taken from the same locations as the preconstruction photographs.

C. Upon the completion of the project, the Contractor shall submit a complete file of the negatives for the project photographs to the Engineer.

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SECTION 02110

STORMWATER POLLUTION PREVENTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, materials, and equipment required in the preparation, submission, and implementation of an acceptable Storm Water Pollution Prevention Plan (SWPPP), as specified herein, and in accordance with all provisions of the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02241 – Off-Site Transportation and Disposal
B. 02242 – Tar Excavation and Off-Site Disposal

1.3 REFERENCES

A. Materials and installation shall be in accordance with the project SWPPP and the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:

1. 40 CFR 122 U.S. Environmental Protection Agency (USEPA) Administered Permit Programs: The National Pollutant Discharge Elimination System

2. 40 CFR 123 State Program Requirements

3. 40 CFR 124 Procedures for Decision Making

4. NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities, Permit No. GP-0-08-001.

5. NYSDEC Standards and Specifications for Erosion and Sediment Control (NYSDEC 2005).

6. New York State Stormwater Management Design Manual (the design Manual) prepared by the Center for Watershed Protection for the NYSDEC (2003; last revised 2008).

1.4 SPECIAL REQUIREMENTS

A. Erosion control shall consist of operations performed to minimize erosion of soils into drainage channels and lands adjacent to or affected by the Work, to prevent storm water run-on onto work areas, and to prevent potentially contaminated storm water run-off (including soils and sediment) from leaving the site without appropriate treatment.

B. Erosion control measures to be implemented shall be in accordance with this specification, the project SWPPP, and as may be required by the NYSDEC or local agency having jurisdiction. In the event of discrepancies between requirements of this specification or government agency, the more stringent requirements shall govern.

C. Construction procedures shall include protection of the environment in accordance with all pertinent federal, State and local regulations. Construction procedures that are prohibited in association with this project include, but are not limited to:

1. Pumping of silt-laden water from excavations into any surface waters, stream corridors, stormwater conveyances, or sanitary sewers.

2. Damaging vegetation beyond the extent necessary for the work of this project.

3. Dumping of spoil material into unspecified or unapproved locations.

D. The Engineer shall have the authority to limit the surface area exposed by clearing, grubbing and excavation, and to direct the Contractor, at no additional cost to the Owner, to implement additional erosion, run-off and run-on control measures as the Engineer deems necessary.

E. The Contractor shall provide all means, methods, equipment, facilities, and personnel required to implement and maintain the SWPPP.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

A. Clearing and Site Preparation

1. Only those portions of the site necessary and essential to be cleared for work shall be cleared. Clearing schedules shall be formulated to provide minimum practical exposure of soils. Local run-on/run-off control measures shall be implemented as conditions warrant. The Contractor shall make every reasonable effort so as to not unduly disturb the ecological or environmental quality of the area.

B. Erosion and Sediment Control

1. During the land disturbance period of this project, the following construction schedule shall be adhered to:

a. Clearing and grubbing of those areas necessary for installation of perimeter controls.

b. Construction of perimeter controls including, but not necessarily limited to, the installation and maintenance of silt fencing along the downgradient perimeter beyond the outer limits of potential set-up and work areas.

c. Remaining clearing and grubbing.

d. Excavation, providing temporary stabilization/erosion/run-off/run-on controls as required.

e. Final grading and permanent stabilization.

f. Removal of perimeter controls.

2. Erosion and sediment control measures may include silt fences, earth dikes, stone outlet sediment traps, stabilized construction entrances, rip rap, stone check dams, seeding/sodding, properly anchored mulch, and/or other measures as required.

3. Erosion and sediment control measures shall be properly maintained and function adequately. Any existing measures that are damaged shall be immediately repaired.

4. Excavated material shall be protected from erosion by using appropriate devices or stabilization.

5. Trapped sediment shall be removed from the area of deposition and disposed of in accordance with the Section "Off-Site Transportation and Disposal".

6. Silt fencing shall be placed along the down gradient perimeter of the site at the approximate limit of the work or as directed by the Engineer.

C. Maintenance of Site Drainage during Construction

1. The Contractor shall provide and maintain slopes, crowns and ditches in or around all excavations to insure satisfactory surface drainage at all times. Ditches and other drainage facilities necessary to remove ponded water shall be constructed as soon as practical to have the work area dry during the progression of work. All existing culverts and drainage systems shall be maintained in satisfactory operating condition throughout the course of the work unless otherwise directed by the Engineer. If it is necessary to interrupt existing surface drainage, then temporary drainage facilities shall be provided until the permanent drainage work is complete.

2. The maintenance of the drainage facilities is to include removal of accumulated silt, removal of mulch damming and removal of all drainage facility obstructions as determined by the Engineer.

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SECTION 02141

CONSTRUCTION WATER MANAGEMENT

PART 1 GENERAL

1.1 SUMMARY

A. The Contractor shall develop and implement an acceptable Construction Water Management Plan detailing the handling, storage, treatment (if necessary), and disposal of all construction water and associated residuals (e.g. spent GAC, filter bags, etc) generated during construction in accordance with all applicable Federal, State, and local regulations.

B. The Contractor is to obtain (if necessary) and operate within all required Federal, State, and local permits and requirements necessary to implement the proposed Construction Water Management Plan. Any and all civil, criminal, and monetary penalties associated with non-compliance in any regard shall be the sole responsibility of the Contractor.

C. The Contractor shall provide all labor, materials, and equipment required for handling, storage, treatment, and disposal of construction water in accordance with the approved Construction Water Management Plan.

D. The Contractor shall perform all specified and necessary sampling and analyses to insure compliance with required permits and applicable laws and regulations or as directed by Engineer.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02110 – Storm Water Pollution Prevention

B. 02241 – Off-Site Transportation and Disposal

C. 02242 – Tar Excavation and Off-Site Disposal

D. 02623 – Cured-in-Place Pipe

1.3 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. The Contractor shall comply with applicable Federal, State and local codes, ordinances, regulations, statutes and standards.

1.4 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. Construction Water Management Plan

2. Shop drawings and test results used in design of the method of handling construction water.

3. Process and instrumentation drawings (P&IDs) and schematic of proposed construction water collection, storage, and treatment process.

4. Implementation schedule for the dewatering operation and the proposed construction water treatment and discharge.

5. Results of all analytical work and final report of dewatering activities completed.

6. Name, location, and contact information of any Contractor proposed off-site treatment facility.

1.5 DEFINITIONS

A. Construction Water. Construction water shall be defined as the following:

1. Surface water resulting from precipitation during construction which has come in contact with potentially contaminated soils, fill, or debris.

2. Water or other liquids drained from or which have come into contact with potentially contaminated soils or debris, in addition to that resulting from precipitation.

3. Equipment and vehicle decontamination liquid.

Exempt from the definition of Construction Water for the Fulton Street MGP project is groundwater collected from the excavation below the static groundwater level since dewatering of the excavation below the static groundwater level is not required for the Removal Action.

PART 2 PRODUCTS

2.1 GENERAL

A. Construction Water Management Plan

1. The Contractor shall submit to the Engineer a plan for managing construction water. The plan shall include, but not be limited to, the Contractor's proposed method of handling, sampling, analyses, storage (if necessary), treatment, and disposal of construction water generated during construction.

2. The acceptable methods of disposal of construction water are limited to collection and:

a. Treated discharge to surface water channel, subject to the requirements of a permit issued by the New York State Department of Environmental Conservation (NYSDEC), after appropriate treatment.

b. Off-site disposal at an approved treatment, storage, or disposal facility (TSDF).

3. The acceptable methods of handling sludge and sediments generated by the Contractor’s management of construction water are limited to:

a. Collection, dewatering and disposal in accordance with Section "Off-Site Transportation and Disposal".

b. Collection, analytical testing, transport, off-site treatment, and disposal shall be in accordance with all applicable Federal, State and local regulations.

B. Facilities

1. The Contractor shall provide methods, means, and facilities required to manage construction water and residuals generated during construction water management.

C. Equipment

1. The Contractor shall provide equipment and personnel to manage construction water.

PART 3 EXECUTION

3.1 GENERAL

A. It shall be the responsibility of the Contractor to investigate and comply with all applicable Federal, State, and local laws and regulations governing the handling, storage and disposal of construction water. All construction water shall be disposed of in a manner which meets applicable permit requirements, laws, and regulations.

B. The Contractor shall obtain all required permits, manifests, and approvals required for the handling, storage, transport, treatment and disposal of construction water and residuals generated during construction water management.

C. Any sampling and analyses necessary to protect the health and welfare of the Contractor's employees and/or agents and/or to characterize collected water, treated water, or residuals shall remain the sole responsibility of the Contractor.

D. Construction water shall be handled using equipment compatible with anticipated contaminants that may be present.

3.2 DISCHARGE TO NEARBY STORM WATER CONVEYANCE

A. No construction water shall be discharged to any storm water conveyance unless it meets all Federal and New York State surface water quality standards. The Contractor shall include specific discharge criteria in the Construction Water Management Plan.

B. All testing required for discharge to any storm water conveyance shall be the responsibility of the Contractor.

3.3 OFF-SITE DISPOSAL OF WASTES

A. Contractor shall characterize construction water related wastes and any settled solids or other residuals as necessary for off-site disposal.

B. No Contractor proposed facility for off-site disposal shall be utilized without prior approval by the Engineer. For all wastes disposed of off-site, Contractor is responsible for characterization of such material and arranging for proper temporary storage, transportation and disposal in accordance with all applicable Federal, State and local regulations at no additional cost to the Owner.

C. Contractor shall dispose of wastes designated for off-site disposal within 90 days of filling the container.

D. Contractor shall mark, label, placard, package and manifest wastes in accordance with applicable codes, regulations, and statutes.

3.4 MINIMIZATION OF CONSTRUCTION WATER

A. The Contractor shall make every effort to minimize the generation of construction water and associated sediments and sludges. Methods to minimize generation of construction water include, but are not limited to:

1. Erection of temporary berms.

2. Use of low permeability tarpaulin or suitable means to cover exposed contaminated areas and materials.

3. Limiting the amount of exposed contaminated areas.

4. Grading to control run-on and run-off.

5. Engineering controls on construction activities to minimize contact of personnel and equipment with contaminated areas thus minimizing the amount of decontamination required and other appropriate methods.

* * * * *

SECTION 02145

GROUNDWATER MONITORING WELL ABANDONMENT

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, equipment and performing all operations required in the abandonment of the groundwater monitoring wells, as specified herein, shown on the Contract Drawings or as specified by the Engineer.

1. Monitoring Wells to be Abandoned: MW-06 and PZ-01

B. Abandonment of any groundwater monitoring wells damaged during the work as directed by the Engineer.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02151 – Groundwater Monitoring Well Repair and Replacement

B. 02241 – Off-Site Transportation and Disposal

C. 02242 – Tar Excavation and Off-Site Disposal

1.3 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

A. The publications listed below form a part of the specifications to the extent referenced. The publications are referred to in the text by basis designation only.

1. American Society of Testing and Materials (ASTM)

a. ASTM C150 Type 1 Portland cement

b. ASTM D5299 Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and other Devices for Environmental Activities

2. New York State Department of Environmental Conservation (NYSDEC)

a. NYSDEC CP-43 Commissioner's Policy on Groundwater Monitoring Well Decommissioning (May 2010).

1.4 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. Proposed grouting materials and methods.

2. Well abandonment logs shall be submitted.

PART 2 PRODUCTS

2.1 GROUT

A. There are two types of grout mixes that may be used to seal wells: a standard mix and a special mix. Both mixes use Type 1 Portland cement and four percent bentonite by weight. However, the special mix uses a smaller volume of water and is used in situations where excessive loss of the standard grout mix is possible (e.g. highly-fractured bedrock or coarse gravels).

B. Standard Grout Mixture

1. Unless otherwise necessary, the following standard mixture shall be used:

a. One 94-lb bag Type I Portland Cement

b. 3.9 lbs powdered bentonite

c. 7.8 gals potable water

2. This mixture results in a grout with a bentonite content of four percent by weight, and shall be used in all cases except in boreholes where excessive use of grout is anticipated. In these cases, a special mixture shall be used.

C. Special Mixture

1. In cases where excessive use of grout is anticipated, such as high permeability formations and highly fractured or cavernous bedrock formations, the following special mixture shall be used:

a. One 94-lb bag type I Portland Cement

b. 3.9 lbs powdered bentonite

c. 1 lb calcium chloride

d. 6.0 – 7.8 gallons potable water (depending on desired thickness)

2. The special mixture results in a grout with a bentonite content of four percent by weight. It is thicker than the standard mixture because it contains less water. This grout is expected to set faster than the Standard Grout Mixture. The least amount of water that can be added for the mixture to be readily pumpable is six gallons per 94-lb bag of cement.

3. In cases where the penetration of the sandpack is critical, such as bedrock wells with screens that transect multiple water-bearing zones, the following alternate mixture shall be used:

a. One 94-lb bag Type III Portland Cement

b. 3.9 lbs powdered bentonite

c. 7.8 gals potable water

2.2 BENTONITE

A. Baroid - Ben Seal

B. Approved equal

PART 3 EXECUTION

3.1 GENERAL

A. No monitoring well abandonment, repair or replacement activities shall commence without acceptance of the Engineer.

B. All monitoring well abandonment shall be performed in accordance with the requirements of this Section and to the satisfaction of the Engineer.

C. Water generated and/or encountered during well abandonment activities shall be collected, analyzed and transported off-site in accordance with all applicable Federal, State and local regulations.

D. Soil cuttings shall be disposed of in accordance with the Section "Off-Site Transportation and Disposal." All other material shall be disposed of off-site in accordance with applicable Federal, State and local regulations.

E. The Contractor shall restore the area in the vicinity of each well location as directed by the Engineer.

F. Following drilling activities, the Contractor shall decontaminate equipment as specified in Section 3.3.

G. If the well to be abandoned is constructed within a bedrock formation, the screened or the open hole portion of the well shall be grouted to the top of the bedrock. Prior to initiating any grouting procedure, the depth of the well shall be measured to determine if any silt or debris infilling has plugged the well. If plugging has occurred, the well shall be flushed with an appropriately sized roller bit or drill rods to remove or suspend the obstruction in the water column. The borehole shall then be tremie grouted from the bottom of the well to the top of bedrock to insure a continuous grout column. Note that if the bedrock well is cased, the screen should be perforated to the top of the rock if the inside diameter of the casing is 4-inches or larger. Furthermore, if the screened interval transects multiple water bearing zones, the special grout mix discussed in Part 2 shall be used to ensure penetration of the sand pack. After the rock hole is grouted, the overburden portion of the well shall be decommissioned in accordance with the following sections.

3.2 ABANDONMENT

A. Removing the Protective Casing

1. Removal of the protective casing of a well must not interfere with or compromise the integrity of decommissioning activities performed at the well.

2. Prior to Sealing the Well Bore

a. The protective casing must be removed unless the drilling tools have an inside diameter larger than the protective casing. An acceptable protective casing removal method involves breaking up the concrete seal surrounding the casing and jacking or hoisting the casing out of the ground. A check should be made during pulling to insure that the inner well casing is not being hoisted with the protective casing. If this occurs, the well casing shall be cut off after the base of the protective casing is lifted above the land surface.

B. Overdrilling

1. An overdrilling method of well abandonment shall be used to prevent cross-contamination. The overdrilling method used shall:

a. Follow the original well bore.

b. Create a borehole of the same or greater diameter than the original boring.

c. Removal of all the well construction materials.

2. Acceptable methods for overdrilling include the following:

a. Using conventional augering (i.e., a hollow stem auger fitted with a plug). The plug cutter shall grind the well construction materials, which shall be brought to the well surface by the auger.

b. Using a conventional cable tool rig to advance casing having a larger diameter than the original boring. The cable tool kit shall be advanced within the casing to grind the well construction materials and soils, which are periodically removed with large diameter bailer. This method is not applicable to bedrock wells.

c. Using an over-reaming tool with a pilot bit nearly the same size as the inside diameter of the casing and a reaming bit slightly larger than the original borehole diameter. This method can be used for wells with steel casings. Using a hollow-stem auger with outward facing carbide cutting teeth having a diameter two to four inches larger than the casing. Outward-facing cutting teeth should prevent severing the casing and drifting off center.

d. Using a hollow-stem auger with a steel guide pipe inside. The casing guides the cutter head and remains inside the auger. The guide pipe should be firmly attached to the inside of the casing by use of a packer or other type of expansion or friction device.

3. Prior to overdrilling, an expandable J-plug or other suitable well cap shall be used to prevent the introduction of soil or cuttings into the well, thereby ensuring a continuous grout column for wells that are grouted in place.

4. In all cases above, overdrilling shall advance through the original bore depth by a distance of 0.5 feet to ensure complete removal of the construction materials. When the overdrilling is complete, the casing and screen should be retrieved from the center of the auger (American Society for Testing and Materials, Standard D 5299), if one of the hollow stem auger methods described above is employed.

5. Subsequent to overdrilling at flush mount well locations where it may be impractical to remove well materials from inside the augers, a 1-2 foot deep area shall be excavated by hand around the flush-mount well to facilitate a conventional well removal while tremie-grouting inside the well. Alternatively, the soil within the annular space may be removed by raising the augers to allow the soil to fall out and re-advance the augers to the original target depth. Grout shall then be tremied within the annular space between the augers and well casings. The grout level in the borehole shall be maintained as the drilling equipment and well materials are sequentially removed.

6. After overdrilling is completed, the borehole shall be grouted and the upper five feet of borehole shall be restored.

D. Grout Placement

1. Grout shall be placed in the borehole from the bottom to the top using a tremie pipe of not less than 1-inch diameter. Grout shall then be pumped into the borehole until the grout appears at the land surface (when grouting open holes in bedrock, the grout level only needs to reach above the bedrock surface). Any groundwater displaced during grout placement shall be collected, analyzed and transported off-site in accordance with all applicable Federal, State and local regulations.

2. When the grout level stabilizes, casing or augers shall be removed from the hole. As each section is removed, grout shall be added to keep the level between 0-feet and 5-feet below land surface. If the grout level drops below the land surface to an excessive degree, an alternate grouting method must be used.

3. Upon completion of grouting, the Contractor shall insure that the final grout level is approximately five feet below land surface. A ferrous metal marker shall be embedded in the top of the grout to indicate the location of the former monitoring well.

E. Backfilling

1. The uppermost five feet of the borehole at the land surface shall be filled with a material physically similar to the natural soils.

3.3 EQUIPMENT DECONTAMINATION REQUIREMENTS

A. To avoid cross-contamination, equipment shall be decontaminated after operations at each well location are complete.

B. The drilling and excavation equipment (i.e., drill rigs, cutting bits, and associated equipment) shall be cleaned at a constructed decontamination facility.

C. The drilling and excavation equipment shall be prepared before it is brought to the decontamination facility and then cleaned at the facility. Preparation includes removing gross soil/rock from the equipment to minimize losses during movement to the decon pad. At the decontamination facility, the equipment shall be steam cleaned or washed using phosphate-free detergent then rinsed. The equipment shall be inspected by the Engineer's field representative after cleaning.

D. All solid waste materials generated during the decommissioning process shall be disposed of properly.

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SECTION 02151

GROUNDWATER MONITORING WELL REPAIR AND REPLACEMENT

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, equipment and performing all operations required in the repair of or replacement of the groundwater monitoring wells which may have been damaged during the construction activities as specified herein, shown on the Contract Drawings or as specified by the Engineer.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02145 – Groundwater Monitoring Well Abandonment
B. 02241 – Off-Site Transportation and Disposal
C. 02242 – Tar Excavation and Off-Site Disposal

1.3 REFERENCES

A. The publications listed below form a part of the specifications to the extent referenced. The publications are referred to in the text by basis designation only.

1. American Society of Testing and Materials (ASTM)

a.	ASTM C150	Type 1 Portland Cement
b.	ASTM A778	Welded Unannealed Austentic Stainless Steel
c.	ASTM A139	Electric-fusion (Arc)-Welded Steel Pipe
d.	ASTM D1586	Test Method for Penetration Test and Split-Barrel Sampling of Soils

2. United States Environmental Protection Agency (USEPA) guidance documents

a.	EPA 530/R-93/001	RCRA Ground-Water Monitoring: Draft Technical Guidance
b.	EPA 600/4-79/020	Methods for Chemical Analysis of Water and Wastes

1.3 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. Proposed monitoring well construction procedures.

2. Borehole logs of proposed soil borings.

3. Proposed monitoring well installation diagrams.

4. Proposed monitoring well survey data.

5. Proposed monitoring well development records.

PART 2 PRODUCTS

2.1 GROUT

A. There are two types of grout mixes that may be used to seal wells: a standard mix and a special mix. Both mixes use Type 1 Portland cement and four percent bentonite by weight. However, the special mix uses a smaller volume of water and is used in situations where excessive loss of the standard grout mix is possible (e.g. highly-fractured bedrock or coarse gravels).

B. Standard Grout Mixture

1. Unless otherwise necessary, the following standard mixture shall be used:

a. One 94-lb bag Type I Portland Cement

b. 3.9 lbs powdered bentonite

c. 7.8 gals potable water

2. This mixture results in a grout with a bentonite content of four percent by weight, and shall be used in all cases except in boreholes where excessive use of grout is anticipated. In these cases, a special mixture shall be used.

C. Special Mixture

1. In cases where excessive use of grout is anticipated, such as high permeability formations and highly fractured or cavernous bedrock formations, the following special mixture shall be used:

a. One 94-lb bag type I Portland Cement

b. 3.9 lbs powdered bentonite

c. 1 lb calcium chloride

d. 6.0 – 7.8 gallons potable water (depending on desired thickness)

2. The special mixture results in a grout with a bentonite content of four percent by weight. It is thicker than the standard mixture because it contains less water. This grout is expected to set faster than the Standard Grout Mixture. The least amount of water that can be added for the mixture to be readily pumpable is six gallons per 94-lb bag of cement.

3. In cases where the penetration of the sandpack is critical, such as bedrock wells with screens that transect multiple water-bearing zones, the following alternate mixture shall be used:

   a. One 94-lb bag Type III Portland Cement

   b. 3.9 lbs powdered bentonite

   c. 7.8 gals potable water

2.2 BENTONITE

A. Baroid - Ben Seal

B. Equal

2.3 GRANULAR MATERIAL

A. The granular material used to backfill the annular space between the well screen and the boring hole shall be a silica sand, Morre size 00 or similar sand as approved by the Engineer.

2.4 DRILLING FLUIDS/GROUT MIXES

A. Drilling fluid shall be bentonite grout drilling fluid.

B. The bentonite or grout material shall be Saline Seal 100 as manufactured by American Colloid Company, M-179 as manufactured by DOW Chemical Company, Dowell Division, or an approved equal.

2.5 ACCEPTABLE STAINLESS STEEL RISER PIPE

A. Type 304 stainless steel conforming to ASTM A778

2.6 ACCEPTABLE CARBON STEEL RISER PIPE

A. Carbon steel casing conforming to ANSI/ASTM A139

2.7 WELL CAPS AND MANHOLES

A. Royer Quality Castings Inc.

B. Approved Equal

PART 3 EXECUTION

3.1 GENERAL

A. No monitoring well repair or replacement shall commence without acceptance of the Engineer.

B. All monitoring well repair or replacements shall be performed in accordance with the requirements of this Section and to the satisfaction of the Engineer. Monitoring wells damaged during the Work, which the Engineer determines cannot be satisfactorily repaired, shall be abandoned by the Contractor in accordance with the specification "Groundwater Monitoring Well Abandonment" and shall be replaced as directed by the Engineer. Construction of replacement wells shall be in accordance with this section. No additional payment shall be made to the Contractor for monitoring wells damaged by the Work requiring repair, abandonment, or replacement.

C. The Contractor shall restore the area in the vicinity of each well location as directed by the Engineer.

D. Following well construction activities, the Contractor shall decontaminate equipment and well materials. Well materials removed during the abandonment activities will be disposed of in accordance with applicable local, State, and Federal regulations.

3.2 MONITORING WELL CONSTRUCTION

A. General

1. Materials delivery, storage and handling

a. All riser pipe and well screens supplied under this Contract shall be shipped, stored and handled in accordance with the recommendations of the manufacturer.

b. All riser pipe shall be high pressure steam cleaned prior to installation.

2. Materials Inspection

a. Prior to well installation, all riser pipe, well screens and granular material shall be inspected by the Contractor in the presence of the Engineer for conformance with the standards and specifications.

B. Borehole Drilling

1. The Contractor shall install the new monitoring wells in the proposed cap area after the placement of excavated soil but before the placement of the geomembrane.

2. The Contractor shall drill the replacement monitoring wells at the locations and depths directed by the Engineer.

3. The Contractor shall utilize hollow stem auger methods or other method approved by the Engineer to drill the boreholes.

4. The Contractor shall obtain continuous soil samples during drilling in accordance with ASTM-D-1586 unless otherwise directed by the Engineer.

5. The Contractor will be responsible for retaining a representative portion of each sample in a one pint glass jar labeled with: site, boring number, interval sample/interval preserved, date and time of sample collection.

6. The Contractor shall thoroughly clean all augers, samplers, rods and subs, and other necessary appurtenances used in the drilling of each monitoring well prior to and following use. Cleaning shall consist of high pressure steam cleaning.

7. The Contractor shall collect all cuttings and drilling fluids. Cuttings shall be disposed of in accordance with the Section "Off-Site Transportation and Disposal". All fluids shall be collected, analyzed and transported off-site in accordance with all applicable Federal, State and local regulations. All other material shall be disposed of off-site in accordance with applicable local, State, Federal regulations. No additional payment shall be made, however, to the Contractor for disposal of wastes generated as a consequence of well abandonment and replacement activities.

C. Installation

1. The monitoring wells shall be constructed as detailed below:

2. The Contractor shall drill a hole which shall permit the driving, sinking and placement of an outer casing to a depth specified below. Following the installation of the outer casing, the inside of the outer casing shall be cleaned of debris such that the monitoring well screen and casing assembly may be installed.

3. The well screen and connecting riser pipe shall be lowered into the outer casing, if required, to the prepared screening level and permanently positioned so that the riser will project a minimum of 2 feet above finished grade. Appropriate centering guides shall be placed as directed by the Engineer no greater than 10 feet apart along the length of the well screen and the riser pipe.

4. After the screen and riser pipe have been properly positioned, the placement of granular backfill and simultaneous retrieval of the outer casing, if installed, shall begin. These operations should be coordinated such that the level of granular backfill placed should be no higher than three feet above the bottom of any given temporary position of the outer casing. The placement of granular backfill shall stop when the stabilized level of granular material is a minimum of two (2) feet above top of the well screen.

5. A solid bentonite plug shall be placed on top of the granular material to a level of two (2) feet above the granular material. The removal of the outer casing, if required, may then proceed with the simultaneous placement of a cement/bentonite grout into the annular space between the riser pipe and the borehole from the elevation of the top of the bentonite plug to two (2) feet below grade. The cement/bentonite grout shall be composed of the specific bentonite mixed with clean off-site water and Portland cement to a grout consistency approved by the Engineer.

6. Wellheads shall be completed as shown on the Contract Drawings.

3.3 DEVELOPMENT OF THE MONITORING WELLS

A. The Contractor shall be responsible for developing the replacement monitoring wells installed by a method accepted by the Engineer. Monitoring well development shall be conducted to remove fine-grained sediments from the well and filter pack. During development, the contractor shall be responsible for measuring and recording the pH, temperature, specific conductivity, and turbidity of the discharge water subsequent to the removal of each well volume. Development will continue until the pH, temperature, specific conductivity, and turbidity stabilize within 10% over three successive readings.

B. All liquid wastes collected during development shall be collected, analyzed and transported off-site in accordance with all applicable Federal, State and local regulations.

3.4 ACCEPTANCE

A. If at any time during the installation of a monitoring well the Engineer determines that it has not been installed to the standards of this Section, the Contractor will abandon the hole as directed by the Engineer and initiate construction of a new well at a location determined by the Engineer at no cost to the Owner.

B. Upon completion of a monitoring well, the Contractor shall demonstrate to the Engineer that the full depth of the well is free from any obstructions and clear of any formation materials and that the well will produce clean sediment-free water, otherwise the monitoring well will be deemed unacceptable and will be abandoned as discussed in "A" above.

3.5 SURVEY

A. The Contractor shall survey the location and elevation of each monitoring well, modified, extended, or replaced as part of the Contract. The vertical location of the ground surface and the mark made on top of the monitoring well riser shall be accurately measured to the nearest 100th foot.

3.6 RECORDS

A. The Contractor will provide the Engineer with a typed, legible copy of a boring log for each monitoring well as follows:

1. A record of the soil materials penetrated and the depth to which they were encountered, including soil type, color, percent recovery, moisture content, odor, and miscellaneous observations for replacement wells installed.

2. A record showing lengths of each diameter of casing and screen used and the location of packers, plugs and seals for all wells installed or modified by the Contractor.

3. Static groundwater level.

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SECTION 02211

CLEARING AND GRUBBING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes clearing and grubbing by removal or destruction of trees, underbrush, logs, stumps, decayed or growing organic matter above the surface of the ground. This section also includes the removal of snow and ice which interfere with construction or landscaping.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork

B. 02241 – Off-Site Transportation and Disposal

C. 02242 – Tar Excavation and Off-Site Disposal

PART 2 PRODUCTS

2.1 GENERAL

A. Contractor shall protect existing trees outside of the excavation limits and trees surrounding the excavations required to complete the remedial actions with suitable stakes or protective measures.

PART 3 EXECUTION

3.1 GENERAL

A. Only those portions of the site necessary and essential to be cleared for work shall be cleared.

B. Tree protection

1. Trees located outside of the excavation limits shall not be disturbed unless necessary to complete the excavations required as part of the remedial actions.

2. Any tree, which will not, in the opinion of the Engineer, hinder construction or landscaping, shall be protected.

3. Special care shall be exercised to minimize injury to trees that will not be removed. Careful digging will be performed to minimize root damage. Roots may be cut and removed up to 25 percent of the estimated root area. If more

than 25 percent is required to be cut, the Engineer shall decide whether the tree shall be removed. Straggling roots shall be pruned.

4. Any tree that is trimmed during construction shall be cut cleanly outside of the branch collar.

C. Removal of brush, trees and spoil

1. Contractor may chip brush and tree limbs. The Contractor shall dispose of all brush, trees, wood chips, logs, cut limbs and similar material off-site at an Owner-approved facility.

2. The cutting of trees and shrubs shall be six inches above the ground surface for clearing in the known contaminated areas. Anything below this height should be considered grubbing, and associated soils shall be handled as contaminated soils and handled in accordance with the Sections titled "Off-site Transportation and Disposal."

3. No brush, trees, peat or other organic material shall be placed on site or used as backfill in any excavations.

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SECTION 02221

EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, and equipment as required to perform excavation and backfilling activities including the loosening, removing, refilling, transporting, storage and disposal of all materials classified as "earth" necessary to be removed for the construction and completion of all work under the Contract, and as shown on the Contract Drawings, specified or directed.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02141 – Construction Water Management
B. 02223 – Embankment
C. 02225 – Structural Excavation, Backfill and Compaction
D. 02231 – Select Fill
E. 02241 – Off-Site Transportation and Disposal
F. 02242 – Tar Excavation and Off-Site Disposal
G. 02503 – Restoration of Surfaces
H. 02981 – Topsoil and Seeding

1.3 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

a. A328 Specification for Steel Sheet Piling

b. D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3)

c. D1556 Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

d. D1557 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3) (2,700 kN-m/m^3)

e. D1760 Specification for Pressure Treatment of Timber Products

f. D2922 Test Methods for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)

1.4 DEFINITIONS

A. Excavation (or Trenching)

1. Grubbing, stripping, removing, storing and rehandling of all materials of every name and nature necessary to be removed for all purposes incidental to the construction and completion of all the work under construction.

2. All sheeting, sheetpiling, bracing and shoring, and the placing, driving, cutting off and removing of the same.

3. All diking, ditching, fluming, cofferdamming, pumping, bailing, draining, well pointing, or otherwise disposing of water.

4. The removing and disposing of all surplus materials from the excavations in the manner specified.

5. The maintenance, accommodation and protection of travel and the temporary paving of highways, roads and driveways.

6. The supporting and protecting of all tracks, rails, buildings, curbs, sidewalks, pavements, overhead wires, poles, trees, vines, shrubbery, pipes, sewers, conduits or other structures or property in the vicinity of the work, whether over- or underground or which appear within or adjacent to the excavations, and the restoration of the same in case of settlement or other injury.

7. All temporary bridging and fencing and the removing of same.

B. Earth

1. All materials such as sand, gravel, clay, loam, ashes, cinders, pavements, muck, roots or 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 or masonry larger than one-half cubic yard in volume.

C. Backfill

1. The refilling of excavation and trenches to the line of filling indicated on the Contract Drawings or as directed using materials suitable for refilling of excavations and trenches; and the compacting of all materials used in filling or refilling by rolling, ramming, watering, puddling, etc., as may be required.

D. Spoil

1. Surplus excavated materials not required or not suitable for backfills or embankments.

E. Embankments

1. Fills constructed above the original surface of the ground or such other elevation as specified or directed.

F. Limiting Subgrade

1. The underside of the pipe barrel for pipelines
2. The underside of footing lines for structures

G. Excavation Below Subgrade

1. Excavation below the limiting subgrades of structures or pipelines.

2. Where materials encountered at the limiting subgrades are not suitable for proper support of structures or pipelines, the Contractor shall excavate to such new lines and grades as required.

PART 2 PRODUCTS

2.1 MATERIALS AND CONSTRUCTION

A. Wood Sheeting and Bracing

1. Shall be sound and straight; free from cracks, shakes and large or loose knots; and shall have dressed edges where directed.

2. Shall conform to National Design Specifications for Stress Grade Lumber having a minimum fiber stress of 1200 pounds per square inch.

3. Sheeting and bracing to be left-in-place shall be pressure treated in accordance with ASTM D1760 for the type of lumber used and with a preservative approved by the Engineer.

B. Steel Sheeting and Bracing

1. Shall be sound

2. Shall conform to ASTM A328 with a minimum thickness of 3/8 inch.

3. Shall be in accordance with technical specification 02400 Steel Sheet Piling.

PART 3 EXECUTION

3.1 UNAUTHORIZED EXCAVATION

A. Whenever excavations are carried beyond or below the lines and grades shown on the Contract Drawings, or as given or directed by the Engineer, all such excavated space shall be refilled with special granular materials, concrete or other materials as

the Engineer may direct. All refilling of unauthorized excavations shall be at the Contractor's expense.

B. All material which slides, falls or caves into the established limits of excavations due to any cause whatsoever, shall be removed and disposed of at the Contractor's expense and no extra compensation will be paid the Contractor for any materials ordered for refilling the void areas left by the slide, fall or cave-in.

3.2 STORAGE OF MATERIALS

A. Sod

1. Any sod cut during excavation shall be removed and stored during construction so as to preserve the grass growth. Sod damaged while in storage shall be replaced in like kind at the sole expense of the Contractor.

B. Topsoil

1. Topsoil suitable for final grading shall be removed and stored separately from other excavated material.

C. Excavated Materials

1. All excavated materials shall be stored in locations so as not to endanger the work, and so that easy access may be had at all times to all parts of the excavation. Stored materials shall be kept neatly piled and trimmed, so as to cause as little inconvenience as possible to public travel or to adjoining property holders.

2. Special precautions must be taken to permit access at all times to fire hydrants, fire alarm boxes, police and fire department driveways, and other points where access may involve the safety and welfare of the general public.

3.3 DISPOSAL OF MATERIALS

A. Spoil Material

1. All spoil materials shall be disposed of as specified under section 02241 “Off-Site Transportation and Disposal”.

2. The surface of all spoil areas shall be graded and dressed and no unsightly mounds or heaps shall be left on completion of the work.

3.4 SHEETING AND BRACING

A. Installation

1. The Contractor shall furnish, place and maintain such sheeting, bracing and shoring as may be required to support the sides and ends of excavations in such manner as to prevent any movement which could, in any way, injure the pipe, structures, or other work; diminish the width necessary for

construction; otherwise damage or delay the work of the Contract; endanger existing structures, pipes or pavements; or cause the excavation limits to exceed the right-of-way limits.

2. In no case will bracing be permitted against pipes or structures in trenches or other excavations.

3. Sheeting shall be driven as the excavation progresses, and in such manner as to maintain pressure against the original ground at all times. The sheeting shall be driven vertically with the edges tight together, and all bracing shall be of such design and strength as to maintain the sheeting in its proper position. Seepage which carries fines through the sheeting shall be plugged to retain the fines.

4. Where breast boards are used between soldier piles, the boards shall be back packed with soil to maintain support.

5. The Contractor shall be solely responsible for the adequacy of all sheeting and bracing.

B. Removal

1. In general, all sheeting and bracing, whether of steel, wood or other material, used to support the sides of trenches or other open excavations, shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a pipe or structural foundation shall not be withdrawn, unless otherwise directed, before more than 6 inches of earth is placed above the top of the pipe or structural foundation and before any bracing is removed. The voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

2. The Contractor shall not remove sheeting and bracing until the work has attained the necessary strength to permit placing of backfill.

C. Left in Place

1. If, to serve any purpose of his own, the Contractor files a written request for permission to leave sheeting or bracing in the trench or excavation, the Engineer may grant such permission, in writing, on condition that the cost of such sheeting and bracing be assumed and paid by the Contractor.

2. The Contractor shall leave in place all sheeting, shoring and bracing which are shown on the Contract Drawings or specified to be left in place or which the Engineer may order, in writing, to be left in place. All shoring, sheeting and bracing shown or ordered to be left in place will be paid for under the appropriate item of the Contract. No payment allowance will be made for wasted ends or for portions above the proposed cutoff level which are driven down instead of cut-off.

3. In the event that sheeting is left in place permanently, it shall be cut off or driven down as directed so that no portion of the same shall remain within 12 inches of the street subgrade or finished ground surface.

3.5 BACKFILLING

A. General

1. All excavations shall be backfilled to the original surface of the ground or to such other grades as may be shown, specified or directed.

2. Backfilling shall be done with suitable excavated materials which can be satisfactorily compacted during refilling of the excavation. In the event the excavated materials are not suitable, Special Backfill as specified or ordered by the Engineer shall be used for backfilling.

3. Any settlement occurring in the backfilled excavations shall be refilled and compacted.

B. Unsuitable Materials

1. Stones, pieces of rock or pieces of pavement greater than 1 cubic foot in volume or greater than 1.5 feet in any single dimension shall not be used in any portion of the backfill.

2. All stones, pieces of rock or pavement shall be distributed through the backfill and alternated with earth backfill in such a manner that all interstices between them shall be filled with earth.

3. Frozen earth shall not be used for backfilling.

C. Compaction and Density Control

1. The compaction shall be as specified for the type of earthwork, i.e., structural, trenching or embankment.

   a. The compaction specified shall be the percent of maximum dry density.

   b. The compaction equipment shall be suitable for the material encountered.

2. Where required, to assure adequate compaction, in-place density test shall at the expense of the Contractor be made by an approved testing laboratory.

   a. The moisture-density relationship of the backfill material shall be determined by ASTM D1557.

      1) Compaction curves for the full range of materials used shall be developed.

b. In-place density shall be determined by the methods of ASTM D1556 or ASTM D2922 and shall be expressed as a percentage of maximum dry density.

3. Where required, to obtain the optimum moisture content, the Contractor shall add, at his expense, sufficient water during compaction to assure the specified maximum density of the backfill. If, due to rain or other causes, the material exceeds the optimum moisture content, it shall be allowed to dry, assisted if necessary, before resuming compaction or filling efforts.

4. The Contractor shall be responsible for all damage or injury done to pipes, structures, property or persons due to improper placing or compacting of backfill.

3.6 OTHER REQUIREMENTS

A. Drainage

1. All material deposited in roadway ditches or other water courses shall be removed immediately after backfilling is completed and the section, grades and contours of such ditches or water courses restored to their original condition, in order that surface drainage will be obstructed no longer than necessary.

B. Unfinished Work

1. When, for any reason, the work is to be left unfinished, all trenches and excavations shall be filled and all roadways, sidewalks and watercourses left unobstructed with their surfaces in a safe and satisfactory condition. The surface of all roadways and sidewalks shall have a temporary pavement.

C. Hauling Material on Streets

1. When it is necessary to haul material over the streets or pavements, the Contractor shall provide suitable tight vehicles so as to prevent deposits on the streets or pavements. In all cases where any materials are dropped from the vehicles, the Contractor shall clean up the same as often as required to keep the crosswalks, streets and pavements clean and free from dirt, mud, stone and other hauled material.

D. Dust Control

1. It shall be the sole responsibility of the Contractor to control the dust created by any and all of the Contractor's operations to such a degree that it will not endanger the safety and welfare of the general public.

2. Calcium chloride and petroleum products shall not to be used for dust control.

E. Test Pits

1. For the purpose of obtaining detail locations of underground obstructions, the Contractor shall make excavations in advance of the work. Payment for the excavations ordered by the Engineer will be made under an appropriate item of the Contract and shall include sheeting, bracing, pumping, excavation and backfilling.

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SECTION 02223

EMBANKMENT

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, and equipment required in the construction of earth embankments constructed to established lines and grades at the locations shown on the Contract Drawings and as directed by the Engineer.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02211 – Clearing and Grubbing
B. 02221 – Earthwork
C. 02241 – Off-Site Transportation and Disposal
D. 02242 – Tar Excavation and Off-Site Disposal
E. 02503 – Restoration of Surfaces
F. 02981 – Topsoil and Seeding

1.3 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

a. D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3)

b. D1556 Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

c. D1557 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3) (2,700 kN-m/m^3)

d. D2922 Test Methods for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)

1.4 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. Proposed testing laboratory.

2. Source of off-site materials.

3. Compaction curves for all materials to be used.

4. Particle size distribution curves for all materials to be used.

5. Certification from Owner of source testing in accordance with the Special Provisions.

6. Location of samples collected within borrow areas for laboratory testing.

7. Results of field tests.

8. All mining and borrow permits required by local, state and federal agencies.

1.5 TESTING

A. All testing, including field and laboratory services, shall be at the Contractor's expense without additional compensation, except where separate payment is specified.

PART 2 PRODUCTS

2.1 GENERAL

A. Embankment material shall be free from frost, stumps, trees, roots, sods, muck, marl, vegetable matter or other unsuitable material and shall be suitable for compaction as described in the following provisions. Where embankments are to be placed underwater only acceptable granular materials shall be used unless otherwise specified.

B. Embankment materials shall be obtained from acceptable soils on the site, or approved off-site sources.

PART 3 EXECUTION

3.1 PREPARATION OF SUBGRADE

A. The entire surface to be covered with embankment shall be grubbed and stripped of all grass, vegetation, topsoil, rubbish, or other unsuitable materials before any embankment material is placed.

1. Topsoil shall be stockpiled or placed as designated.

2. Other grubbed and stripped materials shall be removed as spoil.

B. Stripped or excavated surfaces on which embankments are to be placed shall be compacted to the required density of the embankment prior to any fill being placed.

3.2 PLACEMENT AND COMPACTION

A. Materials shall be placed in lifts not greater than 8 inches of thickness unless greater thicknesses are allowed by the Engineer upon demonstration by the Contractor that the materials and compaction efforts are adequate to obtain the required density.

B. Material shall be placed in a uniform lift and thoroughly compacted by compaction equipment suitable for the material encountered to obtain the required density prior to the placement of succeeding lift.

1. Each lift shall be tested for proper compaction before successive lifts are applied.

C. Stones shall not exceed 6 inches in greatest dimension and shall be well distributed throughout the soil mass. Stone shall be defined as rock material either in its natural or broken state.

D. Stones not well mixed with soil material shall not be used in earth embankments unless the stone material is sufficiently deteriorated or friable so as to be compactable to achieve minimum voids and required density.

E. If the required density is not obtained, compaction of the embankment shall continue until specified densities are obtained, before any additional embankment is placed. Improperly compacted embankment shall be removed.

F. Where required, the Contractor shall, at his expense, add sufficient water during the compaction effort to assure proper density. If, due to rain or other causes, the material exceeds the optimum moisture content for satisfactory compaction, it shall be allowed to dry, assisted by discing or harrowing, if necessary, before compaction or filling effort is resumed.

G. The Contractor shall be required to seal the working surface at the close of each day's operation and when practical prior to rainfall. Sealing shall be accomplished by rolling the surface with a smooth wheel steel roller.

H. Compaction or consolidation achieved by traveling trucks, machines and other equipment will not be accepted unless such procedures are approved by the Engineer and proper compaction density is achieved.

I. Hand tamping shall be required around buried utility lines or other subsurface features that could be damaged by mechanical compaction equipment.

J. Embankments shall be constructed to such elevations as to make allowance for any settlement that may occur. Prior to the construction of any structure, roadway or other ground feature and before final acceptance of the contract, the Contractor shall regrade the embankments to conform to the established lines and grades.

3.3 DENSITY CONTROL

A. Embankments shall be compacted to 90% of maximum dry density as determined by the density tests designated in ASTM D1557.

1. Compaction curves for the full range of soil materials to be used in the embankment shall be developed by an approved independent testing laboratory.

B. Field control samples shall be taken and tested by the testing laboratory as required to assure that adequate compaction of the embankment material is being achieved.

C. A minimum of one (1) in-place density test shall be made for every (10,000) square feet of compacted area per lift.

1. In-place density of soils shall be determined by the methods described in ASTM D1556 or ASTM D2922 and expressed as a percentage of the maximum dry density.

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SECTION 02225

STRUCTURAL EXCAVATION, BACKFILL AND COMPACTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, and equipment as required to perform excavation and backfill activities for the construction of structures in accordance with the applicable provisions of the Section entitled "Earthwork" unless modified herein.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork
B. 02223 – Embankment
C. 02231 – Select Fill
D. 02503 – Restoration of Surfaces
E. 02981 – Topsoil and Seeding

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 LIMITS OF EXCAVATION

A. Excavations shall be made to the elevations or subgrades specified and shall be only of sufficient size to allow suitable room for the proper construction of structures and appurtenances, including allowances for sheeting, dewatering, and other similar work necessary for completion of the Contract.

B. Normal subgrade for structures shall be the underside of footing lines or mud mats, if installed.

C. In no case will undercutting excavation faces be permitted.

3.2 SUBSURFACE REINFORCEMENT

A. Where an unstable subgrade is encountered and subject to the approval of the Engineer, select fill may be used for subgrade reinforcement if satisfactory results can be obtained thereby. Such material shall be applied in thin layers, each layer being entirely embedded in the subsoil by thorough tamping.

B. All excess material shall be removed to compensate for the displacement by the select fill and the finished elevation shall not be above the specified subgrade.

C. Where subgrade reinforcement is unsatisfactory, a concrete mud mat of sufficient thickness to withstand subsequent construction operations shall be installed below the specified elevation and the structural concrete deposited thereon.

3.3 SUBSURFACE

A. Subsurface for all concrete structures shall be undisturbed original earth or, mud mat on undisturbed original earth, or where excavation below subgrade is ordered, it shall be thoroughly compacted special backfill or concrete mudmat as specified or directed and shall be sufficiently stable to remain firm and intact during the preparation for the placing of concrete thereon.

3.4 REMOVAL OF WATER

A. No water entering the excavations shall be removed. The Contractor shall perform all excavation activities to the depths as shown, directed or until contact with groundwater takes place, at which time excavation activities will cease.

3.5 BACKFILLING

A. Backfilling shall be with suitable excavated materials which can be compacted as specified. In the event the excavated materials are not suitable, special backfill as specified or ordered by the Engineer shall be used for backfilling.

B. Backfilling around structures shall not be commenced before the structure has developed sufficient strength to withstand the loads applied. No backfill material shall be allowed to fall directly on a structure until at least 12 inches of material has been hand-placed and compacted, nor shall any material be pushed directly against a structure in backfilling.

C. Backfill shall be deposited in horizontal layers and at no greater thickness than can be compacted to obtain the specified minimum densities.

3.6 COMPACTION

A. Where structures, driveways, sidewalks or other features are to be constructed on the backfilled area the entire backfill shall be compacted to obtain 95% maximum density. Other areas shall be compacted to obtain 90% maximum density.

B. The density shall be determined as set forth in the Section entitled "Earthwork".

* * * * *

SECTION 02229

ROCK REMOVAL

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, and equipment as required for the removal to the widths and depths shown on the Contract Drawings or as directed by the Engineer, including the loosening, removing, transporting, storing and disposal of all materials requiring barring, or wedging for removal from their original beds, and backfill of rock excavations with acceptable materials.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork
B. 02225 – Structural Excavation, Backfill and Compaction
C. 02242 – Tar Excavation and Off-Site Disposal

1.3 DEFINITIONS

A. Rock

1. All pieces of ledge or bedrock, boulders or masonry larger than one-half cubic yard in volume.

2. Any material requiring barring or wedging for removal from its original bed.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 BLASTING

A. General

1. No blasting shall be permitted.

B. Rock Clearance in Trenches

1. Ledge rock, boulders and large stones shall be removed from the sides and bottom of the trench to provide clearance for the specified embedment of each pipe section, joint or appurtenance, steel sheet piling, or jet grouting; but in no instance shall the clearance be less than 6 inches. Additional clearance at the pipe bell or joint shall be provided to allow for the proper make-up of the joint.

2. At the transition from an earth bottom to a rock bottom the minimum bottom clearance shall be 12 inches for a distance of not less than 5 feet.

C. Rock Clearance at Structures

1. Concrete for structures shall be placed directly on the rock and the excavation shall be only to the elevations and grades shown on the Contract Drawings.

3.2 EXCAVATION AND BACKFILL

A. Rock removal and backfilling shall be performed in accordance with the applicable provisions of the Section entitled "Earthwork".

B. The rock excavated which cannot be incorporated into the backfill material, as specified, shall be disposed of as spoil and shall be replaced with the quantity of acceptable material required for backfilling.

* * * * *

SECTION 02231

SELECT FILL

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes select fill materials used in either embedment or special backfill, as specified or as directed by the Owner.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork
B. 02223 – Embankment
C. 02225 – Structural Excavation, Backfill and Compaction
D. 02503 – Restoration of Surfaces

1.3 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

a. D422 - Method for Particle-Size Analysis of Soil

1.4 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. The name and location of the source of the material.

2. Samples and test reports of the material.

1.5 DEFINITIONS

A. Embedment or Lining

1. Any type granular material specified or directed placed below an imaginary line drawn one foot above the inside diameter of the pipe and within the trench limits.

B. Special Backfill

1. Pipelines

a. Any select fill material specified or directed placed above an imaginary line drawn one foot above the inside diameter of the pipe and within the trench limits.

2. Structures

a. Any select fill material specified or directed placed within the excavation limits, either in, under or adjacent to the structure.

C. Special Granular Material

1. Special granular material shall mean any of the granular materials listed below or other materials ordered by the Owner.

PART 2 PRODUCTS

2.1 MATERIALS

A. Type A

1. Crushed Gravel

a. Thoroughly washed crushed, durable, sharp angled fragments of gravel free from coatings. Crushed particles shall be a minimum of 85% by weight of the particles with at least two fractured faces. The total area of each fractional face shall exceed 25% of the maximum cross-sectional area of the particle.

b. Crushed gravel shall have the following gradation by weight:

% Passing	Sieve
100%	1½-inch
0-25%	¾-inch
0-5%	½-inch

B. Type B

1. Crushed Stone

a. Thoroughly washed clean, sound, tough, hard crushed limestone or approved equal free from coatings. Gradation for crushed stone shall be the same as specified for Type A material.

C. Type C

1. Crushed Stone

a. Thoroughly washed, clean, sound, tough, hard, crushed limestone or approved equal free from coatings. It shall have a gradation by weight of 100% passing a 1-inch square opening and 0 - 15% passing a ¼-inch square opening.

D. Type D

1. Washed Sand

a. Washed coarse sand having the following gradation by weight:

% Passing	Sieve
100	3/8 inch
95 – 100	No. 4
80 – 100	No. 8
50-85	No. 16
25 – 60	No. 30
10 – 30	No. 50
2 – 10	No. 100

b. The D10 shall be equal to or greater than 0.65 mm

E. Type E

1. Run-of-Bank Gravel

a. Run-of-bank gravel or other acceptable granular material free from organic matter with a gradation by weight of 100% passing a 1½-inch square opening, 30 to 65% passing a ¼-inch square opening and not more than 10% passing a No. 200 mesh sieve as determined by washing through the sieve in accordance with ASTM D422.

F. Type F

1. Run-of-crusher Stone

a. Run-of-crusher hard durable limestone or approved equal having the following gradation by weight:

% Passing	Sieve
100	1½- inch
95 – 100	1
65 – 80	½
40 – 60	¼
0 – 10	#200 Sieve

G. Type G

1. A mixture of Type E material and Portland cement mixed in a ratio of 15:1 and placed and compacted in a dry state.

H. Type H

1. Graded Aggregate

a. Use graded aggregate base material of uniform quality throughout, substantially free from vegetable matter, shale, lumps and clay balls, and having a Limerock Bearing Ratio value of not less than 100. Use material retained on the No. 10 [2.00 mm] sieve composed of aggregate meeting the following requirements:

Soundness Loss, Sodium, Sulfate: AASHTO T 104 .....15%
Percent Wear: AASHTO T 96 (Grading A)
Group 1 Aggregates 45%
Group 2 Aggregates 65%
Group 1: This group of aggregates is composed of limestone, marble, or dolomite.
Group 2: This group of aggregates is composed of granite, gneiss, or quartzite.
Use graded aggregate base material meeting the following gradation:

% Passing	Sieve
100	2-inch
95 – 100	1 1/2
65 – 90	3/4
45 – 75	3/8
35 – 60	#4 Sieve
25 - 45	#10 Sieve
5 - 25	#50 Sieve
0 - 10	#200 Sieve

PART 3 EXECUTION

3.1 INSTALLATION

A. Special backfill where specified or directed shall be placed in accordance with the backfilling provisions of the Section titled "Earthwork".

3.2 DISPOSAL OF DISPLACED MATERIALS

A. Materials displaced through the use of Select Fill shall be wasted or disposed of by the Contractor and the cost of such disposal shall be included in the unit price bid for each of the materials.

3.3 SETTLEMENTS

A. Any settlements in the finished work shall be made good by the Contractor.

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SECTION 02241

OFF-SITE TRANSPORTATION AND DISPOSAL

PART 1 GENERAL

1.1 SUMMARY

A. The Contractor shall properly transport and dispose of all items, including solid and liquid wastes removed from the site, to appropriate disposal facilities in accordance with the Waste Management Plan for the Remedial Action for Former Fulton Manufactured Gas Plant Site (February 2011) and this specification. This includes former manufactured gas plant (MGP) wastes as well as construction debris and other waste material (*e.g*. trees and brush removed from the areas of excavation) generated by the Contract work. The Contractor shall be responsible and will be held accountable for assuring that all sampling, analysis, transportation, and disposal requirements of the Treatment, Storage, and Disposal Facility (TSDF), Solid Waste Management Facility (SWMF), and/or Publicly Owned Treatment Works (POTW) are complied with as applicable, and that Federal, State, and local government requirements are complied with.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork
B. 02223 – Embankment
C. 02242 – Tar Excavation and Off-Site Disposal

1.3 DOCUMENTS MADE PART OF SPECIFICATION BY REFERENCE

A. Waste Management Plan for the Remedial Action for Former Fulton Manufactured Gas Plant Site (February 2011)

1.4. SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. Transportation Plan: The Contractor shall submit a Transportation Plan to the Engineer prior to the start of work for review. This shall include:

a. Type and number of vehicles used

b. Travel routes and times

c. Copies of transportation permits

2. Disposal Facilities: Prior to the disposal of any waste, the Contractor shall submit to the Engineer information regarding proposed facilities for disposal of each type of waste. All proposed facilities must be permitted. Information submitted shall include, but not be limited to:

a. Name

b. Owner

c. Type of facility/permit

d. Contact person, phone number

e. Location

f. Hours of operation

g. Copies of permits

1.5 PERMITS AND REGULATIONS

A. The Contractor shall comply with all Federal, State, and local regulations regarding transportation and disposal of wastes. These include, but are not limited to:

1. Trucks used for transportation of wastes shall be permitted for such use;

2. Vehicle operator possession of a commercial driver's license with hazardous waste materials endorsement (if applicable);

3. Registration of vehicle as a hazardous waste carrier (if applicable);

4. Utilization of shipping papers and/or hazardous waste manifest (if applicable);

5. Proper marking and placarding of vehicles;

6. Placement of emergency response procedures and emergency telephone numbers in vehicle, and operator familiarity with emergency response procedures; and

7. Compliance with load height and weight regulations.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. All equipment supplied shall be in good working condition. Equipment and machinery delivered to the site, including haul trucks that have visible oil or hydraulic fluid leaks, will not be allowed on site until satisfactorily repaired. The Contractor is responsible for the cleanup of any oil or hydraulic fluid spills at the Contractor's expense.

B. The Contractor shall not allow soil to be tracked off site at any time during the project. Visible soil tracks on streets will not be allowed. The Contractor shall take sufficient precautions to prevent loose soils from adhering to tire treads, wheel wells, etc. Any loose soil spread shall be cleaned up.

C. Trucks used for transportation of material for off-site disposal shall be water tight. The disposal vehicles shall be equipped with solid covers (*e.g*. tightly woven fabric, no mesh covers) that shall be utilized during the transportation of wastes from the Site to the disposal facility. Trucks carrying waste material are not permitted to leave the Site without the waste being covered.

PART 3 EXECUTION

3.1 DECONTAMINATION

A. Transport vehicles shall be decontaminated upon leaving the Exclusion Zone at the site and again at the disposal facility as required.

3.2 TRANSPORTATION

A. Materials shall be transported only at the times and by the routes indicated in the approved Transportation Plan, unless permission is received by the Engineer to do otherwise. The Contractor shall observe the legal load limits.

Prior to shipment of wastes off the site, the Contractor shall confirm by written communication from the designated TSDF that it is authorized, has the capacity, and will provide or assure that the ultimate disposal method is followed for the particular waste on the manifest. Additionally, the Contractor shall confirm by written communication from the designated transporter(s) that they are authorized to deliver the manifested waste to the designated TSDF or SWMF.

3.3 SAMPLING

A. The Contractor shall be responsible for all cost associated with sampling of wastes to be disposed of as may be required by the disposal facility.

3.4 MANIFESTING

A. The Contractor shall complete all required manifest forms and Bill of Lading forms for the Owner for proper transportation and disposal of materials off site. The Contractor shall be responsible and will be held accountable for assuring that all sampling, analysis, transportation, and disposal requirements of the TSDF, SWMF, POTW, Federal, State, and local governments are complied with and properly documented.

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SECTION 02242

TAR EXCAVATION AND OFF-SITE DISPOSAL

PART 1 GENERAL

1.1 SUMMARY

A. Tar shall be defined as visually identifiable tar, which includes tar mixed with soil, slag, ash, or a combination of fill materials and soils.

B. This Section includes excavation and backfilling including the loosening, and removing, of all tar to be removed and disposed of off–site and refilling of the resulting excavation.

C. Excavation of tar to be disposed of off-site to the widths, depths and grades shown on the Contract Drawings, or as directed by the Engineer.

D. The approximate location and limits of tar to be excavated and disposed of off-site are indicated on the Contract Drawings.

E. The tar shall be staged in the water-tight containers. The Contractor is responsible for all handling and processing of the tar material.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 01700 – Health and Safety
B. 02221 – Earthwork
C. 02223 – Embankment
D. 02241 – Off-Site Transportation and Disposal
E. 02270 – Erosion and Sediment Control
F. 02503 – Restoration of Surfaces

1.3 DOCUMENTS MADE PART OF SPECIFICATION BY REFERENCE

A. Waste Management Plan for the Remedial Action for Former Fulton Manufactured Gas Plant Site (February 2011)

1.4 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except when more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

a. ASTM D698 Test Method for Laboratory Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3)

b. ASTM D1557 Test method for Laboratory Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3) (2,700 kN-m/m^3)

c. ASTM D2922 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

d. ASTM D3017 Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

e. USEPA Method 9095 Paint Filter Test

1.5 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. A description, submitted for Engineer review, of the manner in which the tar or excavation spoils removed from the site will be dewatered, if required, for transportation to an off-site disposal facility. The description shall identify the materials/admixtures that will be utilized, if any, and indicate the anticipated quantity (tons) of admixtures that will be utilized.

2. A plan, submitted for Engineer review, depicting the proposed layout of equipment to be utilized for tar or excavation spoils dewatering and showing the proposed locations of any material stockpiles.

3. A Vapor/Odor Management Plan that will detail methods to be implemented to control vapors and odors emanating from excavations and stockpiles.

a. The primary measure to minimize the generation of vapors and odors shall be to minimize, to the extent practical, the exposed surface of waste material and contaminated soil.

b. Secondary measures shall include the use of products such as RUSMAR Foaming Agents, as approved by National Grid and NYSDEC, to mask objectionable odors.

4. Paint filter procedure to be performed.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 TAR EXCAVATION

A. Excavation of tar in the locations shown on the Contract Drawings, specified as approximate areas to be excavated and disposed of off – site, to the extent shown on the Contract Drawings or as directed by the Engineer. All tar excavated within the areas shall be disposed of off-site in accordance with the Waste Management Plan for the Remedial Action for Former Fulton Manufactured Gas Plant Site (February 2011) and as specified.

B. The Contractor shall excavate all tar designated for off-site disposal and stage at location approved by the Engineer. The Contractor shall sample tar designated for off-site disposal and analyze for the requirements of the disposal facility. At minimum, the impacted soil to be disposed of off-site will be sampled at a frequency of 1 composite sample per 1000 tons, made of 5 grab samples representative of the waste, and each composite sample will be analyzed for RCRA characteristics of flammability, ignitability, toxicity, and corrosivity. Also, each composite sample will be analyzed for reactive cyanide and sulfide.

C. The Contractor shall transport all tar designated to be disposed of off-site to the water-tight containers.

D. The Contractor shall contain all excavated tar that cannot be excavated and disposed of within one day, in covered water-tight containers or in piles lined and covered with 40-mil thick plastic sheeting (either singularly or layered). Appropriate erosion controls shall also be placed in accordance with the Section Erosion and Sediment Control.

E. The Contractor shall excavate tar utilizing appropriate procedures and equipment. Normal earthwork excavation shall be used wherever possible.

F. The Contractor shall utilize approved procedures and equipment to mitigate odors and vapors resulting from tar excavation.

3.2 DEBRIS PROCESSING

A. The potential exists for encountering concrete or brick foundation material, abandoned piping, and other debris at the site. It is the Contractor's responsibility to render the materials into manageable size (i.e., less than ½ cubic yard volume or 10-foot lengths of pipe) as directed by the Engineer. Prior to shipping the debris or concrete off-site, grossly contaminated soil adhering to the surface will be removed, as necessary, by scraping, brushing, or other means approved by the Engineer. Associated grossly impacted soil will be transported off-site for treatment (if necessary) and disposed of in accordance with the Waste Management Plan for the Remedial Action for Former Fulton Manufactured Gas Plant Site (February 2011) and applicable regulations.

B. As appropriate, separate stockpiles of soil will be established during the construction; those with soil containing visible coal tar or separate phase materials, and others with soil not exhibiting visible signs of NAPL. To the extent that space allows, surface soil removed for grading purposes and soil that does not contain visible coal tar or separate phase material may be reused on site as excavation backfill beneath the cover with concurrence of the Engineer and NYSDEC.

3.3 MATERIAL SEGREGATION

A. The Contractor shall segregate materials as directed by the Engineer during the excavation of soils for material handling activities including (if necessary): gravity dewatering, mixing, stabilizing, and characterizing.

3.4 PRETREATMENT AND MIXING

A. The Contractor shall be responsible for the pretreatment and mixing of excavated materials (as necessary to meet selected off-site disposal facility requirements) to render the materials suitable for off-site disposal. The pretreatment and off-site transportation of excavated tar will be conducted concurrently with the soil excavation activities in a manner to complete the project in an effective and efficient manner. The Contractor should be aware that very limited space beyond the limits of excavation is available for the pretreatment and mixing of materials. Due to the limited on-site area for the staging of large quantities of materials, pretreatment and mixing of tar shall be performed in such a manner such that the means and methods of pretreatment and mixing of materials does not impact the rate of production necessary to complete excavation activities within the scheduled timeframe. At a minimum, the Contractor shall be responsible for the following:

1. The Contractor shall be responsible for stabilizing/amending the excavated materials as necessary to remove free liquids or otherwise render the materials suitable for disposal, prior to off-site treatment and/or disposal (as directed by the Owner's representative). The Contractor shall be responsible for the determination of means and methods for the stabilization of excavated materials (e.g., by amending tar with on-site soils or clean dry soil by means of mixing materials within the excavation, gravity dewatering, and/or mixing materials adjacent to the excavation area, or mixing materials within lined dump trailers). The contractor shall be prohibited from using quick lime and/or lime kiln dust containing greater than 50% Ca/MgO for the purpose of amending tar impacted soil.

B. The Contractor shall be responsible for developing the means, methods, and rates of pretreatment and mixing of the excavated tar to render them suitable for off-site disposal. The means, method, and rates of pretreatment and mixing of the excavated tar shall be submitted to the Engineer for approval. The Contractor may not blend more material than required to meet requirements for the off-site disposal facility as determined by the Engineer or not as ordered by the Engineer.

3.5 BACKFILL AND COMPACTION

A. The tar excavation areas located within the limits of the Site shall be backfilled with compacted embankment material as specified in the Contract Documents.

B. The Contractor shall compact all backfill to a minimum 90% modified density and tested in accordance with the following:

Test	Standard	Minimum Frequency	Criteria
Compaction Characteristics	ASTM D1557	Once per 5000 cubic yards or a minimum of one, whichever is greater	Develop compaction characteristics
In-Place Moisture Content	ASTM D3017	Five (5) per acre per lift or a minimum of one, whichever is greater	Monitor compaction
In-Place Density	ASTM D2922	Five (5) per acre per lift or a minimum of one, whichever is greater	Minimum 90% of maximum density in accordance with ASTM D1557

C. The Contractor shall make all reasonable efforts to grade cut areas in a manner to achieve the required subgrade following compaction of the said cut areas.

D. Any areas of soils not meeting the criteria shall be reworked by the Contractor to meet the criteria at no additional cost to the Owner.

E. Additional testing may be required at the request of the Engineer.

3.6 TRANSPORTATION AND STAGING

A. All tar to be disposed of off-site shall pass the paint filter test prior to being transported from the limits of the Site.

B. The Contractor shall transport all tar to be disposed of off-site in a water-tight container. The disposal vehicles shall be equipped with solid covers (*e.g.* tightly woven fabric, no mesh covers) that shall be utilized during the transportation of wastes from the Site to the disposal facility. Trucks carrying waste material are not permitted to leave the Site without the waste being covered.

C. The Contractor shall be responsible for storing the tar to be disposed off-site in watertight containers. Precipitation shall not be allowed to come in contact with the tar to be disposed of off-site.

D. The Contractor shall load all tar to be disposed of off site on the transportation vehicles.

E. The Contractor shall utilize preprinted manifests provided by National Grid.

F. The Owner’s representative will maintain characterization and disposal records for all waste materials generated as a direct result of construction activities.

3.7 COVER OF DISTURBED AREAS AND PLACED MATERIALS

A. The portion of the site within the limits of work, as shown on the Contract Drawings shall be restored as specified under Section 02503 “Restoration of Surfaces" or as shown on the Contract Drawings.

B. To control release of dust and to minimize the generation of construction water, the Contractor shall avoid excessive disturbance of the excavated tar.

3.8 RESTORATION

A. No backfilling activities shall be performed without acceptance of the Engineer.

B. Excavated areas within the limits of the Site shall be backfilled with embankment material as shown on the Contract Drawings, specified or directed.

* * * * *

SECTION 02270

EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes erosion and sediment control performed to minimize erosion of soils and sediments into drainage channels, and lands adjacent to or affected by the Work, and to prevent storm water run-on onto work areas and to prevent potentially contaminated storm water run-off (including soils and sediment) from leaving the site without appropriate treatment.

B. Erosion and sediment control measures to be implemented shall be in accordance with this specification, and as may be required by the New York State Department of Environmental Conservation (NYSDEC). In the event of discrepancies between this Specification and the NYSDEC requirements, the NYSDEC requirements shall govern.

C. Erosion and sediment controls shall be constructed at additional locations as ordered by the Engineer and without additional cost when the Engineer is of the opinion that additional measures may be required to provide adequate erosion and sediment control.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02241 – Off-Site Transportation and Disposal
B. 02242 – Tar Excavation and Off-Site Disposal

1.3 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:

1. 40 CFR 122 EPA Administered Permit Programs: The National Pollutant Discharge Elimination System

2. 40 CFR 123 State Program Requirements

3. 40 CFR 124 Procedures for Decision Making

1.4 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions and prior to initiation of any site work, the Contractor shall prepare an Erosion and Sediment Control Plan (ESCP) which shall satisfactorily address, at minimum, the following criteria:

1. Construction schedule and work sequencing. The plan shall clearly describe for each major construction activity the appropriate erosion, sediment, run-off and run-on control measures that will be implemented and the timing for implementation. (For example, perimeter controls for one portion of the site will be installed after the clearing and grubbing necessary for installation of the measure, but before the clearing and grubbing for the remaining portions of the site. Perimeter controls shall be actively maintained until final stabilization of those portions of the site upward of the perimeter control. Temporary perimeter controls shall be removed after final stabilization).

2. Locations of temporary and permanent (if proposed) measures.

3. Vegetative erosion and sediment control measures (*i.e.*, seed, mulch, etc.).

4. Structural erosion and sediment control measures (*i.e.*, traps, silt fences, sedimentation basins, etc.).

5. Stabilized construction entrance, including provisions for wheel washdown.

6. Storm water (run-on and run-off) management including methods to direct clean storm water away from the work area and to contain and minimize the amount of storm water entering the work area which may require treatment, provisions for containment/holding prior to treatment, etc.

1.5 SPECIAL REQUIREMENTS

A. In addition to appropriate permit and ESCP requirements, construction procedures shall include protection of the environment in accordance with all pertinent Federal, State and local regulations. Construction procedures that are prohibited in the undertaking of work associated with this project include, but are not limited to:

1. Indiscriminate, arbitrary, or capricious operation of equipment in any stream corridors, wetlands, or within the 100-year floodplain of any surface waters.

2. Pumping of silt-laden water from trenches or other excavations into any surface waters, or any stream corridors, or wetlands.

3. Damaging vegetation beyond the extent necessary for the work of this project.

4. Disposal of trees, brush, and other debris in any stream corridors, wetlands, or within the 100-year floodplain of any surface waters.

5. Dumping of spoil material into any stream corridor, surface waters, or at any unspecified or unapproved locations.

6. Open burning of any debris.

B. Upon approval of the ESCP, the Contractor shall implement and maintain the Plan. In addition, the Contractor shall place silt fence along the downgradient perimeter of the work areas or as directed by the Engineer.

C. The Engineer shall have the authority to limit the surface area exposed by clearing, grubbing and excavation, and to direct the Contractor to implement additional erosion, run-off and run-on control measures as he deems necessary with no additional consideration for payment being made to the Contractor in this regard.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 GENERAL

A. Clearing schedules shall be formulated to provide minimum practical exposure of soils. Local run-on/run-off control measures shall be implemented as conditions warrant. The Contractor shall make every reasonable effort so as to not unduly disturb the ecological or environmental quality of the area.

3.2 EROSION AND SEDIMENT CONTROL

A. During the land disturbance life of this project, the following sequence shall be adhered to:

1. Clearing and grubbing for those areas necessary for installation of perimeter controls.

2. Construction of perimeter controls including, but not necessarily limited to the installation and maintenance of silt fencing along the entire downgradient perimeter beyond the outer limits of potential set-up and work areas.

3. Remaining clearing and grubbing.

4. Trenching and excavation, providing temporary stabilization/erosion/run-off/run-on controls as required.

5. Final grading and permanent stabilization.

6. Removal of perimeter controls.

B Sediment and erosion control measures may include straw bale dikes, silt fences, earth dikes, stone outlet sediment traps, stabilized construction entrances, rip rap, seeding/sodding, properly anchored mulch, and/or other measures as required.

C. Sediment and erosion control measures shall be properly maintained and adequately functioning. Any existing measures that are damaged shall be immediately repaired.

D. Excavated material shall be protected from erosion by using appropriate devices or stabilization.

E. Trapped sediment shall be removed from the area of deposition and disposed of in accordance with the Section "Off-Site Transportation and Disposal."

F. As soon as possible after disturbance of a graded area, slope stabilization through the use of mulches (wood chips or straw anchored appropriately) or matting shall be provided.

G. Storm water that has come into contact with potentially contaminated sources shall be directed to the excavation.

* * * * *

SECTION 02278

GEOTEXTILE FILTER FABRIC

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of all labor, material, and equipment and performing all operations required for testing, furnishing, hauling, and placing geotextile, complete as specified herein and as shown on the Contract Drawings or specified by the Engineer.

1.2 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

a. ASTM D3786 Test Methods for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabric-Diaphragm Bursting Strength Tester Method

b. ASTM D4355 Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)

c. ASTM D4491 Test Methods for Water Permeability of Geotextiles by Permittivity

d. ASTM D4533 Test Method for Trapezoid Tearing Strength of Geotextiles

e. ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles

f. ASTM D4751 Test Method for Determining the Apparent Opening Size of a Geotextile

g. ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products

h. ASTM D5101 Test Method for Measuring Soil-Geotextile System Clogging Potential (By the Gradient Ratio)

1.3 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the Contractor shall submit manufacturer's certification that all materials furnished are in compliance with the applicable requirements of the referenced standards and this specification.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. The following manufacturers are named to establish a standard of quality necessary for the project:

1. TC Mirafi 1120N
2. Approved equal

2.2 GEOTEXTILE FILTER FABRIC

A. The geotextile filter fabric shall consist of a long-chain geosynthetic polymer composed of at least 85 percent by weight of propylene, ethylene, ester, amids, or vinylidene-chloride, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultra-violet and heat exposure. The geotextile shall also be mildew and rot resistant, insect and rodent resistant, and inert to chemicals and hydrocarbons.

B. The geotextile filter fabric shall be a nonwoven, needle-punched geotextile.

C. The geotextile filter fabric shall conform to the following minimum average roll physical strength requirements:

Property	Standard	Criteria
Mass Per Unit	ASTM D5261	Minimum 12.0 oz/yd^2
Permittivity	ASTM D4491	Minimum 0.8 sec^{-1}
Grab Tensile Strength	ASTM D4632	Minimum 300 lbs
Grab Tensile Elongation	ASTM D4632	Minimum 50%
Trapezoid Tear Strength	ASTM D4533	Minimum 115 lbs
Puncture Strength	ASTM D4833	Minimum 175 lbs
Mullen Burst Strength	ASTM D3786	Minimum 585 psi
UV Resistance	ASTM D4355 (after 500 hours)	70% strength retained
Apparent Opening Size	ASTM D4751	Maximum No. 100 U.S. Sieve

D. During all periods of shipment and storage, the geotextile shall be protected from adverse weather, heavy winds or precipitation, direct sunlight, ultraviolet light, temperatures greater than 140°F, mud, dirt, dust, debris, and vandals. To the extent possible, the geotextile shall be maintained wrapped in a heavy duty protective covering. In the event of damage, the Contractor shall immediately make all repair and replacements at no additional cost to the Owner.

E. All geotextile testing services as specified herein necessary for the Contractor to obtain an approved geotextile material and thread shall be provided by the Contractor. All testing including laboratory and field services required during installation of the geotextile shall be provided by the Contractor.

PART 3 EXECUTION

3.1 INSTALLATION

A. Prior to installation of the geotextile filter fabric, the surface material on which the filter fabric is to be installed will be free of organic matter, irregularities, protrusions, and any abrupt changes in grade that could damage the filter fabric. The surface will be maintained in a smooth and uniform condition during installation of the filter fabric. The surface on which the geotextile is to be placed shall be inspected and accepted by the Engineer prior to placement of the geotextile filter fabric.

B. The geotextile shall be placed in manner and at the locations shown on the Contract Drawings. At the time of the installation, the geotextile shall be rejected if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.

C. The geotextile shall be placed with the long dimension perpendicular to the center line of trench, unless otherwise approved by the Engineer, and shall be laid smooth and free of tension, stress, folds, wrinkles, or creases. The geotextile shall be placed to provide minimum overlaps of 1.5 feet.

D. The geotextile shall be protected at all times during construction from damage by surface runoff and construction activities, and any geotextile so damaged shall be removed and replaced with undamaged geotextile. Any damage to the geotextile during its installation or during placement of soil layers or other activities shall be replaced by the Contractor at the Contractor's expense.

E. The Work shall be scheduled so that the covering of the geotextile (i.e. backfilling) with the specified material is accomplished within 5 days after placement of the geotextile. Failure to comply shall require replacement of geotextile.

F. The geotextile shall be protected from damage due to the placement of materials by limiting the height of drop of the material to less than 1 foot unless otherwise accepted by Engineer.

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SECTION 02402

JET GROUTING

PART 1 GENERAL

1.1 SUMMARY

A. The work covered by this section shall consist of all labor, equipment, supplies and materials for the installation, monitoring and testing of jet grouting within the limits indicated on the Contract Drawings.

B. It shall be the jet grouting Contractor's responsibility to determine and implement the systems and criteria to ensure that specified improvement is achieved.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork

1.3 STANDARDS AND REFERENCES

A. All work shall be performed in compliance with the Contract Documents unless otherwise approved in writing by the Engineer.

B. Materials and installation shall be in accordance with the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:

1. Amerian Society for Testing and Materials (ASTM) Standards (latest revisions):
   a. C39 – Test Method for Compressive Strength of Cylindrical Concrete Specimens
   b. C150 – Portland Cement
   c. C494 – Chemical Admixtures for Concrete
   d. C618 – Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
   e. C1017 – Chemical Admixtures for Use in Producing Flowing Concrete
   f. D2488 – Description and Identification of Soils (Visual – Manual Procedure)

1.4 DEFINITIONS

A. Jet grouting: The process of creating soilcrete in place with stabilizing fluids delivered at high velocity through nozzle(s) at the end of a monitor inserted in a borehole. The soilcrete is created by rotating and lifting the monitor defined above at slow, smooth, constant speeds, eroding the soil with fluid (water or grout slurry) and air, and, if using water as the erosion media, tremie feeding an engineered grout slurry through the base of the monitor to achieve more thorough mixing and a consistent continuous geometry and quality.

B. Monitor: A single, double, or triple-phase fluid drill pipe designed to deliver one to three elements of the jet grouting process: air, water, and grout. The monitor has one or more injection points. The nozzle(s) injects fluid at high velocity into the soil to erode and mix it with cementitious slurry. The cutting action of the fluids is enhanced by surrounding it with a concentric collar of compressed air.

1.5 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. A list of at least five previously completed projects of similar scope and purpose for approval by the Engineer. The list shall include a description of the project, relative size, and contact person with phone number.

B. The following shall be submitted to the Engineer by the grouting Contractor two weeks prior to the start of the work:

1. Resumes of the management, supervisory, and key personnel, for approval by the Engineer.
2. A ground movement monitoring plan, as detailed in section 3.3 of these specifications.
3. A mix design for the project indicating sources and types of grout materials, with volumetric proportions, and field test data from previous projects indicating compressive strength achieved. If the grouting Contractor intends to deviate from the material provided in Section 2.2 of this specification, it shall submit, with the bid, evidence of satisfactory use of the proposed material from past projects with similar soil conditions.
4. Work procedures, sequence, and control criteria (including parameters for each stage).
5. A general Work Procedures Plan outlining the spacing, location, depth and quantity of grout to achieve the specified criteria detailed in Section 3.2 of this specification. Grout hole locations shall be dimensionally referenced to the contract drawings.

C. The following shall be submitted to the Engineer by the grouting Contractor during the work:

1. Accurate daily records of all jet grouting locations, depths of treatment, start and stop times, all jetting parameters, and grout injected for each location.
2. Any change in the predetermined grouting program necessitated by a change in the subsurface conditions.

1.6 QUALITY ASSURANCE

A. The jet grouting program shall be performed by a specialist grouting Contractor with at least ten continuous years of documented experience in jet grouting.

B. The grouting Contractor shall provide experienced management, supervisory and key personnel as required to implement the jet grouting program, as follows:

1. The project manager shall have at least five years of continuous experience in jet grouting, with at least the last two years in the full-time employment of the grouting Contractor.

2. The superintendent shall have at least five years of experience in jet grouting.

3. As detailed in Section 1.4 of these specifications, the grouting Contractor shall provide:

   a. Evidence of previous jet grouting project experience.

   b. Evidence of management, supervisory and key personnel experience.

C. The On-site representative will ensure that procedures and documentation conform to these specifications.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. GENERAL:

1. All equipment used for drilling boreholes; lowering, raising and rotating jet monitors; mixing grout; supplying pressurized grout and air-water to jet monitors; and jet monitors used to perform the seepage barrier shall have proven performance records for use in jet grouting work.

2. Spare parts and equipment shall be available on site to maintain jet grouting equipment in satisfactory operation condition at all times during execution of the jet grouting work.

B. DRILLING EQUIPMENT:

1. Use drilling equipment of a type and capacity suitable for drilling required hole diameters and depths, and lowering, raising, and rotating jet grout monitors to the depths and at the rates required to perform the work as shown on the Contract Drawings and as specified herein.

C. JET GROUTING MONITORS:

1. Use jet grouting monitors as described in Section 1.3.B of this specification having capacity suitable for producing soilcrete columns of the size and depth shown on the Contract Drawings and as specified herein.

D. GROUT MIXING AND INJECTION EQUIPMENT:

1. Use grout mixers and holding tanks, water tanks, air compressors, and pumps of sufficient capacity to ensure adequate supply of grout, air, and water at required pressure to the jet grouting monitors during a full work shift to produce grout columns of the quality and dimensions necessary.

E. QUALITY CONTROL

1. Have available acceptable soilcrete sampling devices to collect and cast samples as required in section 3.3.

2.2 GROUT MATERIALS

A. The grout slurry may consist of any of the following materials:

1. Cement, Portland, ASTM C 150, Type I.
2. Mineral Fillers used as a replacement for a portion of the cement shall be fly ash, composed of finely divided siliceous residue in accordance with ASTM C 618, Class F. The maximum amount of fly ash shall not exceed 30 percent of the cement by weight.
3. Water shall be fresh, clean, potable, and free of soil, acid, salt, alkali, sewage, or phosphates.
4. Admixtures as approved by the engineer. Admixtures are materials other than water, cement, sand, or mineral fillers added to the mixture immediately before or during mixing to alter its chemical or physical properties to a desired characteristic during its fluid or plastic state. Admixtures shall conform to ASTM D 494. Flowing concrete admixtures shall conform to ASTM C 1017, Type I.

PART 3 EXECUTION

3.1 SITE EXAMINATION

A. Underground utilities have been shown on the Contract Drawings where known. Other underground utilities may exist, the extent of which is unknown. Exact dimensions of all structures and utilities are considered approximate only and shall be verified as required by the Contractor in the field prior to construction.

3.2 JET GROUTING

A. Jet grouting shall be performed in accordance with the approved grout injection area layout scheme to achieve the following acceptance criteria in the in situ soil within the work area:

1. Volume coverage of a minimum of 100% of the quantity shown on the drawings.

2. The proportion and injection of the jet grout mix shall create jet grouted columns with a minimum 28-day unconfined compressive strength of 250 psi and a minimum 3-day unconfined compressive strength of 125 psi when tested in accordance with ASTM C 39.

B. Install soilcrete columns, ensuring that continuous spoil return up the borehole annulus is achieved during all work.

C. At completion of daily jet grouting operations, thoroughly clean site and dispose of all spoil debris, water, and spilled material. Spoil stockpiling overnight is permitted prior to transfer to a predetermined waste or fill location.

3.3 FIELD QUALITY CONTROL

A. All jet grouting shall be performed under the inspection of the Engineer.

B. Monitoring and logging of jet grouting operations for both test areas and production work shall be done by the grouting Contractor and Engineer.

C. Any jet grout hole lost or damaged as the result of mechanical failure of equipment, inadequacy of grout, air, or water supplies, or improper drilling or injection procedures shall be backfilled with cement grout and replaced by another hole, drilled and injected by the Contractor at no additional cost to the Owner.

D. Grout injection, rotation, and extraction rates shall be sufficient to produce grout columns meeting the diameter, depth, overlap, and material property requirements specified herein and on the Contract Drawings.

E. Proportion and inject grout mix so that the soilcrete column produced meets the requirements specified in section 3.2.

F. Equipment for mixing, holding, and pumping grout shall be in a secure location and shall be operated to minimize spillage of material. No material will be allowed to enter storm drains or other drainage courses.

G. As detailed in section 1.4, daily records shall be maintained by the grouting Contractor and submitted to the Engineer.

H. Ensure continuous spoil return during all jet grouting operations.

I. The grouting Contractor will monitor nearby structures and utilities during jet grouting operations such that they are not damaged or moved during construction.

3.4 TESTING AND INSPECTION

A. To evaluate the Contractor's proposed methods and the grout mix's ability to produce soilcrete columns meeting the depth, diameter, overlapping and material property requirements shown on the Contract Drawings and specified herein, construct a test section of the jet-grouted soilcrete columns/panels in a location near the proposed jet grouting area and approved by the Engineer, prior to starting jet grouting production work at the site. The effectiveness of the jet grouting will be verified as follows:

1. The Owner may retain a soil testing firm or ask the jet grouting Contractor to perform the in situ testing as directed by the Owner's engineer. Test sections will be performed before and during production work, as follows:

    a. Test section locations will be agreed upon by the (Engineer/grouting Contractor) within the treatment area. A test section shall consist of a single module comprising at least three grout injection points. Tests will be performed at the center of the module prior to and after grouting. Spacing and diameter of elements shall be proposed by the jet grouting Contractor.

b. All testing to determine specification compliance will be provided by an independent testing agency retained by the Contractor. Regardless of the method selected, the same test method shall be utilized both before and after the soil improvement work in order to provide the most accurate assessment of the degree of improvement obtained.

c. The method of installation of the test section shall comply with Section 3.2 of this specification and shall be performed using the same grout line sizes, drilling and grouting equipment and procedures as that to be used for production work.

d. Prior to commencement of production grouting, one test section shall be performed. If the pre-production test sections indicate that the required ground improvement has not been achieved, the grouting Contractor shall revise the Work procedure Plan and re-test.

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SECTION 02503

RESTORATION OF SURFACES

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes restoration and maintenance of all types of surfaces, sidewalks, curbs, gutters, culverts and other features disturbed, damaged or destroyed during the performance of the work under or as a result of the operations of the Contract.

B. The quality of materials and the performance of work used in the restoration shall produce a surface or feature at least equal to the condition of each before the work began.

1.2. RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork
B. 02223 – Embankment
C. 02225 – Structural Excavation, Backfill and Compaction
D. 02231 – Select Fill
E. 02981 – Topsoil and Seeding

1.3 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified:

1. American Society for Testing and Materials (ASTM)

a. D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3)

1.4 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. A schedule of restoration operations. After an accepted schedule has been agreed upon it shall be adhered to unless otherwise revised with the approval of the Engineer.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 GENERAL

A. In general, permanent restoration of paved surfaces will not be permitted until one month's time has elapsed after excavations have been completely backfilled as specified.

B. The replacement of surfaces at any time, as scheduled or directed, shall not relieve the Contractor of responsibility to repair damages by settlement or other failures.

3.2 TEMPORARY PAVEMENT

A. Immediately upon completion of refilling of the excavation, the Contractor shall place a temporary pavement over all disturbed areas of streets, driveways, sidewalks, and other traveled places where the original surface has been disturbed as a result of his operations.

B. Unless otherwise specified or directed, the temporary pavement shall consist of compacted run-of-crusher limestone to such a depth as required to withstand the traffic to which it will be subjected.

C. Where concrete pavements are removed, the temporary pavement shall be surfaced with "cold patch." The surface of the temporary pavement shall conform to the slope and grade of the area being restored.

D. For dust prevention, the Contractor shall treat all surfaces, not covered with cold patch, as frequently as may be required.

E. The temporary pavement shall be maintained by the Contractor in a safe and satisfactory condition until such time as the permanent paving is completed. The Contractor shall immediately remove and restore all pavement as shall become unsatisfactory.

3.3 PERMANENT PAVEMENT REPLACEMENT

A. The permanent and final repaving of all streets, driveways and similar surfaces where pavement has been removed, disturbed, settled or damaged by or as a result of performance of the Contract shall be repaired and replaced by the Contractor, by a new and similar pavement, as specified elsewhere or as directed by the Engineer.

1. The top surface shall conform to the grade of existing adjacent pavement and the entire replacement shall meet the current specifications of the local community for the particular types of pavement.

2. Where the local community has no specification for the type of pavement, the work shall be done in conformity with the State Department of Transportation Standard which conforms closest to the type of surfacing being replaced, as determined by the Engineer.

3.4 PREPARATION FOR PERMANENT PAVEMENT

A. When scheduled and within the time specified, the temporary pavement shall be removed and a base prepared, to the same thickness as the base prior to the work, to receive the permanent pavement.

1. The base shall be brought to the required grade and cross-section and thoroughly compacted before placing the permanent pavement.

2. Any base material that has become unstable for any reason shall be removed and replaced with compacted base materials.

B. Prior to placing the permanent pavement all service boxes, manhole frames and covers and similar structures within the area shall be adjusted to the established grade and cross-section.

C. The edges of existing asphalt pavement shall be cut a minimum of 1 foot beyond the excavation or disturbed base, whichever is greater.

1. All cuts shall be parallel or perpendicular to the centerline of the street.

3.5 ASPHALT PAVEMENT

A. The permanent asphalt pavement replacement for streets, driveways and parking area surfaces shall be replaced with bituminous materials of the same depth and kind as the existing unless specified elsewhere or as directed by the Engineer.

B. Prior to placing of any bituminous pavement, a sealer shall be applied to the edges of the existing pavement and other features.

C. The furnishing, handling and compaction of all bituminous materials shall be in accordance with the State Department of Transportation Standards.

3.6 CONCRETE PAVEMENT AND PAVEMENT BASE

A. Concrete pavements and concrete bases for asphalt, brick or other pavement surfaces shall be replaced with Class “B” Concrete, air-entrained.

B. Paving slabs or concrete bases shall be constructed to extend 1 foot beyond each side of the trench and be supported on undisturbed soil. Where such extension of the pavement will leave less than 2 feet of original pavement slab or base, the repair of the pavement slab or base shall be extended to replace the slab to the original edge of the pavement or base unless otherwise indicated on the Contract Drawings.

C. Where the edge of the pavement slab or concrete base slab falls within the excavation, the excavation shall be backfilled with Special Backfill compacted to 95% maximum dry density as determined by ASTM D 698 up to the base of the concrete.

D. The new concrete shall be of the same thickness as the slab being replaced and shall contain reinforcement equal to the old pavement.

1. New concrete shall be placed and cured in accordance with the applicable provisions of the State Department of Transportation Standards.

3.7 STONE OR GRAVEL PAVEMENT

A. All pavement and other areas surfaced with stone or gravel shall be replaced with material to match the existing surface unless otherwise specified.

1. The depth of the stone or gravel shall be at least equal to the existing.

2. After compaction the surface shall conform to the slope and grade of the area being replaced.

3.8 CONCRETE WALKS, CURBS AND GUTTER REPLACEMENT

A. Concrete walks, curbs and gutters removed or damaged in connection with or as a result of the construction operations shall be replaced with new construction.

1. The minimum replacement will be a flag or block of sidewalk and 5 feet of curb or gutter.

B. Walks shall be constructed of Class "B" concrete, air-entrained with stone aggregate on a 4-inch base of compacted gravel or stone.

1. The walk shall be not less than 4 inches in thickness or the thickness of the replaced walk where greater than 4 inches, shall have construction joints spaced not more than 25 feet apart, shall have expansion joints spaced not more than 50 feet apart, and shall be sloped at right angles to the longitudinal centerline approximately 1/8 inch per foot of width.

C. 2-inch expansion joint material shall be placed around all objects within the sidewalk area as well as objects to which the new concrete will abut, such as valve boxes, manhole frames, curbs, buildings and others.

D. Walks shall be hand-floated and broom-finished, edged and grooved at construction joints and at intermediate intervals matching those intervals of the walk being replaced.

1. The intermediate grooves shall be scored a minimum of 1/4 of the depth of the walk.

2. The lengths of blocks formed by the grooving tool, and distances between construction and expansion joints shall be uniform throughout the length of the walk in any one location.

E. The minimum length of curb or gutter to be left in place or replaced shall be 5 feet. Where a full section is not being replaced, the existing curb or gutter shall be sawcut to provide a true edge.

1. The restored curb or gutter shall be the same shape, thickness and finish as being replaced and shall be built of the same concrete and have construction and expansion joints as stated above for sidewalks.

F. All concrete shall be placed and cured as specified in the Section for concrete pavement.

3.9 LAWNS AND IMPROVED AREAS

A. The area to receive topsoil shall be graded to a depth of not less than 4 inches or as specified, below the proposed finished surface.

B. The furnishing and placing of topsoil, seed and mulch shall be in accordance with the Section entitled "Topsoil and Seeding."

C. When required to obtain germination, the seeded areas shall be watered in such a manner as to prevent washing out of the seed.

D. Any washout or damage that occurs shall be regraded and reseeded until a good sod is established.

E. The Contractor shall maintain the newly seeded areas, including regrading, reseeding, watering and mowing, in good condition.

3.10 OTHER TYPES OF RESTORATION

A. Fence or gates damaged or destroyed as a result of the construction operations shall be replaced in like material and type.

B. Culverts destroyed or removed as a result of the construction operations shall be replaced in like size and material, and shall be replaced at the original location and grade. When there is minor damage to a culvert and with the consent of the Engineer, a repair may be undertaken, if satisfactory results can be obtained.

3.11 MAINTENANCE

A. The finished products of restoration shall be maintained in an acceptable condition for and during a period of one year following the date of Substantial Completion or other such date as set forth elsewhere in the Contract Documents.

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SECTION 02623

CURED-IN-PLACE PIPE

PART 1 GENERAL

1.1 SUMMARY

This section includes all material, labor and equipment necessary for the installation of storm sewer lining, including but not limited to:

A. Coordination with the City of Fulton, the Owner of the sewer pipe.

B. Mobilization and demobilization.

C. Preparation of existing storm sewer to permit proper installation and curing of the liner, including:

1. Sewer cleaning, debris removal and proper disposal.

2. Mineral deposit and root removal and proper disposal.

D. Initial television inspection.

E. Flow control including bypass pumping.

F. Lining calculations, lining installation, curing, and testing.

G. Opening all active storm sewer laterals if encountered.

H. Sealing the entrance and exit at the manholes.

I. Final television inspection of completed work.

J. Final cleanup and restoration of surfaces.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 01700 – Health and Safety

B. 02141 – Construction Water Management

1.3 REFERENCES

A. ASTM D638 - Test methods for tensile properties of plastics.

B. ASTM D790 - Test methods for flexible properties of unreinforced and reinforced plastics and electrical insulating materials.

C. ASTM F1216 - Standard Practice for Rehabilitation of Existing Pipelines and conduits by the Inversion and Curing of a Resin-Impregnated Tube.

D. ASTM F 1743 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe.

1.4 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. Provide product data describing conformance to ASTM codes of the pipe liner material.

2. Manufacturer will perform design calculations for the liner thickness for each manhole to manhole section. The liner provided shall meet the design thickness calculations.

a. Calculations shall be prepared in accordance with ASTM F1216, using the following parameters:

1) Fully deteriorated gravity pipe condition

2) Factor of safety = 3.0

3) Groundwater elevation equal to the surface elevation in each section

4) Long Term modulus of elasticity based upon 50 years of continuous loading

b. Manufacturer shall provide flexural properties from a minimum of five previous projects to show that the flexural modulus obtained in the field matches that used in the design calculations.

c. Manufacturer shall provide third party verification of long term modulus value used in design calculations at time of submittal.

d. The Contractor will keep these calculations on file and submit a letter to the Engineer certifying that the proposed liner meets the minimum structural requirements.

3. The Contractor shall calculate the original design flow capacity of the section of sewer to be lined under this Contract using the field survey information obtained by the Contractor's New York State Professional Land Surveyor and a minimum Mannings "n" value of no less than 0.010. The Contractor will keep these calculations on file and will submit a letter certifying that the rehabilitated sewer has a non-surcharged capacity equal to or greater than existing pipe.

4. Provide manufacturer's detailed installation procedures. The Contractor shall abide by these procedures for the installation of the liner.

5. Detailed Flow Bypass Plan including pump and force main size, location and capacity.

6. Detailed Project Schedule.

7. Maintenance and Protection of Traffic Plan.

8. Health & Safety Plan (HASP) and Combined Space Entry Procedures.

1.5 PROJECT RECORDS

A. Television inspection color video tapes, typewritten logs and report.

1.6 QUALITY ASSURANCE

A. Certification - Installation of the sewer lining system shall be performed by an experienced Contractor licensed and/or certified by the lining process manufacturer as being qualified to perform such work.

1. The Contractor shall furnish, prior to use of the materials, written certification of his compliance with the manufacturer's standards for all materials and conformance with the methods of the lining process.

1.7 REGULATORY REQUIREMENTS

A. Conform to regulatory agencies having jurisdiction over the work.

1.8 FIELD MEASUREMENTS

A. Prior to construction start, verify by field measurements that existing conditions are as shown on Drawings. The Contractor shall notify the Engineer of specific differences.

1.9 COORDINATION

A. Coordinate field work including maintenance of traffic including site access, and emergency vehicle access.

B. Coordinate work with local utility companies (private and municipal) for location of existing utilities and protection thereof.

1.10 CONFERENCES

A. The Contractor will be required to certify after initial television inspection that the product supplied is suitable for use in the sewer segment in question. Any items (i.e., pipe restrictions) which may cause problems during the insertion or restrictions in full pipe capacity after lining will be brought to the attention of the Engineer in writing 72 hours prior to the start of the lining procedure.

PART 2 PRODUCTS

2.1 MATERIALS - SEWER LINER

A. The liner shall be polyester fiber felt tubing lined on the inside with polyurethane impregnated with a thermal-setting resin to seal against the internal circumference of the sewer.

B. The liner shall be fabricated from materials which, when cured, will be chemically resistant to storm water and traces of external exposure to soil bacteria and any chemical attack which may be due to materials in the surrounding ground or typically associated with urban run-off (*e.g.*, oil, grease, road salt).

C. When cured, liner shall extend over the entire length of pipe, manhole to manhole, in a continuous and mechanically locked tight fitting watertight pipe within a pipe.

D. Liners shall be designed to withstand internal and/or external pressures for the specific field conditions. Where special conditions, strength requirements, etc., require, additional liner thickness shall be added in increments of 2.0 mm as determined by design calculations.

E. The reinforcing material of the liner tubing shall be of a needle interlocked polyester felt or other material approved by the Engineer, formed into sheets of required thickness.

1. Tubing shall not be less than 1/2-inch thick.

2. The felt content shall be determined by the Contractor to ensure that the cured liner is the required thickness.

F. The cured liner shall meet the following initial structural properties:

Flexural Strength (ASTM D790) ..... 4,500 psi min.

Flexural Modulus (ASTM D790)..... 250,000 psi min.

G. The liner shall be fabricated to a size which will neatly fit the internal circumference of the sewer and shall allow for longitudinal and circumferential stretching of the liner during

insertion in accordance with the manufacturer's requirements. The Contractor shall verify all inside dimensions of the sewers to be lined.

H. The finished liner will maintain the flow carrying capacity of the original pipe.

2.2 CLEANING REQUIREMENTS

A. Records in printed form shall be kept of all cleaning performed and shall include the name of the Owner, date, manhole section cleaned, manhole section location, line size, length of section, type of cleaning performed, any special remarks concerning the condition of the line, and amount of and nature of material removed and disposal location.

2.3 TELEVISION INSPECTION REQUIREMENTS

A. A continuous video tape recording with audio of the entire length of the pipe inspected shall be made both before and after lining on permanent color VHS cassettes and shall include location of each section, direction of camera travel, and locations of opened and unopened laterals.

B. A television inspection log shall be kept of all sections inspected.

1. Log shall include the number of both upstream and downstream manholes in the particular section, direction of camera travel, and the direction of flow.

2. Location and angular orientation of all lateral connections, both opened and unopened, shall be logged with respect to the upstream manhole.

3. The speed of the camera shall not exceed one-half foot per second.

2.4 TELEVISION INSPECTION EQUIPMENT

A. The work covered by this section of the specifications consists of furnishing all labor, supervision, equipment, appliances, materials and performing all operations in connection with the televising of sewer lines.

B. No sewer lines shall be televised until they have been cleaned and the flow is controlled.

C. Television equipment shall at least include the following items:

1. A sealed sewer camera, video monitor, control unit and necessary camera cable.

a. The camera used shall be specifically designed and constructed for color sewer line inspection work (converted studio cameras will not be acceptable) and shall be comprised of controlled beam, reflector seeded lamps with an automatic light compensator. The camera shall have the ability to pan and tilt to view up in the laterals.

b. Lighting system shall be capable of supplying light intensities for adequate observation of the sewer line.

2. The closed circuit television equipment shall provide a continuous picture with a minimum resolution of 600 lines showing the entire periphery of the pipe with such resolution the joints, root intrusions, open joints laterals and sewer line deposits may be discerned and identified by the City of Fulton public works department.

a. To insure picture stability and impeded operation, the equipment shall be constructed to withstand the shocks and vibrations encountered during operations.

b. Clear and understandable voice recordings of visual observations during video monitoring shall be provided.

3. The unit shall be equipped with remote reading footage counter mounted over the television monitor.

4. The footage counter shall be accurate to within 12 inches, plus or minus, per 400 feet, and shall be calibrated for accuracy prior to commencement of the project and thereafter periodically checked for accuracy.

5. Portable winches with sufficient cable or rods to permit inspection of all specified sewer sections with accurate (12 inches, plus or minus) distance measuring equipment.

6. A communication system.

7. Videotape recording equipment.

PART 3 EXECUTION

3.1 EXAMINATION

A. The Contractor shall have complete responsibility to prepare the sewer line in a manner adequate for his operations, shall furnish a liner and compound designed specifically for the field conditions and carrying fluid in the sewer.

3.2 PREPARATION

A. Cleaning

1. It shall be the responsibility of the Contractor to clear the line of obstructions such as solids, mineral deposits, roots, grease, etc. that will prevent the liner installation.

2. Provide all equipment, tools, labor and materials necessary to satisfactorily clean and remove all visible obstructions, dirt, sand, sludge, roots, gravel, stones, grease, etc.,

from the designated sewers and manholes such that all existing interior pipe surfaces and joints are visible when televised.

3. The Contractor shall clean the sewer by either hydraulic or mechanical means, or combination of such methods. Other methods may be acceptable following review by the Engineer.

4. The Contractor shall maintain clean sewer conditions within each section while the lining installation in that section is completed.

5. The Contractor shall maintain all flows within the sewer system during cleaning by pumping, diversion or whatever other means as reviewed by the Engineer.

6. The Contractor shall take care in cleaning the sewer in order to prevent damage to the pipe. All solids or semi-solid material removed from a section shall be removed in that section and shall not be passed from section to section.

    a. Adequate precaution shall be taken to prevent solid or semi-solid material removed from a section from entering downstream sections.

    b. Solids removed from the sewer cleaning operations must be disposed of in an off-site landfill permitted to receive waste of the type encountered. It is the Contractor's responsibility to provide the disposal site.

7. Precautions shall be taken to ensure that water pressure created during cleaning does not cause any damage or flooding to public or private property being serviced by the manhole section involved.

    a. Any damage occurring due to the Contractor's operations shall be repaired at no additional expense to National Grid.

B. It is the Contractor's responsibility to supply the water necessary to perform the cleaning and liner installation work.

1. The Contractor shall be required to obtain formal authorization from the local water authority to take water from the water system prior to the start of work.

2. Water supplied from fire hydrants shall be at the expense of the Contractor.

3. No fire hydrant shall be obstructed in case of a fire in the area served by the hydrant nor shall a hydrant be used for the purpose described unless a vacuum break is provided.

4. The Contractor shall be required to make good any damages resulting from the improper use of the water supply system.

C. If the liner installation requires the modification of a manhole, the Contractor will be responsible for all costs associated with the modifications and repairs. Repair costs shall be included in the price for cured-in-place sewer lining.

3.3 STORM WATER FLOW CONTROL

A. The Contractor shall be responsible for current flow diversion in accordance with all applicable regulations.

B. There shall be no interruption in the flow of storm water during the Contractor's work operations. To accomplish this, the Contractor shall provide, maintain, and operate all temporary facilities including but not limited to dams, plugs, pumping equipment, conduit and all other equipment necessary to handle the storm water or infiltration or inflow before it reaches points where it would interfere with their work, convey it past the work, and return it to the appropriate facilities downstream of their work.

C. In all cases, the Contractor shall take whatever means necessary including rescheduling of work, to maintain continuous flow of storm water and to avoid damage to new or existing structures during periods of elevated flow. At no time shall storm water be allowed to enter an open trench.

D. The Contractor shall have no claim for additional compensation by reason of delay or inconvenience in adapting his operation to the need for continuous flow of storm water, inflow or infiltration.

3.4 INSTALLATION

A. By beginning the installation of the liner, the Contractor implies, by his actions, the line is acceptable for his needs.

B. It is the intent of this Article of the specification to provide for the lining of sewer lines by the installation of a resin impregnated flexible felt tube, inverted into the existing sewer line utilizing a vertical inversion standpipe and hydrostatic head.

C. Curing shall be accomplished by circulating hot water or other proven method to cure the resin into a hard impermeable pipe liner.

D. The wet out liner shall be inserted through an existing manhole by means of an inversion process and the application of a hydrostatic head sufficient to fully extend it to the next designated manhole.

1. The liner shall be inserted into the vertical inversion standpipe with the impermeable plastic membrane side out.

2. At the lower end of the inversion standpipe, the liner shall be turned inside out and attached to the standpipe so that a leakproof seal is created.

3. The inversion head will be adjusted to be of sufficient height to cause the impregnated liner to invert from manhole to manhole and hold the tube tight to the pipe wall, produce dimples at side connections and flared ends at the manholes.

E. The Contractor may elect to use a top inversion. In this method, the liner is pre-inverted to a distance that corresponds to the required inversion head and instead of attaching to an elbow at the base of the vertical inversion standpipe, it is attached to a top ring and the standpipe is formed from the liner itself.

F. After inversion is completed, the Contractor shall supply a suitable heat source and water recirculation equipment at his expense.

1. The equipment shall be capable of delivering hot water throughout the section by means of a perforated pre-strung hose to uniformly raise the water temperature above the temperature required to effect a cure of the resin.

2. This temperature shall be determined by the resin/catalyst system employed, as recommended by the resin manufacturer.

3. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water supply.

4. Another such gauge shall be placed between the impregnated liner and the pipe invert at the remote manhole to determine the temperatures during cure.

5. Care shall be taken during the elevated curing temperature so as not to over stress the felt fiber.

6. Initial cure shall be deemed to be completed when the exposed portions of the liner appear to be hard and sound during inspection, and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm.

7. The cure period shall be of a duration recommended by the resin manufacturer, as modified for the lining process, during which time the recirculation of the water and cycling of the heat exchanger continues to maintain the temperature.

G. The hardened liner shall be cooled to a temperature below 100 degrees F before relieving the static head in the inversion standpipe.

1. Cool-down may be accomplished by the introduction of cool water into the inversion standpipe to replace heated water.

2. Care shall be taken in the release of the static head so that a vacuum will not be developed that could damage the newly installed liner.

H. The finished liner shall be continuous over the entire length of an inversion run and free from visual defects such as folds, foreign inclusions, dry spots, pinholes, and delamination.

I. Any defect which the Engineer determines will affect, in the foreseeable future, the flow channel, capacity, integrity or strength of the liner shall be repaired or the entire liner replaced at the Contractor's expense.

3.5 LATERAL CONNECTIONS

A. During initial television inspection, each service connection shall be tested by flushing, dye testing, or other approved means to determined whether or not it is active.

B. If, prior to lining, a determination is made that due to misalignments or other characteristics within the existing pipe, the connection cannot be reinstated by an internal cutter, then a point repair excavation to reinstate the service connection shall be performed at no expense to the Owner.

C. After the liner has been inserted and is cured, the Contractor shall use a television camera and internal cutting device or other approved means to open each active service connection.

1. The cutting device shall re-establish the service connection to not less than 90 percent of its original size.

D. An inspection shall be made of each lateral connection once it is fully reopened. If any infiltration is observed entering the newly lined sewer from the joint between the liner pipe and host lateral pipe, the Contractor shall seal that joint with a material compatible to the liner pipe.

3.6 INSPECTION/TESTING

A. Field samples of each inversion shall be taken in accordance with Section 8.1 of ASTM F1216. The Contractor shall conduct third party testing of each sample, per the requirements of Section 8.1. Test results shall be submitted to the Engineer to show conformance of each liner section to the strength requirements of these Specifications.

B. Gravity pipe leakage testing shall be conducted for each inversion per the requirements of ASTM F1216.

C. If the liner fails to make a watertight seal at any manhole openings, laterals, or any other point in the sewer line, it will be the Contractor's responsibility to effectively seal and grout the openings at no additional cost to the Owner. The seal shall be of a resin mixture compatible with the liner pipe.

D. Liners which fail to meet the test requirements listed in this section will be considered defective.

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SECTION 02981

TOPSOIL AND SEEDING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes topsoil, fertilizer, seed, mulch anchorage, and associated work to be placed in the unpaved areas of excavation. These requirements also apply to other disturbed areas.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 02221 – Earthwork
B. 02223 – Embankment
C. 02225 – Structural Excavation, Backfill and Compaction
D. 02503 – Restoration of Surfaces

1.3 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. American Society of Testing and Materials (ASTM)

a. ASTM D422 Method for Particle-Size Analysis of Soils

b. ASTM D2974 Test Method for Moisture, Ash, and Organic Matter of Peat and other Organic Materials

c. ASTM D4972 Standard Test Method for pH of Soils

d. ASTM D5268 Specification for Topsoil Used for Landscaping Purposes

1.4 SUBMITTALS

A. In addition to those submittals identified in the Supplemental Conditions, the following items shall be submitted:

1. Documentation giving location of properties from which the topsoil will be obtained, names and addresses of the owners, and depth to be stripped.

2. Documentation giving the seed vendor's certified statement for the grass seed mixture required, stating common name, scientific name, percentage by weight, and percentages of purity and germination.

3. Documentation giving data concerning hydroseeding equipment (if used), including all material application rates.

4. Documentation regarding test results for particle size, acidity, fertility, and texture performed on representative samples of soil.

5. Each bag of fertilizer shall bear the manufacturer's guaranteed statement of analysis.

PART 2 PRODUCTS

2.1 TOPSOIL

A. The topsoil shall be unfrozen, natural, fertile, friable, clayey loam soil characteristic of productive soils in the vicinity and shall comply with ASTM D5268. No admixtures of subsoil shall be allowed. Topsoil must be uniform in composition and texture, clean and free from clay lumps, stones, weeds, sticks, brush, stumps, roots, toxic substances, and debris or similar substances 2-inches or more in greatest dimension.

B. Prior to and during installation of the topsoil layer, material from the borrow source shall be tested in accordance with the following standards and frequencies:

Parameter	Standard	Minimum Frequency	Criteria
Topsoil Particle Size	ASTM D422	Once per 1500 cy	Monitoring consistency of borrow source
Topsoil pH	ASTM 4972	Once per 1500 cy	pH in the range of 5.5 and 7.6
Topsoil Organic Content	ASTM 2974	Once per 1500 cy	Not less than 5% nor more than 20%

2.2 GRASS SEED

A. Seed mixtures shall be of commercial stock of the current season's crop and shall be delivered in unopened containers bearing the guaranteed analysis of the mix.

B. Seed Mixture: Pounds Per Acre

Common Name	% by Weight	% Purity	% Germination
Timothy	30	90	90
Clover	20	90	90
Perennial Ryegrass	40	90	90
Annual Ryegrass	10	90	90

2.3 FERTILIZER

A. Fertilizer shall be a standard quality commercial carrier of available plant food elements. A complete prepared and packaged material containing a minimum of 10% nitrogen, 10% phosphoric acid and 10% potash.

2.4 MULCH

A. Mulch shall be unrotted stalks of oats, wheat, rye or other approved crops which are free from noxious weeks, salt, mold, or other objectionable material.

B. Other sources of mulch may be utilized if approved by the Engineer.

PART 3 EXECUTION

3.1 INSTALLATION

A. The areas of excavation on site in unpaved areas shall be graded to a depth of not less than 6 inches below the proposed finished surface. If the depth of topsoil existing prior to construction was greater than 4 inches, the topsoil shall be replaced not less than the greater depth.

1. All debris and inorganic material shall be removed and the surface loosened for a depth of 2 inches prior to the placing of the topsoil.

2. The topsoil shall not be placed until the subgrade is in suitable condition and shall be free of excessive moisture and frost.

3. All topsoil shall be free from stones, roots, sticks and other foreign substances and shall not be placed in a frozen or muddy condition.

4. The finished surface shall conform to the lines and grades of the area before disturbed or as shown on the Contract Drawings. Any irregularities shall be corrected before the placement of fertilizer and seed.

B. The fertilizer shall be applied uniformly at the rate of 20 pounds per 1000 square feet.

1. Following the application of the fertilizer and prior to application of the seed, the topsoil shall be scarified to a depth of at least 2 inches with a disc or other suitable method traveling across the slope if possible.

C. When the topsoil surface has been fine graded, the seed mixture shall be uniformly applied upon the prepared surface with a mechanical spreader at a rate of not less than 10 pounds per 1000 square feet.

1. The seed shall be raked lightly into the surface and rolled with a light hand lawn roller.

2. Seeding and mulching shall not be done during windy weather.

D. The mulch shall be hand or machine spread to form a continuous blanket over the seed bed, approximately 2 inches uniform thickness at loose measurement. Excessive amounts or bunching of mulch will not be permitted.

1. Mulch shall be anchored by an acceptable method.

2. Unless otherwise specified, mulch shall be left in place and allowed to disintegrate.

3. Any anchorage or mulch that has not disintegrated at time of first mowing, shall be removed. Anchors may be removed or driven flush with ground surface.

E. Seeded areas shall be watered as often as required to obtain germination and to obtain and maintain a satisfactory sod growth. Watering shall be in such a manner as to prevent washing out of seed.

F. Hydroseeding may be accepted as an alternative method of applying fertilizer, seed and mulch. The Contractor shall submit all data regarding materials and application rates to the Engineer for review.

G. The stand of grass resulting from the seeding shall not be considered satisfactory until accepted by the Engineer. An acceptable lawn shall have a minimum of 90% of the area covered with plants of the specified seed mix and no areas greater than one foot square of bare surface. If areas are determined to be unacceptable, the remaining mulch will be removed and all areas shall be reseeded, refertilized and remulched as per the above application procedures at the Contractor's expense.

* * * * *

Waste Management Plan

REPORT

Waste Management Plan for Remedial Action at Former Fulton Manufactured Gas Plant Site Fulton, New York Site Number 738034

nationalgrid

Date February 2011

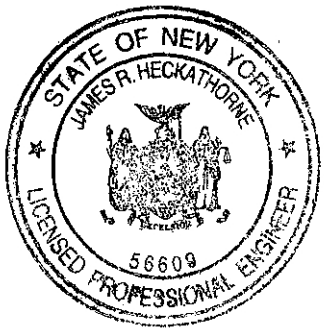
O'BRIEN & GERE

Waste Management Plan for Remedial Action

Former Fulton Manufactured Gas Plant Site
Fulton, New York
Site Number 738034

Prepared for:

nationalgrid



JAMES R. HECKATHORNE, P.E.
O'BRIEN & GERE ENGINEERS, INC.

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1. INTRODUCTION

1.1. GENERAL

This document is the Waste Management Plan (WMP) for the former Fulton Manufactured Gas Plant (MGP) Site (Site No. 738034) located on South First Street in Fulton, New York (Site). This WMP has been prepared on behalf of National Grid to describe requirements for the handling, transportation, and disposal of wastes resultant from the Removal Action (RA) to be completed at the Site in accordance with an Order on Consent between National Grid and the New York State Department of Environmental Conservation (NYSDEC) (Order on Consent Index No. A4-0473-0000 effective November 2003).

1.2. SITE HISTORY

The Former MGP Site occupies approximately 1.04 acres in a residential section of the City of Fulton, Oswego County, New York (Figure 1). The Site operated as an MGP site producing manufactured gas from 1903 to 1932. The manufacturing process involved heating coal and petroleum products to produce combustible gas. The gas was cooled, purified and then piped to the end users. The former MGP facility included a gas holder, gas tank, oil tank, oil house, coke shed, tar well, and concentrator house (Figure 2). In general, Area 2 of the Fulton Site contained the gas production facilities and Area 1 contained facilities for storing and distributing the gas. As the gas was cooled and purified prior to distribution, a dark oily liquid known as coal tar condensed and accumulated in various gas plant structures. Tar leaking from the holders and other structures impacted soil and groundwater in the vicinity of the former MGP.

1.3. REMOVAL ACTION (RA) REQUIREMENTS

A Record of Decision (ROD) was issued by the NYSDEC in March 2009. The ROD presents the NYSDEC-selected remedy that includes among other things the following RA elements:

- Excavation and removal to their full depth of all former MGP-related structures and foundations in Areas 1 and 2 that contain MGP-related contaminated materials. Impacted soil in the immediate vicinity of the structures will be removed to the extent practicable.
- Excavation of soil grossly contaminated with MGP wastes. Materials will be excavated to depths of up to 7 feet below ground surface (bgs) or to the extent practicable due to dewatering limitations. The material to be excavated will include soil containing visible coal tar or separate phase materials. The actual depth of removal will be based on visual observations in the field with the concurrence of the NYSDEC. A visible demarcation barrier will be installed at the bottom of the excavation to mark the extent of soil removal prior to backfilling.
- Excavation areas will be backfilled with clean soil from off-site locations that meet NYSDEC's backfill criteria for intended site use. Excavated soil may be used to backfill the lower portions of the excavation if they meet NYSDEC criteria.
- Installation and maintenance of a soil cover over Areas 1 and 2. The soil cover will consist of a minimum of 2 feet of clean material meeting NYSDEC's backfill criteria. The type and nature of soil cover to be installed will be determined pursuant to 6 NYCRR Part 375.

The following sections describe the RA proposed by the final design to achieve the ROD requirements.

1.3.1. Area 1 Excavations

Only one MGP-related structure is designated for removal on Area 1. This structure is the concrete pad associated with the former above-grade holder. Based on information obtained during the Remedial Investigation, grossly impacted soil is present under the northwest side of this structure. Based on the ground penetrating radar (GPR) survey completed as part of the pre-design investigation, structures relating to the

smaller gas holder and the former horizontal aboveground storage tanks (ASTs) are not present. The holder structure is identified on Design Drawing G-6.

In addition to the structure, several areas of localized grossly impacted subsurface soil requiring removal in accordance with the ROD are also shown on the design drawings. One of these areas is identified on the northwest side of the holder on Area 1. The pre-design investigation indicated that a lens of impacted soil was present at a depth of approximately 8 ft in soil boring SB-50. Although this is a thin lens and at a depth greater than the 7 ft identified in the ROD as the vertical limit of excavation, it likely represents the endpoint of a lens that may originate in the main area of grossly impacted soil identified near the former holder pad. Therefore, the extent of excavation in this area has been expanded to include this boring location. A second area to be excavated is located southwest of the holder near the area where the former horizontal ASTs were located. Impacted soils are present to a depth of approximately 4 ft in this area.

Two smaller areas containing contaminants of concern (COCs) above criteria in surface soil were also identified for removal in the ROD. As shown on Design Drawing G-6, one area is located northeast of the former holder pad. This soil contained carcinogenic polynuclear aromatic hydrocarbons (cPAHs) at concentrations that would require removal to a depth of 1 ft. However, since the cPAHs are at levels consistent with or lower than those to remain in subsurface soil, this area will be managed with the removal of the surficial 2 ft of soil that is needed prior to placement of the soil cover. This soil may be used as backfill into the deeper portions of the excavations as space allows.

The second area is located in the southwest corner of Area 1 and contains cyanide in excess of the criteria to a depth of 2 ft. Specifically, the cyanide concentration in the 0 to 2 ft depth at the SS-02 location is 810 mg/kg and the concentration of cyanide in the 0 to 2 ft depth at SS-02 is 60 mg/kg. These concentrations are higher than the Restricted Residential Soil Cleanup Objective of 27 mg/kg. Horizontal limits for the area containing cyanide that will be removed have been established by drawing a boundary approximately 5 ft from the two surface soil samples found to contain elevated concentrations. Soil from this area will be excavated to a depth of 2 ft and the excavated material will be disposed off-site.

1.3.2. Area 2 Excavations

As shown on Design Drawing G-5 , there are several structures in Area 2 with some extending to or just beyond the property line onto land owned by the City of Fulton. Most of the structures were previously identified and presented within the area of excavation in the ROD. However, based on the pre-design investigation, the excavation area in Area 2 has been modified from that presented in the ROD as follows:

- One additional foundation, located on the western corner of the proposed excavation area, was discovered by the GPR survey.
- The suspected location of the former tar well area in the center of the Site was added to the excavation area. Although an intact structure was not observed, this area was included based on the observations of grossly impacted soil.
- As shown on Drawing G-5, the foundation located on the northwest end of Area 2 near the adjoining residence is not included in the area to be excavated as no impacted soil was found to be present and the westernmost wall of the foundation is within 4 ft of the residential structure. Since the soil in this area does not appear to be impacted, removal is not warranted.

It is unknown whether all of the structures within Area 2 contain grossly impacted MGP materials as defined in the ROD. Therefore, if grossly impacted materials are not identified during construction, the structures will be left in place. Decisions regarding the need for cleanout/removal of the structures will be made in the field during construction activities with concurrence by NYSDEC.

In addition to the structures, one surface soil sample collected southwest of the pavement in Area 2 contained cPAHs above NYSDEC criteria as shown on Design Drawing G-5. Similar to Area 1, soil in this area will be managed by removing soil to facilitate placement of the soil cover as discussed in Section 1.3.1.

1.4. RESULTANT WASTE STREAMS

The RA described above is expected to generate the following waste streams:

- Construction & demolition (C&D) wastes including removed asphalt pavement, concrete (slabs & foundations), and abandoned utilities (existing buried pipe & conduit).
- Excavated soil, suitable for use as subsurface backfill (greater than 2 ft bgs). This soil must exhibit concentrations of MGP-parameters (if any are detected) less than the values indicated in the NYSDEC document Guidance for Site Investigation and Remediation (DER-10) for restricted residential use (6 NYCRR Part 375), and must not contain visible coal tar or other non-aqueous phase liquid (NAPL).
- MGP-impacted soil, as non-hazardous waste. This excavated soil would exhibit concentrations of MGP-parameters above the values indicated in DER-10 for restricted residential use (6 NYCRR Part 375), but would not exhibit visible coal tar or NAPL nor characteristics of hazardous waste as established by 6 NYCRR Parts 370-374 and 376.
- MGP-impacted soil, as hazardous waste. This excavated soil would exhibit characteristics of hazardous waste as established by 6 NYCRR Parts 370-374 and 376. It is not expected that soil exhibiting characteristics of hazardous waste will be generated during the RA, but it is identified here as possible as a contingency.
- Tar or NAPL-containing waste. This would be coal tar or other MGP-related NAPL, recovered either as free product or contained in a grossly contaminated soil matrix.
- Construction water including surface water resulting from precipitation which has come in contact with potentially contaminated soils, fill, or debris; water or other liquids drained from potentially contaminated soils or debris; and equipment and vehicle decontamination liquid. Not included in the definition of Construction Water for the Fulton Street MGP project is groundwater collected from below the static groundwater level since no dewatering of excavations below the static groundwater level will be required during the RA.
- General Contractor wastes including common trash (e.g. office wastes) and used personal protective equipment (PPE) (if any). Also, sanitation wastes from temporary facilities set-up for the use of field personnel during the RA.

Based on the defined areas presented on Design Drawings G-5 and G-6 and described above, it is estimated that there are approximately 7,110 cubic yards (CY) of grossly impacted soil and foundation material that will be disposed of off-site. This volume of material is generally consistent with the information presented in the ROD. The sources of the quantities are listed in the following table:

TABLE 1. ESTIMATED EXCAVATION VOLUMES

	Material to be Removed	Estimated Volume (cy)
AREA 1	Tank Slab (2 ft thick)	150
	Grossly Impacted Soil Areas (to limits as discussed)	550
	2 ft Soil Removal (required for soil cover)	1,350
AREA 2	Structures and Surrounding Grossly Impacted Soil (to 7 ft bgs)	4,500
	2 ft Soil Removal (required for soil cover)	560
	TOTAL	7,110

The following sections describe the waste characterization (if applicable), handling, transportation, and disposal requirements for each of the waste streams listed above.

1.4.1. Construction & demolition (C&D) wastes

Asphalt, concrete, and other C&D wastes shall be disposed of at Bristol Hill Landfill operated by the Oswego County Department of Solid Waste in Volney, New York. Prior to shipping C&D wastes to the landfill, the debris shall be inspected for soil or MGP-material adhered to the surface. Soil and MGP-material shall be removed from the surface by means of brushing or pressure washing. Once MGP-material has been removed from the surface, the C&D waste shall be reduced in size and otherwise processed (e.g. protruding reinforcement bar cut off) as necessary for the material to be transported off-site in accordance with State and local laws and ordinance, and so to be received and accepted by the landfill.

1.4.2. Excavated soil, potentially suitable for use as backfill

Soil that does not contain visible coal tar, NAPL, or otherwise appear to be MGP-impacted shall be excavated from the surface (up to a depth of 2 ft bgs) and stockpiled on Site for potential use as subsurface backfill (greater than a depth of 2 ft bgs). The stockpiles shall not be larger than 1,000 tons in size, and shall be placed on either a paved surface (concrete or asphalt) or above a temporary liner (no less than 40-mils in thickness singularly or combined) to prevent contact with the underlying material. Also, stockpiles shall be covered while not being worked to minimize the potential for dusts and generation of Construction Water.

To determine if a stockpile of soil can be used as backfill below a depth of 2 ft bgs, five grab samples shall be collected from each stockpile and then a composite sample shall be prepared representative of the stockpiled soil. The composite sample shall be analyzed by a certified laboratory for:

- Volatile organic compounds (VOCs) (total and TCLP)
- Semi-volatile organic compounds (SVOCs) (total and TCLP)
- Resource Conservation and Recovery Act (RCRA) metals and mercury (total and TCLP)
- Cyanide (total and RCRA characteristic of reactivity)

The results of the analyses for totals will be compared to the criteria listed in DER-10 for restricted residential use (6 NYCRR Part 375) to determine if the material can be used as backfill on site below a depth of 2 ft.

Soil deemed by the Engineer as not suitable for use as backfill shall be disposed of off-site in accordance with Section 1.4.3.

1.4.3. Excavated soil requiring disposal off-site

Soil designated for disposal off-site, either because it exceeds the criteria listed in Table 1 or exhibits visible MGP-impact, shall be stockpiled on Site or direct-loaded into trucks. The stockpiles shall not be larger than 1,000 tons in size, and shall be placed on either a paved surface (concrete or asphalt) or above a temporary liner (no less than 40-mils in thickness singularly or combined) to prevent contact with the underlying material. Also, stockpiles shall be covered while not being worked to minimize the potential for dusts and generation of Construction Water.

Each stockpile shall be sampled (unless previously sampled under Section 1.4.2) to determine if the material can be disposed of off-site as non-hazardous waste. Five grab samples shall be collected from each stockpile designated for off-site disposal and then a composite sample shall be prepared representative of the stockpiled soil. The composite sample shall be analyzed by a certified laboratory for:

- Volatile organic compounds (VOCs) (total and TCLP)
- Semi-volatile organic compounds (SVOCs) (total and TCLP)
- Resource Conservation and Recovery Act (RCRA) metals and mercury (total and TCLP)

- Cyanide (total and RCRA characteristic of reactivity)

The results will be compared to the criteria listed in 6 NYCRR Parts 370-374 and 376 to determine if the material is non-hazardous.

Non-hazardous soil and waste material shall be disposed of at the following landfill in accordance with Oswego County flow-control ordinance:

Bristol Hill Landfill in Volney, New York
Operated by:
Oswego County Department of Solid Waste
3125 State Route 3
Fulton, New York 13069
(315) 591-9200

Hazardous soil and waste material (if any), that is not eligible for potential off-site low temperature thermal desorption (LTTD) treatment/disposal (Section 1.4.4), shall be disposed of at the following landfill:

Model City Landfill in Model City, New York
Operated by:
CWM Chemical Services, LLC
1550 Balmer Road
Model City, New York 14107

As appropriate, based on the results of the waste characterization analyses, each shipment of waste from the Site shall be placarded, as appropriate. A Bill of Lading will be provided documenting the disposal of each shipment. Also, if the material is characteristically hazardous as defined by 6 NYCRR Part 371, a RCRA hazardous waste manifest will be prepared and signed by a representative of National Grid as required to document disposal of the material.

Only transporters appropriately licensed to ship the material of the particular characteristic (non-hazardous or hazardous waste, as applicable) will be used, and each will provide written proof to National Grid documenting that their license and insurance is current and valid. Prior to shipping wastes off-site in accordance with Federal, State and local laws and ordinance, the wheels and vehicle will be inspected for soil/waste adhering to the surfaces and the truck will be decontaminated by means of brushing or pressure washing as necessary to prevent deposit of soil or waste material on the public roads. Vehicles used to transport material for off-site disposal shall be water tight and equipped with solid covers (e.g. tightly woven fabric, no mesh covers) that shall be utilized during the transportation of wastes from the Site to the disposal facility. All waste soil leaving the Site shall be covered.

1.4.4. Tar or NAPL-containing waste

Dependent on the results of the waste characterization activities, the soil excavated from the Site may be treated/disposed in a manner consistent with the NYSDEC program policy, Technical and Administrative Guidance Memorandum (TAGM) 4061, *Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants* (NYSDEC, 2002). The policy outlines criteria wherein soil that has been contaminated with coal tar waste from MGPs exhibiting only the hazardous waste toxicity characteristic for benzene (D018) may be excluded from the requirements of 6 NYCRR Parts 370-374 and 376 when they are destined for permanent thermal treatment, however requirements of 6 NYCRR Parts 360 and 364 would still pertain.

For tar or NAPL-containing waste to be eligible for potential off-site LTTD treatment/disposal, the material must not contain any listed waste nor exhibit a characteristic of a hazardous waste (except for TCLP benzene). Also, to be eligible for potential off-site LTTD treatment/disposal, the material must not contain a significant quantity of purifier wastes. Materials that contain a discernable amount of purifier material must be tested for the following parameters, in addition to those listed in Section 1.4.3:

- Hazardous characteristic of reactivity
- Total cyanides, and
- Total sulfur

In the event that any characterization results or field observations indicate that certain soils are unsuitable for off-site LTTD treatment/disposal, as determined by National Grid or Engineer, in consultation with the treatment facility, the Contractor shall arrange for off-site incineration and/or disposal at a National Grid-approved facility in accordance with applicable rules and regulations. The Contractor shall coordinate with the facility prior to initiating excavation activities to minimize potential work delays if such material is encountered.

1.4.5. Construction water

Dewatering of the excavation below the static groundwater level is not required by the RA being implemented under the ROD. As such, the quantity of construction water to be generated should be minimal. The Contractor is required to make effort to minimize the generation of construction water and associated sediments and sludges, utilizing methods such as:

- Berms or ditches around the excavation to prevent flow of storm water into the excavation
- Use of low permeability tarpaulin or other suitable means to cover exposed contaminated areas and material stockpiles
- Limiting the amount of exposed contaminated areas
- Grading to control run-on and run-off
- Engineering controls on construction activities to minimize contact of personnel and equipment with contaminated areas thus minimizing the amount of decontamination required and other appropriate methods

The Contractor is required to prepare a Construction Water Management Plan (CWMP) for review and approval by the Engineer. The CWMP must describe the Contractor's proposed means for minimization, collection, treatment, and disposal of construction water. Since the volume of construction water should be minimal, it is anticipated that the Contractor may opt to collect and store the construction water generated during the RA for disposal by them off-site at a permitted waste treatment facility, rather than setting up an on-site treatment system for construction water.

1.4.6. General Contractor wastes

General Contractor wastes including, but not necessarily limited to, common trash and sanitation wastes shall be handled and disposed of in accordance with State and local laws and ordinance at Bristol Hill Landfill (solid wastes) or the municipal waste water treatment facility (waste waters), as applicable.

1.5. TRANSPORTATION AND DISPOSAL PLAN

This Section presents the transportation and disposal plan necessary to implement the RA, and includes identification of the proposed disposal facilities for the C&D wastes, MGP-impacted soil, and coal tar/NAPL (if any). The transporters and disposal facilities identified in the table below are tentative, subject to approvals to transport or receive the waste once characterization sampling and analyses are performed.

Table 2. PROPOSED TRANSPORTERS AND DISPOSAL FACILITIES

Waste Stream or Imported Material	Transporter	Disposal Facility
Soil & waste material disposed as non-hazardous waste	TBD from list provided in Table 4	Bristol Hill Landfill Volney, New York
Soil & waste material disposed as hazardous waste	TBD from list provided in Table 4	Model City Landfill Model City, New York
Coal tar & NAPL saturated soil for LTTD treatment & disposal	TBD from list provided in Table 4	ESMI of New York Fort Edward, New York

Source: O'Brien & Gere

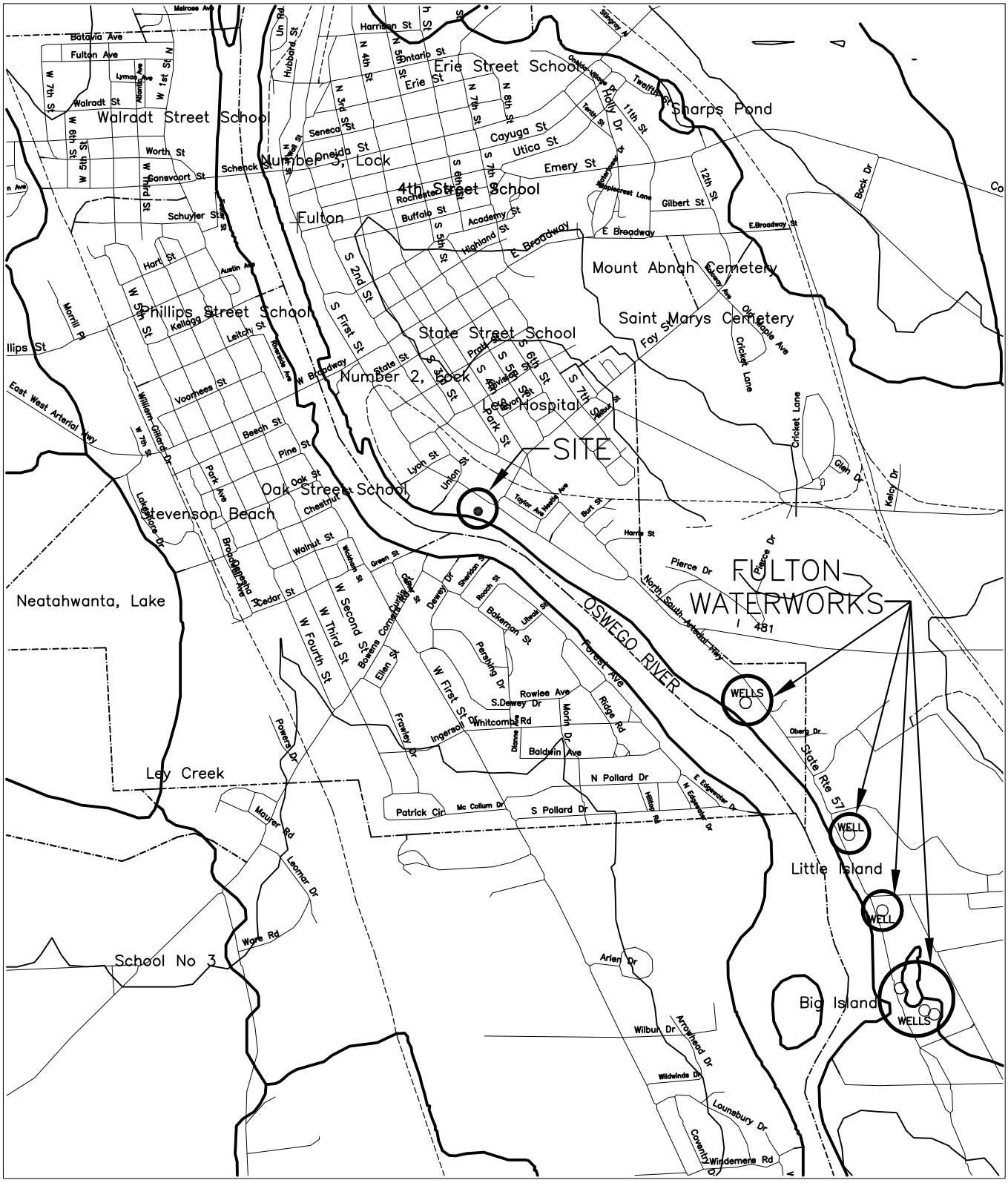
Note: TBD – To be determined

Tables 3 and 4 (at the end of report) provide RCRA transporter and disposal facility identification numbers for each proposed transporter and disposal company, respectively. Provided as exhibits to this WMP is documentation of the current permit status provided by each transportation and disposal company listed.

Table 3 - RCRA Transporter Information for the Former Fulton MGP Site Waste Management Plan							
NAME	ADDRESS	CITY	STATE	ZIP	EPA ID #	BULK SOILS	BOX TRUCK/ DRUMS
BUFFALO FUELS CORP	4870 PACKARD RD	NIAGARA FALLS	NY	14304-1510	NYR000045724	Y	Y
TONAWANDA TANK TRANSPORT SERV	1140 MILITARY RD	BUFFALO	NY	14217	NYD097644801	Y	Y
FREEHOLD CARTAGE	825 STATE ROUTE 33	FREEHOLD	NJ	07728-8431	NJD054126164	Y	Y
HAZMAT ENVIRONMENTAL	60 COMMERCE DRIVE	BUFFALO	NY	14218-1040	NYD980769947	Y	Y

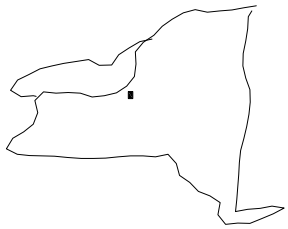
Table 4 - RCRA Disposal Facilities Information for the Former Fulton MGP Site Waste Management Plan							
NAME	**ADDRESS**	**CITY**	**STATE**	**ZIP**	**EPA ID #**	**DATE OF LAST INSPECTION**	**PERMIT LIMITATIONS** (See Exhibit 1 if "yes" indicated)
CWM Chemical Services, LLC	1550 Balmer Road	Model City	NY	14107	NYD049836679	June 30, 2010	No

FIGURE 1



NATIONAL GRID
SOUTH FIRST STREET SITE
FULTON, NEW YORK

SITE LOCATION MAP



QUADRANGLE LOCATION

2000 0 2000

SCALE IN FEET

O'BRIEN & GERE ENGINEERS, INC.

FILE NO. 1118-35165.002

Sep 11, 2008 - 3:36pm

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FIGURE 2

LEGEND

- SEWERLINE
- CONCRETE
- PROPERTY LINES
- CONTOUR
- APPROXIMATE CANAL
- OVERHEAD POWER LINE
- FORMER STRUCTURES
- CONCRETE PAD

NATIONAL GRID
SOUTH FIRST STREET
FULTON, NEW YORK

SITE PLAN

0 25 50 100
Feet

NOVEMBER 2010
1118.44581

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ORC Advanced™ Product Data and Application Instructions

REGENESIS

December 27, 2010

Deborah Wright, CPG
O'BRIEN & GERE
333 West Washington Street | P.O. Box 4873
Syracuse, NY 13221- 4873
p 315-956-6100 | *f* 315-463-7554
deborah.wright@obg.com

Subject: Full-Scale Application of Regenesis's Bioremediation Product Oxygen Release Compound (ORC Advanced™) to Accelerate the Degradation of Hydrocarbons at the National Grid site located in Fulton, NY

Dear Ms. Wright:

Thank you for your interest in Regenesis and our bioremediation product Oxygen Releasing Compound-Advanced formulation (ORC Advanced™). We have reviewed the information that you provided for the above-referenced site. In the following sections of this proposal we discuss the use of ORC Advanced, design and cost information, delivery of ORCA to the subsurface and the performance goals for this particular project. RegenOx Part A is also considered as an additive to promote bioremediation in one of the options presented.

Product Description: ORC-Advanced®

Advanced formula Oxygen Release Compound (ORC Advanced) is a patented formulation of phosphate-intercalated calcium peroxide that is a timed-released source of oxygen. ORC Advanced releases oxygen in the dissolved-phase when it is hydrated. Numerous studies have shown that the lack of oxygen can limit the ability of naturally occurring microorganisms (aerobes) to degrade certain compounds. ORC Advanced provides terminal electron acceptors to support the oxidative biodegradation of many types of aerobically degradable compounds including but not limited to: petroleum-based hydrocarbons (e.g. Toluene) and chlorinated hydrocarbons (e.g. Vinyl Chloride). ORC Advanced is manufactured as a fine powder that can be installed in the subsurface in the following ways: (1) mixed with water to form a slurry that can be injected into both the saturated and unsaturated zones (2) added as a soil amendment to the backfill material used in excavation applications. The use of oxygen sources such as ORC Advanced is recognized as a sensible strategy for engineering accelerated bioattenuation at project sites contaminated with aerobically degradable compounds.

Product Description: RegenOx™

RegenOx™ is a proprietary (patent-applied-for) in *situ* chemical oxidation process using a solid oxidant complex (sodium percarbonate/catalytic formulation) and an activator complex (a composition of ferrous salt embedded in a micro-scale catalyst gel). RegenOx™ with its catalytic system has very high activity, capable of treating a very broad range of soil and groundwater contaminants including both petroleum hydrocarbons and chlorinated solvents. Additionally, RegenOx™ has significant longevity in the subsurface allowing for both the initial contaminant degradation and the continued treatment of contaminants desorbing from the matrix. Most importantly, RegenOx, when handled appropriately, is safe and easy to apply to the contaminated subsurface without the health and safety concerns and lingering environmental issues that that have become associated with other chemical oxidation technologies.

The RegenOx Pat A, when used without activator can provide oxygen to enhance aerobic biodegradation. RegenOx Part A is a percarbonate based product and will slowly release hydrogen peroxide and uncatalyzed will break down to oxygen and water. The Part A is expected to remain active for 2-3 months. The Regenox Part A can be blended with ORCA for a bioremediation application.

Data and Assumptions Used to Design this Bioremediation Application

Assumptions:
Excavation Area: 12,500ft2
Thickness – for treatment : 5 feet
Application across 1-2 feet
Contaminant levels: total: VOC/semiVOC approximately 2mg/L
COD 61mg/L
Dissolved iron: 68mg/L

Two estimates are presented in the following table – one using ORCA only and another using a combination of ORCA and RegenOx Part A. The ORCA estimate was prepared based on target VOC/Semi VOC and dissolved iron data. A total of approximately 2mg/L VOCs and 68g/L dissolved iron was input for an excavation treatment area of 12,500ft^2. The total estimate ORCA is 3500lbs.

The oxygen/ORCA requirement based on a COD value of 61mg/L was also estimated (as an independent calculation) and results are 3031 lbs ORCA. The ORCA required to meet demand associated with COD is less than estimate ORCA based on target compounds, so the more conservative estimate of 3500lbs ORCA is recommended by Regenesis.

The second estimate option splits assumes the oxygen demand estimate for ORCA but splits the source of oxygen between ORCA an Regenox part A.

Enough RegenOx Part A will be added to meet the demand associated with the estimated COD. The assumption is the RegenOx A will be used to rapidly establish aerobic conditions and react with readily available “COD” such as dissolved iron and as well at BTEX present in roundwater. A RegenOx application rate of 0.4g/L is the estimated quantity required to degrade 61mg/L COD in Area 1. That is equivalent to 1125lbs RegenOx Part A and 1500lbs Regenox Part A is proposed for Area A. The RegenOx Part A is expected to remain active for 1-2 months where

the ORCA is used to support long term bioremediation and is expected to remain active for 9-12 months.

Option 1: ORCA Excavation Application	
Design Feature	**Specification**
Thickness requiring treatment	5 feet
Treatment Area	Approximately 12,500ft^2
Excavation Application	Apply across 1-3 feet of backfill. It is important that the ORCA is applied into or at the water table
Application ORCA	3500lbs (equivalent to 595lbs O_2)

Option 2: ORCA & RegenOx Part A Only Excavation Application	
Design Feature	**Specification**
Thickness requiring treatment	5 feet
Treatment Area	Approximately 12,500ft^2
Excavation Application	Apply across 1-3 feet of backfill. It is important that the ORCA is applied into or at the water table
Application 1 RegenOx Part A/ ORCA blend	2500lbs ORCA & 1500lbs RegenOx Part A Oxygen: from ORCA 425lbs + RegenOx Part A 195lbs O2= 620lbs

The total cost of this chemical oxidation/accelerated bioremediation project can be estimated using the following items:

- Material, shipping fees, and sales tax
- Fieldwork costs associated with installation (customers are responsible for selecting the drilling subcontractor that will be used for the project)
- Groundwater/Soil sampling as needed to properly monitor the performance of the project
- All fieldwork and laboratory analysis associated with periodic monitoring
- Consultant oversight and report generation

Recommended Groundwater Monitoring Program for ORCA

Monitoring of selected wells should be conducted to validate the enhancement of bioremediation processes. After delivery of ORC to the subsurface, samples can be collected every 2 to 3 months. After the initial biodegradation and geochemical trends have been identified, the monitoring frequency can be decreased to a semiannual or annual program. The monitoring program should employ low flow groundwater sampling techniques and include the measurement of the following field/chemical parameters:

- all contaminants of concern
- field redox parameters: ORP, pH, conductivity, dissolved oxygen, and ferrous (or dissolved) iron
- chemical oxygen demand at selected wells within treatment area

Groundwater Monitoring Locations

The following table outlines the suggested locations and significance of monitoring wells used to monitor the progress of a RegenOx Part A and ORC *Advanced* -based project.

Location	Significance
Background (Outside the groundwater plume)	Allows for the changes in natural attenuation conditions induced by addition of RegenOx/ORC *Advanced* to be compared to background levels
Upgradient of treatment zone	Provides a measure of contaminant and competing electron acceptor flux entering treatment zone
Inside treatment zone	Provides information on how RegenOx/ORC *Advanced* is affecting the aquifer conditions and contaminant concentrations
Downgradient of treatment zone	Provides information on the effect RegenOx/ORC *Advanced* is having on the biodegradation rates of contaminants and on aquifer conditions and confirms the mitigation migration

Regenesis appreciates the opportunity to provide this information for your project. Please contact me at 781.245.1320 (e-mail at mdooley@regenesis.com) with any questions.

Sincerely,

Maureen Dooley
Northeast Region Manager

dvanced Design Software for Excavation Applications

Aug 2006

is Technical Support: USA (949) 366-8000 www.regenesis.com

id

Consultant: o'brien gere

Estimated Plume Requiring Treatment

Planned Excavation:	Width of planned excavation	100	ft			
	Length of planned excavation	250	ft	=	25,000	ft^2
	Thickness of saturated zone to be excavated	1	ft		25,000	ft^3
GW Plume:	Width of plume area containing contaminant	100	ft			
	Length of plume area containing contaminant	250	ft	=	25,000	ft^2
	Thickness of contaminated saturated zone	6	ft		150,000	ft^3
	Total porosity	0.3				
	Nominal aquifer soil (gravel, sand, silty sand, silt, clay)	silty sand				
	Plume pore volume	45,000	ft^3	=	336,645	gallons

Click for unknown contaminant concentations

Dissolved Phase Oxygen Demand (Based on GW Plume Dimensions)	Contaminant Conc. (mg/L)	Contaminant Mass (lb)	Stoichiometry (wt/wt) O_2/contaminant	ORC-Adv Dose (lb)
Individual species that represent oxygen demand				
Benzene	0.00	0.0	3.1	0
Toluene	0.08	0.2	3.1	4
Ethylbenzene	0.30	0.8	3.2	16
Xylenes	0.60	1.7	3.2	32
MTBE	0.00	0.0	2.7	0
nap	1.00	2.8	3.0	50
User added, add stoichiometric demand and Koc (see pull-down)	0.00	0.0	0.0	0
Reduced metals: Fe+2 and Mn+2	68.00	190.9	0.1	113
1,2,3-trimethylbenzene	<- pull-down menu			
Measures of total oxygen demand				
Total Petroleum Hydrocarbons (see pull-down for Koc)	5.00	14.0	3.1	257
Biological Oxygen Demand (BOD)	0.00	0.0	1.0	0
Chemical Oxygen Demand (COD)	61.00	171.2	1.0	1010

Parameters for Sorbed Phase Oxygen Demand:

Soil bulk density	1.76	g/cm^3 =	110	lb/cf
Fraction of organic carbon (foc)	0.003	range: 0.0001 to 0.01		

(Estimated using sorbed phase = foc*Koc*Cgw) (Adjust Koc as necessary to provide realistic estimates)	Koc (L/kg)	Contaminant Conc. (mg/kg)	Contaminant Mass (lb)	Stoichiometry (wt/wt) O_2/contaminant	ORC-Adv Dose (lb)
Benzene	123	0.00	0.0	3.1	0
Toluene	267	0.06	0.9	3.1	16
Ethylbenzene	327	0.29	4.0	3.2	76
Xylenes	298	0.54	7.4	3.2	139
MTBE	12	0.00	0.0	2.7	0
nap	1000	3.00	41.2	3.0	729
User added, add stoichiometric demand and Koc (see pull-down)	0	0.00	0.0	0.0	0
Measures of total oxygen demand					
Total Petroleum Hydrocarbons	373	5.60	76.8	3.1	1405

Summary of Estimated ORC-Adv Requirements	Dissolved Phase ORC-Adv Demand (lb)	Sorbed Phase ORC-Adv Demand (lb)	Additional Demand Factor (1 to 10x)	Total ORC-Adv Demand (lb)	ORC-Adv Cost
Total BTEX, MTBE, etc.	214	961	3.0	3,495	
Total Petroleum Hydrocarbons	257	1,405	2.0	3,324	
Biological Oxygen Demand (BOD)	0	0	2.0	0	
Chemical Oxygen Demand (COD)	1,010	1,010	1.5	3,031	

Required ORC-Adv quantity (in 25 lb increments) ----------> 3,500 pounds ORC-Adv

Slurry Mixing Volume

Design solids content for spraying into excav. (20-40% by wt.)	30%	
Total water for mixing slurry (gal)	979	gallons

REGENESIS

Oxygen Release Compound (ORC®) Installation Instructions

(Excavation Applications)

SAFETY:

Pure ORC is shipped to you as a fine powder, which is rated at -325 mesh (passes through a 44 micron screen). It is considered to be a mild oxidizer and as such should be handled with care while in the field. Field personnel should take precautions while applying the pure ORC. Typically, the operator should work up wind of the product as well as use appropriate safety equipment. These would include eye, respiratory protection and gloves as deemed appropriate by exposure duration and field conditions.

Although two options are discussed, application of ORC should never be applied by personnel within the tank excavation, unless proper shoring or sidewall cutback is in place.

GENERAL GUIDELINES:

ORC can be applied in a dry powder form or as a slurry. Field conditions dictate which form of ORC can be used most effectively.

Installation of ORC should be within the tank excavation floor and/or in an adequate backfill section thickness to account for the anticipated groundwater "smear zone".

Maximum treatment effect is obtained when ORC is mixed as thoroughly as possible within the backfill material. The more dispersed the ORC slurry/powder within the excavation backfill, the more effective the treatment.

The quantity of ORC to be used is generally calculated prior to moving into the field for installation. Generally it is applied at a rate of between 0.1% and 1.0% by weight of the soil matrix. The following illustrates a dilute application rate calculation:

> Use a weight/weight percent of ORC/backfill material to ensure distribution of the ORC into the desired aquifer section. For example: a 0.15% weight of ORC to weight of backfill for the standard ORC weight (30 pounds) per container calculates as follows: 30 lb. ORC/0.15% = 20,000 lbs. of soil matrix. Thus, to achieve a 0.15% mixture of ORC in the backfill material, 30 lb. of pure ORC should be mixed into 10 tons (20,000 lbs. ÷2,000 lbs./ton) of backfill, or approximately 7 - 10 cubic yards of soil depending on field conditions. Professional judgment should be used to select the appropriate soil mass per cubic yard for designing each site treatment.

CHOOSING THE FORM OF INSTALLATION:

Pure ORC is shipped to you in a powder form. Weather conditions (especially wind) may have a direct effect on the application of ORC as a tank backfill amendment.

Application of the dry powder may be difficult in windy conditions. To counter the effects of wind (and the subsequent potential loss of ORC), Regenesis recommends that a water source or a spray tank be on-site to wet down the ORC and the backfill material as ORC is applied.

Application of ORC in a slurry format is a very effective method and eliminates the wind issue.

Four somewhat different installation conditions can be encountered in the field:

- ORC in a pea gravel back-fill. ("Type 1")
- ORC in a soil back-fill. ("Type 2")
- ORC mixed in native soil in the bottom of a tank pit. ("Type 3")
- ORC installed in soil under standing water in the bottom of a tank pit. ("Type 4")

A single tank pit excavation can include more than one of these conditions, depending on the site and extent of treatment. Instructions for each condition are discussed separately in the following sections. After the installation instructions are detailed instructions for mixing the slurry, if that is the option chosen.

INSTALLATION INSTRUCTIONS:

"Type 1," ORC in a Pea Gravel Back-fill

The easiest method for installing ORC in pea gravel back-fill is to mix the ORC in the material in a backhoe or skiploader bucket before placing it in the excavation.

- **Dry Powder method**

Into each scoop of back-fill material add the appropriate portion of ORC being installed. Generally, it is advisable to moisten the material in the bucket to reduce wind blown ORC loss. Excessive winds make this method not feasible.

After mixing the dry powder in the bucket, it is dumped into the bottom of the excavation. The backhoe bucket can be used for further mixing in the excavation.

- **Slurry method**

Mix a 63% solids slurry of ORC and water (see "Steps to make ORC slurry). This relatively thick slurry is used to help keep the ORC dispersed through the pea gravel, even when it contacts water in the bottom of the excavation during installation. It is generally desirable to avoid having the ORC run down through the pea gravel and collect in the bottom of the excavation. The thick slurry addresses this issue.

In each scoop of back-fill material, add the appropriate amount of ORC slurry. Pre-mix the materials in the backhoe bucket After mixing, dump the slurry and back-fill into the bottom of the excavation. The backhoe bucket can be used for further mixing in the

excavation.

If the slurry method is being used, observe the physical behavior of the ORC in the fill material. If the ORC collects at the bottom of the back-fill material, increase the percent solids content by reducing the amount of water being used to make the slurry.

"Type 2," ORC in a Soil Back-fill

Follow the instructions for the pea gravel back-fill method, except:

If the slurry method is being used, the solids content should be reduced. Typically a 50% solids is appropriate, although soil conditions sometimes dictate lower solids contents (see "Steps to make ORC slurry").

" Type 3," ORC Mixed in Native Soil in the Bottom of the Tank Pit

When ORC is added to the bottom of a tank pit it may be done by backhoe or injection.
CAUTION: Personnel should never work within the tank excavation, unless proper shoring or sidewall cutback is in place.

- **Backhoe method**

A skilled backhoe operator can distribute the ORC around the bottom of the tank excavation and, using the bucket, mix it thoroughly. If there are no winds, it may be possible to:

1. Put the dry ORC powder in the backhoe bucket,
2. Lower it to the bottom of the pit,
3. Gently deposit the ORC evenly on the remaining soil,
4. Use the bucket to mix the powder into the soil,
5. To mitigate dusting, if necessary, spray water into the excavation during the process.

An alternative backhoe method is to use a 50% (or less) solids ORC slurry (see "Steps to make ORC slurry) in place of the dry powder. This eliminates the dusting problem, and in some cases enhances the even distribution of ORC into the soil. Observe the slurry mixing behavior in the bottom of the excavation, and adjust the water content of the slurry to optimize mixing, if necessary.

- **Injection method**

If available, a pump and root feeder may be used to inject an ORC slurry into the excavation floor. This may require a more dilute slurry mix, and care should be taken to assure that the solids do not settle out of the slurry prior to injection.

" Type 4." ORC installed in standing water in the bottom of a tank pit

Application of ORC into tank excavations with standing water requires the operator apply ORC in a slurry form. ORC powder application in this scenario is not advised because a portion of the ORC particle fraction is not likely to pass through the surface tension of the standing water. Caution: Personnel should never work within the tank excavation, unless proper shoring or sidewall cutback is in place.

- **Backhoe method**

A skilled backhoe operator can distribute the ORC slurry within the excavation, and mix it into the soil underlying the standing water with the bucket. Steps for installation:

1. Mix a high solids content ORC slurry (63% solids). See ("Steps to make ORC slurry").
2. Pour slurry into the backhoe bucket.
3. Lower the bucket to the standing water level in the excavation, and deposit the slurry as evenly as possible across the excavation floor. The dense slurry (63%solids is 1.6 grams per ml) will tend to make the majority of the slurry sink quickly to the bottom of the water layer.
4. Use the bucket to mix the slurry into the soil.
5. Water in the vicinity of the ORC slurry will often turn white and milky, since some of the ORC is dispersed within the standing water. This provides additional dispersion within the standing water and back-fill material as it is added to the excavation.

- **Injection method**

If available, a pump and root feeder may be used to inject an ORC slurry into the soil in an excavation. This may require a more dilute slurry mix, and care should be taken to assure that the solids do not settle out of the slurry prior to injection.

MIXING ORC SLURRY:

ORC powder is shipped to you in pre-measured batches. Each batch is contained in a plastic bag which is shipped in a 5-gallon bucket.

Remove the pre-measured ORC bag from the 5-gallon bucket and open
Measure and pour the appropriate amount of water from the following table into the 5 gallon bucket

Slurry Solids Content (%)	Pounds of ORC	Gallons of Water
63%	30 lbs.	2.1 gal. (2 gal. + 2 cups)
50%	30 lbs.	3.6 gal. (3 gal + 2 1/2 qts.)

Add the entire ORC pre-measured bag to the water (30 pounds). If the slurry solids contents of less than 50% are desired, the quantity of ORC per batch mixed in the bucket must be reduced. For example, a bucket containing four gallons of water would require 22.4 pounds of ORC to make a 40% solids slurry, and 16.6 pounds of ORC to make a 33% slurry.

Use an appropriate mixing device to thoroughly mix ORC and water. Regenesis

recommends use of a 0.5 Horsepower (minimum) hand held drill with a “jiffy mixer” or stucco mixer. A common paint paddle can be used to scrape the bottom and sides of the container to ensure thorough mixing. Standard environmental slurry mixers may also be used.

After mixing, small amounts of water can be added to adjust the consistency of the slurry.

When slurries are used, the early batches should be observed in the process of mixing with the soil. Each site can vary, due to soil type and moisture content. Based on professional judgment, additional water can be added to subsequent slurry batches.

ORC slurry should be used ASAP; if the ORC slurry has been standing more than 15 minutes, it should be remixed immediately before using. Do not let stand more than 30 minutes without stirring. Otherwise, the slurry will begin to harden into a weak cement.

For direct assistance or answers to any questions you may have regarding these instructions, contact Regenesis Technical Services at 949-366-8000.

Stormwater Pollution Prevention Plan (SWPPP)

STORMWATER POLLUTION PREVENTION PLAN

Remedial Action
Former Fulton Manufactured Gas Plant Site
Fulton, New York
Site Number 738034

nationalgrid

Date February 2011

O'BRIEN & GERE

SPDES Notice of Intent

3358554733

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR _____
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-08-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
NATIONAL GRID

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
STUCKER

Owner/Operator Contact Person First Name
STEVEN

Owner/Operator Mailing Address
300 ERIE BOULEVARD WEST

City
SYRACUSE

State
NY

Zip
13202 - 4250

Phone (Owner/Operator)
315 428 6552

Fax (Owner/Operator)
315 460 6224

Email (Owner/Operator)
STEVEN.STUCKER@US.GRID.COM

FED TAX ID
150 2555555 (not required for individuals)

Project Site Information

Project/Site Name
FORMER FULTON MANUFACTURED GAS PLANT

Street Address (NOT P.O. BOX)
SOUTH FIRST STREET

Side of Street
○ **North** ○ **South** ● **East** ◉ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)
FULTON

State NY | Zip | County OSWEGO | DEC Region

Name of Nearest Cross Street
FAY STREET

Distance to Nearest Cross Street (Feet)
400

Project In Relation to Cross Street
● **North** ○ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel
2001 10744

Tax Map Numbers
157 158

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site go to the dropdown menu on the left and choose "Get Coordinates". Click on the center of your site and a small window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)
385831

Y Coordinates (Northing)
4799664488000

2. What is the nature of this construction project?

○ **New Construction**

○ **Redevelopment with increase in imperviousness**

● **Redevelopment with no increase in imperviousness**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ● INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION — Number of Lots
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ● OTHER: RESTRICTED

4. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law ? ○ **Yes** ● **No**

5. Is this a project which does not require coverage under the General Permit (e.g. Project done under an Individual SPDES Permit, or department approved remediation)? ● **Yes** ○ **No**

6. Is this property owned by a state authority, state agency or local government? ○ **Yes** ● **No**

7. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area. Round to the nearest tenth of an acre.

Total Site Acreage	Acreage To Be Disturbed	Existing Impervious Area Within Disturbed	Future Impervious Area Within Disturbed
1.01.0	1.01.0	0.50.5	0.00.0

8. Do you plan to disturb more than 5 acres of soil at any one time? ○ **Yes** ● **No**

9. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D
%	%	%	%

10. Is this a phased project? ● Yes ○ No

11. Enter the planned start and end dates of the disturbance activities. **Start Date** __/__/____ - **End Date** __/__/____

12. Identify the nearest, natural, surface waterbody(ies) to which construction site runoff will discharge.

Name

OSWEGO RIVER

12a. Type of waterbody identified in Question 12?

- ○ Wetland / State Jurisdiction On Site (Answer 12b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 12b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ● River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

12b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

13. Has the surface waterbody(ies) in question 12 been identified as a 303(d) segment in Appendix E of GP-0-08-001? ○ Yes ● No

14. Is this project located in one of the Watersheds identified in Appendix C of GP-0-08-001? ○ Yes ● No

15. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? **If no, skip question 16.** ○ Yes ○ No

16. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ Yes ○ No

If Yes, what is the acreage to be disturbed?

[ ][ ][ ][ ].[ ]

17. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ Yes ● No

18. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ● Yes ○ No ○ Unknown

(If No, skip question 19)

19. What is the name of the municipality/entity that owns the separate storm sewer system?

CITY OF FULTON

20. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ Yes ● No ○ Unknown

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book) ? ● Yes ○ No

22. Does this construction activity require the development of a SWPPP that includes Water Quality and Quantity Control components (Post-Construction Stormwater Management Practices) ○ Yes ● No

(If No, skip questions 23 and 27-35)

23. Have the Water Quality and Quantity Control components of the SWPPP been developed in comformance with the current NYS Stormwater Management Design Manual ? ○ Yes ○ No

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ● **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer: O'BRIEN & GERE ENGINEERS, INC.

Contact Name (Last, Space, First): HECKATHORNE, JAMES

Mailing Address: 333 WEST WASHINGTON STREET

City: SYRACUSE

State: NY

Zip: 13221

Phone: 3159566100

Fax: 3154437554

Email: JIM.HECKATHORNE@OBG.COM

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-08-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name: JAMES

MI: R

Last Name: HECKATHORNE

Signature

Date ___ / ___ / ____

25. Has a construction sequence schedule for the planned management practices been prepared? ● Yes ○ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ Check Dams
- ○ Construction Road Stabilization
- ● Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ○ Sediment Traps
- ● Silt Fence
- ● Stabilized Construction Entrance
- ○ Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ● Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ● Seeding
- ○ Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ○ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ○ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ○ Riprap Slope Protection
- ○ Rock Outlet Protection
- ○ Streambank Protection

Other

Water Quality and Quantity Control

Important: Completion of Questions 27-35 is not required if response to Question 22 is No.

Post-Construction Stormwater Management Practices

27. Indicate **all** Stormwater Management Practice(s) that will be installed/constructed on this site:

Ponds
- ○ **Micropool Extended Detention (P-1)**
- ○ **Wet Pond (P-2)**
- ○ **Wet Extended Detention (P-3)**
- ○ **Multiple Pond System (P-4)**
- ○ **Pocket Pond (P-5)**

Filtering
- ○ **Surface Sand Filter (F-1)**
- ○ **Underground Sand Filter (F-2)**
- ○ **Perimeter Sand Filter (F-3)**
- ○ **Organic Filter (F-4)**
- ○ **Bioretention (F-5)**
- ○ **Other**

Alternative Practice
- ○ **Rain Garden**
- ○ **Cistern**
- ○ **Green Roof**
- ○ **Stormwater Planters**
- ○ **Permeable Paving (Modular Block)**

Wetlands
- ○ **Shallow Wetland (W-1)**
- ○ **Extended Detention Wetland (W-2)**
- ○ **Pond/Wetland System (W-3)**
- ○ **Pocket Wetland (W-4)**

Infiltration
- ○ **Infiltration Trench (I-1)**
- ○ **Infiltration Basin (I-2)**
- ○ **Dry Well (I-3)**
- ○ **Underground Infiltration System**

Open Channels
- ○ **Dry Swale (O-1)**
- ○ **Wet Swale (O-2)**

Verified Proprietary Practice
- ○ **Hydrodynamic**
- ○ **Wet Vault**
- ○ **Media Filter**

28. Describe other stormwater management practices not listed above or explain any deviations from the technical standards.

29. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

30. Provide the total water quality volume required and the total provided for the site.

WQv Required . **acre-feet**

WQv Provided . **acre-feet**

31. Provide the following Unified Stormwater Sizing Criteria for the site.

Total Channel Protection Storage Volume (CPv) - Extended detention of post-developed 1 year, 24 hour storm event

CPv Required . **acre-feet**

CPv Provided . **acre-feet**

31a. The need to provide for channel protection has been waived because:

○ **Site discharges directly to fourth order stream or larger**

Total Overbank Flood Control Criteria (Qp) - Peak discharge rate for the 10 year storm

Pre-Development . **CFS**

Post-development . **CFS**

Total Extreme Flood Control Criteria (Qf) - Peak discharge rate for the 100 year storm

Pre-Development . **CFS**

Post-development . **CFS**

31b. The need to provide for flood control has been waived because:

○ **Site discharges directly to fourth order stream or larger**

○ **Downstream analysis reveals that flood control is not required**

IMPORTANT: For questions 31 and 32, impervious area should be calculated considering the project site and all offsite areas that drain to the post-construction stormwater management practice(s). (Total Drainage Area = Project Site + Offsite areas)

32. Pre-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the existing impervious areas before construction begins. 50%

33. Post-Construction Impervious Area - As a percent of the Total Drainage Area, enter the percentage of the future impervious areas that will be created/remain on the site after completion of construction. 0%

34. Indicate the total number of post-construction stormwater management practices to be installed/constructed. 0

35. Provide the total number of stormwater discharge points from the site. (include discharges to either surface waters or to separate storm sewer systems)

36. Identify other DEC permits that are required for this project.

DEC Permits

○ Air Pollution Control	○ Navigable Waters Protection / Article 15
○ Coastal Erosion	○ Water Quality Certificate
○ Hazardous Waste	○ Dam Safety
○ Long Island Wells	○ Water Supply
○ Mined Land Reclamation	○ Freshwater Wetlands/Article 24
○ Other SPDES	○ Tidal Wetlands
○ Solid Waste	○ Wild, Scenic and Recreational Rivers
○ None	○ Stream Bed or Bank Protection / Article 15

● Other

C O # A 4 - 0 4 7 3 - 0 0 0 0

37. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ● **No**

If Yes, Indicate Size of Impact. .

38. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ **Yes** ● **No**

(If No, skip question 39)

39. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ○ **Yes** ● **No**

40. If this NOI is being submitted for the purpose of continuing coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. N Y R

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name S T E V E N **MI**

Print Last Name S T U C K E R

Owner/Operator Signature

Date / /

Erosion and Sediment Control Specification

SECTION 02270 - EROSION AND SEDIMENT CONTROL

02270 – 1 GENERAL

This Section includes temporary erosion and sediment control measures intended to minimize erosion of soils and sedimentation of lands adjacent to or affected by the proposed Remedial Design of the Former Fulton Manufactured Gas Plant (MGP) Site being performed on behalf of National Grid (Owner) pursuant to an Order on Consent between National Grid and the New York State Department of Environmental Conservation (NYSDEC) (Order on Consent Index No. A4-0473-0000 effective November 2003).

02270 – 1.01 REFERENCES

All work shall be performed in substantive compliance with the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit No. GP-0-10-001 for Stormwater Discharges from Construction Activities (Permit No. GP-0-10-001). Materials and installation shall be in accordance with the latest revisions of the NYSDEC Standards and Specifications for Erosion and Sediment Control (NYSDEC, 2005).

Excavation and removal to their full depth of all former MGP related structures and foundations in Areas 1 and 2 that contain MGP related contaminated materials is being performed to remove impacted soils and structures to the extent practicable within the site area. The actual depth of removal will be based on visual observations made in the field with the concurrence of the NYSDEC. The project is expected to maintain stormwater runoff from the MGP Site under developed conditions. In accordance with Permit No. GP-0-10-001, projects that involve ground disturbance that will not result in an increase in impervious surface area are not required to install permanent facilities to manage the water quality and quantity volumes from the project area.

02270 – 1.02 SUBMITTALS

Submittals will include shop drawings of silt fencing and filter fabric.

02270 – 2 MATERIALS

02270 – 2.01 GENERAL

Supervision, labor, equipment and materials will be provided as needed to perform the specified work.

Materials will include silt fence, vegetation, stone, filter fabric, and other manufactured products to reduce erosion and control sedimentation.

02270 – 2.02 SILT FENCE

Posts will be steel (either T or U type) or 2-inch square hardwood with 10-foot spacing. Wire fence backing will be woven wire, 14.5 gauge, with 6-inch maximum mesh opening.

Geotextile filter cloth sizing will be as recommended by the manufacturer. The material will have a minimum tensile strength of 120 pounds (test procedure ASTM D1682).

02270 – 2.03 STABILIZED CONSTRUCTION ENTRANCE

Stone used for stabilized construction entrances will be a minimum of 2-inch stone.

Equivalent material (*i.e.*, reclaimed concrete) may be used with approval from the Engineer.

Geotextile bedding will consist of Mirafi 600X.

02270 – 2.04 TEMPORARY VEGETATION

Seed mixtures will be of commercial stock of the current season's crop and will be delivered in unopened containers bearing the guaranteed analysis of the mix. Seed will meet the standards of germination and purity set by the State of the Association of Official Seed Certifying Agencies (AOSCA).

Seed Mixtures*:

Timothy – 30
Clover – 20
Perennial Ryegrass – 40
Annual Ryegrass - 10
*% by weight

When the final soil surface has been fine graded in accordance with the Final Design Report, the seed mixture will be uniformly applied upon the prepared surface with a mechanical spreader at a rate of not less than 10 pounds per 1000 square feet.

1. Seed will be raked lightly into the surface and rolled with a light hand lawn roller
2. Seeding and mulching will not be done during windy weather.

Hydroseeding may be utilized as an alternative method of applying fertilizer, seed and mulch.

02270 – 3 CONSTRUCTION DETAILS

02270 – 3.01 SEQUENCE

A temporary stabilized construction entrance will be installed in the ingress and egress locations that are agreed to by the Engineer. If needed, vehicles/equipment will be washed on the entrance prior to leaving the site. Periodic top dressing of the entrance will be performed as necessary as material accumulates in an effort to prevent tracking of material onto off-site roads.

Silt fencing will be installed along toes of embankments, on downgradient portions of the MGP site perimeter, and around staging areas.

Staging areas for construction vehicles, equipment, and supplies will be established in areas approved by National Grid.

Areas of the MGP site to be cleared and grubbed will be within the limits of work only. Cleared vegetation, soil, and other debris will be stockpiled in approved areas for disposal at an approved location.

Stockpiled soil will be covered using temporary polyethylene sheets and exposed soil will be stabilized, seeded, and mulched in accordance with the Final Design Report at the conclusion of implementation of the Remedial Design.

Upon stabilization of the project area and approval of the final inspection, temporary Erosion and Sediment Control measures will be removed.

02270 – 3.02 STABILIZATION

Stabilization measures will be initiated in accordance with the NYSDEC Standards and Specifications for Erosion and Sediment Control (NYSDEC 2005) as soon as practicable. For locations where soil disturbance activities have temporarily or permanently ceased, stabilization measures will be implemented within 14 days of the conclusion of activities or within 7 days if authorized to exceed 5 acres of disturbance at one time. This requirement does not apply if the installation of stabilization measures is precluded by snow cover or frozen ground conditions; however measures will be implemented as soon as practicable.

02270 – 3.03 ADDITIONAL STORMWATER CONTROLS

Listed below is a description of additional controls and measures that will be implemented to minimize pollutant transport.

Proper precautions will be taken so materials do not spill onto public thoroughfares. If materials are dropped onto these areas they will be removed as soon as practicable so that they do not enter surface and subsurface drainage systems.

Sediment laden water (if any) from excavation dewatering operations will be collected for pretreatment (if necessary) and proper disposal either on or off site.

Dust control measures will be employed before dust migrates off-site, and may include water application or mulching but will not include use of chemical additives.

Planting materials will be properly stored and/or contained.

Chemicals with spill potential (if any) will have appropriate secondary containment.

02270 – 3.04 MAINTENANCE

Construction period operation and maintenance:

1. Clean and/or repair or replace silt fences as necessary.

2. Stabilized construction entrances will be resurfaced as necessary.

3. Debris and litter will be removed on a weekly basis, or more frequently if necessary.

Post-construction operation and maintenance:

1. Seed and mulch will be spread within the project area at the conclusion of implementation of the Remedial Design and will be maintained until the vegetation is at least 80% established to protect against erosion.

2. Sloughing or erosion of embankments will be repaired.

02270 – 3.05 INSPECTION DURING CONSTRUCTION

General

The Owner will be responsible to provide a Qualified Inspector[1] to inspect the proposed erosion and sediment control measures and disturbed areas for compliance with the SWPPP. These inspections will be completed at least once every seven calendar days. There will be a minimum of two full calendar days between inspections. A typical Inspection Report Form for conducting the inspections is included in the SWPPP.

The inspection report will include the inspector's name, date, and findings of the inspections, notes, and actions taken to repair/replace defective control measures. A map indicating locations of areas of concern and drainage pathways will be included. Based on the results of the inspection, the pollution prevention measures identified herein will be revised and implemented as appropriate within one business day and completed within seven calendar days following the date of the inspection. Deficiencies noted during any inspection will be corrected as soon as practicable within the 7 days from the inspection. Further mitigation measures will be implemented if warranted. Each inspection report is to remain on file at the project area as part of the SWPPP until the MGP site and restored staging areas are stabilized and the SPDES Notice of Termination (NOT) is submitted to the NYSDEC.

Prior to construction, O'Brien & Gere will identify at least one Trained Contractor[2] that will be responsible for implementation of the SWPPP and inspection of the erosion and sediment controls in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (NYSDEC 2005). O'Brien & Gere will provide that at least one Trained Contractor is present at the project area on a daily basis while soil disturbance activities are being performed.

Temporary Construction Shutdown (Winter Conditions)

When soil-disturbing activities have been temporarily suspended (*e.g.*, winter shutdown) and temporary stabilization measures have been applied to disturbed areas, the Trained Contractor may suspend daily inspections. However, the Qualified Inspector must perform an inspection of the project area at least once every 30 calendar days. The Owner will notify the NYSDEC in writing prior to reducing the inspection frequencies. The Owner will resume inspections by the trained individual and qualified inspector in accordance with this Section as soon as soil disturbance activities resume.

Final Site Inspection

The Qualified Inspector will perform a final inspection to certify that:

- construction is complete and disturbed areas have been stabilized
- temporary erosion and sediment control facilities have been removed
- permanent stormwater management practices have been installed and are in operation and on-line.

Upon satisfactory completion of the final inspection, the Qualified Inspector will sign the appropriate sections of the NOT form.

---

[1] Qualified Inspector includes persons knowledgeable in the principles and practices of erosion and sediment controls, such as a licensed professional engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect or other NYSDEC endorsed individual. It also means someone working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control.

[2] Trained Contractor means an employee from a contracting (construction) firm that has received four hours of training that has been endorsed by the NYSDEC (*i.e.*, Soil and Water Conservation District, CPESC, Inc., or other NYSDEC endorsed entity), in proper erosion and sediment control principles no later than two years from the date the general permit was issued. After receiving the initial training, the Trained Contractor shall receive four hours of training every three years. This individual will be responsible for implementation of the SWPPP.

02270 – 3.06 NON-STORMWATER DISCHARGES

Areas of the site dedicated for construction vehicle transit or equipment staging will be visually inspected, and where necessary runoff will be controlled.

Decontamination of construction vehicles and equipment will occur in designated staging/lay down areas. Chemicals and detergents will not be used.

Water used for dust control measures will be applied using proper quantities and equipment to avoid runoff to the extent practicable. No chemical additives will be used.

02270 – 3.07 SPILL PREVENTION

The following spill prevention measures will be performed:

- Materials with potential for spillage will be stored at the project area in a neat, orderly manner in their appropriate containers and in secondary containment.
- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the substance manufacturer.
- Whenever possible, product will be used up or packages resealed before proper disposal of contents and containers off site.
- Manufacturers' recommendations for proper use and disposal will be followed.
- Inspection will be made for proper use and disposal of materials.
- On-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage of petroleum products. Petroleum products will be stored in closed containers which are clearly labeled. Used oils will be disposed of properly.
- Materials will be brought to the project area in the minimum quantities required to limit such storage.
- Refueling of vehicles and equipment will occur no closer than 50-feet from streams and wetlands.

02270 – 3.08 SPILL CONTROL PRACTICES

Spills of petroleum, toxins, or hazardous material will be reported to the Respondents immediately, regardless of size. The Project Coordinator will notify the appropriate State or local government agencies following notification to the Owner. Spills will be cleaned up immediately after discovery.

Manufacturers' recommended methods for spill cleanup will be clearly posted and appropriate personnel will be made aware of the procedures and the location of the information and cleanup supplies.

Materials and equipment necessary for spill cleanup will be kept in material storage area at the project location. Equipment and materials will include but not be limited to shovels, rags, gloves, goggles, spill control materials, sand, sawdust, and trash containers specifically for this purpose.

The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.

A spill report will be completed and will include a description of the spill, what caused it, and the corrective measures taken.

02270 – 3.09 CERTIFICATIONS

Contractor Certification - Each responsible Contractor will understand and sign a form containing

the following certification statement:

> "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 an inspection. I also understand that the Respondents or operator must comply with the terms and conditions 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 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. I also certify that I have received a copy of the SWPPP and will retain a copy of such SWPPP at the project area during construction."

Prior to construction, the Owner will identify at least one qualified inspector who will understand and sign a form containing the following certification statement:

> "I hereby certify that I meet the criteria set forth in the General Permit to conduct inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the Pre-construction Site Assessment Checklist have been adequately installed or implemented, ensuring overall preparedness for the commencement of construction."

02270 – 3.10 NOTICE OF INTENT/TERMINATION

National Grid (Owner) will be responsible for submitting the SPDES General Permit No. GP-0-10-001 Notice of Intent (NOI) to the NYSDEC, after it has been signed, prior to initiation of construction activities. The Notice of Termination (NOT) will be submitted to the NYSDEC by the Owner upon completion of construction and stabilization of the project area.

Pre-Construction Requirements

Pre-Construction Requirements

Instructions to Owner/Operator or Respondents/Contractor

1. The Owner and Contractor shall read this Stormwater Pollution Prevention Plan (SWPPP) document to become familiar with all aspects of Stormwater Pollution Prevention associated with this project. This document shall be kept on file at the work site at all times (*i.e.*, in the work trailer).

2. The Owner and Contractor shall read the New York State Department of Environmental Conservation SPDES General Permit for Storm Water Discharges from Construction Activities GP-0-10-001. This SWPPP has been prepared on behalf of the Respondents to assist the Contractor with compliance with GP-0-10-001. The Contractor shall follow the SWPPP and understand that this document constitutes the minimum standards for compliance with GP-0-10-001.

3. In the event of a transfer of responsibility for stormwater runoff, the original Owner shall notify the new Owner/Operator or Respondents in writing of the requirement to obtain permit coverage by submitting a new Notice of Intent (NOI). Once the new Owner/Operator or Respondents obtains permit coverage, the original Owner shall submit a completed Notice of Termination (NOT) with the name and permit identification number of the new Owner/Operator or Respondents. If the original Owner/Operator or Respondents maintains ownership of a portion of the construction activity and will disturb soil, they shall obtain their coverage under GP-0-10-001. Permit coverage for the new Owner/Operator or Respondents will be effective as of the date a completed NOI is sent and an acknowledgement letter is received, provided the original Respondents were 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/Operator or Respondents.

4. Prior to commencing construction activities, National Grid shall complete and submit the forms and certifications herein. This information shall be kept updated.

5. All enclosed certifications shall be completed and each one of the Contractors shall complete their portion of the certification. Each certification to be completed by one of the Contractors shall be signed by a president, treasurer or vice president or any person who performs similar policy or decision making functions and by the on-site individual having responsibility for the firm and each one of the Contractors implementing erosion control measures.

Pre-Construction Requirements

I. PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name _____
Permit No. _____ Date of NYSDEC Authorization _____
Name of Respondent _____
Prime Contractor _____
Contractors _____

a. Preamble to Assessment and Inspections

The following information to be read by all persons involved in the construction of stormwater related activities:

The Owner agrees to have a Qualified Inspector[1] conduct an assessment of the project area prior to the commencement of construction[2]. The Owner shall certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed and implemented to ensure overall preparedness of the project area for the commencement of construction.

When construction starts, the Qualified Inspector shall conduct at least one inspection of the project area every seven calendar days. There should be a minimum of two full calendar days between inspections. The Owner shall maintain a record of all inspection reports at the project area which shall be made available to the permitting authorities upon request.

Prior to submitting the Notice of Termination or the end of permit term, the Owner shall have a Qualified Inspector perform a final inspection of the project area. The Qualified Inspector shall certify that the project area has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed.

[1] "Qualified Inspector means a person knowledgeable in the principles and practices of erosion and sediment controls, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect, or other Department endorsed individual. It also means someone working under the direction and supervision of a licensed Professional Engineer or licensed Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control.

[2] "Commencement of construction" means the initial disturbance of soils associated with clearing, grading or excavation activities or other construction activities that disturb or expose soils such as demolition or stockpiling of fill material.

[3] "Final stabilization means that all soil-disturbance activities at the project area have ceased and uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established or 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.

Pre-Construction Requirements

Pre-construction Site Assessment Checklist
(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes	No	NA	
[ ]	[ ]	[ ]	Has a Notice of Intent been filed with an acknowledgement letter received from the NYS Department of Environmental Conservation?
[ ]	[ ]	[ ]	Has MS4 Approval Letter (if needed) been received?
[ ]	[ ]	[ ]	Is the SWPPP at the project location? Where? _____
[ ]	[ ]	[ ]	Is the Plan current? What is the latest revision date? _____
[ ]	[ ]	[ ]	Is a copy of the NOI (with brief description) at the project location: Where?
[ ]	[ ]	[ ]	Have all Contractors involved with the stormwater related activities signed a Contractor's Certification?
[ ]	[ ]	[ ]	Has Contractors stabilization/construction sequence been received?

2. Resource Protection

Yes	No	NA	
[ ]	[ ]	[ ]	Are construction limits clearly flagged or fenced? _____
[ ]	[ ]	[ ]	Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ]	[ ]	[ ]	Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes	No	NA	
[ ]	[ ]	[ ]	Clean stormwater runoff has been diverted from areas to be disturbed.
[ ]	[ ]	[ ]	Bodies of water located either on-site or in the vicinity of the site have been identified and protected.
[ ]	[ ]	[ ]	Appropriate practices to protect on-site or downstream surface water are installed.
[ ]	[ ]	[ ]	Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Entrance

Yes	No	NA	
[ ]	[ ]	[ ]	A temporary construction entrance for the purpose of capturing mud and debris from construction vehicles before they enter the public highway has been installed.
[ ]	[ ]	[ ]	Other access areas (entrances, construction routes, and equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ]	[ ]	[ ]	Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Perimeter Sediment Controls

Yes	No	NA	
[ ]	[ ]	[ ]	Silt fence material and installation comply with the standard drawing and specifications.
[ ]	[ ]	[ ]	Silt fences are installed at appropriate spacing intervals.
[ ]	[ ]	[ ]	Sediment/detention basin was installed as first land disturbing activity.
[ ]	[ ]	[ ]	Sediment traps and barriers are installed.

Pre-Construction Requirements

6. Pollution Prevention for Waste and Hazardous Materials

Yes	No	NA	
[ ]	[ ]	[ ]	The Respondents or their designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ]	[ ]	[ ]	The plan is contained in the SWPPP on page _____
[ ]	[ ]	[ ]	Appropriate materials to control spills are at the project location. Where?

b. Qualified Inspector's Credentials and Certification

"I hereby certify that I meet the criteria set forth in the General Permit to conduct inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the following Pre-construction Site Assessment Checklist have been adequately installed or implemented, ensuring overall preparedness for the commencement of construction"

Name (please print): _____

Title: _____ Date: _____

Address: _____

Phone: _____ Email: _____

Signature: _____

Pre-Construction Requirements

CONTRACTOR'S CERTIFICATION STATEMENT

(Each Contractor shall sign the certification statement prior to working on-site).

I. SITE INFORMATION

Construction Site Name: _____

Site Location: _____

II. CONTRACTORS INFORMATION

Contracting Firm

Contracting Firm Address

Telephone Number(s)

Contact(s) 1)
2)
3)

Name(s) of Trained Contractor(s) that will be responsible from Contractor's company for implementing the SWPPP:

Name_____Title _____

Name_____Title _____

A Trained Contractor is an employee of the contracting company that has received four (4) hours of training, which has been endorsed by the Department from a Soil and Water Conservation District, CPESC, Inc. or other Department endorsed entity in proper erosion and sediment control principles no later than two (2) years from the date this general permit is issued. After receiving the initial training, the Trained Contractor shall receive four (4) hours of training every three (3) years.

III. STORMWATER MEASURES

Contractor shall implement and maintain the following stormwater measures:

1.
2.
3.
4.

IV. CERTIFICATION

"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 an inspection. I also understand that the Respondents or operator must comply with the terms and conditions 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 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. I also certify that I have received a copy of the SWPPP and will retain a copy of such SWPPP at the project area during construction."

V. SIGNATURE: _____ DATE

Name (print): _____ Title:

Inspection Forms

FIELD RECORD COPY

Former Fulton Manufactured Gas Plant Site

SWPPP MAINTENANCE INSPECTION FORM

Inspection Location: _____ Inspection #: _____

Name of Inspector: _____ Date/Time of Inspection: _____

Soil Conditions: **WET /DRY /SATURATED** (Circle One) Weather Conditions:_____

Type of Inspection	Yes	No
1. Initial Inspection		
2. Weekly/Biweekly Inspection		
3. Construction Shutdown Inspection		
4. Final Inspection:		
a. Has the Site undergone final stabilization?		
b. Have all temporary erosion controls been removed?		

(Edit Checklist below for Project Specifics)

Project Checklist (indicate Areas of concern on the attached map)	Yes	No	N/A
Erosion and Sediment Controls:			
1. Is there any evidence of sediment leaving the site?			
2. Are silt fences in good condition and free from visible signs of erosion (___% sediment buildup)?			
3. Are sediment traps in good condition (___% sediment buildup)?			
4. Are construction access/egress points stabilized?			
5. Are vehicles and equipment being washed down in a stabilized area?			
6. Are dust control measures being applied as needed?			
Stabilization Practices:			
7. Have all disturbed portions of the site where earth disturbing activities have ceased and will not resume within 14 days been temporarily stabilized by covering with plastic, mulching, or by mulching and seeding?			
8. Have all disturbed portions of the site where earth disturbing activities have permanently ceased been stabilized with topsoil and permanent seed?			
Additional Stormwater Controls:			
9. Are material storage / handling/stockpile areas properly stabilized?			
10. Are concrete disposal areas being properly utilized?			
11. Is there any evidence of spills or leaks from vehicles/equipment?			

List Disturbed Areas	Stabilized Yes	No
1.		
2.		
3.		
4.		
5.		

FIELD RECORD COPY

FIELD RECORD COPY

Former Fulton Manufactured Gas Plant Site
SWPPP MAINTENANCE INSPECTION FORM

Work Performed Since Last Inspection & Effectiveness of Corrective Actions: _____

Comments on General Site Conditions: _____

Remarks/Recommendations*: _____

* Please make a distinction between deficiencies to the SWPPP and normal maintenance items.

Condition of Runoff at Discharge Points (Photos Attached): _____

PLEASE SEE ATTACHED MAP FOR LOCATIONS

IF ALL QUESTIONS ARE ANSWERED "YES" OR "N/A", THEN SIGNATURE BELOW ACKNOWLEDGES COMPLIANCE WITH THE EXISTING STORMWATER POLLUTION PREVENTION PLAN AND NYSDEC SPDES PERMIT (GP-0-10-001).

Inspector: _____ **Date:** _____
Signature of Inspector

Reviewed: _____ **Date:** _____
Qualified Professional

FIELD RECORD COPY

Contract Documents (bound separately)

FORMER FULTON MGP SITE
OSWEGO COUNTY, NEW YORK

SITE NO. 738034
REMEDIAL DESIGN

SPECIAL PROVISIONS

SP-1 General Construction Sequence
SP-2 Work Schedule
SP-3 Contract Work Area Security
SP-4 Notices
SP-5 NYSDEC Review
SP-6 Odor Control
SP-7 Progress and Coordination Meetings
SP-8 Emergency Calls
SP-9 Existing Utilities
SP-10 Dust Monitoring and Control Program
SP-11 Contractor's Construction Quality Control Plan
SP-12 Borrow Materials
SP-13 Retention of Records
SP-14 Reporting Requirements
SP-15 Emergency Response
SP-16 Staging Plan
SP-17 Utilization of On-Site Materials
SP-18 Supplemental Information
SP-19 Construction Water Management
SP-20 Potential to Treat by Low Temperature Thermal Desorption
SP-21 Pre-Construction Inspection
SP-22 Noise Control

TECHNICAL SPECIFICATIONS

Section 01300 Surveys
Section 01700 Health and Safety
Section 02003 Field Office Trailer
Section 02007 Perimeter Air Monitoring and Dust Control Plan
Section 02009 Project Photographs
Section 02110 Stormwater Pollution Prevention
Section 02145 Groundwater Monitoring Well Abandonment
Section 02151 Groundwater Monitoring Well Repair and Replacement
Section 02211 Clearing and Grubbing
Section 02221 Earthwork
Section 02223 Embankment
Section 02225 Structure Excavation, Backfill and Compaction
Section 02229 Rock Removal
Section 02231 Select Fill
Section 02241 Off-Site Transportation and Disposal
Section 02242 Tar Excavation and Off-site Disposal
Section 02270 Erosion and Sediment Control
Section 02278 Geotextile Filter Fabric

TECHNICAL SPECIFICATIONS (continued)

CONTRACT DRAWINGS

Construction Quality Assurance Plan (CQAPP)

REPORT

Construction Quality Assurance Project Plan for Remedial Action at Former Fulton Manufactured Gas Plant Site Fulton, New York Site Number 738034

nationalgrid

Date January 2011

O'BRIEN & GERE
www.obg.com

Construction Quality Assurance Project Plan for Remedial Action

Former Fulton Manufactured Gas Plant Site
Fulton, New York
Site Number 738034

Prepared for:

nationalgrid

JAMES R. HECKATHORNE, P.E.
O'BRIEN & GERE ENGINEERS, INC.

TABLE OF CONTENTS

FIGURES

1 INTRODUCTION

This document has been prepared as a means of providing guidelines and procedures for Construction Quality Assurance and Construction Quality Control (CQA/CQC) and Manufacturing Quality Assurance and Manufacturing Quality Control (MQA/MQC) during the Remedial Action (RA) at the Fulton Former Manufactured Gas Plant (MGP) Site.

CQA means a planned system of activities that provides assurance that the facility was constructed as specified in the design. CQA refers to measures taken by the CQA organization to assess if the installer or contractor is in compliance with the plans and specifications and permits for the project. This may also include quality control for those actions taken before construction to evaluate if materials chosen and workmanship comply with agency approved engineering plans and specifications.

CQC means a planned system of inspections that are used to directly monitor and control the quality of a construction project. CQC includes those actions normally performed by the installer to achieve high quality in the constructed or installed system. CQC refers to measures taken by the installer or contractor to determine compliance with the requirements for materials and workmanship as stated in the plans and specifications for the project.

MQA is defined as a planned system of activities which provides assurance that materials were manufactured as specified in the contract documents. MQA includes manufacturing facility inspections, verifications, audits and evaluation of the quality of manufactured materials. MQA refers to measures taken by MQA organization to determine if the manufacturer is in compliance with the product certification and contract plans for a project.

MQC is defined as a planned system of inspections that is used to directly monitor and control the manufacture of a material that is factory originated. MQC is usually performed by the manufacturer of the materials and is necessary to ensure minimum (or maximum) specified values in the manufactured product. MQC refers to measures taken by the manufacturer to determine compliance with the requirements for materials and workmanship as stated in certification documents and contract documents.

This CQA/CQC Plan outlines the responsibilities of each of the entities associated with the project. This includes a delineation of the appropriate lines of communication between the Owner, Contractor, inspection personnel and design personnel associated with construction activities. Also provided is a description of the required level of experience and training for the Contractor and CQA/CQC inspectors in sufficient detail to determine that personnel permitted to be involved with the project have the necessary qualifications to properly complete the work in accordance with the methods and procedures specified. In addition to personnel requirements, a description of the CQA/CQC protocols to be utilized for documenting construction activities and compliance with the specifications is provided.

2 PROJECT ORGANIZATION AND RESPONSIBILITIES

An important facet of construction management is CQA/CQC and MQA/MQC during construction of the project. In this section, organizations involved in CQA/CQC and MQA/MQC for this project along with their responsibilities and qualifications are discussed. Lines of communication are presented, along with procedures for submission of CQA/CQC and MQA/MQC information.

2.1 PROJECT ORGANIZATION AND RESPONSIBILITIES

Several organizations are involved in CQA/CQC and MQA/MQC prior to, during, and following construction. These include the following:

- New York State Department of Environmental Conservation (NYSDEC) as the regulatory agency
- National Grid as the Owner
- O'Brien & Gere Engineers, Inc. as the Design Engineering Firm
- Engineer (to be determined) as the organization or individuals engaged by the Owner for the project to monitor that work is constructed in accordance with the approved plans and specifications
- Construction Contractor (Contractor) (to be determined)
- Owner's Representative (to be determined)
- Testing laboratories (to be determined)
- Manufacturers and fabricators (to be determined)
- Installers (to be determined).

The responsibilities of these organizations are delineated in the following subsections.

Regulatory agency responsibilities. As the regulatory agency, the NYSDEC will perform the following functions:

- Review and approve original designs
- Review project submittals for compliance with regulations
- Issue approval to construct the project once an approved design has been submitted
- Review and approve major design modifications or requests for variances from the regulatory conditions during construction.

Owner responsibilities. The Owner will:

- Bear responsibility for the design, construction, construction inspection and operation of the project
- Comply with NYSDEC requirements to obtain approvals and/or permits
- Bear responsibility for all communications with the NYSDEC
- Bear responsibility for providing CQA/CQC and MQA/MQC documentation to the NYSDEC that construction activities associated with the project are proceeding in accordance with the approved design (and approved design modifications)
- Select organizations charged with design, CQA/CQC, MQA/MQC, and construction activities
- Accept or reject design plans and specifications, CQA/CQC plan, reports and recommendations of the design engineer, and the materials and workmanship of the Contractor

- Bear responsibility for providing the Construction Completion Report to the NYSDEC for review and acceptance.

Design engineer's responsibilities. As the Design Engineering Firm, O'Brien & Gere Engineers will perform the following:

- Provide a project design that fulfills the performance requirements of the NYSDEC
- Prepare this CQA/CQC Plan
- Prepare necessary design modifications during construction if necessitated by unexpected site conditions or required changes in construction methodology.

Engineer's responsibilities. The Engineer will oversee the CQA/CQC and MQA/MQC activities required by this plan. The Engineer will perform the following:

- Review design plans and specifications
- Coordinate the review of the Contractor's shop drawing submittals
- Observe each construction activity
- Confirm the Contractor's CQC Plan is in accordance with the CQA/CQC Plan
- Accept methods employed by the Contractor to perform CQC testing services
- Confirm that regular calibration of testing equipment is properly conducted and recorded
- Confirm that testing laboratories conform to CQA/MQA requirements and procedures and sample custody procedures are followed
- Confirm that testing equipment, personnel, and procedures do not change over time, or if changes are made, monitor that any changes do not adversely impact inspection processes
- Confirm that test data inspection reports are accurately recorded and maintained
- Provide the Owner with reports on testing and inspection results
- Notify the Contractor of deficiencies based on results of field inspections, CQA/CQC and/or MQA/MQC results
- Schedule and attend project CQA/CQC meetings during construction
- Provide daily on-site inspection of the work in progress to assess compliance with design plans and specifications
- Visually inspect materials brought to the Site for conformance with the specifications and for variations from material that was tested
- Observe field sampling and testing performed by the Contractor and review the results
- Observe whether materials are being properly handled and stored on-site
- Conduct day to day interaction with the Contractor
- Conduct day to day interaction with the Owner's Representative
- Attend job meetings as required
- Certify that the facility was constructed in accordance with the plans and specifications approved by the regulatory agency
- Oversee the preparation of the Construction Completion Report and Record Drawings

Construction contractor's responsibilities. The general Contractor selected by the Owner will perform the following:

- Construct the project in accordance with the design plans and specifications using appropriate construction procedures and techniques
- Retain and oversee qualified subcontractors to perform specialized components of construction
- Develop a CQC implementation plan for CQC to assure compliance with the design plans, specifications and this CQA/CQC Plan
- Schedule and coordinate CQA/CQC and MQA/MQC inspection and testing activities
- Retain testing laboratories to provide CQC testing services
- Submit required reports, results, shop drawings, etc. to the Design Engineer for distribution for review and acceptance
- Prepare a construction activity schedule using the Critical Path Method (CPM) or a bar graph and update it monthly
- Provide the Engineer marked-up drawings for Record Drawing preparation

Owner's Representative. As the third party person or corporation hired by the Owner, independent from the Contractor or Engineer, the Owner's Representative will perform the following:

- Observe and document activities related to the quality control of remedial activities from delivery of materials through installation
- Review contract documents
- Recommend to the Engineer changes in the CQA Plan and in the contract documents
- Communicate directly with the Owner
- Prepare weekly reports

Testing laboratory responsibilities. The testing laboratory utilized will meet the following requirements:

- Have an internal CQC plan in-place to confirm that laboratory procedures conform to the appropriate United States Environmental Protection Agency (USEPA) analysis methods, American Society for Testing and Materials (ASTM) standards, or other applicable standards and methods
- Follow internal CQC procedures
- Maintain sample chain-of-custody records
- Report results of testing

The testing laboratory will be required to allow the Owner, the regulatory agency, the Design Engineer, the CQC Inspector, the Installer, the Engineer, and the Owner's Representative to observe sample preparation, testing procedures, or record-keeping procedures upon request. The Owner, the NYSDEC, the Design Engineer, the Owner's Representative, and/or the Installer will be allowed to observe some or all tests on a particular job at any time, either announced or unannounced.

Manufacturer and fabricator responsibilities. The manufacturers and fabricators of material and equipment required for construction of the project will:

- Certify that materials manufactured or fabricated meet the specifications
- Provide MQC steps taken during manufacturing or fabrication
- Allow the Owner, the regulatory agency, the Design Engineer, the Engineer, the Owner's Representative, and the Installer to observe the manufacturing and fabrication process and MQC procedures

The manufacturer or fabricator should have an MQC officer designated to be in charge of the MQC program. The MQC officer will be the individual to contact with questions regarding MQC and for arranging site visits to inspect MQC procedures and fabrication procedures. The MQC Officer will also be responsible for directing personnel in charge of MQC.

Installer's responsibilities. The Installer is the contractor or subcontractor that installs manufactured and fabricated products, such as the sewer pipe liner. The Installer's responsibilities include the following:

- Maintaining a CQC Plan in-place for handling, storing, placing, and installing materials
- Handling, storage, placement, and installation of manufactured and fabricated materials
- Following CQC procedures
- Informing the Engineer of the schedule for installation of manufactured or fabricated materials

2.2 PERSONNEL QUALIFICATIONS

To confirm that the project is constructed in accordance with the approved design plans and specifications, it is important that organizations and personnel involved in implementing the remedy possess suitable qualifications to perform the work. This includes personnel responsible for CQA/MQA as well as the Contractor and the Contractor's CQC personnel. The following sections describe qualifications and minimum acceptable experience for positions identified in the CQA/CQC Plan.

Engineer. The Engineer will be required to be or work under the direction of a licensed professional engineer in the State of New York with demonstrated competency in similar projects. The Engineer will be responsible for observation of construction activities and will have a thorough familiarity with the project and testing requirements. The Engineer will also have experience in testing and inspection of earthwork, granular materials, geosynthetic materials, concrete, and site improvements.

Contractor. The general Contractor selected to construct this project will be required to present evidence of having experience in constructing projects of similar size and scope, including, but not limited to, projects requiring material excavation and off-site transportation/disposal of non-hazardous special wastes and hazardous wastes, construction water management, protection of utilities, bypass pumping, *in situ* lining of sewer pipe, and jet grouting.

CQC geotechnical laboratory. The CQC Geotechnical Laboratory will be an independent laboratory approved by the Engineer. The CQC Geotechnical Laboratory will not be owned by the Contractor and/or subcontractors or owned by a subsidiary of the Contractor and/or his subcontractors.

The laboratory will be qualified to perform geotechnical testing presented in the specifications and have a minimum of five years experience in testing soil properties required for the project. The laboratory will be required to submit references from three other similar projects. All laboratory test results will be certified by a Laboratory Manager with a minimum of two years of soils testing experience.

CQC analytical laboratory. The CQC analytical laboratory will be an independent laboratory approved by the Engineer. The CQC analytical laboratory will not be owned by the Contractor and/or subcontractors or owned by a subsidiary of the Contractor and/or his subcontractors.

The CQC analytical laboratory will be qualified to perform the analytical testing presented in the specifications. The laboratory will be required to submit references from three other similar projects. All laboratory tests will be certified by a Laboratory Manager with a minimum of two years of testing experience.

Manufacturers and fabricators. Manufacturers and fabricators of the pipe liner and geosynthetics will be required to have experience in manufacturing or fabricating similar materials for a minimum of five completed facilities of equivalent or larger scope. The manufacturers and fabricators will each be required to submit the list of facilities to the Engineer.

Installers. Installers of specified equipment and materials will be required to demonstrate experience in projects of similar size and nature as requested by the Engineer. Installers responsible specifically for the installation of the sewer pipe liner will be trained and qualified to install and test the pipe liner. *In situ* pipe liner installers will be required to demonstrate experience in installing the liner by inversion method or other approved method at a minimum of five completed facilities. The pipe liner installer will be required to submit the list of facilities to the Engineer.

2.3 LINES OF COMMUNICATION

An important component to the successful completion of any project is effective communication between the parties involved. The lines of communication shown in Figure 1 will be followed on this project.

The Engineer will notify the Owner's Representative when deficiencies in the work are noted based on field inspections, CQA/CQC or MQA/MQC results. The Engineer will notify the Owner' Representative and, if appropriate, order corrective measures or recommend work stoppage. Formal communications related to submittals and changes or modifications of work shall be made in accordance with the terms of the Contract Documents.

2.4 MEETINGS

To strengthen responsibility and authority, enhance communications, and maintain the progress of the work in an orderly and efficient manner, scheduled on-site construction and project management meetings will be held prior to and throughout the course of construction.

Pre-construction meeting. After award of the contract, a pre-construction meeting will be held. Attendees at this meeting may include:

- Regulatory representative (NYSDEC)
- Design Engineer (O'Brien & Gere Engineers)
- Engineer
- Owner's Representative
- Contractor

Representatives of the Owner may also attend this meeting.

The meeting will cover contractual obligations, scheduling, and construction details. Important objectives of the meeting directly related to construction quality will be to:

- Provide each organization with all relevant CQA/CQC and MQA/MQC documents and supporting information
- Familiarize all entities with this CQA/CQC Plan and its role relative to the plans and specifications
- Determine any changes to the CQA/CQC Plan that are needed to monitor that the Project will be constructed to meet or exceed the specified design

- Review the responsibilities of each organization
- Review lines of authority and communication
- Discuss the established procedures or protocol for observations and tests including sampling strategies
- Discuss CQC/MQC proposed by Contractors and Installers
- Discuss established procedures or protocol for handling construction deficiencies, repairs, and retesting
- Review methods for documenting and reporting inspection data
- Review methods for distributing and storing documents and reports
- Review work area security and safety protocols
- Discuss procedures for the location, storage, and protection of construction materials and for the prevention of damage to the materials from inclement weather or other adverse events
- Conduct a site walk to review the project site layout, construction material and inspection equipment storage locations.

Minutes of the pre-construction meeting will be kept by the Owner's Representative and distributed to all attendees.

Weekly construction meetings. Construction meetings will be held weekly to discuss project progress and scheduling. Attendees at the meeting may include the NYSDEC representative, Engineer, Owner's Representative, Contractor, and CQC Inspector (if applicable). The Owner may also attend. Items of discussion will include:

- The progress of the work to date
- The schedule to accomplish upcoming work tasks
- Problems encountered or anticipated during construction.

The Owner's Representative will keep minutes of the weekly progress meetings and distribute the minutes to all attendees and others affected by decisions or actions from each meeting.

Work deficiency meetings. In the event that problems or recurring work deficiencies arise or are foreseen during construction, a special meeting will be held to define and resolve the problems or deficiencies. At a minimum, attendees at the meetings should include a representative of the Contractor with decision making authority, the Engineer, and the Owner's Representative. It may also be necessary to have a representative of the Design Engineer attend. The meeting will be conducted in the following manner:

- Define the problem and discuss it among the attendees
- Propose and review alternate plans for solving the problem
- Implement the plan selected to resolve the problem or deficiency.

Minutes of the meeting will be kept by the Owner's Representative and distributed to all attendees.

3 CQA/CQC AND MQA/MQC

This CQA/CQC Plan will provide the basis for CQA/CQC and MQA/MQC activities associated with the remedial action at the Fulton Former MGP Site. Detailed information, including the frequency of inspection, field testing methods, sampling requirements for laboratory testing, testing procedures and equipment to be used, criteria for acceptance/failure, and a description of the corrective actions to be initiated upon test failure are also presented in the Technical Specifications, bound separately, and provided as part of the project's Contract Documents.

3.1 IN-SITU LINING OF STORM SEWER

The storm sewer will be cleaned, inspected, and relined in accordance with the Technical Specification Section 02623 - Cured-In-Place Pipe.

3.1.1 Manufacturing Quality Control

The liner for the pipe shall be polyester fiber felt tubing lined on the inside with polyurethane impregnated with a thermal-setting resin to seal against the internal circumference of the sewer. The liner shall be fabricated from materials which, when cured, will be chemically resistant to storm water and exposure to soil bacteria and any chemical attack which may be due to materials in the surrounding ground or typically associated with urban run-off (*e.g.*, oil, grease, road salt). The reinforcing material of the liner tubing shall be of a needle interlocked polyester felt or other material approved by the Engineer, formed into sheets of required thickness.

When cured, the liner shall extend over the entire length of pipe, manhole to manhole, as a continuous and mechanically locked tight fitting watertight pipe within a pipe. Liners shall be designed to withstand internal and/or external pressures for the specific field conditions. Where special conditions, strength requirements, etc., require, additional liner thickness shall be added in increments of 2.0 mm as determined by design calculations. Tubing shall not be less than 1/2-inch thick. The felt content shall be determined by the Contractor to ensure that the cured liner is the required thickness.

The cured liner shall meet the following initial structural properties:

- Flexural Strength (ASTM D790) 4,500 psi min.
- Flexural Modulus (ASTM D790) 250,000 psi min.

The Contractor will provide the Engineer with certified copies of the factory and laboratory test results prior to arrival of material on-site. In addition, the Contractor will provide the manufacturer's certification that the pipe lining material meets the chemical, physical, and manufacturing requirements.

Prior to procurement of any material, the Engineer will review and verify submittal and sample information from the Contractor. The information will be reviewed to evaluate compliance with the Contract Documents. The Engineer will return the submittals to the Contractor, and depending on the review (acceptance or non-acceptance), the Contractor will proceed with ordering the materials. Upon delivery of the pipe liner, the Engineer will visually inspect the material.

3.1.2 Construction Quality Assurance

A continuous video tape recording with audio of the entire length of the pipe inspected shall be made both before and after lining. It shall be the responsibility of the Contractor to clear the line of obstructions such as solids, mineral deposits, roots, grease, etc. that will prevent the liner installation.

During installation of the pipe liner, the Engineer will monitor that the liner is installed in accordance with the requirements of the manufacturer instructions, and the Contract Documents and Contract Drawings.

During the installation phase (inversion run), the liner will be visually inspected over the entire length of a run to verify it as being free from visual defects such as folds, foreign inclusions, dry spots, pinholes, and delamination. Any imperfections, such as those noted above, will be immediately repaired by the Contractor and reinspected.

Field samples of each inversion shall be taken in accordance with Section 8.1 of ASTM F1216. The Contractor shall conduct third party testing of each sample, per the requirements of Section 8.1 of ASTM F1216. Test results shall be submitted to the Engineer to show conformance of each liner section to the strength requirements of the specifications.

Also, gravity pipe leakage testing shall be conducted for each inversion per the requirements of ASTM F1216. If the liner fails to make a watertight seal at any manhole openings, laterals, or any other point in the sewer line, it will be the Contractor's responsibility to effectively seal and grout the openings at no additional cost to the Owner. The seal shall be of a resin mixture compatible with the liner pipe.

Liners which fail to meet the test requirements listed above will be considered defective.

3.2 JET GROUTING

Jet grout will be used to seal the bedding material of the storm sewer at the property line to minimize the potential for channeling of groundwater trough the sewer bedding. Installation requirements for the jet grouted bedding are described in Specification Section 02402-Jet Grouting.

3.2.1 Construction Quality Control

The Contractor will be required to review the Contract Documents for material and installation requirements to jet grout the buried utility bedding. Prior to ordering any materials, the Contractor shall review the Contract Documents and make all required submittals to the Engineer.

Submittals will typically include, but not be limited to, the following information:

- Contractor's work experience, where applicable.
- Resumes of the management, supervisory, and key personnel, for approval by the Engineer.
- A ground movement monitoring plan.
- A mix design for the project indicating sources and types of grout materials, with volumetric proportions, and field test data from previous projects indicating compressive strength achieved.
- Work procedures, sequence, and control criteria (including parameters for each stage).
- A general Work Procedures Plan outlining the spacing, location, depth and quantity of grout to achieve the specified criteria detailed in the technical specification.
- Accurate daily records of all jet grouting locations, depths of treatment, start and stop times, all jetting parameters, and grout injected for each location.
- Any change in the predetermined grouting program necessitated by a change in the subsurface conditions.

The Contractor will be fully familiar with the material and installation requirements of the jet grouted barrier and provide personnel to ensure that the correct material is handled and installed in the correct manner to provide a complete operating system in accordance with the separately bound Contract Documents and Contract Drawings.

The Contractor will be required to review the Contract Documents to determine the project survey and stakeout requirements for the installation of the jet grouted barrier at the locations shown or specified.

3.2.2 Construction Quality Assurance

Prior to the Contractor ordering any materials, the Engineer will review the shop drawings to evaluate compliance with the Contract Documents. The Engineer will return the shop drawings to the Contractor and depending on the review (acceptance or non-acceptance); the Contractor will proceed with ordering the materials.

The Engineer will observe and report to the Owner whether the Contractor is in general compliance with the accepted shop drawing submittals, including the use of correct materials and correct installation and testing.

The Engineer will inform the Contractor of all modifications to design, whether a change in layout, materials or installation.

3.3 EXCAVATED SOIL SAMPLING

The excavated soil will be segregated, to the extent practicable, into piles of soil visibly stained or containing visible tar or non-aqueous phase liquid (NAPL), and piles of soil appearing based on visual and olfactory observation to be potentially "clean". Soil appearing to be clean may potentially be used as backfill below a depth of 2 ft below ground surface (bgs), with concurrence of the Engineer and NYSDEC.

The piles of MGP-impacted soil will be disposed of off-site at an appropriate landfill permitted to receive the material, based on tests performed to characterize the material in accordance with Resource Conservation and Recovery Act (RCRA) requirements and those of the disposal facility. At minimum, the impacted soil to be disposed of off-site will be sampled at a frequency of 1 composite sample per 1000 tons, made of 5 grab samples representative of the waste, and each composite sample will be analyzed for RCRA characteristics of flammability, ignitability, toxicity, and corrosivity. Also, each composite sample will be analyzed for reactive cyanide and sulfide.

3.4 DEMARCATION LAYER FABRIC

A visible demarcation layer will be placed on top of soils left in place or backfill that potentially contains chemical concentrations exceeding 6NYCRR Part 375 Restricted Residential Use SCOs. The geotextile filter fabric will consist of a nonwoven, needle-punched geotextile. Prior to the work, the Contractor will be required to document that the physical properties of the geotextile filter fabric to be used to demark the extent of excavation comply with the requirements of Technical Specification Section 02278 – Geotextile Filter Fabric. The Contractor will provide the Engineer with certified copies of the factory and laboratory test results prior to arrival of material on-site. In addition, the Contractor will provide the manufacturer's certification that the geotextile filter fabric meets the chemical, physical, and manufacturing requirements.

Construction quality assurance. Prior to procurement of any material and during construction, the Engineer will review and verify submittal and sample information from the Contractor. The information will be reviewed to evaluate compliance with the Contract Documents. The Engineer will return the submittals to the Contractor, and depending on the review (acceptance or non-acceptance), the Contractor will proceed with ordering the materials. Upon delivery of the rolls of geotextile filter fabric, the Engineer will visually inspect the material.

During installation of the geotextile filter fabric, the Engineer will monitor that the geotextile filter fabric is installed in accordance with the requirements of the Contract Documents and as shown on the Contract Drawings.

During the installation phase, the geotextile filter fabric will be visually inspected for the following:

- Defects
- Rips

- Holes
- Flaws
- Deterioration
- Damage

Any imperfections, such as those noted above, will be immediately repaired by the Contractor and reinspected.

3.5 SELECT FILL, EMBANKMENT, AND TOPSOIL

3.5.1 Construction Quality Control

No material shall be imported to the site for use as backfill in the excavation or for other purpose until the results of tests have been accepted by the Engineer as complying with the project criteria.

The Contractor shall submit an affidavit from the owner of the source of each type of borrow material to be imported to the site stating that to the best of his knowledge, the site of the source material was never used as a dump site for chemical, toxic, hazardous or radioactive materials and it is not now, or ever has been, listed as a suspected depository for chemical, toxic, hazardous, or radioactive materials by any federal, state, or other governmental agency, department, or bureau. Also, the Contractor shall sample each different type of off-site material to be incorporated into the work at the location or locations identified by the Engineer. The Contractor shall perform analyses for Target Analyte List (TAL) volatile organic compounds (VOCs), TAL semi volatile organic compounds (SVOCs), TAL metals, cyanide (total and amenable), and polychlorinated biphenyls (PCBs), pesticides and herbicides for one composite sample of each source. Laboratory data shall be submitted to the Engineer for review, on Owner's behalf, immediately upon receipt and prior to use of the material on-site. The Engineer shall be the sole judge as to what constitutes each different type of material; however the definition of "different" shall include, but is not necessarily limited to, variances in the physical properties of the same material, as well as the same material derived from separate borrow sources or separate areas in the same borrow pit. The analytical results will be compared to the cleanup objectives set forth in 6 NYCRR Part 375 and must satisfy the soil cleanup objectives for the lower of the protection of groundwater or the protection of public health - residential. If the materials are found to be unacceptable by the Engineer, the Contractor shall remove and properly dispose of the materials in accordance with all applicable Federal, State and local laws and regulations at the Contractor's expense and liability.

The Contractor also will be required to collect samples of proposed select fill (if acceptable based on chemical analyses) and submit the samples to the CQC Geotechnical Laboratory for gradation and geotechnical testing in accordance with the Technical Specification Sections 02223 – Embankment, 02231 – Select Fill, and 02981 – Topsoil as applicable for the material shown on the Contract Drawing or specified for use by the Engineer, as applicable. Results of the tests will be provided to the Engineer for acceptance.

Construction quality assurance. Prior to procurement of any material and during construction, the Engineer will review and verify submittals and sample information from the Contractor. The information will be reviewed to evaluate compliance with the Contract Documents. The Engineer will return the submittals to the Contractor, and depending on the review (acceptance or non-acceptance), the Contractor will proceed with ordering the materials.

The material delivered to the site will be visually and continuously inspected by the Engineer to monitor that the submitted materials are used during construction. If changes in material occur prior to acceptance of the material by the Engineer, the material will be tested and evaluated with respect to the requirements of the Contract Documents. Any material not meeting the requirements will be removed from the site and replaced by the Contractor at no cost to the Owner.

4 DOCUMENTATION

This section describes the recordkeeping that will be used to document the CQA/CQC and MQA/MQC activities performed during construction of this project. The documentation will comprise the final records of the project, with the results of material and installation inspections and tests.

4.1 PROBLEM IDENTIFICATION AND CORRECTIVE MEASURE REPORTS

In the event that the Engineer determines that material or workmanship does not meet the requirements of the plans, specifications or CQA/CQC Plan, or if an obvious defect in material or workmanship is noted, the Engineer will complete a problem identification and corrective measures report.

4.2 MEETING MINUTES

Documentation of all meetings described in Section 2.4 of this plan will be maintained by the Owner's Representative in the form of written minutes or, for daily progress meetings, diary notes. Formal minutes of weekly meetings will be circulated by the Owner's Representative to all meeting attendees, the Engineer, the Contractor, and the Owner for review and comment.

4.3 PHOTOGRAPHS

All photographs taken by the Contractor will be recorded on a photo log which will include, at a minimum, the date, time, location, and description of the work.

4.4 RECORD DRAWINGS

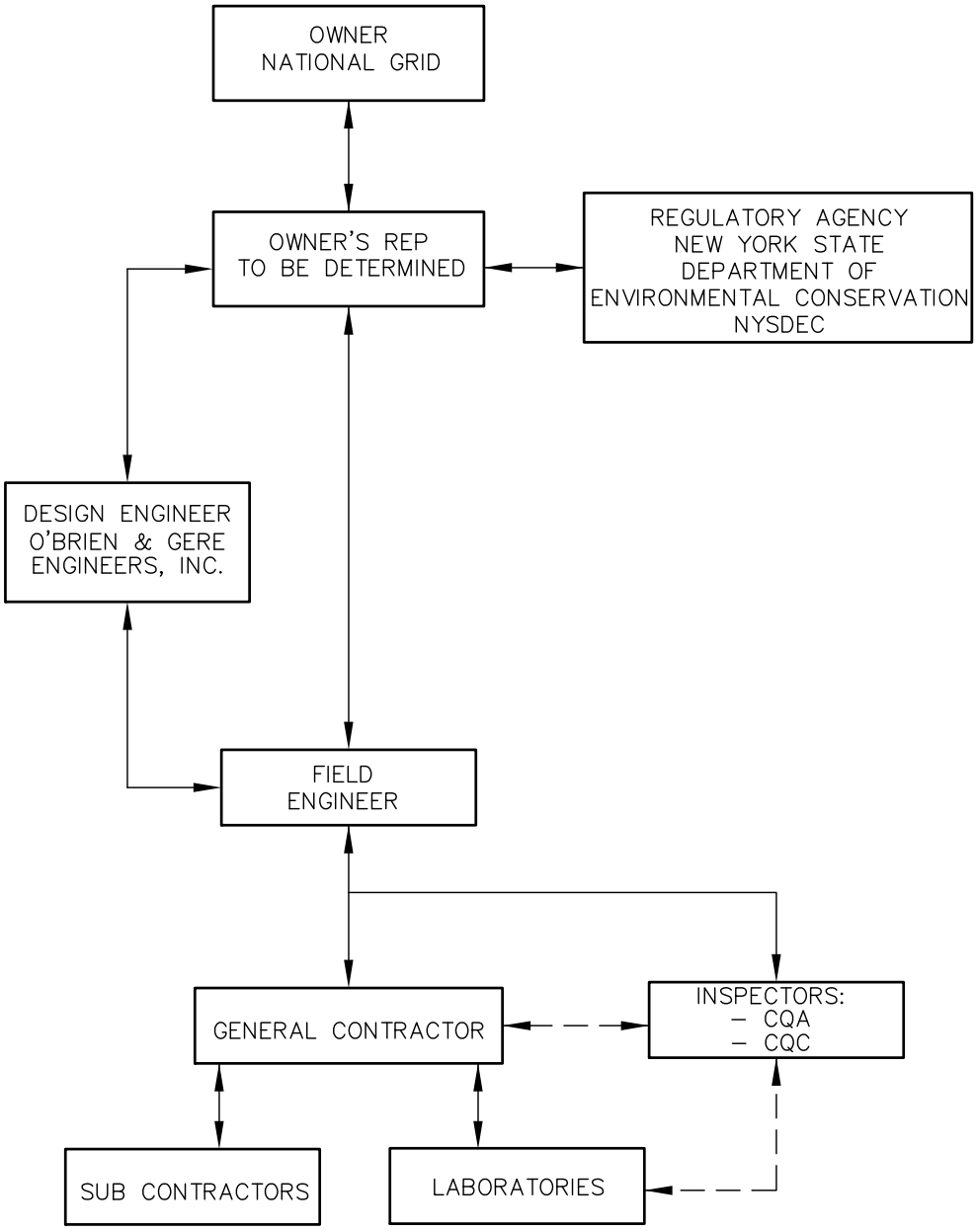
At the completion of the project, all as-built information will be transferred to a reproducible set of final record drawings by the Contractor to document site conditions.

4.5 STORAGE AND DISPOSITION OF RECORDS

During construction of this project, the Contractor will be responsible for all facility CQA/CQC and MQA/MQC documents. This includes a copy of the design criteria, Contract Documents and Drawings, the CQA/CQC Plan, and the originals of all the data sheets and reports. Duplicate records may be kept at other locations to avoid loss of this information if the originals are destroyed.

Copies of the documents shall be provided to the Engineer and Owners Representative, and the original documents will be stored in a manner that will allow for easy access while still protecting them from damage. All documentation will be maintained through the post-closure (30 years) monitoring period of the facility.

FIGURE 1



NATIONAL GRID
FULTON MANUFACTURED GAS PLANT SITE
SITE NO. 7–38–034

LINES OF COMMUNICATION

1118.44581.015
JANUARY 2011

O'BRIEN & GERE
ENGINEERS INC.

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Draft Site Management Plan

Former Manufactured Gas Plant Site
South First Street, Fulton
OSWEGO, NEW YORK

Site Management Plan

NYSDEC Site Number: 738034

Prepared for:
National Grid, Inc.
300 Erie Boulevard West
Syracuse, NY 13202

Prepared by:
O'Brien & Gere Engineers, Inc.
333 West Washington Street
Syracuse, NY 13221-4873

Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date
0	2/15/11	Draft Pre-Construction Submittal for NYSDEC Review	

FEBRUARY 2011

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SITE MANAGEMENT PLAN

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

This document is required as an element of the remedial program at Former Fulton Manufactured Gas Plant Site, South First Street, Fulton, New York (hereinafter referred to as the "Site") under the New York State (NYS) Environmental Restoration Program (ERP) administered by New York State Department of Environmental Conservation (NYSDEC). The Site was remediated in accordance with Order on Consent Index A4-0473-0000 (effective November 2003) for Site # 738034.

1.1.1 General

National Grid, Inc. entered into an Order on Consent with the NYSDEC to remediate a 1.04 acre property located on South First Street in Fulton, New York (Figure 1). This Order on Consent required the Remedial Party, National Grid, to investigate and remediate contaminated media at the Site.

The Site is bordered on the west by the Oswego River which, at this point, is also a branch of the New York State Barge Canal. South First Street passes through the Site dividing it into two parcels referred to as Area 1 and Area 2 lying to the east and west, respectively, of South First Street (Figure 2). Areas 1 and 2 are currently vacant and both are owned by National Grid.

The boundaries of the Site are more fully described in the metes and bounds site description that is part of the Environmental Easement.

After completion of the remedial work described in the Remedial Action Final Design (O'Brien & Gere, February 2011), some contamination was left in the subsurface

at this Site, which is hereafter referred to as 'remaining contamination." This Site Management Plan (SMP) was prepared to manage remaining contamination at the Site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by O'Brien & Gere Engineers, Inc., on behalf of National Grid, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated June 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement for the Site.

1.1.2 Purpose

The Site contains contamination left after completion of the Remedial Action (RA). Engineering Controls have been incorporated into the Site remedy to control exposure to remaining contamination during the use of the Site to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Oswego County Clerk, will require compliance with this SMP and all ECs and ICs placed on the Site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that remains at the Site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the Site after completion of the RA, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations (when applicable).

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for maintenance of containment.

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the Site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the environmental easement, which is grounds for revocation of the Certificate of Completion (COC);
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the Order on Consent (Index #A4-0473-0000; Site #738034) for the Site, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. In accordance with the Environmental Easement for the Site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The Site is located in City of Fulton in Oswego County, New York and is identified as Block xxxx and Lot xxx on the [Municipality or County Name] Tax Map. The Site is an approximately 1.04-acre area bordered on the west by the Oswego River. South First Street passes through the Site dividing it into two parcels referred to as Area 1 and Area 2 lying to the east and west, respectively, of South First Street (Figure 2). Areas 1 and 2 are currently vacant and both are owned by National Grid. The boundaries of the Site are more fully described in Appendix [x] – Metes and Bounds.

1.2.2 Site History

The Site operated as a manufactured gas plant (MGP) site producing manufactured gas from 1903 to 1932. The manufacturing process involved heating coal and petroleum products to produce combustible gas. The gas was cooled, purified and then piped to the end users. The former MGP facility included a gas holder, gas tank, oil tank, oil house, coke shed, tar well, and concentrator house (Figure 2). In general, Area 2 of the Fulton Site contained the gas production facilities and Area 1 contained facilities for storing and distributing the gas. As the gas was cooled and purified prior to distribution, a dark oily liquid known as coal tar condensed and accumulated in various gas plant structures. Tar leaking from the holders and other structures impacted soil and groundwater in the vicinity of the former MGP.

A Record of Decision (ROD) was issued by the NYSDEC in March 2009. As presented in the ROD, the remediation goals for the Site are to prevent, eliminate or reduce to the extent practicable:

- Ingestion/direct contact with contaminated soil;
- Inhalation of contaminants volatilizing from contaminated soil;
- Eliminate through removal, treatment and/or containment source areas in soil;
- Migration of contaminants into the adjacent surface water;
- Eliminate through removal, treatment and/or containment, the impact of soil to groundwater;
- Potential infiltration of chemicals of concern (COCs) into the storm sewer adjacent to Area 2 of the Site.

To meet these goals, the ROD presents the NYSDEC-selected remedy that includes the following elements:

- Implementation of a Remedial Design program.
- Excavation and removal to their full depth of all former MGP related structures and foundations in Areas 1 and 2 that contain MGP related contaminated materials.

Impacted soil in the immediate vicinity of the structures will be removed to the extent practicable.

- Excavation of approximately 2,822 cubic yards of soil grossly contaminated with MGP wastes. Materials will be excavated to depths of up to 7 feet below ground surface (bgs) or to the extent practicable due to dewatering limitations. The material to be excavated will include soil containing visible coal tar or separate phase materials. The actual depth of removal will be based on visual observations in the field with the concurrence of the NYSDEC. A visible demarcation barrier will be installed at the bottom of the excavation to mark the extent of soil removal prior to backfilling.
- Excavation areas will be backfilled with clean soil from off-site locations that meet NYSDEC's backfill criteria for intended site use. Excavated soil may be used to backfill the lower portions of the excavation if they meet NYSDEC criteria.
- Installation and maintenance of a soil cover over Areas 1 and 2. The soil cover will consist of a minimum of 2 feet of clean material meeting NYSDEC's backfill criteria. National Grid may propose to use other cover materials such as asphalt or other paving material to meet the next intended use of the property subject to NYSDEC approval. The type and nature of soil cover to be installed will be determined pursuant to 6 NYCRR Part 375.
- Groundwater treatment through the introduction of oxygen (or other nutrients, if necessary) in Areas 1 and 2 to enhance aerobic biodegradation of contaminants in groundwater *in-situ*.
- Rehabilitation of the storm sewer adjacent to and west of Area 2 to reduce groundwater infiltration into the storm sewer and prevent off-site migration of impacted groundwater. Measures to reduce migration of groundwater through soil bedding under the sewer line will be implemented.
- Imposition of institutional controls in the form of an environmental easement.

1.2.3 Geologic Conditions

Geology at the Site consists, from the surface down, of four primary geologic units:

- Fill
- Sand and silt
- Sand and gravel
- Till

Fill materials consist of sand, gravel and various debris such as brick fragments, asphalt pieces, cinders, glass and other material. In Area 1, fill materials range in thickness from 0.5 ft in the south central end to 8 ft in the northwest portion of Area 1. In Area 2, fill thickness ranges from 1.5 ft on the northwest side to 15 ft on the southwest Site boundary near the Oswego River. In general, fill thickness increases towards the river. A geologic section is shown in Figure [x].

Review of historic maps and aerial photographs indicates that the Oswego Canal was filled sometime between 1911 and 1938. Evidence of the former Oswego Canal (e.g., canal bottom and/or walls) was not observed during drilling performed as part of the Remedial Investigation (O'Brien & Gere, 2009a). Some historic maps indicate that the canal structure ended just north of the Site, such that the segment of the canal adjacent to the Site was not contained within structural walls. It is speculated that the canal channel was filled with several types of material, some similar to native soils. Thus, there is not a distinct subsurface material indicative of canal fill. Dredge spoils were reportedly placed on Yelverton Island (located between the canal and the Oswego River) and these materials may have also been used for fill in the canal.

The unit underlying the fill is a series of discontinuous layers of silt, silt and fine sand, sand, clay, and gravel. The thickness of this unit and the individual layers varies across the Site. However, as the unit approaches the river, the composition becomes primarily silt with obvious clay lenses. This unit is the result of historical depositional environments, such as recent processes of the Oswego River or historic streambeds

feeding into the river. As noted above, the deposits near the river may actually be local, native material that was placed in the former Oswego canal.

A glacial till unit, consisting primarily of sand with varying amounts of silt and gravel, overlies bedrock at the Site. The density of the till varies from loose at shallow depths to extremely dense with greater depth. The top of the till undulates and was observed from 5.3 ft on the northeast side of Area 1 to 26.2 ft near the river. Similarly, the top of the dense till is encountered at depths ranging from 12 ft on Area 1 and to 28.5 ft below land surface (bls) near the river. The top of the dense till layer slopes down toward the southwest and the river. The unit was fully penetrated in the center of Area 2 where bedrock was encountered at 36.5 ft below grade. At this location the dense till is 17.5 ft thick.

Shallow groundwater at the Site occurs between 1.5 ft below grade on Area 1 to 8 ft below grade to the southwest of Area 2. The resulting groundwater flow direction is to the south and west, ultimately discharging into the Oswego River. A groundwater flow figure is shown in Figure [x]. The local sand deposits have been designated as a Principal Aquifer by the NYSDEC. The aquifer is used by the City of Fulton for a public water supply but the nearest public supply wells are located approximately one mile upgradient (south) of the Site, outside the area subject to impact from the Site. There are no private water supply wells within that distance of the Site.

1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

A Remedial Investigation (RI) was performed to characterize the nature and extent of contamination at the Site. The results of the RI and other investigations are described in detail in the following reports:

- Preliminary Site Assessment Interim Remedial Measures (PSA/IRM) Study Report, May 1996 (O'Brien & Gere,1996)
- Soil Vapor Sampling Report (letter), October 19, 2007 (O'Brien & Gere, 2007)
- Soil Vapor Sampling Results (letter), September 15, 2008 (O'Brien & Gere, 2008)

- Remedial Investigation Report May 2006, revised March 2009 (O'Brien & Gere, 2009a)
- Feasibility Study Report, February 2009 (O'Brien & Gere, 2009b)

Evidence of past MGP practices was observed during field investigations performed at the Site between 1998 and 2005. Specifically, MGP-impacted material characterized by observations of odor, sheen, or blebs is noted in boring logs across the Site. Grossly impacted material, characterized by observations of non-aqueous phase liquid (NAPL) and NAPL-saturated soil, or a combination of heavy sheens and staining, was also noted in some borings at the Site. MGP-related constituents of concern (COCs) (benzene, toluene, ethylbenzene and xylene (BTEX), semivolatile organic compounds (SVOCs) summarized as total carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and total PAHs, and the inorganic compound cyanide) were detected in samples from various media at the Site.

The Feasibility Study Report (O'Brien & Gere, 2009b) presents a summary of the nature and extent of MGP-related material observed at the Site as summarized in this section. A detailed description of the nature and extent of contamination is presented in the Remedial Investigation (RI) Report (O'Brien & Gere, 2009a). The following presents a summary of the media of concern at each of the two areas of the Site that have been identified in the ROD. This summary is based on the information generated during the Remedial Investigation (O'Brien & Gere, 2009a) and the pre-design investigation.

1.3.1. Area 1

Structures

There were several former MGP structures located on Area 1, including two circular holders and two sets of tank cradles that formerly supported horizontal above-ground storage tanks (ASTs).

Surface Soil

As described in the ROD, two surface soil samples located in Area 1, SS-01 and SS-02, were identified during the RI as containing total PAH and/or total cPAH (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)-fluoranthene, chrysene, dibenzo[a,h]anthracene, and ideno(1,2,3-cd)pyrene) at concentrations that were

considered elevated in comparison to background concentrations. Soil in the vicinity of these samples was addressed as part of the remedy.

In addition to PAHs, cyanide was detected in the 0 to 2-inch and 0 to 24-inch intervals of surface soil sample SS-02 at concentrations ranging from 11 mg/kg to 810 mg/kg. Further sampling in the vicinity of SS-02 indicated that the extent of cyanide is limited to the immediate vicinity of SS-02; however, concentrations of cyanide at SS-09 were found to be 60 mg/kg. These concentrations are above the Restricted Residential Soil Cleanup Objective of 27 mg/kg. As outlined in the ROD, the concentrations of cyanide at SS-02 and SS-09 from the surface to 24 inches bgs was addressed during the remedy.

Subsurface Soil

Both analytical and visual evidence of grossly impacted material was observed in subsurface soil at two locations within Area 1. One area is located around SB-40 where stained soil was observed in the upper 4 ft. The second area is located in the vicinity of the northeastern concrete gas holder pad as shown on Figure 4. Subsurface soil from the adjacent properties bordering Area 1 did not exhibit MGP-impacted material. However, because of the proximity of this area to the property boundary, additional borings were completed as part of the pre-design investigation.

Two borings were originally proposed as part of the pre-design investigation to evaluate the extent of grossly impacted soil to the northwest of the large holder pad on Area 1. Boring SB-50 encountered a cobble with a thin (1/4") lens of NAPL at 8 ft below grade and some visible, pin-sized blebs of NAPL with coal tar odors between 8 and 9.7 ft. This boring is located approximately 6.5 ft from the property boundary and 20 ft from SB-15, where sheens, stained soils and odors were noted from 6 ft to approximately 8 ft below grade. The second boring, SB-49, did not encounter any impacted soil and the material beginning at 2.2 ft was dense native silt with clay.

An additional boring, SB-57, was completed on Area 1 during the pre-design investigation to further evaluate the potential southwestern extent of grossly impacted soil identified for removal. This boring is located approximately 12 ft south of SB-50 and did not encounter impacted soil. The area identified for excavation as shown on Figure 4 was developed based on information generated during the RI and augmented by the information obtained from the pre-design borings.

1.3.2. Area 2

Structures

The main production area of the former MGP was located on Area 2. The foundations associated with these former structures are outlined on Figure 4. In addition, a building that most recently served as a church was located on the southeast side of Area 2. This structure was demolished in 1992. However, the slab for this structure is still present and visible at the surface at the location shown in Figure 2.

The GPR survey identified portions of the foundation walls of the known former structures. However, the GPR signatures of the materials used for construction of the foundations were similar to that of the surrounding fill material such that the presence or absence of the individual structures could not be clearly confirmed in many instances. The survey did identify a deeper (approximately 10 ft) filled depression in the vicinity of the former tar well in the center of Area 2. In addition, the GPR survey identified one angular structure that was not previously known to have been present based on review of historical Sanborn maps. As shown on Figure 4, this structure is located on the west central portion of Area 2. As with the Area 1 structures, the GPR signature for this structure, as well as a small square area of a previously identified structure on the northwest corner of the area, suggested that a solid surface such as a foundation slab was present at a shallow depth.

Borings SB-53, SB-54, SB-55, and SB-58 were added to investigate the structures identified by the GPR survey as shown on Figure 4. The findings are as follows:

- SB-53 was completed on the western side of Area 2 near the exposed foundation wall where the GPR suggested a slab was present. This boring encountered crushed concrete and brick fill material with no visible impacts associated with MGP waste. A slab was not encountered.
- SB-54, completed in the area of the slab structure in the center of Area 2, encountered a 6-inch layer of concrete just below the asphalt. Concrete was also observed in boring SB-16 completed during the RI on the western end of the GPR anomaly, suggesting that this is a foundation with a slab. No visually impacted soil was encountered in SB-54 or SB-16.

- Borings SB-55 and SB-58 were completed in the vicinity of the suspected tar well based on the identification of a deeper, filled depression in the area during the GPR survey. NAPL-containing soil and associated sheens were encountered, however, no discrete pocket of NAPL or tar was observed.

Surface Soil

SS-4 is located adjacent to the pavement in Area 2 on the property owned by National Grid (Figure 4). This surface soil was found to contain cPAHs in excess of the background concentrations in the area and was addressed during the remedy.

Subsurface Soil

In Area 2, analytical and visual evidence of grossly MGP-impacted material was reported in subsurface soil in several areas. The observations generally begin 4 ft below grade and, in the southern corner of the area, extend to depths of up to at least 28 ft below grade. The widest zone of observed grossly MGP-impacted material was between 4 ft and 12 ft below grade. The MGP-impacted material extends off the National Grid property and onto the Canal Corporation property to the south, but was not observed adjacent to the Oswego River.

Impacted material was reported in subsurface soil in two additional off-site areas to the west of Area 2. One area, located west of the former Oswego Canal (vicinity of SB-43 and SB-44), was considered to be from cinders and other fill material known to be present and therefore, did not require remedial action. The second location was in the vicinity of the sewer line that runs along the southwestern side of Area 2 (vicinity of SB-14 and PZ-06). Although the materials observed were potentially MGP-related, the impacted materials may be associated with dredge spoils or canal sediments placed on, or relocated to, this area rather than migration of NAPL from Area 2, and therefore, were not identified as requiring remediation by the ROD.

1.3.3. Groundwater

Concentrations of BTEX compounds, PAHs, and cyanide above the groundwater screening criteria (NYSDEC TOGS) are limited to the shallow groundwater beneath Area 2. Constituent concentrations in off-site wells, including those between Area 2 and the Oswego River, are below the screening criteria. Groundwater with constituent concentrations above the criteria is likely captured via seepage to the storm sewer located directly southwest of Area 2. Video inspection directly upstream and downstream of the Site did not indicate any visible Site-related impacts. Samples from storm sewer manholes located 400 ft upstream and 600 ft downstream of the Site indicated the presence of low concentrations of benzene, ethylbenzene, and total xylenes in the downstream storm water sample. It is unclear whether this is the result of contribution from the property or influent from storm water discharges from nearby roadways or other potential sources.

Groundwater downgradient of Area 1 (MW-02) is not impacted. Although a slight sheen was noted on the saturated soil samples in the area of SB-15 and the recent boring, SB-50 (Figure 4), the lack of constituents of concern in MW-02 suggests that soil impacts are localized and not mobile.

1.4 SUMMARY OF REMEDIAL ACTIONS

The Site was remediated in accordance with the NYSDEC-approved Remedial Design dated [month, year].

The following is a summary of the Remedial Actions performed at the Site:

- Excavation and removal to their full depth of all former MGP related structures and foundations in Areas 1 and 2 that contained MGP related contaminated materials. Impacted soil in the immediate vicinity of the structures was removed to the extent practicable.
- Excavation of approximately ____ cubic yards of soil grossly contaminated with MGP wastes. Materials were excavated to depths of up to 7 feet below ground surface (bgs) or to the extent practicable due to dewatering limitations. The material excavated

included soil containing visible coal tar or separate phase materials. The depth of excavation was based on visual observations in the field with the concurrence of the NYSDEC. A visible demarcation barrier was installed at the bottom of the excavation to mark the extent of soil removal prior to backfilling.

- Excavated soil from the Site satisfying NYSDEC's backfill criteria was used to backfill the lower portions (greater than a depth of 2 ft bgs) of the excavation. Where necessary, additional clean soil from off-site locations satisfying NYSDEC's backfill criteria for intended site use was imported to the Site to backfill the excavations.
- Placed a soil cover over Areas 1 and 2. The soil cover consists of a minimum of 2 feet of clean material meeting NYSDEC's backfill criteria imported from off-site.
- Groundwater treatment through the introduction of oxygen (or other nutrients, if necessary) in Areas 1 and 2 to enhance aerobic biodegradation of contaminants in groundwater *in-situ*.
- Rehabilitation of the storm sewer adjacent to and west of Area 2 to reduce groundwater infiltration into the storm sewer and prevent off-site migration of impacted groundwater. Measures to reduce migration of groundwater through soil bedding under the sewer line were also implemented.
- Imposition of institutional controls in the form of an Environmental Easement

Remedial activities were completed at the Site in [month, year].

1.4.1 Removal of Contaminated Materials from the Site

This section should describe:

- Soil cleanup objectives used for the site.
- Materials removed.
- Quantities removed.
- Locations of material removed:
  - Figures of excavation and materials removed
  - Figures of backfill areas.

The following text should be included somewhere in this section:

A list of the soil cleanup objectives (SCOs) for the primary contaminants of concern (COCs) and applicable land use for this Site is provided in Table [x].

A figure showing areas where excavation was performed is shown in Figure [x]. Provide a contour figure showing the thickness of cut and backfill if available.

1.4.2 Remaining Contamination

This section should provide a sufficient summary of contamination remaining at the Site that anyone performing future excavations at the Site can anticipate the environmental conditions they will encounter.

- A narrative description of the remaining contamination, including:
  - A description of the demarcation layer;
  - A description of the depths at which the demarcation layer or surface of remaining contamination will be encountered, and at which contamination is no longer expected. If the upper surface of the remaining contamination zone varies due to differing cover types, a figure showing the elevations of top of remaining contamination zone should be included. Similarly the thickness of the remaining contamination zone may be shown on a figure.
  - If certain areas of the Site contain source areas or higher levels of contamination than others, these should be described.
  - If active utility lines or other subsurface infrastructure are present at the Site, contaminant levels in these areas must be described, so that future maintenance activities can be properly planned.
  - If contamination was not remediated due to the presence of buildings or critical infrastructure, and the decision document required this contamination to be removed if such infrastructure is replaced, this must be discussed. Alternatively, if this contamination is not to be remediated, this should also be identified.
- A summary of all contaminated soil and structures left on-site after remedy is complete. Include the following as applicable:

- Table of exceedances of applicable/relevant Track 1 SCOs (Part 375-6) after Remedial Action;
- Figure of exceedances of applicable/relevant Track 1 SCOs (Part 375-6) after Remedial Action (i.e., below the cover system);
- Figure of areas complying with unrestricted SCOs (Part 375-6) after Remedial Action;

The following text should be included somewhere in this section:

Table [x] and Figure [x] summarize the results of all soil samples remaining at the Site after completion of Remedial Action that exceed the Track 1 (unrestricted) SCOs.

Figure [x] summarizes the results of all soil samples remaining at the Site after completion of Remedial Action that meet the SCOs for unrestricted use of the Site.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 INTRODUCTION

2.1.1 General

Since remaining contaminated soil and groundwater/soil vapor exists beneath the Site, Engineering Controls and Institutional Controls (EC/ICs) are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management of all EC/ICs at the Site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of all EC/ICs on the Site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the Excavation Work Plan for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Site; and
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the site remedy, as determined by the NYSDEC.

2.2 ENGINEERING CONTROLS

2.2.1 Engineering Control Systems

Engineering controls at the Site include:

- Lining the storm sewer to prevent infiltration and conveyance of groundwater
- Jet grout injected into the sewer bedding at the property border to minimize the potential for channeling groundwater flow
- Utilization of an oxygen releasing compound to promote natural attenuation of the residual MGP compounds at the base of the excavation
- 2-ft thick soil cover satisfying the NYCRR Part 375 requirements for the intended site use placed above the backfilled excavations.

2.2.1.1 Storm Sewer Lining

The storm sewer pipe was lined in place using a polyester fiber felt tube, impregnated with a thermal-setting resin to seal against the internal circumference of the sewer. The liner was fabricated from materials which, when cured, are chemically resistant to storm water and traces of external exposure to soil bacteria and chemical attack which may be due to materials in the surrounding ground or typically associated with urban run-off (*e.g.*, oil, grease, road salt). The liner extends over the entire length of pipe from manholes MH-A to MH-B (Drawing G8) in a continuous and mechanically locked tight fitting watertight pipe within a pipe.

2.2.1.2 Soil Cover

Exposure to remaining contamination in soil/fill at the Site is prevented by a demarcation layer placed at the floor of excavation where MGP-impacted soil soil cover system placed over the Site. This cover system is comprised of a minimum of 24 inches of clean soil. The Excavation Work Plan that appears in Appendix A outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection and maintenance of this cover are provided in the Monitoring Plan included in Section 4 of this SMP.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

2.2.2.1 Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

2.3 INSTITUTIONAL CONTROLS

A series of Institutional Controls is required by the ROD to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the Site to restricted residential uses only. Adherence to these Institutional Controls on the Site is required by the Environmental Easement and will be implemented under this Site Management Plan. These Institutional Controls are:

- Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- All Engineering Controls on the Controlled Property must be inspected at a frequency and in a manner defined in the SMP.
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;

- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in this SMP;

Institutional Controls identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement.

The Site has a series of Institutional Controls in the form of site restrictions. Adherence to these Institutional Controls is required by the Environmental Easement. Site restrictions that apply to the Controlled Property are:

- The property may only be used for restricted residential or recreational use provided that the long-term Engineering and Institutional Controls included in this SMP are employed.
- The property may not be used for a higher level of use, such as unrestricted use without additional remediation and amendment of the Environmental Easement, as approved by the NYSDEC;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use;
- The potential for vapor intrusion must be evaluated for any buildings developed in the area noted on Figure [x], and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the property are prohibited;
- The Site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that

NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.3.1 Excavation Work Plan

The Site [has been, will be] remediated for restricted residential or recreational use. Any future intrusive work that will penetrate the soil cover, or encounter or disturb the remaining contamination, including any modifications or repairs to the existing cover soil will be performed in compliance with the Excavation Work Plan (EWP) that is attached as Appendix A to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the Site. A sample HASP is attached as Appendix [x] to this SMP that is in current compliance with DER-10, and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. Based on future changes to State and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-submitted with the notification provided in Section A-1 of the EWP. Any intrusive construction work will be performed in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (See Section 5).

The Site owner and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as building foundations and bridge footings). The Site owner will ensure that site development activities will not interfere with, or otherwise impair or compromise, the engineering controls described in this SMP.

2.3.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures located over areas that contain remaining contamination and the potential for soil vapor intrusion (SVI) has been identified (see Figure [x]), an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the

proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation.

SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

2.4 INSPECTIONS AND NOTIFICATIONS

2.4.1 Inspections

Inspections of all remedial components installed at the Site will be conducted at the frequency specified in the SMP Monitoring Plan schedule. A comprehensive site-wide inspection will be conducted annually, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether Engineering Controls continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;

- If site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system;

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this plan (Section 5).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the site by a qualified environmental professional as determined by NYSDEC.

2.4.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the Order on Consent, 6NYCRR Part 375, and/or Environmental Conservation Law.
- 7-day advance notice of any proposed ground-intrusive activities pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other Engineering Controls and likewise any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the Order on Consent, and all approved work plans and reports, including this SMP
- Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to [qualified environmental professional]. These emergency contact lists must be maintained in an easily accessible location at the Site.

Table [x]: Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Table [x]: Contact Numbers

[qualified environmental professional:]	[phone]

* Note: Contact numbers subject to change and should be updated as necessary

2.5.2 Map and Directions to Nearest Health Facility

Site Location: [insert information]

Nearest Hospital Name: [insert information]

Hospital Location: [insert information]

Hospital Telephone: [insert information]

Directions to the Hospital:

1. [insert information]
2.
3.

Total Distance: [insert information]

Total Estimated Time: [insert information]

Map Showing Route from the site to the Hospital:

[insert map]

2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Table [x]).

3.0 SITE MONITORING PLAN

3.1 INTRODUCTION

3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site, the soil cover system, and all affected site media identified below. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of groundwater;
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards;
- Assessing achievement of the remedial performance criteria.
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Annual monitoring of the performance of the remedy and overall reduction in contamination on-site will be conducted for the first 5 years. The frequency thereafter will be determined by NYSDEC. Trends in contaminant levels in groundwater in the affected areas will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in Table [x] and outlined in detail in Sections 3.2 and 3.3 below.

Table [x]: Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Matrix	Analysis

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

3.2 SOIL COVER SYSTEM MONITORING

Inspection of the soil cover will occur quarterly for the first year following construction or until such time that the NYDEC and National Grid agree that a sufficient grass cover has been established to prevent erosion. Following establishment of vegetation, routine inspection of the Site will be performed on an annual basis.

Additionally, an inspection of the Site will occur within one week after a 5-year storm event during the first year following construction. After the first year, inspection of the Site after a 5-year storm event may occur if prior to the storm event thinning of vegetation is noted. If thinning of vegetation is noted, the area will be re-seeded with a seed mixture of commercial stock appropriate for planting in New York State and fertilized.

The NYSDEC will be informed of the inspections, except those occurring after a storm event. The inspector will observe the condition of the Site for areas of thinning vegetation or other signs of vegetation stress, burrowing animals, settlement, erosion, or other damage to the soil cover.

Also, the drainage features on site will be inspected at the same frequency for accumulation of debris which may inhibit flow, ponds of water which might indicate settlement or scouring in or around structures, and for excessive scouring which may erode swales.

3.3 MEDIA MONITORING PROGRAM

3.3.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy. Groundwater samples will be collected from 9 wells (Figure X) to represent conditions upgradient, within, and downgradient of soil-removal areas within Area 1 and Area 2, as follows:

MW-1	MW-4	MW-11
MW-2	MW-5	MW-12S
MW-3	MW-7	MW-14

Monitoring well construction logs are included in Appendix [x].

3.3.2 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log presented in Appendix [x]. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

Groundwater samples will be collected using low-flow sampling methods. The samples will be collected using a bladder pump with dedicated tubing. In accordance with the USEPA guidance, the flow rate for sampling shall not exceed 0.5 liters/min.

Measurements of temperature, pH, specific conductance, dissolved oxygen, redox potential (ORP), and turbidity will be taken in the field at the time of sample collection using a flow-through cell and turbidity meter. Measurements will be recorded on the sampling log at time intervals sufficient to evacuate the volume of the flow-through cell.

The sample will be collected after equilibration of water quality parameters. Equilibrated trends are generally obvious and usually follow either an exponential decay or asymptotic trend during purging. The equilibration guidelines are as follows:

Temperature	± 3% of measurement
pH	± 0.1 pH units
Specific conductance	± 3% of measurement
ORP	±10 mV
DO	±10% of measurement
Turbidity	± 10% of measurement

If the indicator field parameters have not equilibrated within the above specified limits after 4 hours of purging, then one of the following options may be taken: 1) continue purging until stabilization is achieved; or 2) discontinue purging and collect samples (document attempts to achieve stabilization). The total volume of water purged and purging time will be recorded on the sampling log for future reference.

At the time the sample is collected, additional field analyses will be completed for ferrous iron and dissolved oxygen using field titration kits. These results will be recorded on the sampling log.

3.3.3 Analyses Protocol

The collected samples will be delivered under chain-of-custody documentation to a laboratory for analysis. The laboratory selected will have ELAP certification for completion of analyses in accordance with the New York State Contract Laboratory Protocol (CLP) using the NYSDEC Analytical Services Protocol (ASP), if available. The analyses to be completed include the following:

Parameter	**Analysis method**
Volatile Organic Compounds (VOCs)	8260
Semivolatile Organic Compounds (SVOCs)	8270
Sulfide	SM 4500 S2 E
Methane	8015
Total Organic Carbon (TOC)	SM 5310 B
Chemical Oxygen Demand (COD)	410.4
Alkalinity	SM 2320 B
Sulfate	375.4
Nitrate	353.2
Nitrite	353.2
Dissolved Oxygen	Field Test
Dissolved Ferrous Iron	Field Test
Total & Dissolved Iron	6010
Total & Dissolved Manganese	6010

Samples will be analyzed using conventional laboratory methods and internal quality assurance and quality control (QA/QC) procedures. A blind duplicate and a trip blank (VOCs only) will be used for QA/QC purposes. The laboratory will be requested to provide Level I (data only) results. The data will not be validated.

3.3.4 Monitoring Well Repairs, Replacement and Decommissioning

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.4 SITE-WIDE INSPECTION

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, an inspection form will be completed (Appendix [x]). The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that site records are up to date.

3.5 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the site (Appendix [x]). Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
    - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
    - Sample holding times will be in accordance with the NYSDEC ASP requirements.
    - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:
    - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
    - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.

3.6 MONITORING REPORTING REQUIREMENTS

Forms and any other information generated during regular monitoring events and inspections will be kept on file. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP.

All monitoring results will be reported to NYSDEC on a periodic basis in the Periodic Review Report. The report will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected (e.g., groundwater);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC. A summary of the monitoring program deliverables are summarized in Table [x] below.

Table [x]: Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC

4.0 OPERATION AND MAINTENANCE PLAN

4.1 INTRODUCTION

The Site remedy does not rely on any mechanical systems, such as sub-slab depressurization systems or air sparge/soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

5. INSPECTIONS, REPORTING AND CERTIFICATIONS

5.1 SITE INSPECTIONS

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedule provided in Section 3 Monitoring Plan of this SMP. At a minimum, a site-wide inspection will be conducted annually. Inspections of remedial components will also be conducted whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

A general site-wide inspection form will be completed during the site-wide inspection (see Appendix [x]), subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format in the Periodic Review Report.

5.1.3 Evaluation of Records and Reporting

The results of the inspection and site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- The site remedy continues to be protective of public health and the environment and is performing as designed in the RAWP and FER.

5.2 CERTIFICATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

After the last inspection of the reporting period, a qualified environmental professional or Professional Engineer licensed to practice in New York State will prepare the following certification:

For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;
- The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the site is compliant with the environmental easement;
- The engineering control systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program; and
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class “A”

misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] for the site.

The signed certification will be included in the Periodic Review Report described below.

5.3 PERIODIC REVIEW REPORT

A Periodic Review Report will be submitted to the Department every year, beginning eighteen months after the Certificate of Completion or equivalent document (eg., Satisfactory Completion Letter, No Further Action Letter, etc.) is issued. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in Appendix B (Metes and Bounds). The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. Media sampling results will also incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- Groundwater data summary tables and graphical representations of contaminants of concern, which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A site evaluation, which includes the following:

- The compliance of the remedy with the requirements of the site-specific ROD;
- Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
- Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
- The overall performance and effectiveness of the remedy.

The Periodic Review Report will be submitted, in hard-copy format, to the NYSDEC Central Office and Regional Office in which the site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation.

5.4 CORRECTIVE MEASURES PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

APPENDIX A – EXCAVATION WORK PLAN

Future excavation on site will not be allowed without first receiving written approval from National Grid and the NYSDEC. If excavation is necessary, an Excavation Work Plan will be required to be prepared and provided to National Grid and the NYSDEC describing the reason for excavation, proposed limits of excavation (horizontal and vertical), and detailing how material (e.g. soil, construction water, etc) will be managed and if necessary disposed.

Any excavation on site deeper than a depth of 2 ft bgs must be made and supervised by individuals having been 40-hour trained in accordance with 29 CFR 1910. If soil is removed from below the demarcation fabric and depth of 7 ft bgs, that soil must be handled as potentially MGP impacted material, tested and analyzed for MGP parameters including volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs), metals, ammonia and cyanide (total and amenable).

Soils excavated from a depth below 7 ft bgs shall be stockpiled in a dedicated material staging area for subsequent transportation to an off-site treatment/disposal facility on National Grid's approved waste transportation and disposition vendor list (Attachment X).

The Contractor shall be responsible for all stabilization and dewatering activities associated with excavated soils prior to the transportation of such materials to the approved off-site treatment/disposal facility. The means and methods of stabilization/dewatering shall be in accordance with the Remedial Design. At a minimum, excavated soils must pass Paint Filter testing procedures prior to the transportation of such materials to the approved offsite treatment/disposal facility.

The Contractor shall complete and submit a waste profile to the approved treatment/disposal facility, and appropriately containerize (i.e., completely line and cover waste hauling vehicles), label, and transport the soils to the off-site treatment/disposal facility in accordance with applicable rules and regulations. The Contractor will be responsible for preparing all waste profiling and manifest forms. National Grid will

review and approve waste profiles and draft manifests prior to off-site disposition of materials and will sign all waste manifests/bills of lading as long as it owns the Site.

Dependent on the results of the waste characterization activities, the soil excavated from below 7 ft bgs may be treated/disposed in a manner consistent with the NYSDEC program policy, Technical and Administrative Guidance Memorandum (TAGM) 4061, *Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants* (NYSDEC, 2002). The policy outlines criteria wherein soil that has been contaminated with coal tar waste from MGPs exhibiting only the hazardous waste toxicity characteristic for benzene (D018) may be excluded from the requirements of 6 NYCRR Parts 370-374 and 376 when they are destined for permanent thermal treatment.

A-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

[Name of Regional Hazardous Waste Remediation Engineer]

Regional Hazardous Waste Remediation Engineer

[Address of Regional Office where the site is located]

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control,
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work,
- A summary of the applicable components of this EWP,

- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in Appendix [x] of this document,
- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

A-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

A-3 STOCKPILE METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC.

A-4 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

A-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Truck transport routes are as follows: [describe route and provide map]. All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport; [(g) community input [where necessary]]

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

A-6 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class

of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

A-7 MATERIALS REUSE ON-SITE

Chemical criteria for on-site reuse of material have been approved by NYSDEC and are listed in DER-10 for restricted residential use (6 NYCRR Part 375). The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below a demarcation layer or impervious surface, and will not be reused within a cover soil layer (from ground surface to 2 ft bgs), within landscaping berms, or as backfill for subsurface utility lines.

Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

A-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

A-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the Remedial Action Final Design and Record of Decision. The demarcation layer, consisting of a geotextile filter fabric specified in the final design or equivalent material, will be replaced to provide a visual reference to the top of the 'Remaining Contamination Zone', the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this Site Management Plan. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the Remaining Contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in any updates to the Site Management Plan.

A-10 BACKFILL FROM OFF-SITE SOURCES

This section should describe all methods to be followed for the import, handling and placement of backfill material from off-site. The following topics should be covered:

- Source area approval process
  - Sources of backfill material
    - Past use of site
    - Source area background check
    - DOT Certification
  - Chemical sampling
    - Analytes
    - Frequency
  - Imported Soil Chemical Quality Standards
    - Applicability of protection of groundwater SCOs
    - Applicability of protection of ecological resources SCOs
- Procedure for determining if reuse is appropriate
  - Sampling (methods and analytical)
- Stockpile procedures for imported backfill material
  - Size of stockpiles, cover, etc.

The following text should be included somewhere in this section:

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in Table [x]. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

A-11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are

accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

A-12 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

A-13 COMMUNITY AIR MONITORING PLAN

This section should provide all details of the Community Air Monitoring Plan. Guidance can be obtained in Appendix 1A of DER-10, Generic Community Air Monitoring Plan. At a minimum, this section must include:

- Details of the perimeter air monitoring program;
- Action levels to be used;
- Methods for air monitoring ;
- Analytes measured and instrumentation to be used;

- A figure of the location(s) of all air monitoring instrumentation. A figure showing specific locations must be presented for monitoring stations based on generally prevailing wind conditions, with a note that the exact locations to be monitored on a given day will be established based on the daily wind direction.
  The following text should be included somewhere in this section:

A figure showing the location of air sampling stations based on generally prevailing wind conditions is shown in Figure [x]. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations. If a sensitive receptor, such as a school, day care or residential area is adjacent to the site, a fixed monitoring station should be located at that site perimeter, regardless of wind direction, and discussed in the text.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

A-14 ODOR CONTROL PLAN

NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work if necessary, is the responsibility of the property owner's remediation Contractor, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

A-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

A-16 OTHER NUISANCES

A plan will be developed and utilized by the Contractor for all remedial work to ensure compliance with local noise control ordinances.

REFERENCES

NYSDEC, 2009. Record of Decision, New York State Department of Environmental Conservation, March 2009.

O'Brien & Gere Engineers, Inc., 1996, Preliminary Site Assessment Interim Remedial Measures (PSA/IRM) Study Report, May 1996.

O'Brien & Gere Engineers, Inc., 2007, Soil Vapor Sampling Report (letter), October 19, 2007.

O'Brien & Gere Engineers, Inc., 2008, Soil Vapor Sampling Results (letter), September 15, 2008.

O'Brien & Gere Engineers, Inc., 2009a, Remedial Investigation Report May 2006, revised March 2009.

O'Brien & Gere Engineers, Inc., 2009b, Feasibility Study Report, February 2009.