

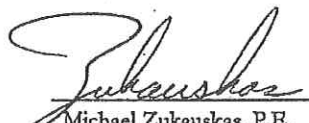
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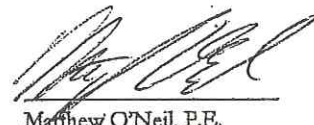
**FINAL Phase I Remedial Action Work Plan**  
**Glen Cove Former Manufactured Gas Plant**  
Glen Cove, Town of Oyster Bay  
Nassau County, New York  
Order on Consent Index No. D1-001-98-11  
Site No. 1-30-089P

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## **Professional Engineer's Certification**

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I Michael D. Zukauskas certify that I am currently a NYS registered professional engineer and that this Remedial Action Work Plan was prepared in substantial accordance with applicable statutes, regulations, and the DER Technical Guidance for Site Investigation and Remediation (DER-10).

June 1, 2010  
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## Abbreviations and Acronyms

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bgs	below ground surface
BUG	Brooklyn Union Gas
CAMP	Community Air Monitoring Plan
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Contaminants of Concern
COPECs	Chemicals of Potentially Ecological Concern
CRZ	Contamination Reduction Zone
DER	Department of Environmental Remediation
DNAPL	Dense Non-Aqueous Phase Liquid
EPA	United States Environmental Protection Agency
EZ	Exclusion Zone
Frac	Fractionation
GEI	GEI Consultants, Inc.
GTE	GeoTesting Express
HASP	Health and Safety Plan
HAS	Hollow Stem Auger
IRM	Interim Remedial Measure
LILCO	Long Island Lighting Company
LIPA	Long Island Power Authority
LIRR	Long Island Railroad
LNAPL	Light Non-Aqueous Phase Liquid
MGP	Manufactured Gas Plant
MNA	Monitored Natural Attenuation
NAPL	Non-Aqueous Phase Liquid
NCHD	Nassau County Health Department
NCDPW	Nassau County Department of Public Works
NTUs	Nephelometric Turbidity Units
NYCRR	New York Codes, Rules, and Regulations
NYSASP	New York State Analytical Service Protocol
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORP	Oxygen Reduction Potential
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbon

## Abbreviations and Acronyms (continued)

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PCBs	Polychlorinated Biphenyls
PPE	Personal Protective Equipment
PS&S	Paulus, Sokolowski, and Sartor Engineering, PC
PVC	Polyvinyl Chloride
RA	Remedial Action
RAP	Remedial Action Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RIR	Remedial Investigation Report
ROW	Right of Way
SARA	Superfund Amendments and Reauthorization Act
SCGs	Standards, Criteria, and Guidance
SCOs	Soil Cleanup Objective
SVOCs	Semivolatile Organic Compounds
SZ	Support Zone
TCLP	Toxic Characteristic Leaching Procedure
UDC	Utility Detection Corporation
VOCs	Volatile Organic Compounds
<b>MEASUREMENTS</b>	
ft	Feet
ft-msl	Feet above mean sea level
bgs	below ground surface
mg/kg	milligrams per kilogram
ug/L	micrograms per liter

# 1. Introduction

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National Grid has prepared this Remedial Action (RA) Phase I Work Plan to address the partial removal of Manufactured Gas Plant (MGP)-related source material observed in the subsurface at the Glen Cove former MGP site (the Site) located in Glen Cove, Nassau County, New York (**Figure 1**). The Site is currently occupied by an active electric system substation, owned by the Long Island Power Authority (LIPA). This RA Phase I represents a portion of the complete site remedy detailed in the *Remedial Action Plan, Glen Cove Former Manufactured Gas Plant, Town of Oyster Bay, Nassau Country, New York* (RAP) prepared by GEI Consultants, Inc. (GEI), dated March 2010.

The selected remedy includes the excavation of shallow soils and off-site disposal of accessible MGP-related source material (or “hot spots”), groundwater treatment using oxygen injection technology, and the installation of recovery wells to remove mobile non-aqueous phase liquids (NAPL). Source material is defined in 6 NYCRR Part 375-1.2(a). For the purposes of this Site, source material consists of materials containing tar or oil-like materials, where individual droplets, pools, or stringers are visible to the naked eye. The current property owner, LIPA, is planning to conduct a facility upgrade beginning in September 2010. The upgrade will include the installation of underground utilities, foundation, pilings, and associated electric equipment. LIPA is planning to upgrade this substation to meet the growing energy demand in the Glen Cove region. There are two nearby substations; however they will not be able to supply the entire load of the Glen Cove area. Therefore, the substation cannot be taken out of service to accommodate complete removal of all impacted materials. LIPA has requested that the hot spot excavation activities be performed prior to the upgrade.

To accommodate the planned substation upgrade the RA has been divided into two phases. Phase I will consist of the excavation portion of the remedy which will be completed prior to LIPA commencing its improvement of the substation facility, and the pilot test of the oxygen injection system which shall be performed after LIPA has complete their work on the Site. The second phase of the RA will consist of the remaining portion of the remedy as detailed in the RAP which shall include the installation of the full oxygen injection system and the recovery wells. Phase II of the RA will not commence until LIPA has completed the Glen Cover substation upgrade. A work plan detailing the execution of Phase II of the RA will be issued under separate cover.

LIPA has emphasized that they will not permit remedial work during the summer of 2010 as this is the period when the need for optimal substation operation is the most critical.

Therefore, Phase I of the RA will be conducted during spring of 2010 and completed prior to the facility upgrade work.

This Phase I RAWP has been prepared to be consistent with the Order on Consent, Index Number D1-001-98-11 (the Order) signed by National Grid and the New York State Department of Environmental Conservation (NYSDEC), the factors set forth in Title 6 of the New York Code of Rules and Regulations Part 375 (6 NYCRR Part 375) for remedial action, and NYSDEC *Draft DER-10* [Department of Environmental Remediation] *Technical Guidance for Site Investigation and Remediation*. This Phase I RA Work Plan describes the Phase I remedial action goals and objectives as well as the techniques used for material handling, waste characterization, processing, transportation, and disposal of the MGP-related source material. This effort will be performed under the approval and oversight of the NYSDEC and the New York State Department of Health (NYSDOH).

## 1.1 Work Plan Organization

This Phase I RA Work Plan has been organized as follows:

- Section 1, the introduction, describes the purpose and objectives of the Phase I RA. It also includes a description and historical information relative to the Site and information on previous site investigations including the pre-characterization program.
- Section 2 presents the Phase I RA goals and objectives.
- Section 3 presents a summary of the Phase I RA scope of work.
- Section 4 presents the vapor/odor management program.
- Section 5 describes the erosion and sediment control plan.
- Section 6 presents the Site security plan.
- Section 7 presents the equipment decontamination plan.
- Section 8 includes the waste management practices for the Phase I RA.
- Section 9 provides sample methodology and frequency for documentation sampling.
- Section 10 provides the plan for managing groundwater in the excavation.
- Section 11 outlines the traffic control concerns and measures for the Site.
- Section 12 presents the proposed schedule for implementation of the Phase I RA.
- Section 13 discusses the Completion Report to be prepared following completion of the remedial action.

## 1.2 Site Description and History

The Glen Cove Former MGP site is an inverted L-shaped parcel of approximately 1.9 acres presently occupied by an active electrical substation (**Figure 2**) which services Glen Cove and the surrounding area. Topographically, the Site is a flat depression bounded by approximately 20-foot high slopes to the north, south and east.

To the west, the property slopes downward about 17 ft to Glen Cove Creek, a channelized stream, which eventually discharges to Hempstead Bay. The Site is bordered by a health club parking area to the north, with the Long Island Railroad (LIRR) tracks to the northwest, mixed commercial/residential properties to the south and east, and Glen Cove Arterial Highway (Route 107) right-of-way (ROW) to the west. Glen Cove Creek flows in a general south to north direction along the western property line. It approaches the property via a culvert which passes beneath Route 107 and flows along the property line in an open channelized section. The creek leaves the property boundary at the northwest corner of the Site through a box culvert that directs flow beneath the LIRR tracks. The creek eventually discharges to Mosquito Cove (Hempstead Bay).

The Site is located in a flat depression bounded by approximately 20-foot high slopes to the north, south and east. Vehicle access to the Site is limited to a one-lane steeply-graded access road from Grove Street from a residential neighborhood terminating at the flat area in the center of the Site. The active LIPA substation, located on the flat portion of the Site, is an important component of the utility's infrastructure. The substation is fenced, as is access to the wooded western portion of the Site, and access from Grove Street. An easement runs along the north boundary of the property parallel to the health club property terminating to the east at Cedar Swamp Road.

MGP operations at the Site began in 1905 under the ownership of the Sea Cliff and Glen Cove Gas Company. The facility's footprint was relatively small and remained unchanged through its operational period, which ended in 1929. Facility structures were located on the northern section of the property, and consisted of a 60,000 cubic foot gas holder; boilers, purifiers, retorts, coal shed, engine room, tar and oil tank; and approximately eight gas tanks. In 1923, Sea Cliff and Glen Cove Gas Company was purchased or merged with the Long Island Lighting Company (LILCO). A 40,000 cubic foot high pressure Hortonsphere gas holder was added to the facility in the southwestern portion of the Site in 1925 for gas distribution purposes.

In 1929, LILCO terminated MGP operations and demolished the facility's surface structures sometime thereafter. Site activities following 1929 consisted solely of natural gas storage in the Hortonsphere gas holder through the 1950s. The Hortonsphere was decommissioned and demolished between 1959 and 1966. A major electrical substation was constructed on the Site in the mid-1960s. In 1998, Brooklyn Union Gas (BUG) and LILCO merged to form the KeySpan Corporation, at which time the ownership of the substation was transferred to Long Island Power Authority (LIPA). In 2007, National Grid acquired responsibility for the former MGP property through the acquisition of KeySpan. Currently, the Site is owned by LIPA and operated by National Grid under contract to LIPA.

The substation footprint is coincidental with the majority of the main operations area of the former MGP. High voltage transmission lines transverse the fenced substation area and the west and northwest sections of the Site both aerially and below grade (**Figure 3**).

Through the 2007 acquisition of KeySpan, National Grid has accepted responsibility for addressing the environmental issues at the Site. As such, National Grid will be referenced in the performance of all past and future work throughout the remainder of the document.

### **1.2.1 Geology**

The shallow stratigraphy beneath the Site is considered heterogeneous fill and Upper Pleistocene deposits. The stratigraphic sequence consists of outwash deposits overlain by heterogeneous fill. The heterogeneous fill across most of the Site ranges in thickness from approximately 10 ft throughout most of the former site to 30 ft in the off-site area just north of the Site boundary. The fill composition is primarily poorly sorted and highly permeable sand and gravel with varying percentages of gravel, silt, clay, and coal fragments. The glacial outwash deposits consist mainly of interbedded layers of permeable sand and gravel, and less permeable silty sand. The top of the glacial unit was encountered from approximately 10 ft below ground surface (bgs) on the central portion of the Site to approximately 32 ft bgs from the top of the railroad embankment. The ground surface elevation of the Site is significantly lower than the top of the railroad embankment and when factoring in the ground surface elevation difference, the glacial deposits are encountered at similar elevations across the Site and beneath the railroad embankment.

Glen Cove Creek originally occupied a natural stream channel just to the west of the Site before it was channelized along its present alignment. The natural creek bed is indicated by the alluvial deposits consisting of reworked glacial outwash present along the western boundary of the Site. The alluvial deposits associated with the original stream channel consist of isolated sand and gravelly sand layers encountered in the upper 5 to 10 ft of soils at the western site boundary.

### **1.2.2 Hydrogeology**

The groundwater beneath the Site is considered part of the regional Upper Glacial aquifer. Regionally, this aquifer is not used for drinking water. Drinking water for Long Island is provided by the deeper Magothy aquifer. The Upper Glacial aquifer occurs in the glacial outwash encountered beneath the Site. Outwash soils encountered during well installation were permeable sands and gravelly sands with little to no fines interbedded with less permeable silty sands. These soil types are consistent with the Upper Glacial aquifer matrix description and the observed interbedding of permeable and lower permeability soil is consistent with the regional anisotropy (horizontal to vertical) of 10:1.

The observed interbedding and resulting anisotropy significantly limits the rate of vertical flow and migration as compared to the horizontal direction.

Groundwater elevations of site wells were similar for the shallow and intermediate wells ranging from about 43 to 53 ft above mean sea level (ft-msl). In general, groundwater is encountered near the base of the fill layer at the Site. Groundwater elevation contours indicate a consistent groundwater flow direction to the west for the shallow zone wells (3 to 22 ft bgs) and the west-northwest for the intermediate zone (16 to 36 ft bgs). The potentiometric surface in the shallow groundwater follows the general topography of the Site sloping from east to west. The hydraulic gradient is relatively steep (0.06 feet/foot) in the eastern and western portions of the Site and less steep (0.02 feet/foot) in the central portion of the Site with an average gradient of 0.04 feet/foot. A uniform hydraulic gradient of about 0.01 feet/foot appears in the intermediate groundwater across the Site. The estimated groundwater seepage flow velocities, assuming an effective porosity of 20%, were calculated for the shallow and intermediate aquifer zones as 0.044 and 0.001 ft/day, respectively.

The potential vertical hydraulic gradient in the central portion of the Site indicated a downward potential vertical gradient. An upward potential vertical gradient was present along the Site's western boundary. Wells installed off-site to the north of the Site showed variable potential vertical gradients likely due to recharge from rainfall events.

### **1.2.3 Remedial Investigation Findings for Soil**

A number of investigations were performed to characterize the Site conditions and identify impacts to soil. Based on the findings of the previous investigations, the Remedial Investigation (RI) program, and subsequent investigations, the following conclusions were reached in the RI:

- The shallow stratigraphy beneath the Site consists of approximately 10 to 30 feet of heterogeneous fill soil at the surface overlying Upper Pleistocene glacial deposits. The fill soils are underlain by glacial outwash deposits to the greatest depth investigated (82 feet). The outwash deposit soils consist of highly permeable sands and gravelly sands interbedded with lower-permeability silty sands which appear to have retarded the vertical migration of dense non aqueous phase liquid (DNAPL) at the Site.
- Groundwater was generally encountered near the base of the fill soils at a depth of 8 feet bgs on the Site proper and is part of the regional Upper Glacial Aquifer. Groundwater flows in an east to west direction across the Site to Glen Cove Creek and eventually enters Glen Cove Creek as a non-point discharge.

- The areal extent of the visually apparent residual MGP-related impacts is limited to areas beneath or in the immediate vicinity of the former MGP operations in the northern and western portions of the Site and just beyond the Site limits to the north.
- The vertical distribution of MGP-related visual impacts begins at the water table, at a depth of 8 feet as DNAPL/tar saturation and blebs, and their occurrence reduces with depth. The interbedded lower-permeability silty sand layers appear to have contributed to the limited vertical extent of DNAPL migration beneath the former MGP.
- The fill soils which are predominately above the water table are generally free of MGP residuals indicating that the fill was likely placed after removal of the MGP operation.
- Polycyclic aromatic hydrocarbons (PAHs) and metals are the identified constituents of concern in surface and near surface site soils. Based on the background surface soil study, the relatively elevated PAHs detected on-site in surface/near surface soils suggests a potential contribution of PAH constituents from activities conducted on the former MGP site after or as part of placement of the surface fill soils. The source of the PAHs detected in soils at depths below the water table are associated with the MGP-related visual impacts, including DNAPL saturated and stained soil, present at the same locations and depths. The background surface soil study indicated similar conditions between on-site and off-site surface soil regarding the detected metals (arsenic, barium, cadmium, chromium, lead and mercury). This indicates that concentrations noted on-site are consistent with local conditions surrounding the Site and are not likely attributable to the activities on the former MGP site.
- There are no significant or imminent threats to human health that warrant an interim remedial action. The on-site risks are associated with potential contact with PAHs detected in the Site surface soils, which are presently prevented through Institutional and Engineering Controls. The Institutional Controls currently in place include site awareness and worker training. The current Engineering Controls include a gravel cover, which is restricting direct contact with surface soils and preventing fugitive dust generation. Also, fencing and gating is maintained at the Site to restrict public access.
- A number of chemicals of potential ecological concern (COPECs) in soil, sediment and surface water exceed some toxicological benchmark values; however, there is little area for ecological communities to come in contact with contaminated media within the Site. Although the COPECs pose a potential risk of impacting local wildlife species this risk is minimal due to several reasons: the industrial/commercial area provides minimal habitat, constant physical disturbance prevents wildlife population from developing; only transient species and few individual animals utilize the area; and the frequency and duration of exposure is limited.

Therefore, the observed chemicals detected on-site do not pose a current risk nor is any risk expected in the future.

- Soil vapor samples were collected on properties adjacent to the Site to evaluate the potential migration of chemicals of potential concern (COPC) impacting adjacent structures. Although COPCs were detected in soil vapor on these properties above the Upper Fence Values of the New York State Department of Health (NYSDOH) Background Outdoor Air Concentrations, the concentrations were too low to present a risk if associated with adjacent structures. They were also too low to determine whether their presence in the soil vapor was related to activities conducted on these properties versus soil vapor migrating from the Site. Therefore, no further investigation regarding off-site soil vapor was found to be warranted.

As described above, this Phase I RA Work Plan is intended to address only accessible MGP-related source material or “hot spots” in advance of the planned substation upgrade currently scheduled for September 2010. The groundwater remediation and NAPL recovery will be the focus of the Phase II RA Work Plan which will be issued as a separate report at a later date.

### 1.3 Summary of Previous Investigations

The Final Remedial Investigation Report prepared by Paulus, Sokolowski and Sartor Engineering, PC (PS&S) was submitted by National Grid to the NYSDEC on November 14, 2008. The RI included the installation of soil borings, groundwater probes, monitoring wells and the sampling and analysis of soil, sediment, groundwater, surface water, and soil vapor. Previous investigation boring and monitoring well logs are located in Appendix A. The results of the RI delineate the nature and extent of soil, creek sediment, groundwater and surface water impacts associated with the former MGP operations. Soil vapor was not determined to be a media of concern at this site; therefore, there is no further discussion of soil vapor nature and extent. The RI presented a compilation of the remedial and supplemental remedial investigations completed by PS&S and the findings of the following previously conducted site investigations:

- *Phase I Site Investigation Report For The Glen Cove Former Manufactured Gas Plant Site*, GEI Consultants, Inc./Atlantic Environmental Division, dated April 21, 1997
- *Due Diligence Investigation*, Dvirka and Bartilucci, dated February 16, 2000
- *Remedial Investigation – Preliminary Data Submittal and Proposed Additional Work Scope*, Paulus, Sokolowski and Sartor Engineering, PC, October 2004.

The following sections provide a summary of the findings of the RI and subsequent investigations. Additional details can be found in the 2004 RIR.

## 1.4 Summary of Pre-Characterization Investigation

In February of 2010, based on the NYSDEC-approved work plan, GEI conducted a Pre-Characterization Investigation at the Site. The investigation included:

- A private utility survey;
- Nine Geoprobe® soil borings in the excavation area to a depth of 20 ft bgs with analytical samples collected from each boring;
- Installation of six 1-inch monitoring wells for use in pilot testing the oxygen injection technology at the Site;
- Two groundwater probes in the area of the proposed oxygen injection system to confirm current groundwater conditions for system design; and
- Three hollow stem auger (HSA) borings with split spoon samples collected via standard penetration tests to gather geotechnical data on the excavation area.

The pre-characterization work plan specified the installation of three well clusters that were to be installed downgradient of the proposed oxygen injection system location. These wells will be used to monitor the effectiveness of the system when it is pilot tested and eventually placed into service, however, they were not installed during the period of work discussed in this section. The topography of the Site prevented the drill rig from being able to safely access two of the locations. The third well cluster was not installed during this mobilization due to property access. Access to this property was obtained by National Grid for the purpose of the remedy and well installation. Therefore, the three well clusters will be installed during the Phase I RA when the topography at the Site can be altered to better accommodate a drill rig.

### 1.4.1 Site Investigations and Methods

This following sections provides detailed descriptions of the methods and procedures utilized during the pre-characterization work.

#### 1.4.1.1 Community Air Monitoring

During pre-characterization, as required by the NYSDEC and NYSDOH, a community air monitoring plan was implemented and continuously conducted during intrusive work (well installation, groundwater probes, and soil borings). Air monitoring was conducted at the perimeter of the Site, in upwind and downwind locations, as well in the immediate vicinity of the work zone (i.e. next to the drilling equipment). The wind direction was determined using flags from neighboring properties.

At the perimeter stations VOC levels were monitored using a MiniRAE 2000 photoionization detector (PID), and respirable particulates less than 10 microns in size were monitored using a DustTrak Aerosol Monitor 8520 particulate meter.

The work zone air monitoring stations utilized the same DustTrak equipment, but substituted the MiniRAE 2000 for a MultiRAE four gas meter to monitor levels of VOCs, oxygen, carbon monoxide, and hydrogen sulfide. All of equipment was calibrated at least daily. Some small gaps in the air monitoring data were created by the extreme cold temperatures negatively affecting the battery life of the air monitoring equipment. Every effort was made by the GEI field staff to maintain continuous data logging including switching battery packs, replacing rechargeable batteries with disposable batteries, and repeated checks to insure that the units were operable.

#### 1.4.1.2 Soil Borings

Zebra Environmental (Zebra) of Lynbrook, New York advanced nine borings with a direct push Geoprobe<sup>®</sup> (GCGEO-01 thru 09), and Fenley & Nichol Environmental Inc. (F&N) of Deer Park, New York advanced three hollow stem auger (HSA) borings (SB-102 thru 104) from a truck mounted drill rig during the pre-characterization program. Borings were completed to collect geotechnical data and soil samples for waste characterization.

The GeoProbe<sup>®</sup> soil borings were advanced to a depth of 20 ft bgs. The depth and spacing intervals of the borings were selected to develop a waste characterization profile that would be acceptable to the National Grid-approved disposal facilities that will be receiving the excavated material.

The HSA borings were advanced to depths ranging from 20 to 51 ft bgs. The borings were positioned on the Site to generate a profile of surficial geology and collect data that could be used in the design of excavation support and dewatering systems.

The table below provides a summary of boring IDs and the associated rationales for their chosen locations.

Boring ID	Year Drilled	Rationale
GCGEO-01	2010	Waste characterization
GCGEO-02	2010	Waste characterization
GCGEO-03	2010	Waste characterization
GCGEO-04	2010	Waste characterization
GCGEO-05	2010	Waste characterization
GCGEO-06	2010	Waste characterization
GCGEO-07	2010	Waste characterization
GCGEO-08	2010	Waste characterization
GCGEO-09	2010	Waste characterization
GCMW-18I2	2010	Collect soil samples for analysis from well screen intervals
GCMW-19I2	2010	Collect soil samples for analysis from well screen intervals
SB102	2010	Collect geotechnical data
SB103	2010	Collect geotechnical data
SB104	2010	Collect geotechnical data

Lithology and physical observations of potential MGP-related impacts were continuously logged for each soil boring. The Geoprobe<sup>®</sup> borings were also screened with a PID, and a digital photograph of each sample interval was recorded.

The borings logs are attached in Appendix A.

#### 1.4.1.3 Subsurface Soil Sampling and Analysis

A composite soil sample was collected from each of the nine waste characterization Geoprobe<sup>®</sup> borings advanced at the Site. The samples were composited from the most visually impacted portion of the soil collected during each boring.

F&N collected split spoon samples from each HSA boring completed at the Site. The sampling frequency varied with drilling conditions, but in general, the soil was sampled continuously through the first 10 ft bgs and then every 5 feet thereafter. The split spoon samples were collected by performing Standard Penetration Tests, which is completed by dropping a 140 lb hammer from a height of 30 inches on a 1.5 inch inner diameter sampler until it has been driven 2 ft into undisturbed soil.

GEI contracted with H2M Labs, Inc. of Melville, New York (H2M) to conduct the laboratory analysis. The parameters and analytical methods selected were based on the requirements

obtained from the National Grid-approved disposal facilities designated to receive the excavated material.

Each waste characterization sample was analyzed as follows:

<u>Parameter</u>	<u>Analysis Method</u>
Total Metals (RCRA+Cu, Ni, Zn)	6010B and 6010
TCLP Metals	1311
Ignitability	1030 and 1010A
Corrosivity	1030 and 9040C
Reactivity	1110 and SW846 Ch7.5
PCBs	8082, 8082A, and 8080
Total Sulfur	ASTM D129
TCLP Volatile Organics	8260B
TCLP Semi-volatile Organics	8270D
TCLP Herbicides	1311
TCLP Pesticides	1311
Total Mercury	7471
Total VOCs	8260
Total SVOCs	8270C

The results of the waste characterization analysis are provided in **Table 1**.

GEI contracted with GeoTesting Express (GTE) of Boxborough, Massachusetts to conduct a grain size analysis on selected samples collected during the HSA borings. The lab tests were performed to verify the soil classifications made in the field. The results of the tests conducted by GTE are contained in Appendix B.

#### 1.4.1.4 Well Construction

Six oxygen injection pilot test wells were installed. When the total depth of the borehole was attained, a 1 inch inner diameter flush threaded PVC screen and solid riser were placed inside the casings. The annular space between the well screen and borehole wall was backfilled with chemically inert sand (#1 Morie) as the casings were removed. A two foot bentonite seal was placed above the sand pack and hydrated before the remaining annulus was tremie-grouted to ground surface. Each well was finished with a flush-mounted locking cover.

All drilling and well installation was performed by Zebra, and the locations were surveyed by GEI. The well construction details are presented in the table below.

Well ID	Northing/ Easting	Ground Elevation	Riser Elevation	Riser Interval (BGS)	Screen Interval (BGS)	Sand Pack Interval (BGS)	Bentonite Seal Interval (BGS)	Cement Grout (BGS)	Concrete (BGS)
GCMW17I	251710.80/ 1088497.52	57.15	56.77	0.0-25.0	25.0- 27.0	23.0-29.0	21-23	0.5-21.0	0.0-0.5
GCMW17I2	251710.79/ 1088502.71	57.51	57.07	0.0-43.0	43.0- 45.0	41.0-47.0	39.0-41.0	0.5-39.0	0.0-0.5
GCMW18I	251715.26/ 1088500.09	57.52	57.25	0.0-25.5	25.5- 27.5	23.5-29.5	21.5-23.5	0.5-21.5	0.0-0.5
GCMW18I2	251716.98/ 1088505.28	57.83	57.45	0.0-43.0	43.0- 45.0	41.0-47.0	39.0-41.0	0.5-39.0	0.0-0.5
GCMW19I	251723.54/ 1088504.17	58.63	58.35	0.0-25.0	25.0- 27.0	23.0-29.0	21-23	0.5-21.0	0.0-0.5
GCMW19I2	251725.51/ 1088509.13	58.84	58.47	0.0-43.0	43.0- 45.0	41.0-47.0	39.0-41.0	0.5-39.0	0.0-0.5

#### 1.4.1.5 Well Development

The wells were developed with the surge and pump method to promote flow of formation groundwater into the well. Well development occurred a minimum of 24 hours after the well was installed and the cement had cured. Recharge water was pumped from the well until the turbidity had been reduced to 50 nephelometric units (or less), or at least ten well volumes had been removed. Discharge water was contained on-site in steel drums until completion of the pre-characterization work. The water was disposed of by Clean Harbors, Inc. on behalf of National Grid.

#### 1.4.1.6 Groundwater Probes

Two groundwater probes were advanced as a portion of the pre-characterization program. The probes were performed to refine the horizontal and vertical extent of the identified groundwater impacts present at the Site. Discrete groundwater samples were collected from the water table and at approximately 16-foot intervals to approximately 60 feet below ground surface.

The groundwater probes were performed by Zebra, and the locations were surveyed by GEI. The probes details are presented in the table below.

Well ID	Northing/ Easting	Ground Elevation	Sample Interval 1 (BGS)	Sample Interval 2 (BGS)	Sample Interval 3 (BGS)	Sample Interval 4 (BGS))	Sample Interval 5 (BGS))
GCGWP101	251724.01/ 1088515.59	56.08	60-64	40-44	35-39	30-34	14-18
GCGWP102	251721.06/ 1088506.43	55.70	60-64	40-44	35-39	25-30	14-18

The groundwater was pumped to the surface using a peristaltic pump connected to a Horiba U22 with a closed flow through cell which was used to measure pH, conductivity, dissolved oxygen, temperature, salinity, and oxygen reduction potential (ORP). Groundwater samples were collected when the parameters stabilized within 10 percent. If stabilization did not occur, a maximum of five well volumes were purged, then sampling was conducted

The samples collected from the groundwater probes were analyzed by H2M as follows:

<u>Parameter</u>	<u>Analysis Method</u>
Total Metals	(RCRA+Cu, Ni, Zn) 6010
Total VOCs	8260
Total SVOCs	8270C

The analytical results from these groundwater probes will be used as a screening tool to refine the depths where the impacts are present and determine the proper placement of the oxygen injection line.

#### 1.4.1.7 Waste Handling and Disposal

Investigation-derived waste (personal protective equipment, drill cuttings, decon wastewater monitoring well discharge water) was stored in secure, separate DOT-approved steel drums on-site. Clean Harbors, Inc. (a National Grid waste disposal subcontractor) was provided with sample results and/or sampled the waste as necessary and disposed of the waste at approved facilities on behalf of National Grid.

#### 1.4.1.8 Site Physical Characteristics

This section of the report describes the physical characteristics of the Site as noted during the pre-characterization work. For a more in depth discussion on the physical characteristics of the Site refer to the *Glen Cove Former MGP Site Final Remedial Investigation Report*, PS&S, November 2008.

The shallow soils at the Site include fill, and silty sand with gravel. GEI adapted geologic cross sections of the Site from the RI completed by PS&S in 2008 to display the results of the pre-characterization borings (**Plate 1**). A brief description of each unit follows in order of occurrence at the Site:

**Fill.** A distinct layer of urban fill, approximately 10 ft thick, is present at the Site. The fill is generally black, fine to medium sand, with some cinders and cobbles. The composition of the fill is generally similar to the uppermost layer of native soil, but will differ in color and tend to have a higher percentage of silt.

**Silty Sand with Gravel.** The uppermost unit of native soil consists of a tan to dark brown medium to fine silty sand, with gravel. The stratum is well interbedded with alternating layers of silty sand and coarse sand with gravel. The silty sand with gravel unit begins approximately 10 ft bgs and was observed to be continuously present to the bottom of the deepest exploration at approximately 50 ft bgs.

#### 1.4.1.9 Groundwater

The depth below ground surface of the water table was noted for every exploration. Groundwater levels will fluctuate with season, precipitation, temperature, construction activity in the area, and other factors. Groundwater level measurements represent conditions at the times and location the measurements were made. Significantly different groundwater levels may occur at other times and locations.

The groundwater table information noted at the time of drilling is presented in the table below:

Well ID	Date	Groundwater Elevation (ft bgs)
GEO-01	2/4/2010	7
GEO-02	2/2/2010	10
GEO-03	2/3/2010	10
GEO-04	2/2/2010	10
GEO-05	2/3/2010	10
GEO-06	2/2/2010	9
GEO-07	2/2/2010	10
GEO-08	2/1/2010	10
GEO-09	2/1/2010	10
GCMW-18I2	2/4/2010	9
GCMW-19I2	2/5/2010	10
SB102	2/12/2010	9
SB103	2/9/2010	11
SB104	2/18/2010	10

#### 1.4.1.10 Pre-Characterization Conclusions and Recommendations

The primary purpose of this investigation was to confirm that the planned excavation depth was sufficient and to collect waste characterization samples of material located in the proposed excavation area identified in the *Glen Cove Former MGP Site Remedial Action Plan*, GEI, March 2010. Based on the results of the work, the following was determined:

- The excavation for the Phase I RA, as it is currently designed, (15 ft bgs (plus an additional 2 feet at the discretion of the NYSDEC), will be successful in removing accessible MGP-related source material (“hot spots”) that is known to contain significant amounts of NAPL mass.
- The borings advanced during the pre-characterization work indicate that some impacted material will be left at depth in the northern portion of the excavation area, which is consistent with the selected remedy from the RAP for the Site.

### 1.5 Project Organizational Structure and Responsibility

National Grid will coordinate with NYSDEC, NYSDOH, Nassau County Health Department (NCHD), Nassau County Department of Public Works (NCDPW), and other local regulatory agencies to conduct the Phase I RA at the Site. Approval of this Work Plan by NYSDEC will be obtained prior to Site preparation. It is anticipated that NYSDEC and/or NYSDOH will have representatives at the Site periodically during the Phase I RA.

The Phase I RA will be performed as defined in the Contract Documents which will include the terms and conditions, drawings, specifications, and any approved change orders.

National Grid will have final responsibility and authority for all aspects of the Phase I RA activities at the Site. National Grid is responsible for enforcement of the terms and conditions of the Contract Documents and negotiating and approving any change orders for construction activity, if necessary. A National Grid representative will be on-site or accessible via phone throughout the Phase I RA activities. When the National Grid representative is off-site, the Construction Manager will act as National Grid’s representative. National Grid will be responsible for all communication with regulatory agencies, members of the surrounding community and the press.

The Contractor, under contract to National Grid, will be responsible for all on-site construction activities including, but not limited to, compliance with all applicable Occupational Safety and Health Administration (OSHA) health and safety regulations, construction personnel health and safety, implementation of odor control measures (as necessary), traffic control, site security, excavation, material handling, transportation and disposal activities associated with the Phase I RA, and any other specified tasks outlined in this Work Plan or the Contract Documents.

The Engineer (GEI), under contract to National Grid, will serve as the Engineer of Record for the Phase I RA. As such, the Engineer will be responsible for engineering design and oversight of the Contractor to ensure compliance with Contract Documents. The Engineer will not direct the Contractor on specific means and methods to perform the work; however, the Engineer will advise the Construction Manager and Contractor of non-compliance with the Contract Documents and identify required corrective action. GEI will also be responsible for the implementation of the Community Air Monitoring Plan (CAMP).

The Construction Manager, under contract to National Grid, will represent National Grid as the Site Construction Manager to ensure the Phase I remedial construction activities are conducted in conformance with the project specific Contract Documents. The Construction Manager will act as National Grid's representative on-site and be responsible for managing all Site activities. This will include providing day-to-day field oversight of Phase I remedial construction activities to ensure technical compliance with the design documents (in conjunction with the Engineer) and conformance with all relevant portions of NYSDEC DER-10, Technical Guidance for Site Investigation and Remediation. The Construction Manager will assist National Grid with communications with NYSDEC and NYSDOH, and other project stakeholders, including adjacent property owners, other members of the community, and city government officials. The Construction Manager will assist National Grid in the review of technical specifications, remedial contractor proposals and contractor remedial design submittals. Representatives of NYSDEC and the owner will be invited to attend all regular job progress meetings, including pre-construction meetings.

The following are the key personnel or agencies involved with Phase I RA at the Site:

**National Grid:**

Sarah Aldridge  
Project Manager  
National Grid  
175 E. Old Country Road  
(516) 545-2568

**NYSDEC:**

Amen Omorogbe, P.E.  
Project Manager  
Remedial Bureau C Division of Remediation  
New York State Department of Environmental Conservation  
625 Broadway  
Albany, New York, 12233  
(518) 402-9662  
(866) 520-2334

**NYSDOH:**

Jacquelyn Nealon  
Bureau of Environmental Exposure Investigation  
New York State Department of Health  
547 River Street, Room 300  
Troy, New York 12180  
(800) 458-1158 ext. 2-7880  
or (518) 402-7870

**Construction Manger:**

AECOM

**Contractor:**

Joseph K. Posillico  
Posillico Environmental, Inc.  
1750 New Highway  
Farmingdale, NY 11735  
(631) 752-2145

**GEI Consultants, Inc.:**

Michael Zukauskas, PE  
Project Manager  
1 Greenwood Avenue, Suite 210  
Montclair, New Jersey 07042  
(973) 873-7113

Matthew O'Neil, P.E.  
Project Engineer  
GEI Consultants, Inc.  
455 Winding Brook Drive, Suite 201  
Glastonbury, Connecticut 06415  
(860) 368-5300

## **2. Phase I RA Goals and Objectives**

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### **2.1 Remedial Action Goal**

The NYSDEC remedial program identifies the goal for site remediation under 6 NYCRR Sub-Part 375-2.8(a) as:

“...restore that site to pre-disposal conditions, to the extent feasible. At a minimum, the remedy selected shall eliminate or mitigate all significant threats to the public health and to the environment presented by contaminants disposed at the Site through the proper application of scientific and engineering principles and in a manner not inconsistent with the national oil and hazardous substances pollution contingency plan as set forth in section 105 of CERCLA [Comprehensive Environmental Response, Compensation and Liability Act], as amended as by SARA [Superfund Amendments and Reauthorization Act].”

Where restoration to pre-disposal conditions is not feasible, the NYSDEC may approve an alternative criteria based on the Site conditions (6 NYCRR (New York Codes, Rules, and Regulations) Sub-Part 375-2-8(b)(1)). This could include the application of one of the Soil Cleanup Objectives (SCOs) listed in Table 375-6.8(a) (Unrestricted Use) or Table 375-6.8(b) (Restricted Use). Alternatively, the responsible party may “propose site-specific soil cleanup objectives which are protective of public health and the environment based upon other information.”

Based on these criteria, the goal for the Phase I RA of the former Glen Cove MGP property is as the following:

- Remove the MGP-related shallow source material via excavation to the extent practicable, where present and accessible.

As discussed in the Introduction, for the purposes of this Phase I RA, source material consists of materials containing tar or oil-like materials, where individual droplets, pools, or stringers are visible to the naked eye.

### **2.2 Remedial Action Objectives**

Remedial Action Objectives (RAOs) are medium-specific or operable-unit specific objectives for the protection of human health and the environment. RAOs are developed based on contaminant-specific Standards, Criteria and Guidance (SCGs) and the intended land use.

SCGs are defined in the 2002 NYSDEC Draft DER-10. Standards and Criteria are New York State regulations or statutes, which dictate the cleanup standards, standards of control and other substantive environmental protection requirements, criteria, or limitations which are generally applicable, consistently applied, officially promulgated and are directly applicable to a remedial action. Guidance are non-promulgated criteria and are not legal requirements; however, those responsible for investigation and/or remediation of the Site should consider guidance that, based on professional judgment, are determined to be applicable to the Site.

For this Phase I RA, one SCG was applied to the Site, 6 NYCRR Part 375 for shallow accessible soils. Specifically, the Commercial Use SCOs listed in Table 375-6.8(b) will apply to shallow subsurface soils at the Site. For the purposes of this Phase I RA, shallow subsurface soils are defined as soils up to an approximate maximum of 15 ft bgs across the Site.

This Phase I RA focuses on addressing the following soil RAO identified in the RAP:

- Prevent, to the extent practicable, ingestion/direct contact with MGP-related soil contamination.

### 3. Phase I RA Summary

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The Phase I RA proposed for the Glen Cove former MGP is to remove MGP-impacted materials from the Site via excavation, where they are present and accessible. Specifically, the Phase I RA will entail:

- **Excavation:** The top 8 feet of urban fill will be removed via a combination of vacuum and conventional excavation methods which will allow for the removal of accessible MGP-related source material or “hot spots” in advance of the planned substation upgrade currently scheduled for September 2010. Excavation depths will range between 6 to 15 feet bgs.

The observed extent of impacts at the Glen Cove Site is shown in **Figure 4**. In addition, further delineation of accessible MGP-related source material was undertaken under a Soil Pre-Characterization Investigation program which is detailed in Section 1.4. This Soil Pre-Characterization program was conducted in accordance with the NYSDEC approved *Soil Pre-Characterization Investigation Work Plan*, GEI Consultants, Inc., dated January 11, 2010. More detailed information regarding the implementation of the Phase I RA is provided in the Contract Documents which are included as Appendix C.

#### 3.1 Execution of the Phase I RA

The proposed Phase I RA includes the excavation, removal, and off-site disposal of MGP-related impacted materials to a depth of approximately 15 feet below existing grade on the former Glen Cove MGP property within the identified “hot spot” areas. Impacted soils will be transported off-site for treatment and disposal at a permitted facility. The excavation will be lined with a demarcation barrier and brought to final grade using clean backfill. Asphalt pavements, concrete aprons, and fencing will be restored to pre-Phase I RA conditions or better. The final grade of the Site will be restored to match the existing grade.

#### 3.2 Mobilization and Site Access

Prior to mobilization, the Contractor will prepare and submit all required documents identified in the Contract Documents for review and approval by National Grid, the Engineer, and the NYSDEC. The Engineer will review final Contractor submittals to ensure conformance with the Contract Documents.

The Contractor or National Grid will apply for and obtain all necessary Federal, State, and local permits associated with the Phase I RA work plan. These permits may include, but are not limited to, traffic routing, construction, air emissions, noise, etc.

The Contractor will contact New York City-Long Island One Call to request that all utilities on the Site are located and marked. LIPA will conduct a survey of the property to locate and mark underground utilities associated with the active substation. In addition, the Contractor will contract a private utility locator service to identify any utilities on private properties and confirm the LIPA survey. Any underground utility protection and/or relocation will be the responsibility of the Contractor prior to mobilization.

The Construction Manager and Engineer will conduct a pre-construction site meeting, after the project is awarded, with the Contractor, National Grid, Nassau County Department of Public Works (NCDPW), and NYSDEC prior to the commencement of Phase I RA. The meeting will be conducted to review specified construction requirements and schedules, as well as to review the responsibilities of the Contractor, the Construction Manager, the Engineer, and National Grid with respect to the Phase I RA implementation.

H2M Group of Melville, New York, under contract to National Grid, conducted an external pre-construction survey and inspection of adjacent properties to document existing conditions. The findings have been reviewed and approved by the Construction Manager, Engineer and National Grid.

The Engineer conducted a pre-construction survey of the retaining wall along the eastern side of the access road and concluded the wall appears to be of satisfactory condition to handle additional vibrations from the excavation and increased vehicular traffic. The results of both pre-construction surveys have been provided to the Contractor.

A New York State licensed surveyor will be contracted to establish a temporary baseline grid and benchmarks for the Phase I remedial work.

The grid and benchmarks will be established in English Units (ft) in the following datums:

- Horizontal: New York State Plane Coordinate System Long Island 3104.
- Vertical: North Geodetic Vertical Datum 1929, NGVD29.

The surveyors will return as needed to establish other reference points, layout work, and survey record information such as the locations of documentation samples and the limits of the excavations. Other site personnel may perform additional intermediate surveys as needed.

The Contractor will mobilize all necessary labor, equipment, supplies and materials to complete the Phase I RA upon approval by National Grid.

### **3.3 Site Preparation**

The Contractor will be responsible for preparing the Site for the Phase I RA. Site preparation activities necessary to provide support for the work include, but are not limited to, the establishment of work zones, support facilities, decontamination facilities, the clearing of vegetation, the installation of erosion control measures and temporary security fencing around the work area, and roll-off box staging area (for debris).

The appropriate exclusion zone(s) and contaminant reduction zone(s) will be established to conduct the planned activities safely and effectively.

As the excavation will occur outside the gated area of the substation, it is anticipated that LIPA will install a temporary gate to allow access to the substation during the Phase I RA. This gate will be installed so that it will not impede the use of the access road as primary means of access and egress to the Site.

The Contractor will be responsible for removing/preserving existing trees, fences, and structures/appurtenances, prior to the start of the Phase I RA.

The Contractor will be required to obtain approval from a primary and an alternate, properly licensed National Grid-approved disposal facility for all excavated material, prior to beginning any excavation work.

Soil erosion and sediment control measures will be installed prior to excavation and maintained throughout the project in accordance with the Erosion and Sediment Control Plan in Section 5, and the Contract Documents.

An 8 feet high fence will be erected to enclose the north and west portions of the Phase I RA area and control access to the construction Site for the duration of the work. These areas are currently outside of the existing fence located at the property. The new fence will be tied into the existing fence along the north side of the Site and the existing fence located along Glen Cove Creek. The Site Security Plan, Section 6, indicates the location and installation of the temporary fence.

Following preparation of the Site, a decontamination/anti-traction pad will be constructed. The pad will likely be located towards the southern edge of the remedial area near the access road. The Decontamination Plan, Section 7, details the placement and operation of the decontamination/anti-traction pad.

### **3.3.1 Retaining Wall Monitoring**

In order to complete this Phase I RA Work Plan in its currently prescribed form it will be necessary to monitor the retaining wall along the eastern side of the access road that leads to the Site from Grove Street. The Engineer conducted and evaluated this retaining wall and concluded that this retaining wall appears to be of satisfactory condition to handle the additional vibrations from the excavation and increased vehicular traffic. The monitoring will be strictly a precautionary measure, and shall consist of settlement points placed at the top of the retaining wall which will be measured and recorded daily. The Contractor is responsible to provide a surveyor to monitor settlement points on a daily basis during the Phase I RA.

In addition to the retaining wall located along the access road, additional monitoring or structural support may be necessary for the retaining wall located on the south side of the gated substation. National Grid contracted H2M Group to conduct a structural assessment of the existing retaining wall and provide recommendations to increase slope stability during the Phase I RA and future construction work, if necessary. This evaluation is complete and the final report has been provided to the Contractor.

### **3.3.2 Access Road Improvements**

The access road that is used to connect the substation to Grove Street is in a state of moderate to poor repair and may require improvements prior to the execution of the Phase I RA. Specifically, the road may need to be widened to accommodate trucks, and it may be necessary to make other improvements based on the thickness of the road and the condition of its sub-grade, which are currently not known.

## **3.4 Excavation**

### **3.4.1 Excavation Limits**

The anticipated extent of the excavation was established based on the existing Site data, and limitations due to the infrastructure of the active substation. Additional data has been collected during a Pre-Characterization boring program, which was conducted to refine the required depth of excavation. The results of the Pre-Characterization program indicate that the depth of the excavation is sufficient to achieve the goals of the selected remedy as set forth in the NYSDEC approved RAP. Expansion of the horizontal limits of the excavation is constrained by the Site topography, Glen Cove Creek, and the active substation. In the event that expansion of the excavation limits is needed, but is not possible in a given area of the Site, the Phase I RA goals may need to be modified and additional institutional controls or engineering controls may be required.

The final design criteria for the excavation requires that the Contractor's excavation support plan allow for local increases in depth of no greater than 2 feet without changing the excavation support system.

**Figure 4** depicts the extent of MGP-related impacted materials based on existing data and the anticipated extent of excavation limits based on the SCOs. **Figure 5** represents the location of the excavation areas relative to the utilities present on the Site. The unsaturated material above the water table will be excavated via conventional excavation methods outside the substation fence. The MGP-related source material located at and below the water table up to an approximate maximum of 15 bgs will be excavated to the depths determined for each excavation area. In the event that this material does not meet the disposal facility moisture content limitations, the material may be placed on lined and covered stockpiles adjacent to the excavation and allowed to gravity drain back into the excavation. In addition, the Contractor will be responsible for providing additional amendments, if necessary, to ensure that the material meets the disposal facility acceptance criteria for moisture content prior to being loaded out for off-site disposal. Any amendments proposed by the Contractor will be pre-approved by the NYSDEC and meet the NYSDEC restrictions on the use of quick lime or other similar materials.

#### **3.4.2 Earth Support System**

A temporary earth support structure will be required to reach the target depths identified in each area of the excavation. It is anticipated that excavations may extend between 3 and 6 feet below the surface of the water table. Based on the proposed depth of excavation, construction dewatering will be required.

Upon completion of the excavation, the Site will be backfilled and the temporary earth support structure removed.

#### **3.4.3 Backfill**

The excavation will be backfilled with materials meeting the Unrestricted Use SCOs. Backfill materials will be imported and placed in accordance with the Contract Documents.

#### **3.4.4 Monitoring Well Abandonment**

Monitoring wells and piezometers within excavation limits will be abandoned per the 2003 NYSDEC *Groundwater Monitoring Well Decommissioning Procedures*.

The wells and piezometers to be abandoned within the excavation limits include:

- GCMW09S
- GCMW09I
- GCMW14S

- GCMW14I
- PZ01A

### **3.4.5 Material Handling**

Due to the constraints of the Site size, the Phase I RA excavation activities will be conducted as a direct load operation. All loading of excavated material will occur within the Phase I RA area. Once a truck is filled with excavated material, spray-on odor suppressing materials such as Rusmar Foam may be used to reduce potential VOC emissions during transit, if necessary. A solid truck tarp will then be employed over the truck bed and secured on all sides. A plastic tarp may be used in the event that solid covers are not available for material removed from above the water table. The truck will then exit the excavation area and proceed immediately to a decontamination pad. Following decontamination, the truck will proceed directly to the designated disposal facility. All trucks shall have watertight compartments and liners to prevent seepage due to wet soil from leaking onto public streets.

Limited stockpiling of materials will be authorized within the excavation area to allow for gravity dewatering, if needed. Lined and covered roll-off bins will be staged on Site to contain construction debris and bulk waste for waste classification and appropriate disposal.

Based on the investigation data, it is anticipated that excavated material will be transported as non-hazardous material.

If necessary, suspect materials encountered during excavation, which may exhibit hazardous characteristics, will be segregated, stored on Site, sampled, and disposed of appropriately.

### **3.4.6 Odor and Fugitive Dust Control**

The Contractor will provide an odor suppressant system consisting of chemical foam (e.g., Rusmar foam) or other approved method. The Contractor will keep sufficient odor suppressant on Site to manage the odors generated from the excavated materials, including, but not limited to, open excavations, limited stockpiles, or materials loaded into trucks for transportation and disposal. The odor suppressant system will be stored near the excavation and will be easily mobile in case of need. The Contractor will be required to provide a misting system or Engineer-approved equivalent to deliver the odor suppressing agent as a part of the odor and fugitive dust control methods for the Site. Further details about the management of the odor suppressant system are presented in Section 5. All open excavations containing MGP-related source material will be backfilled or covered at the end of each working day to suppress odors.

Conditions within the excavation area will be monitored in accordance with the Contractor Health and Safety Plan (HASP). Conditions on the perimeter will be monitored in accordance with the CAMP.

### 3.5 Oxygen Injection System Pilot Test

A pilot test will be conducted to assess the Site and collect data that will be used in the design of an oxygen injection system. The activities proposed under the pilot test will be to address the following primary objectives.

- **Assess bioremediation rates:** The main goal of the oxygen injection system will be to create an aerobic environment to hasten the bioremediation of the dissolved phase contaminant plume moving from the Site and into Glen Cove Creek. Sampling the groundwater in monitoring wells that will be installed as a part of the Phase I RA will provide monitored natural attenuation (MNA) data that can then be used to create a system with injection points located and screened at appropriate intervals.
- **Evaluate the depth and location of the proposed oxygen injection points:** The results of the pilot test will be used to evaluate the radius of influence and determine the depths and locations of injection wells within the area targeted for enhanced bioremediation which have the greatest potential to effectively remediate the dissolved phase contaminants of concern (COCs).

The oxygen injection system pilot test wells have already been installed as a part of the Pre-Characterization program. The portion of the Site that has been targeted for enhanced bioremediation, the location of the pilot test injection wells, and the proposed MNA well locations are shown in **Figure 4**.

After the completion of the pilot test, the results will be presented in the Phase II RA Work Plan. This report will summarize the pilot test implementation, and data collected. The summary will include the determination of the proposed screened depths, injection point spacing, and oxygen injection rates needed to effectively remediate the dissolved phase contaminants.

***Installation of the remaining components of the oxygen injection pilot test system will be completed during the Phase I RA, and the test will be conducted after the scheduled facility upgrade. 3.5.1 Monitoring Well Installation***

In order to perform MNA on the groundwater as it leaves the Site, three additional groundwater monitoring well clusters will be installed at locations downgradient of the treatment line along the Glen Cove Creek and the two monitoring well clusters abandoned during the excavation will be reinstalled.

The well clusters will include multiple screen depths for monitoring the oxygen injection system performance throughout the vertical extent of the aquifer. The proposed locations are depicted in **Figure 4**.

There is no indication that any light non-aqueous phase liquid (LNAPL) or DNAPL are present in the proposed system location. However, if LNAPL is encountered in the borings, the well screen will terminate approximately 2 ft above the water table. If DNAPL is encountered, the well screen bottom will be installed on top of any observed confining layer that may be retarding the migration of DNAPL, and the sump will be installed into the confining unit with a bentonite clay seal at the elevation of the top of the confining layer.

### **3.6 Construction Oversight**

A representative of National Grid, or the Construction Manager acting as an agent of National Grid, will be on Site during all Phase I RA activities. The Engineer will be responsible for oversight of the Phase I RA with respect to conformance with the Contract Documents. The specific responsibilities of the Construction Manager, Engineer, Contractor, and National Grid are discussed in subsection 1.5.

Representatives of the NYSDEC, NYSDOH, NCHD, and NCDPW may be present during construction and restoration activities.

## 4. Vapor/Odor/Dust Management

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Excavation activities at remediation sites typically generate airborne dust and vapors (VOCs) that have the potential to migrate off-Site. In recognition of this potential hazard, the NYSDOH has promulgated a CAMP that establishes action levels of respirable dust and VOCs that are protective of the surrounding community. The requirements of the CAMP are contained in Appendix 1A of the 2002 Draft DER-10 Technical Guidance for Site Investigations and Remediation. The CAMP is intended to supplement, but be discrete from the air-monitoring program implemented by the Contractor for purposes of evaluating Site worker health and safety.

### 4.1 CAMP Summary

A site-specific CAMP has been prepared for the Site and is included in Appendix D. The CAMP is designed to provide monitoring procedures, Alert Limits, Action Limits, and contingency measures if Action Limits are approached. An Alert Limit is a contaminant concentration or odor intensity that triggers contingency measures. An Alert Limit does not suggest the existence of a health hazard, but serves instead as a screening tool to trigger contingency measures if necessary, to assist in minimizing off-site transport of contaminants and odors during remedial activities. An Action Limit is a contaminant concentration or odor intensity that triggers work stoppage.

During times of ground intrusive activities, fence line perimeter air monitoring will be conducted using a combination of real-time (continuous and almost instantaneous) air monitoring at fixed locations and walk-around supplemental monitoring using hand-held instruments on an as-needed basis. Contaminants commonly found at former MGP sites will be monitored, including VOCs and dust. The CAMP includes a Contingency Plan that defines Alert Levels, Action Levels, and specific response activities to be implemented during working hours if an exceedance of an Alert Limit or Action Limit for a measured compound occurs. The response actions, potentially including work stoppage, are intended to prevent or significantly reduce the migration of airborne contaminants from the Site.

If the real-time perimeter Action Limits are exceeded or significant nuisance odors are noted, National Grid, the Engineer, and the Contractor will consult to determine what type of emission control action is appropriate. Actions that may be taken to reduce emissions include the following:

- Spraying water on exposed soil surfaces and/or roadways to suppress windblown dust.

- Covering working areas of exposed impacted soils, trucks loaded with impacts soils, or stockpiles of impacted soils with tarpaulins, vapor suppressing foam, or other vapor control agents.
- Temporarily relocating work to an area with potentially lower emission levels.
- Reduce the production rate or change the sequence of work activities.
- Change the work methods or equipment to alternatives that minimize air emissions.
- Using odor suppressing foams or mists.

In practice, these actions will typically be employed proactively to prevent action levels from being reached at the exclusion zone perimeter in the first instance. These above mentioned Alert and Action Level Concentrations are included in the CAMP and will be summarized in the Contract Documents. The anticipated locations of the air monitoring stations are also noted in Appendix D, subject to change according to the Contractor's means and methods.

## **4.2 Fugitive Dust Control**

Construction activities will be performed so as to limit the potential for fugitive dust emissions. Dust control measures will be implemented to minimize the potential for dust generation during soil excavation and handling, and placement of fill. Dust control measures will include water spraying, and/or suppressant foams. The Contractor will provide materials to act as a dust suppressant. This may include tarps and/or water, or chemical foam, (e.g., Rusmar<sup>TM</sup> foam) or other National Grid-approved method. The selected Contractor will keep sufficient dust suppressant materials on site to suppress fugitive dust from the excavation. The material will be stored near the excavation and will be easily mobile in case of need.

Truck routes within the exclusion zone and the support zone will be inspected continuously during high truck traffic periods for excessive dirt or dust. Proper cleaning of trucks exiting the exclusion zone will aid in minimizing/eliminating dusty conditions on site and on adjacent roadways. A decontamination pad large enough to accommodate equipment and truck traffic will be constructed at the exit point to clean tires of transport trucks exiting the Site. Transport trucks exiting the exclusion zone will pass through an inspection area and/or be inspected to ensure tires and undercarriages are clean and that tarps are secured. Excessive mud and loose dirt observed on the trucks will be manually removed with brooms and brushes as necessary.

## **5. Erosion and Sediment Control Plan**

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The erosion and sediment controls are intended to mitigate erosion and sedimentation from the Site as indicated in the Contract Documents.

### **5.1 Description of Construction Activities**

This project involves the excavation of approximately 1,900 cubic yards of MGP-related source material and urban fill. Excavation depths will be approximately 15 ft bgs. The average groundwater depth is approximately 8 to 10 ft bgs. Construction dewatering shall be required unless the Contractor is able to develop an alternative method of excavating in the wet that is acceptable to National Grid and the Engineer.

All stormwater runoff from the exterior of the excavation area will be collected, routed, and discharged into the Glen Cove Creek prior to contact with any impacted materials. Access areas between the excavation area and the adjacent public streets will contain decontamination stations for all trucks and equipment. The decontamination waters will be collected and stored in an on-site frac tank or bulked with construction dewatering fluids.

### **5.2 Potential Areas for Erosion and Sedimentation**

The excavation area itself is relatively flat, however, the grade outside the substation slopes down sharply to the Site from the north, east, and south, while the western edge grades down and away toward the Glen Cove Creek. The Site is composed of a gravel surface within the active substation, asphalt for the access road, and a wooded area adjacent to the Glen Cove Creek.

The potential sources for erosion and sedimentation while conducting this Phase I RA at the Site are the following:

- Trucks/equipment exiting the excavation area could track soils onto traveled areas.
- Wet excavated soils could seep out of the trucks and onto public roads.
- A drainage pipe from an upslope parking lot drains onto the Site which has the potential to cause the erosion of impacted materials into the creek.
- Vegetation that will be removed has the potential to cause an increased erosion of the wooded area adjacent to the creek.

The erosion control methods detailed in the following section are specifically intended to mitigate the potential sources of erosion and sedimentation listed above.

### **5.3 Implementation of Erosion Control Measures**

Sediment fence will be installed around the perimeter of the Site and all areas to be excavated. As discussed in subsection 4.2, decontamination stations will act as anti-tracking pads, thereby, removing soil and sediment from all trucks/equipment wheels and bodies that are exiting the Site.

The Contractor shall install and maintain the erosion control measures indicated in the Contract Documents for the duration of the excavation work. Additional erosion control measures may be needed due to unforeseen conditions. The Contractor shall install additional measures as necessary and as directed by National Grid or the Construction Manager.

### **5.4 Restoration**

Upon completion of the remedy, the Contractor may remove all sediment fencing and restore the surface to pre-Phase I RA conditions. The Contractor may be directed to leave sediment fencing in place if there is no accumulated sediment or if the accumulated sediment can be removed to help facilitate the LIPA expansion. If taken down, the sediment accumulated in the fencing will be removed and transported to a properly licensed National Grid-approved disposal facility.

## **6. Site Security Plan**

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The objectives of the Site security plan are to prevent the vandalism/destruction of construction equipment, prevent access, and minimize health and safety concerns for the surrounding residential neighborhood.

### **6.1 Perimeter Security**

An 8 foot high fence will be erected to enclose the north and west portions of the Phase I RA area and control access to the construction Site for the duration of the Phase I RA. These areas are currently outside of the existing fence located at the property. The new fence will be tied into the existing fence along the north side of the Site and the existing fence located along Glen Cove Creek. A temporary fence will be erected around the perimeter of all open excavations at the end of each workday. If the area is not otherwise lighted (i.e. building floodlights, municipal streetlights, etc.) the Contractor will provide temporary lighting on the fencing at the edge of the excavation to prevent injury to LIPA employees who may enter the substation during non-working hours. The main gate for the Site on Grove Street will be secured at the end of each workday.

### **6.2 Equipment Security**

All vehicles and/or equipment left on the Site must be secured at the end of each working day. This criteria can be met by vehicles and equipment remaining inside the perimeter fence, or at a remote secured area if left on-site overnight or during non-work days. No vehicles or equipment may be left overnight in an unsecured location. It is the responsibility of the Contractor to ensure that all non-essential equipment is de-energized when left on-site and not in use to prevent electrical/fire/explosive hazards. No equipment will run overnight and/or on non-working days without prior approval from National Grid.

The Contractor will make every effort to minimize the storage of equipment or materials in areas other than the Site.

### **6.3 Overnight Security**

Overnight security measures will be provided by the Contractor. The exact nature of the security measures is detailed in the Contract Documents.

## 7. Decontamination Plan

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The objectives of the decontamination plan at the Site are to provide the procedures and tools necessary to decontaminate personnel/equipment, and to prevent cross-contamination from the excavation to public areas (i.e., highways, roads, support trailer, vehicles, etc.). This plan does not replace the decontamination procedures outlined in the HASP, Appendix E. This plan provides additional guidelines on decontamination locations, necessary equipment, and procedures.

The Site will be divided into three primary zones: the exclusion zone (EZ), the contamination reduction zone (CRZ), and the support zone (SZ) during the implementation of remedial activities. These locations will be detailed in the Contract Documents and shall be further defined in the field based on work activities being conducted in an individual area as well as the results of air monitoring activities.

### 7.1 Decontamination Procedures

The Contractor will establish decontamination areas for the following activities.

- Personnel decontamination
- Equipment decontamination

#### 7.1.1 Personnel Decontamination Station

Personnel field decontamination/cleanup will take place at the exit of the established EZs in the CRZs. If possible, these field decontamination facilities will be located upwind of the EZs.

Disposable Personal Protective Equipment (PPE) that has been worn in an EZ will be removed and placed in the disposal container before leaving the CRZ. Once removed, disposable PPE will be collected at the field decontamination site in a drum or large plastic bag which will then be secured to prevent the accidental spread of contamination. Additional details for personnel decontamination are presented in the HASP contained in Appendix E.

The designated personnel field decontamination area will be equipped with basins for water and detergent, and trash bags or cans for containing disposable PPE and discarded materials. Once personnel have decontaminated at this station and taken off their PPE, they will proceed to a sink where they will wash themselves as a secondary means of personal hygiene (e.g., hands, face, etc.).

The specific decontamination procedures and requirements for the disposal of decontamination wastewater are outlined in the HASP, Appendix E.

### **7.1.2 Equipment Decontamination Station**

Equipment decontamination will take place on a decontamination pad that will, at a minimum, be a plastic lined, bermed, wastewater collection sump. Decontamination activities shall include the removal of contaminated soil, debris, and other miscellaneous materials from all construction equipment and tools utilized within the EZ using a high-pressure, low volume cleaner. In addition, physical/mechanical agitation (scrapping with hand tools) of soil may be utilized during winter months to prevent freezing and icy conditions.

All equipment leaving the Site will be decontaminated per these guidelines. In addition, any equipment previously utilized to excavate impacted material will be decontaminated prior to use in backfilling (e.g. excavator bucket).

The decontamination pad will be constructed to adequately facilitate decontamination of the largest mobile construction equipment and to withstand the anticipated traffic loads throughout the duration of the project. The decontamination pad will be located and constructed as detailed in the Contract Documents. Provisions will be made to control overspray at the decontamination pad(s).

Drilling equipment, hand tools, and miscellaneous small equipment that come in contact with excavated soils or impacted groundwater will be decontaminated on the decontamination pad in buckets of water and detergent.

Wastewater from equipment decontamination will be collected and pumped into the frac tanks, or disposed of in accordance with a discharge permit. Disposal of the wastewater will be handled in accordance with the Waste Management Plan (Section 8).

Soils collected from the decontamination pads will be bulked with the excavated material and sent to the properly licensed National Grid-approved disposal facility as necessary.

### **7.1.3 Material Transport Vehicle Decontamination**

Trucks transporting soil off-site will enter the excavation area as described in the Traffic Control Plan (Section 11). Care will be exercised when performing soil loading so as not to spill material on the outside of the trucks. Upon exiting the EZ, the Contractor will stage the vehicles on the equipment decontamination/anti-traction pad. The trucks will then be visually inspected (i.e., box sidewalls, box tailgate, and tires, etc.), cleaned with brushes/brooms, and decontaminated with pressure sprayers, if necessary, prior to being allowed to leave the Site.

In addition, trucks will be required to cover their material loads with solid plastic tarp prior to departing the EZ. All collected soil and decontamination fluids will be managed in accordance with the Waste Management Plan (Section 8).

## **7.2 Decontamination Equipment**

The Contractor will be responsible for maintaining a sufficient supply of materials/equipment required to implement decontamination procedures, which may include, but are not limited to, the following items:

- Plastic trash barrels
- Liners for trash barrels
- Wash basins
- Alconox<sup>TM</sup> detergent concentrate
- Hand pump sprayers
- Long handled soft bristle brushes
- Large sponges
- Cleaning wipes for respirators
- Bench or stool(s)
- Stepladder(s)
- Steam generator
- Liquid detergent and paper towels
- Plastic trash bags
- Supplies/equipment to construct the decontamination pads
- All necessary hosing, connections, etc., to collect and transport decontamination fluids to the wastewater treatment system

## **8. Waste Management Plan**

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The objective of the waste management plan at the Site is to provide the Contractor guidelines for managing each waste stream. The Contractor will dispose of all waste materials generated as a result of the Phase I RA in accordance with all applicable laws and regulations at a National Grid-approved disposal facility. National Grid will prepare and submit to the treatment/disposal facility a generator profile of soils and wastes generated at the Site.

### **8.1 Disposal    Record Keeping**

Manifests and/or bills of lading for all shipments will be submitted to the Construction Manager prior to any vehicle departing the Site. The manifest form and/or bills of lading will be signed by an approved agent for National Grid and by the truck driver before the material leaves the Site, and by a representative of the disposal facility when the load is received. A copy of the signed manifest will be maintained on file in the administrative trailer of the Contractor by the Construction Manager. Upon arrival at the disposal facility, the manifest will be signed and a copy returned to the Engineer, complete with all applicable signatures as proof of delivery. The returned manifests will be cross checked and matched with the original copy of the manifest already on file. Copies of all returned manifests will be provided to the Engineer.

A log of all shipments and copies of all manifests and/or bills of lading will be maintained by the Construction Manager on-Site for reference in the Contractor's trailer. Upon completion of the Phase I RA, National Grid will receive all logs and manifests and/or bills of lading. The logs, manifests, and bills of lading will be included in the Completion Report following completion of the Phase II RA to create a permanent record of disposal.

### **8.2 Material    Shipping Procedures**

Waste transporters, properly permitted by the NYSDEC, will be utilized to ship the impacted soils to approved disposal facilities. The selected Contractor will manage all disposal documentation including, but not limited to, all necessary manifests, bill-of-ladings, weight tickets, and certificates of treatment/destruction.

The selected Contractor will coordinate with the transport and disposal facilities to determine an appropriate number of transport trucks based on the capabilities of the facility to accept material. This coordination will be critical to accommodate the sequence of proposed excavation activities. To eliminate the need for the staging of trucks on local roadways, trucks will be scheduled in a manner that will minimize the wait time for loading.

Vehicles that are waiting to be loaded will be directed to the on-site staging area, or the SZ as detailed in the Contract Documents.

Upon entry to the Site, the trucks will be inspected to ensure the proper placards, decals and permits are displayed. While on-site, transport trucks will remain on designated haul routes, and all loaded trucks leaving the EZ will follow the Decontamination Plan (Section 7). Transport trucks will utilize the approved truck route through Glen Cove and then the most direct hauling route to the disposal facility.

All material transportation vehicles leaving the Site must be watertight and will be decontaminated in accordance with the Decontamination Plan prior to departing. The watertight beds will be lined with plastic truck liners prior to material being placed in the bed. In the event that significant odors are noted, the material in the bed may be covered with Rusmar foam or similar odor suppressant prior to being covered in plastic. Finally, a solid tarp will be affixed to the truck bed to prevent volatilization or fugitive dust emissions during transit to the disposal facility. In the event that a truck arrives at the Site without a solid tarp, plastic sheeting will be used to cover the material in the bed or the truck will be sent back to the facility.

All material transportation vehicles leaving the Site will be decontaminated in accordance with the Decontamination Plan (Section 7) prior to departing the EZ.

Individual waste streams will be handled as follows.

### **8.2.1 Non-Impacted Soils for Reuse**

It is anticipated that most excavated material from the Phase I RA will have MGP-impacts and, therefore, will not be suitable for reuse as backfill on-site. However, any excavated soils that are suitable for reuse, and are not used as backfill, will be transported off Site to a disposal/landfill at a licensed facility capable of handling such material, or to a thermal desorption facility at the discretion of National Grid.

### **8.2.2 Impacted Soils and Bulky Waste**

All excavated MGP-related impacted material will be placed directly into haul vehicles and transported directly to an appropriately licensed National Grid-approved disposal facility. The Contractor will have a primary and an alternate receiving facility prepared to receive the impacted soils prior to excavation.

Vehicles containing excavated soils will be covered with a solid plastic tarp. If necessary, spray-on odor suppressing materials such as Rusmar Foam may be used to reduce potential VOC emissions during transit.

Impacted soils that contain too high a water content to be transported safely (e.g. without risk of a liquid spill off-site) must be amended on-site within the excavation area, by the Contractor prior to shipment off-Site. All amendments used at the Site will meet NYSDEC requirements.

Impacted bulky waste (i.e., concrete, debris, etc.) will be separated from source material upon excavation, and transported for treatment/disposal as regulated waste at an approved facility.

### **8.2.3 Uncontaminated Bulky Waste**

Uncontaminated bulky waste (i.e., asphalt pavement sections, concrete, and debris) will be separated, if possible, from impacted soil upon excavation, immediately placed in a roll-off container or temporarily placed on the Site for future loading, and transported for disposal as construction debris at an approved facility/landfill.

### **8.2.4 Impacted Groundwater and Decontamination Water**

Contaminated liquids from the decontamination of equipment and personnel will be pumped into frac tank(s) and disposed of off-site. The Contractor will retain a licensed liquid waste hauler to remove this liquid from the Site and properly dispose of the material in accordance with all applicable regulations. The selected Contractor will be responsible for obtaining any appropriate Federal, State, and/or local permits that may be required.

It is not anticipated that impacted groundwater will be collected during this Phase I RA. However, in the event that impacted groundwater is collected, it will be containerized for off-site disposal or treated and discharged in accordance with state and local regulations.

Solid material collected in the frac tank(s), as a result of settlement, will be bulked with the MGP-related source material and sent to an appropriately licensed National Grid-approved disposal facility as necessary.

## **8.3 Soil Disposal Characterization Analyses**

Refer to the *Soil Pre-Characterization Investigation Work Plan*, GEI Consultants, Inc., dated January, 2010 for details on the collection of soil samples for waste characterization. The results of this program have been provided to the Contractor under separate cover, and a summary of the investigation is contained in Section 1.4.

## **9. Sample Collection & Analysis Plan**

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The sample collection and analysis plan for the Site has been designed to support the requirements of the Phase I RA. The remedial work includes the removal of MGP-related source material. This plan describes the sampling and analysis procedures for collecting representative samples of backfill and waste water for disposal.

Material within the excavation limits will be removed and the excavation will be backfilled with clean fill. Documentation sampling is not anticipated for the material below the bottom of the excavation. Sampling from previously completed investigations already identified the magnitude of the remaining impacts, where present.

All analytical testing will be performed by a laboratory that holds a current NYSDOH Environmental Laboratory Approval Program certification.

### **9.1 Representative Sampling of Backfill**

The excavation will be backfilled with imported material, or urban fill found to be suitable for on-site reuse. The Contractor will identify the New York State Department of Transportation-approved borrow pit location(s) of imported material prior to the start of Phase I RA excavation activities. The Contractor will provide certificates of clean fill for the imported material identifying said material as native. In addition, the Contractor will provide analytical results from the borrow pit(s), specific to the actual fill being imported to the Site, as confirmation that the material is free of contamination. At a minimum, a sample of the backfill will be collected at the beginning, the middle, and the end of backfill operations. Backfill samples will be analyzed for Resource Conservation and Recovery Act (RCRA) 8 Metals, PCBs by United States Environmental Protection Agency (EPA) Method 8082, VOCs by EPA Method 8260 or NYSASP Method 95.1, and SVOCs by EPA Method 8270C or NYSASP Method 95-2.

### **9.2 Dewatering/Wastewater Sampling**

No real-time sampling of wastewater is anticipated. However, if the need arises, the discharge and/or influent to the frac tank(s)/discharge point will be sampled by the Contractor in accordance with the conditions of the receiving facility for off-site disposal or in accordance with any applicable permit conditions and the results provided to National Grid and the Engineer.

## **10. Water Management Plan**

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The objective of the groundwater management plan at the Site is to establish requirements for the collection and off-site disposal of decontamination and dewatering wastewater, and the collection and discharge of stormwater.

### **10.1 Decontamination and Dewatering Wastewater**

Wastewater associated with decontamination activities on the Site will be pumped into a covered frac tank(s), or sent to a wastewater treatment system located outside of the excavation area. The system must be sufficiently sized to contain the wastewater and provide some measure of primary treatment (settling) with weirs, baffles or other appropriate technology, and flow equalization, if needed. Effluent will then be disposed of off-site as described in subsection 10.2.

Due to the depth to groundwater at the Site, it is anticipated that construction dewatering will be required. Groundwater measurements from previous investigations indicate that the approximate depth to water in the excavation area is 8 to 10 ft bgs. Dewatering liquids will be treated and discharged in accordance with the applicable state and/or local discharge permits.

### **10.2 Off-Site Disposal of Wastewater**

The Contractor may arrange for the off-site disposal of all generated wastewater. All generated wastewater requiring off-site disposal will be handled in accordance with the Waste Management Plan (Section 8).

A licensed liquid waste hauler shall remove this liquid from the Site and properly dispose of this material in accordance with all applicable regulations and codes. The Contractor will have a primary and an alternate properly permitted, National Grid-approved receiving facility prepared to receive all liquid wastes generated.

In addition, the Contractor will ensure that off-site disposal and/or on-site storage volumes are adequate to avoid construction delays.

### **10.3 Stormwater Runoff Control**

The excavation area is under mostly paved and wooded sections of the Site and stormwater drainage is handled primarily through surface runoff to Glen Cove Creek and infiltration into non-paved areas. In preparation for and throughout the duration of the Phase I RA, the

control and diversion of stormwater runoff is essential to reduce the potential for impacted material discharges off-site.

Stormwater contact with the impacted soils will be limited due to the erosion and sediment control barriers around the area of excavation. Therefore, it is not anticipated that runoff from the exterior will come in contact with the excavation area. The Contractor will be required to utilize appropriate control measures to route the runoff from the collection system to the appropriate outlet. Stormwater runoff control measures may include the installation of berms, barriers, and a sump for the collection and discharge of the water.

## 11. Traffic Control Plan

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The objectives of the traffic plan at the Site are to describe the traffic objectives and concerns. The Traffic Control Plan indicates the traffic routes to and from the Site for:

- Trucking soil and bulky waste off-site.
- Importing clean fill to the Site.
- Liquid waste hauler off loading dewatered liquids if necessary.
- Contractor access and parking.
- Equipment access and storage.

A traffic survey has been conducted by Nelson, Pope & Voorhis, LLC of Melville, New York, under contract to National Grid, to confirm the best route to and from the Site. National Grid has met with town officials to discuss the routes that were recommended in this report.

Vehicles hauling contaminated soil, fill materials, and supplies shall enter Glen Cove from Cedar Swamp Road (RT 107). The vehicles shall continue right on Cedar Swamp Road where it splits with RT 107. Vehicles should then take a left onto Grove Street. From Grove Street, a right should be made to the substation's access road.

Vehicles shall retrace the Site entry route to exit Glen Cove.

The Contractor shall provide traffic control personnel when all trucks are exiting the Site onto Grove Street. Traffic control personnel shall also direct traffic as needed upon delivery of equipment, trailers, excavation support materials, etc. To maintain access and ensure that lines of sight are maintained, the Contractor shall arrange for and coordinate with the appropriate local authorities to ensure that on-street parking nearest to the entrance/exit gate is limited throughout the duration of the Phase I RA.

The Contractor shall provide a detailed traffic route for all vehicles transporting waste materials to the specific disposal facilities as well as maintain all signage and traffic controls required until the completion of the project.

## 12. Completion of Remedial Activities

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Upon completion of the Phase I RA, the Site will be returned to the pre-Phase I RA conditions. Excavations will be backfilled to existing grades with imported clean fill. Restoration actions shall include, but may not be limited to:

- Backfill and compaction of the excavated areas
- Removal of all erosion control measures after permanent stabilization
- Grading the Site to prevent pounding or runoff of stormwater that could adversely affect the Site or adjacent properties
- Demobilization of the dewatering storage frac tank(s)
- Removal of any temporary earth support structures
- Demobilization of the CAMP equipment
- Removal of the decontamination pads
- Restoration of any Site features that have been damaged or removed
- Post restoration survey to document conditions following restoration

## 13. RA Completion Report

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Following the completion of RA Phase II, a Final Engineering Report will be developed and stamped by an engineer licensed to practice in the State of New York. As part of the report, the Phase I RA activities will be documented. The Phase I RA-related section of the report will include a summary of the field program, documentation of any changes to the Work Plan, documentation of the final disposal of both solid and hazardous waste, and contain a statement that the work was performed in accordance with the Phase I RA Work Plan, contract drawings, specifications, and any approved changes to those documents. The report will also contain a summation of the contaminant distribution observed beneath the floor of the excavation and an assessment of the degree to which the Phase I RA activities met the remedial objective.

Specific components of the Phase I RA section of the Final Engineering Report will include:

- Record drawings, specifications, addenda, and approved changes
- The actual volumes of excavated material and treated wastewater
- The results of documentation analyses
- Other plans and figures (if required), photographs, cross sections, data summary tables, and appendices that will provide National Grid with an accurate accounting of the remedial measures implemented at the Site
- Approval and Closure documents from NYSDEC
- Approved permits
- Summary of construction work, meetings, and changes in work scope
- Shipping manifests and bills of lading (contaminated soil, clean fill, and construction dewatering liquids)
- Summary of Air Monitoring Data collected during the remedial activities
- Certification that material transported off-site was disposed of at a properly licensed National Grid-approved disposal or treatment facility

## Table

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**Table 1**  
**Pre-Characterization Lab Results**  
**Glen Cove Site**  
**Glen Cove, New York**

Sample Name:	6 NYCRR 375 SCO	GEO-01	GEO-02	GEO-03	GEO-04	GEO-05	GEO-06	GEO-07	GEO-08	GEO-09
Sample Interval (ft):	RESTRICTED USE	(13-18)	(13-17)	(15-20)	(12-17)	(13-17)	(10-11+15-19)	(13-17)	(10-14)	(15-20)
Sample Date:	COMM	2/4/2010	2/3/2010	2/3/2010	2/2/2010	2/4/2010	2/2/2010	2/2/2010	2/1/2010	2/1/2010
<b>BTEX (mg/kg)</b>										
Benzene	210	<b>0.36</b>	0.011 U	0.056 U	0.011 U	0.011 U	<b>0.69</b>	0.012 U	0.012 U	0.011 U
Toluene	500	<b>0.67</b>	0.011 U	<b>0.19</b>	0.011 U	0.011 U	<b>3.6 D</b>	0.012 U	0.012 U	<b>0.016</b>
Ethylbenzene	17	<b>5.8 D</b>	0.011 U	<b>5.7 D</b>	0.011 U	0.011 U	<b>13 D</b>	0.012 U	0.012 U	<b>0.081</b>
Xylene, total	65	<b>4.8</b>	0.011 U	<b>10 D</b>	0.011 U	0.011 U	<b>27 D</b>	0.012 U	0.012 U	<b>0.17</b>
<b>Other VOCs (mg/kg)</b>										
Acetone	500	0.11 U	<b>0.016</b>	0.056 U	<b>0.012 U</b>	<b>0.017</b>	0.058 U	0.012 U	<b>0.013</b>	0.011 U
Bromodichloromethane	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Bromoform	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Bromomethane	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Butanone,2-	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Carbon disulfide	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Carbon tetrachloride	22	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Chlorobenzene	500	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Chloroethane	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Chloroform	350	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Chloromethane	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Dibromochloromethane	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Dichloroethane,1,1-	240	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Dichloroethane,1,2-	30	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Dichloroethene,1,1-	500	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Dichloroethene,1,2- (total)	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Dichloropropane,1,2-	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Dichloropropene, cis-1,3	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Dichloropropene, trans-1,3	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Hexanone,2-	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Methyl tert-butyl ether	500	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Methyl-2-pentanone,4-	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Methylene chloride	500	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Styrene	NE	0.11 U	0.011 U	<b>0.073</b>	0.011 U	0.011 U	<b>0.34</b>	0.012 U	0.012 U	0.011 U
Tetrachloroethane,1,1,2,2-	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Tetrachloroethene	150	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Trichloroethane,1,1,1-	500	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U

**Table 1**  
**Pre-Characterization Lab Results**  
**Glen Cove Site**  
**Glen Cove, New York**

Sample Name: Sample Interval (ft): Sample Date:	6 NYCRR 375 SCO RESTRICTED USE COMM	GEO-01 (13-18) 2/4/2010	GEO-02 (13-17) 2/3/2010	GEO-03 (15-20) 2/3/2010	GEO-04 (12-17) 2/2/2010	GEO-05 (13-17) 2/4/2010	GEO-06 (10-11+15-19) 2/2/2010	GEO-07 (13-17) 2/2/2010	GEO-08 (10-14) 2/1/2010	GEO-09 (15-20) 2/1/2010
Trichloroethane,1,1,2-	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Trichloroethene	NE	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
Vinyl chloride	13	0.11 U	0.011 U	0.056 U	0.011 U	0.011 U	0.058 U	0.012 U	0.012 U	0.011 U
<b>TCLP VOCs (mg/L)*</b>										
Benzene	0.5	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	<b>0.015</b>	0.01 U	0.01 U	0.01 U
Butanone,2-	NE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon tetrachloride	0.5	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chlorobenzene	100	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform	6	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Cresols	200	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Dichlorobenzene,1,4-	7.5	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dichloroethane,1,2-	0.5	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dichloroethene,1,1-	0.7	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dinitrotoluene,2,4-	0.13	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Hexachlorobenzene	0.13	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Hexachlorobutadiene	NE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Hexachloroethane	3	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methylphenol, 3,4-	NE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methylphenol,2-	NE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Nitrobenzene	NE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Pentachlorophenol	NE	0.025 U	0.025 U	<b>0.029</b>	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Pyridine	5	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Tetrachloroethene	0.7	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Trichloroethene	NE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Trichlorophenol,2,4,5-	NE	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Trichlorophenol,2,4,6-	NE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Vinyl chloride	0.2	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
<b>Non-carcinogenic PAHs (mg/kg)</b>										
Acenaphthene	NE	<b>1.3 3.1</b>		<b>260 D</b>	<b>3.4</b>	0.37 U	<b>250 D</b>	<b>1.7</b>	<b>5.6</b>	<b>99 D</b>
Acenaphthylene	500	0.37 U	<b>0.76 30</b>	<b>JD</b>	<b>1.5</b>	0.37 U	<b>150 D</b>	<b>2</b>	<b>1.7</b>	<b>20 JD</b>
Anthracene	500	<b>1.6</b>	<b>4.1</b>	<b>120 D</b>	<b>6.8 D</b>	0.37 U	<b>420 D</b>	<b>9.1 D</b>	<b>6.4 D</b>	<b>100 D</b>
Benzo[g,h,i]perylene	500	<b>0.83 0.49</b>		<b>50 JD</b>	<b>1.2</b>	0.37 U	<b>20 JD</b>	<b>1.3</b>	<b>1.2</b>	<b>10 JD</b>
Fluoranthene	500	<b>4.3</b>	<b>6 D</b>	<b>290 D</b>	<b>9.7 D</b>	0.37 U	<b>230 D</b>	<b>13 D</b>	<b>12 D</b>	<b>110 D</b>

**Table 1**  
**Pre-Characterization Lab Results**  
**Glen Cove Site**  
**Glen Cove, New York**

Sample Name:	6 NYCRR 375 SCO	GEO-01	GEO-02	GEO-03	GEO-04	GEO-05	GEO-06	GEO-07	GEO-08	GEO-09
Sample Interval (ft):	RESTRICTED USE	(13-18)	(13-17)	(15-20)	(12-17)	(13-17)	(10-11+15-19)	(13-17)	(10-14)	(15-20)
Sample Date:	COMM	2/4/2010	2/3/2010	2/3/2010	2/2/2010	2/4/2010	2/2/2010	2/2/2010	2/1/2010	2/1/2010
Fluorene	NE	1.3 4.1		150 D	5.5	0.37 U	230 D	8.1 D	6.4 D	81 D
Methylnaphthalene,2-	4.7	0.37 U	0.7 230	D	1.4	0.37 U	430 D	1.2	0.65	38 D
Naphthalene	13	0.94 1.8		630 D	2.6	0.37 U	560 D	2.8	1.5	64 D
Phenanthrene	NE	4.7	14 D	720 D	31 D	0.37 U	730 D	29 D	25 D	290 D
Pyrene	500	5.4	7.8 D	390 D	14 D	0.37 U	330 D	17 D	16 D	150 D
<b>Carcinogenic PAHs (mg/kg)</b>										
Benz[a]anthracene	5.6	2.1 3.1		120 D	4.4	0.37 U	110 D	7.2 D	5.4	54 D
Benzo[a]pyrene	1	1.5 2.6		110 D	3.5	0.37 U	80 JD	5.4	5.1	42 D
Benzo[b]fluoranthene	5.6	0.97 2.4		87 D	3	0.37 U	60 JD	5	4.8	30 JD
Benzo[k]fluoranthene	56	1.1 0.81		30 JD	1.1	0.37 U	30 JD	1.5	2	10 JD
Chrysene	56	2.1 2.5		70 JD	4.6	0.37 U	110 D	6	5	63 D
Dibenz[a,h]anthracene	0.56	0.37 U	0.37 U	5.1 0.37		0.37 U	4.3 0.43		0.39 U	2.1
Indeno[1,2,3-cd]pyrene	5.6	0.73 0.51		40 JD	1.1	0.37 U	20 JD	1.3	1.2	10 JD
<b>Other SVOCs (mg/kg)</b>										
Bis(2-chloroethoxy)methane	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Bis(2-chloroethyl)ether	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Bis(2-ethylhexyl)phthalate	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.5	0.38 U	0.39 U	0.37 U
Bis(chloroisopropyl)ether	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Bromophenyl phenyl ether,4-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Butyl benzyl phthalate	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Carbazole	NE	0.37 U	0.37 U	2.2	0.37 U	0.37 U	77 DU	0.38 U	0.39 U	0.57
Chloro-3-methylphenol,4-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Chloroaniline,4-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Chloronaphthalene,2-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Chlorophenol,2-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Chlorophenyl phenyl ether,4-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Dibenzofuran	350	0.37 U	0.37 U	20 JD	0.37 U	0.37 U	20 JD	0.38 U	0.39 U	9 JD
Dichlorobenzene,1,2-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Dichlorobenzene,1,3-	280	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Dichlorobenzene,1,4-	130	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Dichlorobenzidine,3,3-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Dichlorophenol,2,4-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Diethyl phthalate	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U

**Table 1**  
**Pre-Characterization Lab Results**  
**Glen Cove Site**  
**Glen Cove, New York**

Sample Name: Sample Interval (ft): Sample Date:	6 NYCRR 375 SCO RESTRICTED USE COMM	GEO-01 (13-18) 2/4/2010	GEO-02 (13-17) 2/3/2010	GEO-03 (15-20) 2/3/2010	GEO-04 (12-17) 2/2/2010	GEO-05 (13-17) 2/4/2010	GEO-06 (10-11+15-19) 2/2/2010	GEO-07 (13-17) 2/2/2010	GEO-08 (10-14) 2/1/2010	GEO-09 (15-20) 2/1/2010
Dimethyl phthalate	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Dimethylphenol, 2,4-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Di-n-butyl phthalate	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Dinitro-2-methylphenol,4,6-	NE	0.93 U	0.92 U	0.94 U	0.93 U	0.93 U	0.97 U	0.96 U	0.98 U	0.94 U
Dinitrophenol,2,4-	NE	0.93 U	0.92 U	0.94 U	0.93 U	0.93 U	0.97 U	0.96 U	0.98 U	0.94 U
Dinitrotoluene,2,4-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Dinitrotoluene,2,6-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Di-n-octyl phthalate	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Hexachlorobenzene	6	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Hexachlorobutadiene	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Hexachlorocyclopentadiene	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Hexachloroethane	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Isophorone	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Methylphenol, 4-	500	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Methylphenol,2-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Nitroaniline,2-	NE	0.93 U	0.92 U	0.94 U	0.93 U	0.93 U	0.97 U	0.96 U	0.98 U	0.94 U
Nitroaniline,3-	NE	0.93 U	0.92 U	0.94 U	0.93 U	0.93 U	0.97 U	0.96 U	0.98 U	0.94 U
Nitroaniline,4-	NE	0.93 U	0.92 U	0.94 U	0.93 U	0.93 U	0.97 U	0.96 U	0.98 U	0.94 U
Nitrobenzene	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Nitrophenol,2-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Nitrophenol,4-	NE	0.93 U	0.92 U	0.94 U	0.93 U	0.93 U	0.97 U	0.96 U	0.98 U	0.94 U
N-Nitrosodi-n-propylamine	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
N-Nitrosodiphenylamine	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Pentachlorophenol	NE	0.93 U	0.92 U	0.94 U	0.93 U	0.93 U	0.97 U	0.96 U	0.98 U	0.94 U
Phenol	500	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Trichlorobenzene,1,2,4-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
Trichlorophenol,2,4,5-	NE	0.93 U	0.92 U	0.94 U	0.93 U	0.93 U	0.97 U	0.96 U	0.98 U	0.94 U
Trichlorophenol,2,4,6-	NE	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.39 U	0.37 U
<b>PCBs (mg/kg)</b>										
Aroclor 1016	NE	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.039 U	0.038 U	0.039 U	0.037 U
Aroclor 1221	NE	0.075 U	0.075 U	0.076 U	0.075 U	0.075 U	0.078 U	0.077 U	0.079 U	0.076 U
Aroclor 1232	NE	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.039 U	0.038 U	0.039 U	0.037 U
Aroclor 1242	NE	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.039 U	0.038 U	0.039 U	0.037 U

**Table 1**  
**Pre-Characterization Lab Results**  
**Glen Cove Site**  
**Glen Cove, New York**

Sample Name:	6 NYCRR 375 SCO	GEO-01	GEO-02	GEO-03	GEO-04	GEO-05	GEO-06	GEO-07	GEO-08	GEO-09
Sample Interval (ft):	RESTRICTED USE	(13-18)	(13-17)	(15-20)	(12-17)	(13-17)	(10-11+15-19)	(13-17)	(10-14)	(15-20)
Sample Date:	COMM	2/4/2010	2/3/2010	2/3/2010	2/2/2010	2/4/2010	2/2/2010	2/2/2010	2/1/2010	2/1/2010
Aroclor 1248	NE	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.039 U	0.038 U	0.039 U	0.037 U
Aroclor 1254	NE	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.039 U	0.038 U	0.039 U	0.037 U
Aroclor 1260	NE	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.039 U	0.038 U	0.039 U	0.037 U
<b>TCLP Pesticides (mg/L)*</b>										
Alpha-chlordane	NE	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Chlordane	0.03	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Chlordane, trans-	0.54	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Endrin	0.02	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Gamma-BHC	NE	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Heptachlor	0.008	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Heptachlor epoxide	NE	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Methoxychlor	10	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Toxaphene	NE	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
<b>TCLP Herbicides (mg/L)*</b>										
D,2,4'-	NE	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Silvex	NE	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
<b>Total Metals (mg/kg)</b>										
Aluminum	NE	2620	2630	2850	5120	2520	3750	4700	6790	2560
Antimony	NE	6 U	6.68 U	6.76 U	6.7 U	6 U	7 U	6.92 U	7.05 U	6.8 U
Arsenic	16	2.89	1.39	1.13 U	1.57	1 U	2.55	1.55	1.88	2.11
Barium	400	20 U	22.3 U	28.1	32.6	20 U	30.1	56.2	31.8	22.7 U
Beryllium	590	0.5 U	0.557 U	0.564 U	0.559 U	0.5 U	0.583 U	0.577 U	0.59 U	0.57 U
Cadmium	9.3	0.5 U	0.557 U	0.564 U	0.559 U	0.5 U	0.583 U	0.577 U	0.59 U	0.57 U
Calcium	NE	555	531	837	1000	438	708	796	924	626
Chromium	NE	9.91	12.4	7.26	13.1	6.83	9.01	13.2	16.0	10.2
Cobalt	NE	5 U	5.57 U	5.64 U	5.81	5 U	5.83 U	5.77 U	5.88 U	5.66 U
Copper	270	4.26	13.2	6.80	9.24	3.95	10.6	6.26	5.62	6.38
Iron	NE	5380	8030	5250	9310	3930	6720	7340	7800	7670
Lead	1000	2.65	7.87	2.69	4.06	2.06	36.7	7.58	14.0	4.02
Magnesium	NE	808	858	1000	1730	782	1140	1190	993	724
Manganese	10,000	40.6	51.4	64.5	123	47.1	75.0	61.7	56.6	57.8
Mercury	2.8	0.20 U	0.22 U	0.22 U	0.22 U	0.20 U	0.23 U	0.23 U	0.23 U	0.23 U
Nickel	310	4.76	5.89	6.08	8.43	4.97	6.54	6.30	9.15	6.98

**Table 1**  
**Pre-Characterization Lab Results**  
**Glen Cove Site**  
**Glen Cove, New York**

Sample Name:	6 NYCRR 375 SCO	GEO-01	GEO-02	GEO-03	GEO-04	GEO-05	GEO-06	GEO-07	GEO-08	GEO-09
Sample Interval (ft):	RESTRICTED USE	(13-18)	(13-17)	(15-20)	(12-17)	(13-17)	(10-11+15-19)	(13-17)	(10-14)	(15-20)
Sample Date:	COMM	2/4/2010	2/3/2010	2/3/2010	2/2/2010	2/4/2010	2/2/2010	2/2/2010	2/1/2010	2/1/2010
Potassium	NE	433 603	733		1100	380	675	576 385	504	
Selenium	1500	0.5 U	0.557 U	0.564 U	0.559 U	0.5 U	0.583 U	0.577 U	0.59 U	0.57 U
Silver	1500	1 U	1.11 U	1.13 U	1.12 U	1 U	1.17 U	1.15 U	1.18 U	1.13 U
Sodium	NE	28.3 30.2	38.1 45.8	32.5			38.6	39.2 36.5	33.8	
Thallium	NE	1 U	1.11 U	1.13 U	1.12 U	1 U	1.17 U	1.15 U	1.18 U	1.13 U
Vanadium	NE	8.37 8.86	9.27 16.0	6.68			10.4	14.1 15.7	9.09	
Zinc	10,000	20.8 20.1	17.5 24.7	16.1			44.2	18.9 71.8	14.1	
<b>TCLP METALS (mg/L)*</b>										
Arsenic	5	0.02 U	0.02 U	0.052	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Barium	100	0.520 0.396	0.514	0.527 0.258			0.690	0.416 0.399	0.290	
Cadmium	1	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Chromium	5	0.018	0.01 U	0.018	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Copper	NE	0.051 0.031	0.089	0.030 0.091			0.032	0.030 0.029	0.100	
Lead	5	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.091	0.02 U	0.029	0.02 U
Mercury	0.2	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Nickel	NE	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Selenium	1	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Silver	5	0.00059	0.00026	0.00048	0.000325	0.00024	0.000224	0.000191	0.000538	0.000443
Zinc	NE	0.310 0.145	0.150	0.243 0.112			0.329	0.167 0.229	0.143	
<b>Other</b>										
Corrosivity (pH solid) (pH units)	NE	5.8	7.7	7.2	6.7	6.4	6.3	6.8	7.2	6.7
Cyanide Reactivity (mg/kg)	NE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
Ignitibility (deg c)	NE	60 >	60 >	60 >	60 >	60 >	60 >	60 >	60 >	60 >
Moisture, percent (%)	NE	10.4	10.2	11.3	10.5	11.1	14.3	13.3	14.9	11.7
Sulfide Reactivity (mg/kg)	NE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
Sulfur (%)	NE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.13	0.1 U	0.1 U	0.1 U

**Table 1**  
**Pre-Characterization Lab Results**  
**Glen Cove Site**  
**Glen Cove, New York**

**Notes:**

**Data for these sampling events have not been validated. Qualifiers are Lab Qualifiers.**

Analytes in red were not detected in any sample

mg/kg - milligrams/kilogram or parts per million (ppm)

mg/L - milligrams/liter or parts per million (ppm)

BTEX - benzene, toluene, ethylbenzene, and xylenes

VOCs - volatile organic compounds

PAHs - polycyclic aromatic hydrocarbons

SVOCs - semivolatile organic compounds

PCBs - polychlorinated biphenyls

TCLP- toxicity characteristics leaching procedure

\*TCLP samples are compared to Title 40 CFR Chapter 1, Subchapter 1, Part 261 for TCLP, Ignitability and Corrosivity

6 NYCRR - New York State Register and Official Compilation of Codes, Rules and Regulations of the State of New York

6 NYCRR 375 SCO RESTRICTED USE COMM - regulatory comparison against NYCRR, Chapter IV, Part 375-6 Restricted Use Commercial Soil Cleanup Objectives

NE - not established

NA - not analyzed

**Bolding indicates a detected concentration**

Gray shading and bolding indicates that the detected result value exceeds established 6 NYCRR SCO COMM

**Laboratory Qualifiers:**

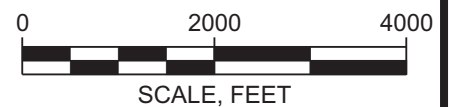
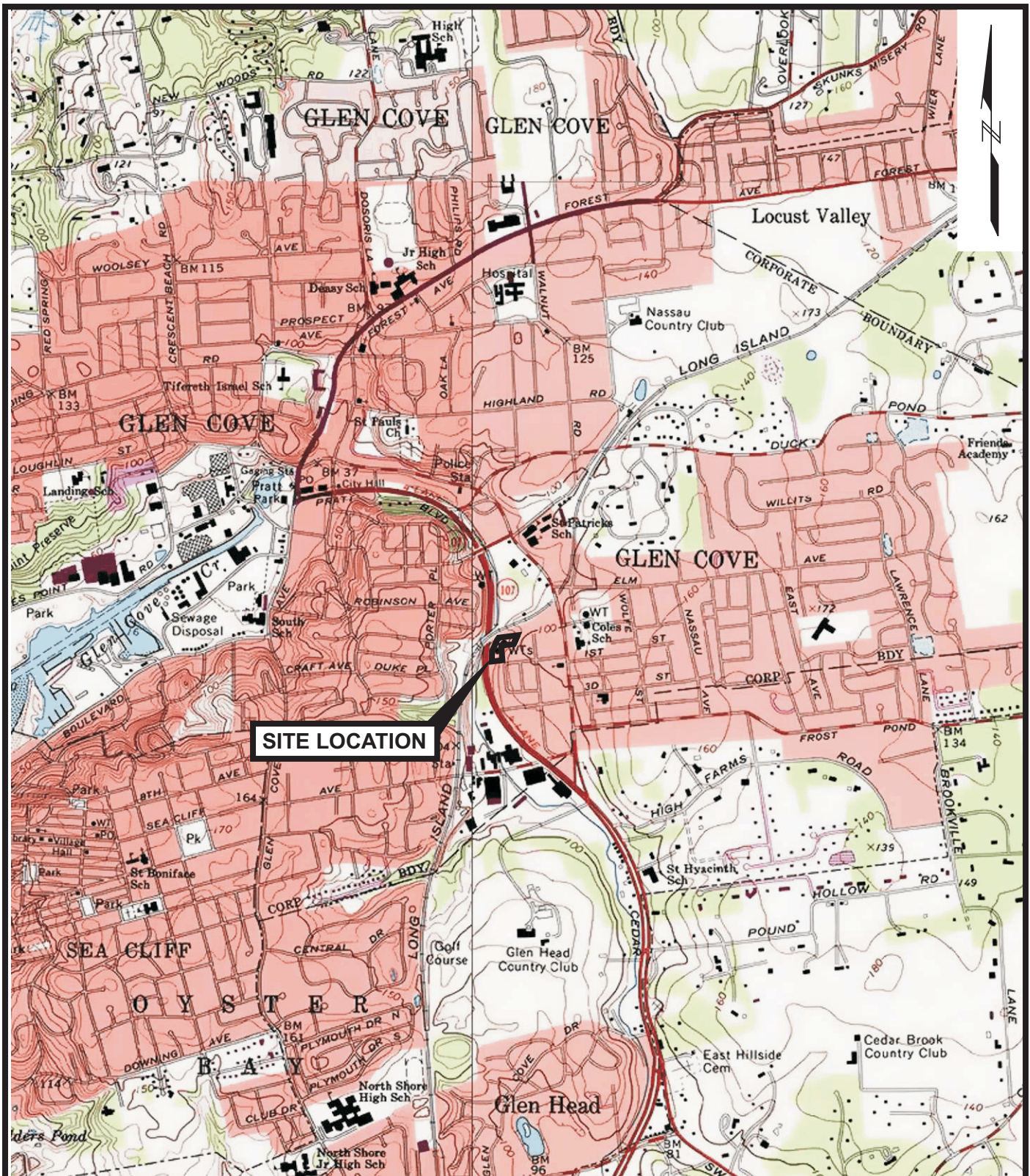
J - estimated value

U - indicates not detected at or above the reporting limit shown.

D - results for dilution

## Figures

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SOURCE: MAP CREATED WITH TOPO!™ ©2000 WILDFLOWER PRODUCTIONS (www.topo.com)

**PHASE I REMEDIAL ACTION WORK PLAN  
GLEN COVE FORMER MGP SITE  
GLEN COVE, NEW YORK**

**nationalgrid**



Project 093270-3

**SITE LOCATION MAP**

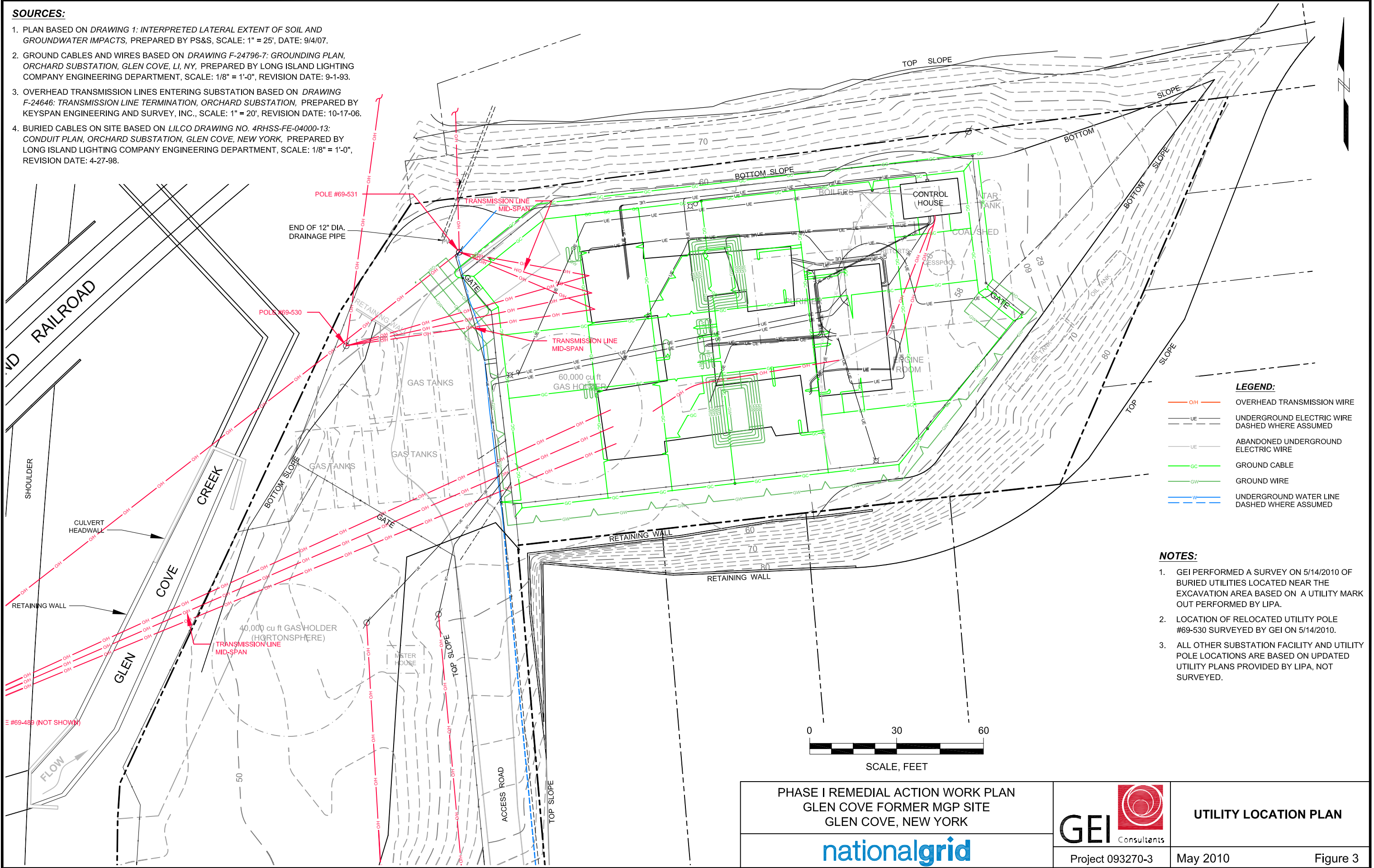
May 2010

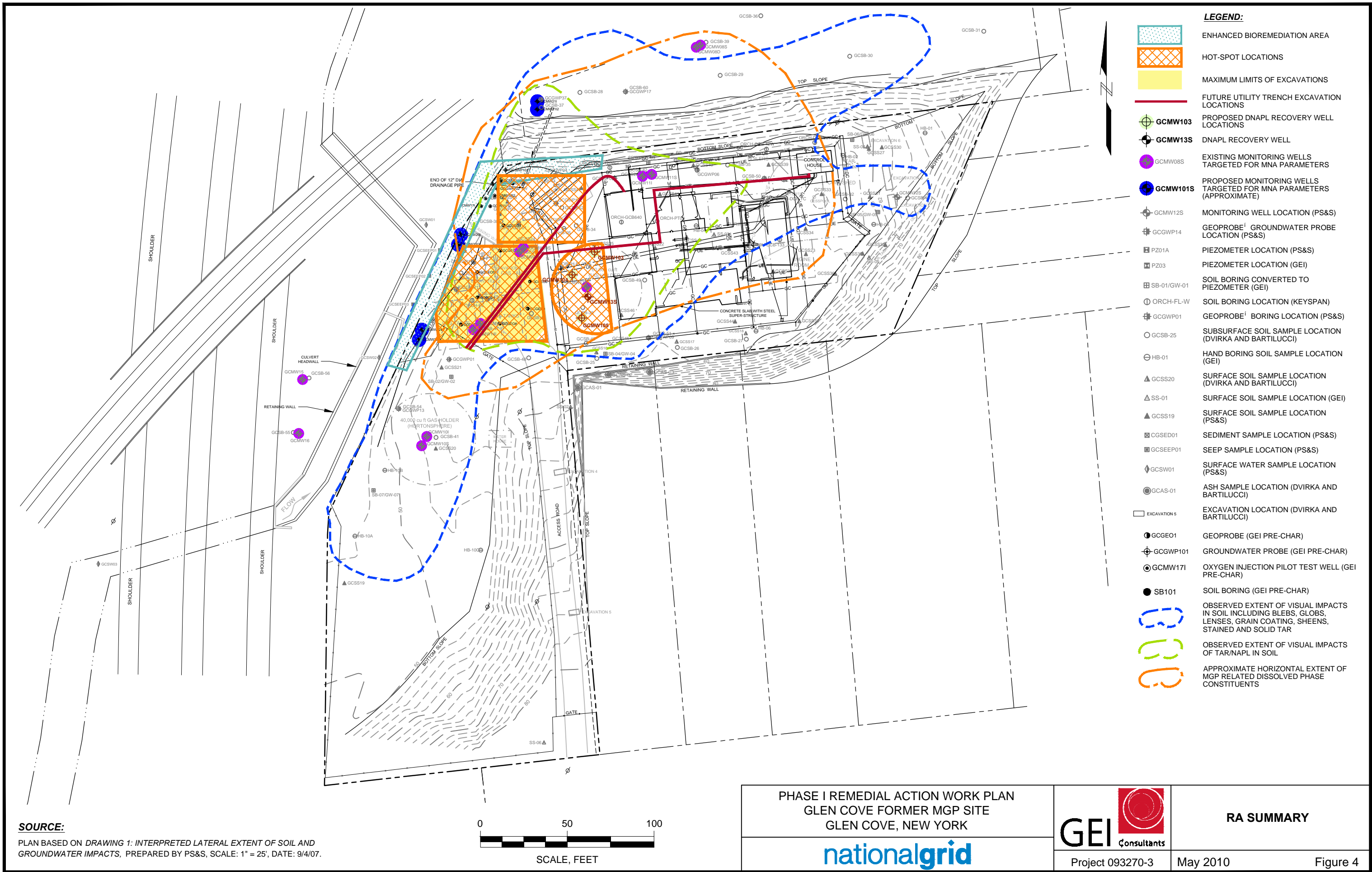
Figure 1



**SOURCES:**

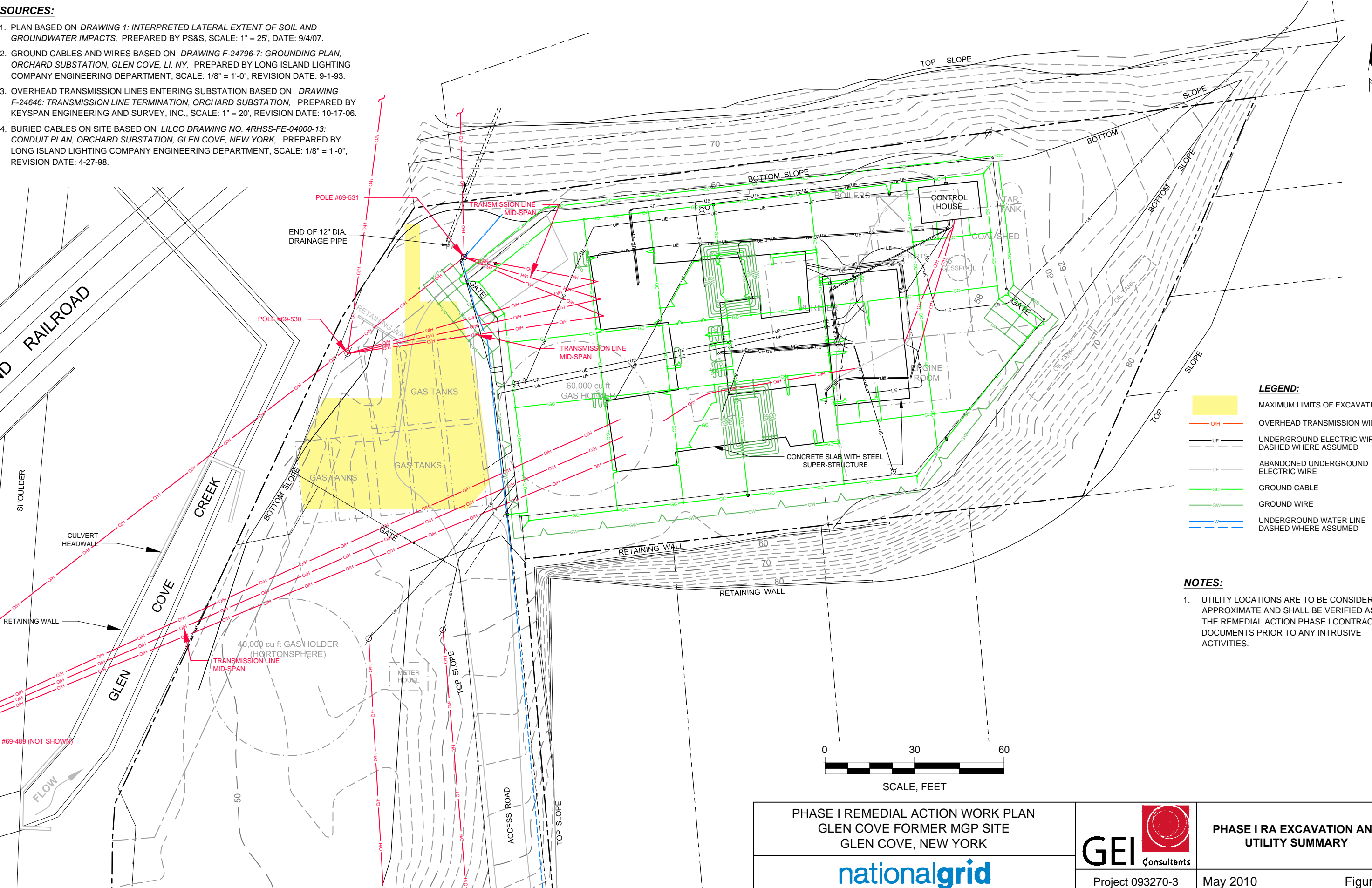
1. PLAN BASED ON *DRAWING 1: INTERPRETED LATERAL EXTENT OF SOIL AND GROUNDWATER IMPACTS*, PREPARED BY PS&S, SCALE: 1" = 25', DATE: 9/4/07.
2. GROUND CABLES AND WIRES BASED ON *DRAWING F-24796-7: GROUNDING PLAN, ORCHARD SUBSTATION, GLEN COVE, LI, NY*, PREPARED BY LONG ISLAND LIGHTING COMPANY ENGINEERING DEPARTMENT, SCALE: 1/8" = 1'-0", REVISION DATE: 9-1-93.
3. OVERHEAD TRANSMISSION LINES ENTERING SUBSTATION BASED ON *DRAWING F-24646: TRANSMISSION LINE TERMINATION, ORCHARD SUBSTATION*, PREPARED BY KEYSPAN ENGINEERING AND SURVEY, INC., SCALE: 1" = 20', REVISION DATE: 10-17-06.
4. BURIED CABLES ON SITE BASED ON *LILCO DRAWING NO. 4RHSS-FE-04000-13: CONDUIT PLAN, ORCHARD SUBSTATION, GLEN COVE, NEW YORK*, PREPARED BY LONG ISLAND LIGHTING COMPANY ENGINEERING DEPARTMENT, SCALE: 1/8" = 1'-0", REVISION DATE: 4-27-98.





SOURCES:













- 1. PLAN BASED ON DRAWING 1: INTERPRETED LATERAL EXTENT OF SOIL AND GROUNDWATER IMPACTS, PREPARED BY PS&S, SCALE: 1" = 25', DATE: 9/4/07.
- 2. GROUND CABLES AND WIRES BASED ON DRAWING F-24796-7: GROUNDING PLAN, ORCHARD SUBSTATION, GLEN COVE, LI, NY, PREPARED BY LONG ISLAND LIGHTING COMPANY ENGINEERING DEPARTMENT, SCALE: 1/8" = 1'-0", REVISION DATE: 9-1-93.
- 3. OVERHEAD TRANSMISSION LINES ENTERING SUBSTATION BASED ON DRAWING F-24646: TRANSMISSION LINE TERMINATION, ORCHARD SUBSTATION, PREPARED BY KEYSPAN ENGINEERING AND SURVEY, INC., SCALE: 1" = 20', REVISION DATE: 10-17-06.
- 4. BURIED CABLES ON SITE BASED ON LILCO DRAWING NO. 4RHSS-FE-04000-13: CONDUIT PLAN, ORCHARD SUBSTATION, GLEN COVE, NEW YORK, PREPARED BY LONG ISLAND LIGHTING COMPANY ENGINEERING DEPARTMENT, SCALE: 1/8" = 1'-0", REVISION DATE: 4-27-98.



## Plate

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- |   |  |
|---|--|
|    | FILL   |
|    | SAND AND GRAVEL                              |
|    | SILTY SAND                                   |
|   | SILTY CLAY                                   |
|  | INTERLAYERED SAND WITH GRAVEL AND SILTY SAND |
|  | TAR/NAPL SATURATED                           |
|  | BLEBS, SHEENS, LENSES, GLOBS, GRAIN COATING  |
|  | STAINED                                      |
|  | SOLID TAR                                    |
|  | WATER TABLE                                  |
|  | ODOR   |
|  | WELL SCREEN INTERVAL                         |

1. IMPACTS NOTED IN EXPLORATIONS CONDUCTED BY GEI ARE SHOWN IN THEIR RESPECTIVE BORING DIAGRAMS ONLY .
2. THE LOCATION OF IMPACTS AS REPORTED BY PS & S IN THE CROSS SECTIONS WERE NOT ALTERED TO ACCOMMODATE FOR NEW INFORMATION FROM THE EXPLORATIONS CONDUCTED BY GEI.



1. PLAN BASED ON DRAWING 1: INTERPRETTED LATERAL EXTENT OF SOIL AND GROUNDWATER IMPACTS, PREPARED BY P&S, SCALE: 1" = 25', DATE: 9/4/07.
2. SITE FENCE LOCATION BASED ON DRAWING TOPOGRAPHICAL SURVEY ORCHARD SUBSTATION PREPARED BY NATIONAL GRID ENGINEERING AND SURVEY, INC., SCALE: 1" = 20', DATE: 8/19/09.
3. A-A IS EXCERPTED FROM FIG 3A GEOLOGIC CROSS SECTION A-A DATED 6/12/06 PREPARED BY P&S FOR NOVEMBER 2008 RI REPORT.
4. B-B IS EXCERPTED FROM FIG 3B GEOLOGIC CROSS SECTION B-B DATED 6/12/06 PREPARED BY P&S FOR NOVEMBER 2008 RI REPORT.

- HORIZONTAL: NEW YORK STATE PLANE COORDINATE  
SYSTEM LONG ISLAND 3104
- VERTICAL : NATIONAL GEODETIC VERTICAL DATUM 1929

- | PROPOSED LIMITS OF EXCAVATION   |  |
|---|--|
|  | SECTION A-A'   |
|  | SECTION B-B'   |
|  | OBSERVED EXTENT OF VISUAL IMPACTS IN SOIL<br>INCLUDING BLEBS, GLOBS, LENSES, GRAIN COATING,<br>SHEENS, STAINED AND SOLID TAR |
|  | OBSERVED EXTENT OF VISUAL IMPACTS OF TAR/NAPL IN<br>SOIL   |
|  | APPROXIMATE HORIZONTAL EXTENT OF MGP RELATED<br>DISSOLVED PHASE CONSTITUENTS   |

## **Appendix A**

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### **Boring and Monitoring Well Logs (electronic only)**

# BORING HB-1

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

CATION:

DATE STARTED: 11/09/95

DATE COMPLETED: 11/09/95

DRILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: Hand Auger

SAMPLING METHOD:

GROUND ELEVATION: 68 ft MSL

DATUM:

INSPECTOR: Rob Cooney

SPLIT SPOON AMPLE EPH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION	VISUAL CONTAM.			ODOR			SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				color, density, SOIL,admixture, moisture, other notes, ORIGIN	NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT			
				Light brown fine to coarse sand, little gravel, little organics, FILL.									
				Gray fine to medium sand, some gravel, little coal, FILL.									
				Black sand and clinker, some ash, little gravel, FILL, no odor.									
				End of boring at 2.0 feet. Refusal on cobbles.									

ATLANTIC

# BORING HB-3

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

CATION:

DATE STARTED: 11/07/95

DATE COMPLETED: 11/07/95

DRILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: Hand Auger

SAMPLING METHOD:

GROUND ELEVATION: 61 ft MSL

DATUM:

INSPECTOR: Rob Cooney

SPLIT SPOON DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION	VISUAL CONTAM.				ODOR			SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				color, density, SOIL, admixture, moisture, other notes, ORIGIN	NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT	MODERATE			
0-2				Dark brown medium sand and silt, some organics (twigs, leaves, etc.), FILL. Light brown medium sand and gravel, some silt, trace brick, FILL.										0
2-4				Light brown sand and gravel to cobbles, trace asphalt, FILL. Light brown sand FILL.										
				End of boring at 4.0 feet. Refusal.										5

ATLANTIC

# BORING HB-4

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

CATION:

DATE STARTED: 11/10/95

DATE COMPLETED: 11/10/95

DILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: Hand Auger

SAMPLING METHOD:

GROUND ELEVATION: 57.5 ft MSL

DATUM:

INSPECTOR: Rob Cooney

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION	VISUAL CONTAM.				ODOR			SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				color, density, SOIL,admixture, moisture, other notes, ORIGIN	NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT	MODERATE			
0-2				Brown medium sand, some angular gravel (FILL).  Grades to little gravel, subround.										0
2-4				Becomes light brown, sand grades to medium to coarse, moist to wet. Groundwater interface. Brown fine to very fine sand, little silt, FILL.										
4-6				End of boring at 4.25 feet. Refusal.										5

**ATLANTIC**

# BORING HB-5

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

LOCATION:

DATE STARTED: 11/10/95

DATE COMPLETED: 11/10/95

DRILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: Hand Auger

SAMPLING METHOD:

GROUND ELEVATION: 56.7 ft MSL

DATUM:

INSPECTOR: Rob Cooney

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION	VISUAL CONTAM.				ODOR			SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				color, density, SOIL,admixture, moisture, other notes, ORIGIN	NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT	MODERATE			
0-2				Dark brown medium sand and angular gravel, FILL. Brown medium sand, some subangular to subround gravel, FILL.										0
2-4				Light brown medium to coarse sand, little round to subround gravel, FILL, moist. Brown fine to very fine sand, some silt, trace gravel, FILL, moist.										
4-6														5
6-8				Black sand and coke/coal, trace clinker, trace gravel, FILL, slight hydrocarbon odor.										
				End of boring at 7.25 feet. Refusal.										

ATLANTIC

# BORING HB-6

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

LOCATION:

DATE STARTED: 11/08/95

DATE COMPLETED: 11/08/95

DRILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: Hand Auger

SAMPLING METHOD:

GROUND ELEVATION: 58 ft MSL

DATUM:

INSPECTOR: Rob Cooney

SPLIT SPOON AMPLE IEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION	VISUAL CONTAM.			ODOR			LITHOLOGY	DEPTH (FT.)
				color, density, SOIL,admixture, moisture, other notes, ORIGIN	NONE STAIN SHEEN HEAVY	NONE SLIGHT MODERATE HEAVY	SAMPLE ANALYSIS					
0-2				Dark brown medium sand and organics (leaves), trace silt, FILL, no odor. Light brown medium sand and gravel, FILL, no odor.								0
2-4				Sand and silt, FILL. Light brown sand and gravel, some gray clay, FILL. Light brown sand and gravel, some gray clay, FILL, little coal fragments. Medium to coarse sand and gravel, trace coal fragments, FILL. Brown sand, FILL. Light brown sand and gravel, FILL. Light brown-gray gravel, FILL.								
4-6				Light brown gravel to cobble, FILL. Light brown sand and gravel, little gray silt, trace clay, FILL, dense, no odor. Dark gray SILT, some gravel, FILL, tight. Light brown medium sand and gravel, FILL.  Brown/light brown medium sand and silt, FILL. Light brown medium sand and gravel, FILL.								5
6-8				Light brown medium sand and gravel, FILL, trace coal fragments.  End of boring at 6.5 feet. Refusal on cobbles.								

ATLANTIC

# BORING HB-7

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

LOCATION:

DATE STARTED: 11/08/95

DATE COMPLETED: 11/08/95

DRILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: Hand Auger

SAMPLING METHOD:

GROUND ELEVATION: 54 ft MSL

DATUM:

INSPECTOR: Rob Cooney

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION	VISUAL CONTAM.				ODOR			SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				color, density, SOIL,admixture, moisture, other notes, ORIGIN	NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT	MODERATE			
				Medium to coarse sand and gravel, FILL, no odor.										0
0-2				Coarse sand and gravel, some cobbles, FILL, moist to wet, no odor, groundwater interface at 1.0.										
				Coarse sand and cobbles, FILL, saturated (unconsolidated material continues to fall in boring).										
2-4				End of boring at 2.5 feet. Refusal.										

ATLANTIC

# BORING HB-10A

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: I691-08-02

LOCATION:

DATE STARTED: 11/08/95

DATE COMPLETED: 11/08/95

DRILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: Hand Auger

SAMPLING METHOD:

GROUND ELEVATION: 47.85 ft MSL

DATUM:

INSPECTOR: Rob Cooney

SPLIT SPOON DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION  color, density, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.			ODOR			LITHOLOGY	DEPTH (FT.)
					NONE	STAIN	SHEEN	NONE	SLIGHT	MODERATE		
0-2				Dark brown sand and silt, some organics (roots), little gravel, FILL. Gray medium to coarse sand and gravel, FILL. Light brown fine to coarse sand, little gravel, micaceous.								0
				Sand grades to medium.								
2-4				Groundwater interface at 2.5. Gray staining, slight odor (petroleum).								
				Brown fine sand, little silt, little gravel, trace coal/coke, FILL.								
4-6				End of boring at 4.25 feet.								5

ATLANTIC

# BORING HB-10B

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

LOCATION:

DATE STARTED: 11/08/95

DATE COMPLETED: 11/08/95

DRILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: Hand Auger

SAMPLING METHOD:

GROUND ELEVATION: 48.14 ft MSL

DATUM:

INSPECTOR: Rob Cooney

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION	VISUAL CONTAM.				ODOR			SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	
				color, density, SOIL,admixture, moisture, other notes, ORIGIN	NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT	MODERATE				HEAVY
0-2				Light brown sand, little silt, little organics, FILL, no odor.  Light brown fine to medium sand, some silt, little gravel, FILL, compact.  Light brown sand and silt, some gravel, FILL, no odor.          Cinders and coal fragments, FILL, no odor.											0
2-4				  											

ATLANTIC

# BORING HB-10C

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

LOCATION:

DATE STARTED: 11/08/95

DATE COMPLETED: 11/08/95

DILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: Hand Auger

SAMPLING METHOD:

GROUND ELEVATION: 51 ft MSL

DATUM:

INSPECTOR: Rob Cooney

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION	VISUAL CONTAM.				ODOR			SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)
				color, density, SOIL,admixture, moisture, other notes, ORIGIN	NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT	MODERATE			
0-2				Dark brown medium sand and silt, some gravel, little organics (leaves, twigs, etc.), FILL, no odor.										0
				Brown silt, some sand, some gravel, little brick fragments, FILL, no odor.										
				Dark brown sand and silt, some organics (roots), little gravel, trace coal/cinder, FILL.										
				Dark brown medium to fine sand, some silt, little coal fragments, little cinder, trace gravel, FILL.										
2-4				Dark brown medium sand and gravel, little coal fragments, little gravel, FILL, iron oxide staining, no odor.										
				Clinker, FILL, iron oxide staining, no odor.										
				Coal fragments, some iron oxide stained silt, FILL.										
				Dark gray with black streaks, gravel and clinker, some coal, little organics (peat), FILL, sulfur odor.										
				Dark gray CLAY, slight sulfur odor.										
4-6				End of boring at 4.5 feet. Clay won't remain in auger.										5

ATLANTIC

## BORING SB-1

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

LOCATION:

DATE STARTED: 11/07/95

DATE COMPLETED: 11/08/95

**DRILLING CONTRACTOR:** Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: 4-1/4" ID Hollow Steam Auger

SAMPLING METHOD: 2-inch split spoon

GROUND ELEVATION: 56.67 ft. MSL

WELL ELEVATION:

WATER TABLE ELEVATION:

DATUM:

INSPECTOR: Richard Mitchell

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION	VISUAL CONTAM.				ODOR			LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION		
				color, density, SOIL,admixture, moisture, other notes, ORIGIN	NONE	STAIN	SLEEN	HEAVY	NONE	SLIGHT	MODERATE			HEAVY	SAMPLE ANALYSIS	
0.5-2	9,10,13	50	0.1	Augered through asphalt.	[Black bar]	[Black bar]	[Black bar]	[Black bar]	[Black bar]	[Black bar]	[Black bar]	[Cross-hatched pattern]	0	2" PVC Riser	[Well diagram]	Concrete
2-4	20,25 20,18	50		Brown fine to coarse sand and gravel, little silt, little brick, FILL, moist.												
4-6	15,15 15,12	50		Gray fine sand, some silt, trace gravel, FILL.												
6-8	8,7 4,3	25		Brown fine to medium sand, some silt, FILL, moist.												
8-10	5,3 1,3	50		Black cinders, ash, fine sand, little silt, trace brick, FILL.												
10-12	3,3 7,13	50		4									Brown fine to coarse sand and gravel, FILL, slight odor.			
2-14	15,15 17,21	65														
14-16	10,13 15,13	50														
6-18	11,12 14,17	100											2.2			
18-20	27,33 34,34	50		Brown fine to coarse SAND, some fine gravel, tar seams present, moderate odor.												
0-22	14,34 40,33	50		Brown fine to medium SAND, little gravel, little silt, tar seam at 19 feet, moist, very compact.												
22-24	33,41 68,50/.1	25		Brown fine to medium SAND, some gravel, no tar, no odor, very compact.												
4-26	37,25 28,30	40		65									Brown fine to coarse SAND, some fine gravel, little silt, very compact, medium sand seam at 23.8.			
26-28	12,30 34,35	65											Brown fine to coarse SAND and GRAVEL, little silt, moist.			
8-30	25,31 34,22	50	Brown fine to medium SAND, little fine gravel, trace silt, moist.													
30-32	12,24 30,38	75	Brown fine to coarse SAND, some gravel, trace silt, saturated.													
5-37	4,5 4,28	75	50	Augered to 35 feet.												
38-39	100/0.5'	50		Brown fine to coarse SAND and GRAVEL, trace silt, saturated.												
				Brown fine to medium SAND, little coarse gravel, trace silt, saturated.												
				End of boring at 39.0 feet.									40			

*ATLANTIC*

# BORING SB-2

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: I69I-08-02

LOCATION:

DATE STARTED: 11/08/95

DATE COMPLETED: 11/08/95

DRILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: 4-1/4" Hollow Stem Auger

SAMPLING METHOD: 2-inch split spoon

GROUND ELEVATION: 55.5 ft MSL

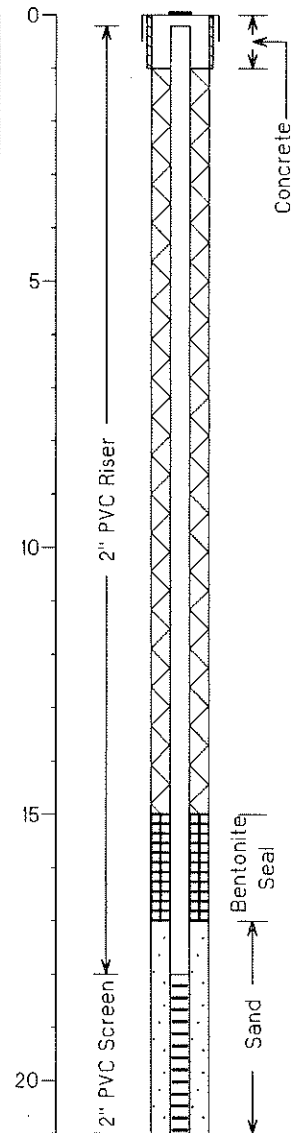
WELL ELEVATION:

WATER TABLE ELEVATION:

DATUM:

INSPECTOR: Richard Mitchell

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION  color, density, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.				ODOR			LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT	MODERATE	HEAVY		
				Augered through brown sand and gravel, little silt.										
				Black staining and moderate odor present in cuttings.										
15-17	10,17 18,23	75		Brown fine to medium SAND, little gravel, little silt.										
17-19	14,15 19,19	65	0.0	Brown fine to coarse SAND, some fine gravel, little silt. Groundwater interface at 17.										
				Augered to 21 feet.										
				End of boring at 21.0 feet.										



ATLANTIC

# BORING SB-3

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

LOCATION:

DATE STARTED: 11/08/95

DATE COMPLETED: 11/08/95

DRILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: 4-1/4" Hollow Stem Auger

SAMPLING METHOD: 2-inch split spoon

GROUND ELEVATION: 56.76 ft MSL

WELL ELEVATION:

WATER TABLE ELEVATION:

DATUM:

INSPECTOR: Richard Mitchell

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION color, density, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.				ODOR			LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT	MODERATE	HEAVY		
				(Hand augered to 5.0 feet). Brown fine to coarse sand and gravel, little silt, FILL.									0	
				Becomes moist.									5	
				Augered through black fine to coarse sand, some gravel, little silt, FILL, moderate odor.									10	
2-14	21,25 33,37	50		Black sand and gravel, FILL, moderate odor.									15	
				Black fine to medium sand, little silt, FILL, moderate odor.									20	
				Brown fine to coarse sand, some gravel, little silt, no stain or odor.									25	
15-17	7,17 15,15	50	0.0	Brown fine to coarse sand, little gravel, little silt, trace purifier material, FILL, tar seams, slight odor.									30	
17-19	9,28 33,38	15		Brown fine to coarse SAND, little gravel, little silt, no tar, no odor.									35	
19-21	21,34 33,33	55	0.0	Brown fine to coarse SAND, some fine to coarse gravel, little silt, groundwater interface at 19.									40	
				End of boring at 21.0 feet.									45	

ATLANTIC

# BORING SB-4

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: I69I-08-02

LOCATION:

DATE STARTED: 11/09/95

DATE COMPLETED: 11/09/95

DILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: 4-1/4" Hollow Stem Auger

SAMPLING METHOD: 2-inch split spoon

GROUND ELEVATION: 56.94 ft MSL

WELL ELEVATION:

WATER TABLE ELEVATION:

DATUM:

INSPECTOR: Richard Mitchell

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION  color, density, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.				ODOR				LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT	MODERATE	HEAVY			
				Augered through black fine to medium sand, little gravel, little silt (FILL). Augered through brown fine to medium sand and gravel, little silt, FILL.										0	
			0.2	Augered through black fine sand, some silt, trace gravel, FILL, slight odor.										5	
				Augering became more difficult (cobbles).										10	
15-17	15,17 17,21	50	0.0	Black fine to medium sand, little gravel, trace silt, FILL.										15	
17-19	30,40 45,67	85		Grades to brown fine to medium sand, little gravel, trace silt, FILL, slight odor, unconsolidated, groundwater interface at 15.5.										20	
19-20	25,38	50		Brown fine to medium SAND, some fine gravel, little silt, compact, no odor.											
				End of boring at 20.0 feet.											

ATLANTIC

# BORING SB-5

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

LOCATION:

DATE STARTED: 11/09/95

DATE COMPLETED: 11/09/95

DRILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: 4-1/4" Hollow Stem Auger

SAMPLING METHOD: 2-inch split spoon

GROUND ELEVATION: 59.34 ft MSI

WELL ELEVATION:

WATER TABLE ELEVATION:

DATUM:

INSPECTOR: Richard Mitchell

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION  color, density, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.				ODOR			SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT	MODERATE	HEAVY			
				Augered through brown fine to coarse gravel and sand, little silt, little brick, FILL.										0	
				Becomes very cobbly.										5	
				Augered through fine to coarse SAND and GRAVEL, some silt, slight odor.										10	
4-16	10,12 12,16	15	0.0	Brown fine to coarse GRAVEL and SAND, little silt, slight odor, groundwater interface at 14.0.										15	
3-18	6,7 7,11	50	0.0												
				End of boring at 18.0 feet.										20	

ATLANTIC

# BORING SB-6

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

CATION:

DATE STARTED: 11/10/95

DATE COMPLETED: 11/10/95

ILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: 4-1/4" Hollow Steam Auger

SAMPLING METHOD: 2-inch split spoon

GROUND ELEVATION: 58.52 ft MSL

WELL ELEVATION:

WATER TABLE ELEVATION:

DATUM:

INSPECTOR: Richard Mitchell

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION color, density, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.			ODOR			LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					NONE	STAIN	SHEEN	NONE	SLIGHT	MODERATE	HEAVY		
				(Hand augered to 5 feet). Brown fine to medium sand, some fine to coarse gravel, little silt, trace coal, FILL. Black coal, some fine to coarse sand and gravel, little silt, FILL.									
3-10	10,4 4,5	50		Brown fine to coarse sand and gravel, little silt, FILL, saturated, no odor. Gray/brown fine sand and silt, FILL, tight, groundwater interface at 9.0. Augered to 15 feet.									
15-17	38,22 22,27	50	0.0	Brown fine to coarse GRAVEL and SAND, trace silt, saturated.									
				End of boring at 17.0 feet.									

ATLANTIC

# BORING SB-7

Page 1 of 1

PROJECT: Glen Cove MGP Site

PROJECT NO: 1691-08-02

LOCATION:

DATE STARTED: 11/10/95

DATE COMPLETED: 11/10/95

DILLING CONTRACTOR: Aquifer Drilling and Testing

DRILLER:

DRILLING METHOD: 4-1/4" Hollow Steam Auger

SAMPLING METHOD: 2-inch split spoon

GROUND ELEVATION: 47.68 ft MSL

WELL ELEVATION:

WATER TABLE ELEVATION:


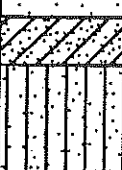
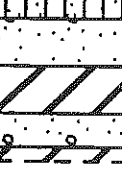
DATUM:

INSPECTOR: Richard Mitchell

SPLIT SPOON SAMPLE DEPTH (ft)	BLOWS PER 6"	% RECOVERY	HNU (ppm)	SOIL DESCRIPTION  color, density, SOIL, admixture, moisture, other notes, ORIGIN	VISUAL CONTAM.			ODOR			SAMPLE ANALYSIS	LITHOLOGY	DEPTH (FT.)	WELL CONSTRUCTION
					NONE	STAIN	SHEEN	HEAVY	NONE	SLIGHT	MODERATE	HEAVY		
0-2	3,3 4,5	65		Brown fine to medium sand, little gravel, little silt, FILL. Gray-brown fine sand, some silt, little gravel. Black coal, some fine to medium sand, little cinder, little silt, FILL.										
2-4	2,3 3,4	50		Brown/black fine sand and silt, little gravel, FILL, groundwater interface at 3.5.										
4-6	8,8 10,11	75		Brown fine to coarse gravel and sand, trace silt, FILL, saturated.										
6-8	12,12 14,17	50												
8-10	13 50/0	10												
10-12				End of boring at 10.0 feet.										

ATLANTIC

Location: Glen Cove	Site Id: GCSB-25
Station: 0.00'	Completed Depth: 11.00'
Datum: Mean Sea Level	Total Depth: 11.00'
Drilled By: Jeff Diamond	Borehole Dia.: 2.00in
Use: Soil Boring	Remarks: Samples selected for analysis at: 0-2', 4-6', and 8-11'
(s): 11/22/99 - 11/22/99	
Drilling Firm: Dvirka & Bartilucci	
Contractor: Emington Environment	
Logging Method: Geoprobe	
Log No.:	
Log Date: / /	

Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
		(0-4)	5.4 ppm 13.1 ppm 43.6 ppm 12.9 ppm 5.5 ppm		Gray-black, SILTY CLAY Yellow-brown, fine-very coarse SILTY SAND w/mica & pebbles Yellow-brown, fine-med. SILTY SAND w/v.coarse sand, clay, pebbles
		(4-8)	47.1 ppm 26.3 ppm 24.6 ppm 27.9 ppm 22.9 ppm 42.9 ppm		Yellow-brown, coarse-very coarse SAND w/fine gravel Yellow-brown, medium-coarse CLAYEY SAND & gray SILTY SAND Black-gray, fine-med. CLAYEY SAND w/fine-med. gravel, clinkers
10		(8-11)	63.3 ppm 71.1 ppm 190 ppm 187 ppm 180 ppm 37.2 ppm		Gray-black, fine-medium SAND w/gravel to brown med.-coarse SAND Dark gray, CLAY, w/med.-coarse SAND, odor Med.-Coarse GRAVEL to gray CLAYEY SAND, odor Yellow-brown, med-v.coarse SAND w/gravel & pebbles Yellow-brown, SANDY CLAY, micaceous w/trace fine gravel

Location: Glen Cove	Site Id: GCSB-26
Elevation: 0.00'	Completed Depth: 10.00'
Datum: Mean Sea Level	Total Depth: 10.00'
Logged By: Jeff Diamond	Borehole Dia.: 2.00in
Purpose: Soil Boring	Remarks: Samples selected for analysis at: 0-2', 4-6', and 8-10'
Date(s): 11/22/99 - 11/22/99	
Consulting Firm: Dvirka & Bartilucci	
Contractor: Emington Environment	
Drilling Method: Geoprobe	
Permit No.:	
Permit Date: / /	

Elevation (ft)	Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
			(0-4)	474 ppm 242 ppm 499 ppm 498 ppm		Dark gray, fine SILTY SAND Yellow-brown, medium-very coarse, SILTY SAND w/pebbles & fine gravel
			(4-8)	67.7 ppm 113 ppm 97.3 ppm 205 ppm 179 ppm		Yellow-brown, med.-v.coarse SAND w/pebbles Dark gray, fine SAND to gray-black pasty CLAY w/fine-coarse SAND Yellow-brown, fine-coarse CLAYEY SAND w/fine gravel
			(8-10)	0.0 ppm 0.0 ppm		Dark yellow-brown, fine-medium SAND w/mica Yellow-brown to gray-black, coarse-very coarse SAND w/pebbles Yellow-brown, SILTY CLAY, micaceous, w/fine sand
-10	10					Base of boring- 10 ft.

Location: Glen Cove	Site Id: GCSB-27
Elevation: 0.00'	Completed Depth: 10.00'
Datum: Mean Sea Level	Total Depth: 10.00'
Logged By: Jeff Diamond	Borehole Dia.: 2.00in
Purpose: Soil Boring	Remarks: Samples selected for analysis at: 0-2', 4-6', and 8-10'
Date(s): 11/22/99 - 11/22/99	
Consulting Firm: Dvirka & Bartilucci	
Contractor: Emington Environment	
Drilling Method: Geoprobe	
Permit No.:	
Permit Date: / /	

Elevation (ft)	Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
			(0-4)	0.0 ppm		Gray-black, silty TOP SOIL, organics to dark gray fine SAND w/clay
				0.0 ppm		Yellow brown, medium-coarse SAND w/pebbles
				0.0 ppm		Yellow-brown, coarse SILTY SAND w/clay & pebbles to CLAYEY SAND
			(4-8)	739 ppm		Yellow-brown to gray-orange, coarse SAND w/fine gravel
				917 ppm		Yellow-brown, coarse SAND w/fine gravel to gray fine SAND w/clay
				845 ppm		Yellow-brown, fine-med. SILTY SAND to med-coarse SAND w/pebbles
				169 ppm		Yellow-brown, fine-coarse CLAYEY SAND w/trace of pebbles
			(8-10)	192 ppm		Yellow-brown, med.-coarse SILTY SAND to brown, fine CLAYEY SAND
				414 ppm		
				284 ppm		
				400 ppm		Yellow-orange, med.-coarse SAND to brown fine-coarse SAND w/pebbles
				523 ppm		
-10	10					Base of Boring- 10 ft.

Location: Glen Cove	Site Id: GCSB-28
Elevation: 0.00'	Completed Depth: 47.00'
Datum: Mean Sea Level	Total Depth: 47.00'
Logged By: Jeff Diamond	Borehole Dia.: 8.50in
Purpose: Soil Boring	Remarks: Samples selected for analysis at 8-10', 16-18', 22-24', 34-36'
Date(s): 11/16/99 - 11/16/99	
Consulting Firm: Dvirka & Bartilucci	
Contractor: Emington Environment	
Drilling Method: Hollow Stem Auger	
Permit No.:	
Permit Date: / /	

Elevation (ft)	Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
			(2-4)	488 ppm		Black, silty TOP SOIL w/subrounded pebbles
			(4-6)	78.8 ppm		Black, silty TOP SOIL w/brown SILTY CLAY, pebbles and asphalt
			(6-8)	0.0 ppm		Yellow-brown, medium-coarse CLAYEY SAND w/some mica
			(8-10)	0.0 ppm		Black, SILTY SAND to green-gray SILTY CLAY, micaceous, w/gravel & coal fragments
-10	10		(10-12)	6.8 ppm		Gray-black, SILTY to CLAYEY SAND w/yellow-orange micaceous CLAY, w/coal tar & pebbles
			(12-14)	0.0 ppm		Gray-black, micaceous SILTY CLAY w/angular pebbles & coal-like material
			(16-18)	0.0 ppm		Dark gray, SILTY CLAY and fine SAND w/subrounded to angular pebbles and coal
			(18-20)	0.0 ppm		Yellow-brown, micaceous SILTY CLAY to medium-very coarse SAND w/subrounded pebbles
-20	20		(22-24)	2000+ ppm		Dusky yellow-brown, SILTY CLAY
			(24-26)	2000+ ppm		Yellow-orange, coarse-very coarse SAND w/silty sand, subrounded pebbles and coal fragments
			(26-28)	765 ppm		Gray-black, med.-coarse SILTY SAND w/subangular pebbles to yellow-brown micaceous SILTY CLAY & CLAYEY SAND
			(28-30)	453 ppm		Dark gray, med.-very coarse SILTY SAND w/subangular pebbles & silty clay
				160 ppm		Yellow-brown/gray micaceous SILTY CLAY w/subrounded pebbles
				96.2 ppm		
				83.1 ppm		
				62.2 ppm		






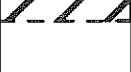
Location: Glen Cove	Site Id: GCSB-28
Logged By: Jeff Diamond	Total Depth: 47.00'
Purpose: Soil Boring	
Consulting Firm: Dvirka & Bartilucci	

Elevation (ft)	Depth (ft)	Recovery	Sample Interval	PLD	Graphic Log	Material Description
			(30-32)	2.8 ppm 10.5 ppm 11.2 ppm 97.1 ppm		Dark gray-brown, medium-fine SILTY SAND w/fine-v.coarse CLAYEY SAND
			(32-34)	65.7 ppm 10.2 ppm		Yellow-brown, fine SILTY SAND, micaceous w/trace fine gravel, (wet)
			(34-36)	0.0 ppm 5.3 ppm 1.4 ppm		Yellow-brown, fine-medium SAND w/coarse sand, pebbles, silt, clay & mica
			(36-38)	0.0 ppm		Gray-yellow-brown, coarse-very coarse SAND w/gravel, pebbles, brown clayey sand, sheen, slight odor
			(38-40)	0.0 ppm		Yellow-brown-orange, fine-very coarse SAND w/pebbles, fine gravel, sheen
			(40-42)	0.0 ppm		Yellow-brown, med.-v.coarse SAND w/fine gravel, pebbles, wet, w/sheen Pale yellow-brown, med.-fine micaceous SAND, clayey, w/gravel & pebbles Dark yellow-brown, coarse-very coarse CLAYEY SAND w/pebbles & cobble
			(45-46)	0.0 ppm 1.9 ppm		Yellow-brown, coarse SAND w/gravel, pebbles, brown med.-coarse CLAYEY SAND
						Base of Boring- 47 ft.

Location: Glen Cove	Site Id: GCSB-29
Elevation: 0.00'	Completed Depth: 40.00'
Datum: Mean Sea Level	Total Depth: 40.00'
Logged By: Jeff Diamond	Borehole Dia.: 8.50in
Purpose: Soil Boring	Remarks: Samples selected for analysis at 8-10', 14-16', 24-26', 34-36'
Date(s): 11/17/99 - 11/17/99	
Consulting Firm: Dvirka & Bartilucci	
Contractor: Emington Environment	
Drilling Method: Hollow Stem Auger	
Permit No.:	
Permit Date: / /	

Elevation (ft)	Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
			(2-4)	10.7 ppm 42.5 ppm 29.2 ppm		Yellow-brown, CLAYEY-SILTY med. SAND w/pebbles, asphalt, silty clay
			(4-6)	0.0 ppm 27.5 ppm 29.5 ppm		Yellow-brown, CLAYEY-SILTY med.-coarse SAND w/medium sand & pebbles
			(6-8)	0.0 ppm		Yellow-gray/brown, CLAYEY-SILTY fine SAND w/pebbles, asphalt, gray-brown fine-med. clayey sand
			(8-10)	0.0 ppm		Gray-black, fine-med. SILTY SAND w/pebbles, yellow-brn. med.-v.coarse SAND w/pebbles & mica
-10	10		(10-12)	0.0 ppm		
			(12-14)	17.7 ppm 8.8 ppm		Yellow-brown, fine-med. SILTY SAND w/wood fragments
			(14-16)			Gray-black, fine-v.coarse SILTY SAND w/pebbles, mica, wood, clay, odor
			(16-18)	189 ppm		Black, fine-med. SILTY SAND, micaceous, w/pebbles, odor
			(18-20)	213 ppm 169 ppm 0.0 ppm		Black, fine-v.coarse SILTY-CLAYEY SAND w/odor, pebbles, yellow-gray medium-coarse SAND w/clinkers & pebbles
-20	20		(20-22)	1988 ppm		Gray-black, fine-medium SILTY SAND, micaceous, w/pebbles, clay, odor
			(22-24)	1218 ppm 1126 ppm		Gray-black to yellow-brown, fine-v.coarse SILTY SAND w/pebbles & clay, odor
			(24-26)	658 ppm 1035 ppm		Yellow-brown, medium-very coarse SAND w/subangular pebbles
			(26-28)	1002 ppm 42.0 ppm		Yellow-brn, fine-v.coarse CLAYEY SAND w/pebbles, mica, dk. gray silty clay
			(28-30)	0.0 ppm		Dark gray, pasty CLAY w/pebbles, yellow-brn. med-v.coarse SILTY SAND w/clay
-30	30					Dark gray, pasty CLAY, micaceous w/pebbles

Location: Glen Cove	Site Id: GCSB-29
Drilled By: Jeff Diamond	Total Depth: 40.00'
Use: Soil Boring	
Consulting Firm: Dvirka & Bartilucci	

Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
0		(30-32)	0.0 ppm		Yellow-brown, coarse-v.coarse SAND w/pebbles, dark gray pasty CLAY
		(32-34)	0.0 ppm		Gray-black, CLAY w/coarse-v.coarse SAND & subrounded pebbles
		(34-36)	0.0 ppm		Yellow-brown, very coarse SAND w/gravel, pebbles, wet, oily appearance
		(36-38)	0.0 ppm		Green-gray, fine-med. SAND w/clay, pebbles, staining, odor
		(38-40)	0.0 ppm		Yellow-brown, med-v.coarse SILTY SAND w/fine gravel & pebbles
40					Gray pasty clay interbedded w/coarse SAND, med-fine sand, silt & pebbles
					Yellow-brown, pasty CLAY, micaceous w/pebbles, thin bed gray gravel & yellow-brown coarse sand, slight odor
					Base of boring- 40 ft.
50					

Location: Glen Cove	Site Id: GCSB-30
Elevation: 0.00'	Completed Depth: 40.00'
Datum: Mean Sea Level	Total Depth: 40.00'
Logged By: Jeff Diamond	Borehole Dia.: 8.50in
Purpose: Soil Boring	Remarks: Samples selected for analysis at: 8-10', 16-18', 24-26', 36-38'
Date(s): 11/18/99 - 11/18/99	
Consulting Firm: Dvirka & Bartilucci	
Contractor: Emington Environment	
Drilling Method: Hollow Stem Auger	
Permit No.:	
Permit Date: / /	

Elevation (ft)	Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
			(2-4)	0.0 ppm		Black, coarse SAND w/pebbles & asphalt
			(4-6)	0.0 ppm		Yellow-brown, SILTY CLAY, micaceous, w/fine SAND & subrounded pebbles
			(6-8)	0.0 ppm		Black/yellow-brown, fine-coarse SILTY SAND w/asphalt & pebbles
			(8-10)	0.0 ppm		Black, fine-very coarse SILTY SAND w/clay & asphalt fragments
-10	10		(10-12)	19.8 ppm 1193 ppm		Gray-black/yellow-brown, fine-medium SAND w/silt, clay, mica, pebbles
			(12-14)	908 ppm 60.9 ppm		Gray-black, fine-very coarse SILTY SAND w/pebbles & coal fragments
			(14-16)	105 ppm 70.5 ppm		Gray-black, fine-med. SILTY SAND w/pebbles & wood fragments
			(16-18)	45.8 ppm 1036 ppm		Gray-black/yellow-brown, fine-very coarse SILTY SAND w/subrounded pebbles, styrofoam, asphalt
			(18-20)	1017 ppm 776 ppm		Gray-black, SILT to yellow-brown coarse SAND w/pebbles, asphalt
-20	20		(20-22)	1014 ppm 259 ppm		Gray-black, fine-med. SILTY SAND w/pebbles & wood; yellow-brown fine-v.coarse micaceous silty sand
			(22-24)	191 ppm 0.0 ppm		Gray-black/yellow-brown, med.-v.coarse SILTY SAND, micaceous w/pebbles & coal fragments
			(24-26)	2000+ ppm 2000+ ppm		Gray-black-brown, fine-medium SILTY SAND w/coal & pebbles
			(26-28)	497 ppm 940 ppm		Yellow-brown, medium-coarse SAND w/fine gravel
			(28-30)	1846 ppm 0.0 ppm		Gray-black, fine-medium SILTY SAND, micaceous w/wood & pebbles; yellow-brown, fine-v.coarse SAND w/pebbles, mica
				31.5 ppm 53.1 ppm		Gray-brown/red brown, CLAY w/silt, very coarse sand, pebbles, moist
				0.0 ppm 13.6 ppm		Dark gray, micaceous CLAY w/silt, v.coarse sand, pebbles, wood frags
				24.4 ppm		Yellow-brown, medium-v.coarse SAND w/clay, pebbles, wood frags, silt, wet
30						Gray-black-green, CLAY micaceous w/med-v.coarse SAND, pebbles

Location: Glen Cove	Site Id: GCSB-30
Logged By: Jeff Diamond	Total Depth: 40.00'
Core Type: Soil Boring	
Consulting Firm: Dvirka & Bartilucci	

Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
30		(30-32)	0.0 ppm 0.7 ppm 8.8 ppm		Gray-black, pasty CLAY, wet w/fine gravel & pebbles; yellow-orange med-coarse sand w/fine gravel, pebbles, mica, staining
		(32-34)	3.4 ppm 0.0 ppm		Yellow-orange, medium-coarse SAND, micaceous w/pebbles, fine gravel
		(34-36)	0.0 ppm		Yellow-brown, fine-coarse micaceous SAND w/silt, subrounded pebbles
		(36-38)	2.3 ppm 4.9 ppm 13.9 ppm		Yellow-brown, coarse SAND, micaceous w/ fine gravel; gray-black pasty CLAY
		(38-40)	20.3 ppm 30.7 ppm 13.9 ppm		Yellow-brown, fine-coarse SAND, micaceous w/trace pebbles
40					Gray-black, pasty CLAY; yellow-brn med.-fine SAND, both w/f.gravel, pebbles Base of boring- 40 ft.
50					
60					

Location: Glen Cove	Site Id: GCSB-31
Elevation: 0.00'	Completed Depth: 36.00'
Datum: Mean Sea Level	Total Depth: 36.00'
Logged By: Jeff Diamond	Borehole Dia.: 8.50in
Purpose: Soil Boring	Remarks: Samples selected for analysis at 10-14', 18-20', 22-24', and 32-36'
Date(s): 11/19/99 - 11/19/99	
Consulting Firm: Dvirka & Bartilucci	
Contractor: Emington Environment	
Drilling Method: Hollow Stem Auger	
Permit No.:	
Permit Date: / /	

Elevation (ft)	Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
			(2-4)	14.4 ppm 37.1 ppm 49.6 ppm		Yellow-brown, fine-med. SILTY SAND, micaceous w/fine gravel, pebbles, clay
			(4-6)	33.9 ppm 28.5 ppm		Gray-black, med.-coarse SAND w/pebbles & yellow-brn clayey sand
			(6-8)	31.5 ppm		Yellow-brown, fine-med. SILTY SAND, gray-black fine-med. SAND w/mica, pebbles & clay
			(8-10)	24.1 ppm 35.2 ppm		Yellow-brown, fine-med. SILTY SAND; gray-black fine-med. SAND w/clay wood fragments & subrounded pebbles
-10	10		(10-12)	37.6 ppm 45.7 ppm		Yellow-brown, coarse-v.coarse SILTY SAND, micaceous, w/wood & pebbles
			(12-14)	52.3 ppm 51.6 ppm		Yellow-brown, fine-med. SILTY SAND, micaceous w/clay, pebbles, wood
			(14-16)	54.4 ppm 62.2 ppm		Yellow-brown, fine-med. CLAYEY SAND w/v.coarse sand & silt
			(16-18)	1222 ppm		Gray-black, fine-med. SILTY SAND w/very coarse SAND & pebbles
			(18-20)	1295 ppm 209 ppm		Gray-black, fine-med. SILTY SAND; yellow-brn SILTY CLAY, both w/pebbles
-20	20		(20-22)	148 ppm 1088 ppm 11.1 ppm		Yellow-brown, medium-coarse SAND, micaceous w/subrounded pebbles
			(22-24)	2000+ ppm 2000+ ppm 2000+ ppm 2000+ ppm		Gray-black/yellow-brown, fine-med. SAND w/silt, pebbles, micaceous
			(24-26)	131 ppm 54.2 ppm 1941 ppm 424 ppm		Yellow-brn, SILTY CLAY, micaceous w/pebbles; fine yellow-brn SAND w/pebbles
			(26-28)			Yellow-brown, medium-coarse SAND, micaceous, w/pebbles & rock fragments
			(28-30)	2000+ ppm 318 ppm 540 ppm 225 ppm		Yellow-brown, fine-very coarse SAND w/silt, mica, gravel & pebbles
						Yellow-brown, coarse-v.coarse SAND w/some fine gravel
						Yellow-brown, fine-coarse CLAYEY SAND, micaceous, w/gravel, moist
30						Yellow-brown, CLAY w/fine-very coarse sand, pebbles, micaceous, (wet)

Location: Glen Cove	Site Id: GCSB-31
Logged By: Jeff Diamond	Total Depth: 36.00'
Purpose: Soil Boring	
Consulting Firm: Dvirka & Bartilucci	

Elevation (ft)	Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
0			(30-32)	136 ppm 107 ppm 61.8 ppm 43.3 ppm 0.0 ppm		Yellow-brn, micaceous CLAY, wet w/coarse-v.coarse SAND w/f.gravel, pebbles
			(32-34)	0.0 ppm		
			(34-36)	0.0 ppm		
						Base of Boring- 36 ft.
-40	40					
-50	50					
-60						

WEATHER: Cold Mid 30s  
TOTAL DEPTH: 52'  
GROUND SURFACE ELEVATION: 58.96'  
DATE BEGUN: 1/22/04  
DATE COMPLETED: 1/23/04

0	GCSB-32 (10-12)	60		0	Dark brown fine to medium SAND, some fine gravel, some cobbles, loose, moist (Fill)	SP		No physical/visual evidence of impacts	
2									
4									
6		24	0	0	Light gray fine silty SAND (Fill)	FILL		Black solid coal fragments	
8					FILLMaterial			Fill material - coal, brick, and glass	
10					Reddish yellow medium to fine SAND, some fine to medium gravel & silt, wet at bottom	SM			
12		31	0	0	Reddish yellow medium to fine SAND, some fine to medium gravel and silt, wet				
14		32.4	0		Olive fine to medium SAND, silt and fine to medium gravel				
16		49.5	0		Black fine SAND, silty clayey sand			Strong Petroleum-like odor, Sheen	
18					Coarse to fine GRAVEL with coarse to medium sand, some rock fragments				
20	GCSB-32 (18-20)	44	53.5	0	Olive medium to fine SAND, medium to fine gravel	SP		Moderate Petroleum-like Odor	
22			20.2	0	Dark blueish grey coarse to medium SAND, fine to medium gravel				
24									
26		28	7.9	0	Greenish grey fine to medium SAND, coarse to fine gravel, some				
28			0.8	0	Light olive brown fine to medium SAND, coarse to fine gravel			No physical/visual evidence of impacts	
30									
32									
34									
36									
38									
40									
42									
44									
46									
48									
50									
52									
54									
56									
58									
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74									
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88									
90									
92									
94									
96									
98									
100									

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB - 32	
PROJECT NUMBER:	2522.012.024			WEATHER:	Cold Mid 30s
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	52'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 58.96'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	1/22/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 1/23/04	
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
32			0	0		Brown clayey silty SAND, some gravel				
	38		0	0		Brown silty fine to medium SAND, some fine gravel				
34			0	0		Weak red medium to fine SAND, light grey clay bands				
			0	0		Light brown with 1/2" band of black mica clayey silty SAND				
36	34		0	0		Light grey clayey SAND	SP			
			0	0		Brown fine SAND, medium to fine gravel				
38			0	0		Light grey clayey SAND	SC			
			0	0		Light brown medium to fine silty SAND				
40	28		0	0		Reddish brown fine SAND	SP			
							SP			
42	25		0	0		Light brown coarse to fine SAND, some fine gravel				
44			0	0		Light brown silty SAND, some fine gravel				
							SM			
46			0	0		Olive brown dense silty SAND				
48	2		0	0		Light brown medium to coarse SAND, medium to fine gravel	SP			
50			0	0		Brown dense silty SAND, medium to fine gravel				
							SM			
52										

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB - 33	
PROJECT NUMBER: <b>2522.012.024</b>			WEATHER: <b>Overcast 35 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52'</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>58.07'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>2/5/04</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>2/9/04</b>		
DRILLER / HELPER: <b>Bob/Luke</b>					
ENVIRONMENTAL SCIENTIST: <b>Joseph Trocchio</b>					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		60	0	0		Light brown fine to medium SAND, some medium to coarse gravel, cobbles medium to large, moist Grey fine to medium silty SAND, some fine gravel, mica (Fill)	SP		No physical/visual evidence of impacts	
2							SM			
4										
6		26	0	0		Light brown fine SAND, w/some fine to medium gravel (Fill)	SP			
8			0	0		Olive silty SAND, w/some fine to medium gravel (Fill)	SM			
			0	0		Olive silty SAND, moist (Fill)				
			0	0		Rock fragments/concrete (Fill)	FILL			
10		35	0	0		Light brown, medium to fine SAND, some gravel, moist (Fill)			No physical/visual evidence of impacts	
			0	0		Olive silty SAND, moist (Fill)				
			0	0		FILL: brick, concrete, iron ore (Fill)				
12	GCSB-33 (12-14)		2.4	0		Dark brown medium to fine SAND (Fill)	SP		Saturated bands, Sheen, Slight to Moderate Naphthalene-like Odor	
14		38	7.8	0		Dark brown coarse SAND, fine to medium gravel (Fill)			Stained, Sheen, Moderate Naphthalene-like Odor	
			3.2	0		Dark brown coarse SAND, medium to fine gravel (Fill)				
			7.4	0		Olive medium to fine SAND (Fill)				
16			5.3	0		Light brown medium to fine SAND (Fill)				
18		31	2.7	0		Brown fine SAND (Fill)			Moderate Naphthalene-like Odor	
			3.4	0		Dark brown fine to medium SAND, with some rock fragments, fine to medium gravel (Fill)			Moderate Naphthalene-like Odor	
20		48	3.6	0		Light brown silty SAND (Fill)	SM		Moderate Naphthalene-like Odor	
			13.8	0		Rock fragments (Fill)				
	GCSB-33 (21-23)		231	0		Brown silty SAND(Fill)			Moderate Naphthalene-like Odor	
22			295.0	0		Coarse to medium SAND and fine gravel	SP		Moderate to Strong Naphthalene-like Odor, Pockets of NAPL Saturation and Sheen	
24			77.5/178	0		Olive fine SAND			Moderate Naphthalene-like Odor, Sheen, and 1" band of NAPL Saturation and Sheen	
26		33	2.3	0		Olive fine SAND			Slight Naphthalene-like Odor	
			1.2	0		Medium to coarse SAND, some fine to medium gravel			Slight Naphthalene-like Odor	
28			21.8	0		Brown silty SAND			Slight Naphthalene-like Odor	
			9.1	0		Black rock fragments	SM		Slight Naphthalene-like Odor	
						Fine SAND, some silt			Slight Naphthalene-like Odor	
30		12	1.2	0		Brown silty SAND, little coarse to medium gravel and rock fragments				

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB - 33	
PROJECT NUMBER: 2522.012.024		WEATHER: Overcast 35 deg. F			
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 52'			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 58.07'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: 2/5/04			
DRILLING METHOD: GeoProbe		DATE COMPLETED: 2/9/04			
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
30	GCSB-33 (30-32)	16	0.7	0		Brown silty SAND, rock fragments			No physical/visual evidence of impacts	
32		18	0.1	0		Brown coarse to medium SAND, some medium to fine gravel	SP			
34		14	0	0		Brown silty SAND, little medium to fine gravel				
36		15	0	0		Brown medium to fine SAND, some medium to fine gravel				
38			0	0		Brown silty SAND, some medium to fine gravel				
40		15	0	0		Brown silty SAND				
			0	0		Light brown coarse to medium SAND, some fine gravel, tip of sample has black rock fragments				
42		15	0	0		Brown medium to fine SAND, some rock fragments				
			0	0		Brown SILT with trace clay				
44		15	0	0		Brown medium to fine SAND, some fine to medium gravel				
46		17	0	0		Brown fine to medium SAND Brown silty SAND, little fine to medium gravel Light brown rock fragments	SM			
48			0	0		Brown silty SAND, little fine to medium gravel				
		17	0	0		Brown medium SAND Brown fine SAND	SP			
50	GCSB-33 (50-52)	17	0	0		Brown silty SAND				
52			0	0		Brown silty SAND	SM			
						Brown silty SAND, little fine to medium gravel				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB -34	
PROJECT NUMBER: 2522.012.024			WEATHER: Sunny 40 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 50'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.82'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: 2/26/04		
DRILLING METHOD: GeoProbe			DATE COMPLETED: 2/27/04		
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		60	0	0		Light brown fine to medium SAND, some fine to medium gravel, trace medium to large gravel, moist (Fill)	SP		No physical/visual evidence of impacts	
2			0	0		Fine gray silty SAND, trace fine gravel (Fill)	SM			
4										
6		41		0		Reddish brown fine to medium SAND (Fill) Olive fine to medium SAND, with trace fine to medium gravel (Fill)	SP		No physical/visual evidence of impacts	
8		45		0		Fill material	FILL		Fill material: coal, slag, ash, cinders	
10			1.0	0		Olive fine to medium SAND(Fill)	SP			
			16.5	0		Reddish brown fine to medium SAND	SP			
				0		Black coarse to medium SAND	SM		Stained, Sheen, Moderate to Strong Naphthalene-like Odor	
				0		Dark olive silty SAND	SP		Sheen, Coated, Moderate to Strong Naphthalene-like Odor	
12		38	30.2	0		Dark olive coarse to medium SAND, with fine to medium gravel	SP			
14	GCSB-34 (13-15)		16.2	0	▼	Dark olive coarse to medium SAND				
			33.5							
			41.2	0		Dark olive coarse to medium SAND with coarse to fine gravel			Sheen, Slight Napthalene-like Odor	
			24.7							
16										
18		29	0.1	0		Olive coarse to medium SAND, some coarse to fine gravel and 2" band of rock fragments, stiff			Slight Napthalene-like Odor	
			0.2							
20		31	0.2	0		Light olive sandy SILT, trace clay, very stiff	SM		No physical/visual evidence of impacts	
22	GCSB-34 (20-22)						SP			
24			0	0		Brown fine SAND and silt, little F/C gravel, stiff, 1" band of rock fragments				
26		14	0	0		Gray fine to coarse SAND, trace silt				
			0	0		Light brown silty SAND, little fine gravel				
28		18	0	0		Brown fine SAND, some silt and little fine to medium gravel, dense	SM			
							SP			
30		16	0	0		Brown fine to medium SAND, little fine gravel and trace rock fragments, dense				








Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -34	
PROJECT NUMBER: 2522.012.024		WEATHER: Sunny 40 deg. F			
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 50'			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 57.82'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: 2/26/04			
DRILLING METHOD: GeoProbe		DATE COMPLETED: 2/27/04			
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
32		18	0	0		Brown fine to coarse SAND, soft				
		18	0	0		Brown medium to coarse SAND, coarse to fine gravel				
			0	0		Brown fine SAND, little silt, loose				
			0	0		Brown fine to medium SAND, trace silt and fine gravel, loose				
34		18	0	0		Brown SILT, loose	SM			
			0	0		Olive fine to medium SAND, little medium to fine gravel				
36			0	0		Brown silty SAND, little fine gravel				
			0	0		Brown fine to coarse SAND, some fine to medium gravel, loose	SP			
		21	0	0		Brown fine SAND, little fine gravel and little silt				
						Brown silty SAND	SM			
38		15	0	0		Brown coarse to medium SAND, some coarse to medium gravel	SP			
							SP			
		20	0	0		Brown silty SAND, dense	SM			
40										
42		15	0	0		Brown silty SAND, dense				
		16	0	0		Brown silty SAND, dense to very dense				
44										
			0	0		Brown silty SAND, dense				
46	GCSB-34 (46-48)									
		18	0	0		Brown silty SAND, dense				
48										
		21	0	0		Brown silty SAND, dense				
50										

Paulus, Sokolowski & Sartor					BORING LOG			BOREHOLE NUMBER - GCSB-35		
PROJECT NUMBER: 2522.012.024					WEATHER: Sunny, Clear 36 deg. F					
PROJECT NAME: Glen Cove Former MGP Site					TOTAL DEPTH: 52'					
LOCATION: Glen Cove, Long Island, NY					GROUND SURFACE ELEVATION: 58.00'					
DRILLING CO: Zebra Environmental Corp.					DATE BEGUN: 2/2/04					
DRILLING METHOD: GeoProbe					DATE COMPLETED: 2/2/04					
DRILLER / HELPER: Bob/Luke										
ENVIRONMENTAL SCIENTIST: Joseph Trocchio										
DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		54		0		Light reddish brown to brown fine to medium SAND, some medium to coarse gravel, loose, moist (Fill)	SP		No physical/visual evidence of impacts	
2										
4		27	0	0		Black clayey SILT, fine gravel (Fill)	SM			
6		6				Coarse to medium SAND, some fine to medium gravel (Fill)	FILL			
						Fill Material (Fill)	SM			
						Black silty SAND (Fill)	SM			
						Olive silty SAND, some gravel (Fill)	SP			
8		28	0	0	▼	Light brown fine to coarse SAND, some fine to coarse gravel, wet (Fill)	SP			
10	GCSB-35 (9-11)					Dark brown clayey SILT (Fill)	CL		Slight Petroleum-Like Odor	
12		37	0	0		Gray coarse to medium SAND, fine to medium gravel (Fill)	SP			
			5.3			Reddish brown silty SAND, gray mottles	SM			
			0.6			Brown medium to coarse SAND with 4" of light gray clayey sand, some fine to coarse gravel	SP		NAPL Saturated, Moderate MGP-like Odor	
14	GCSB-35 (14-16)		0.5			Black coarse to medium SAND	SM		No physical/visual evidence of impacts	
						Light brown silty SAND with some fine gravel				
						Light gray clayey SAND				
						Light brown silty SAND				
16		26	0.1	0						
			1.1							
			1.2							
18						Brown silty SAND, some fine to medium gravel	SP		Slight MGP-like Odor	
20		25	0.6	0		Brown medium to coarse SAND, some fine to medium gravel	SM		No physical/visual evidence of impacts	
			0.1			Brown silty SAND, some fine to medium gravel				
			0.1							
22			0.1			Brown silty SAND, some fine gravel	SP			
						Light brown rock fragments				
						Reddish brown medium to coarse SAND, some fine gravel	SP			
24	GCSB-35 (24-26)	36	0	0		Light brown fine to medium SAND, some fine gravel	SM			
						Brown silty SAND				
26						Brown silty SAND, some fine to medium gravel				
28		22	0	0						
30										
32						Brown silty SAND, some gravel	SP			
						Brown medium to coarse SAND, some fine to coarse gravel				

Page 1 of 2

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB-35	
PROJECT NUMBER: 2522.012.024		WEATHER: Sunny, Clear 36 deg. F			
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 52'			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 58.00'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: 2/2/04			
DRILLING METHOD: GeoProbe		DATE COMPLETED: 2/2/04			
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
34		30	0	0		Brown silty SAND, some rock fragments, some fine to medium gravel	SM			
36		28	0	0						
38						Brown silty SAND, some fine to medium gravel				
40		27	0	0						
42						Brown silty SAND, some fine to medium gravel				
44		27	0	0		Brown fine to medium SAND, some silt, some fine to medium gravel	SP			
46						Brown silty SAND, little fine to medium gravel	SM			
48						Coarse to medium SAND, some coarse to fine gravel	SP			
48		32	0	0		Brown silty SAND, little fine to medium gravel	SM			
50						Brown medium to fine SAND, some silt, some fine to medium gravel				
50	GCSB-35 (50-52)					Black rock fragments	SP			
52						Brown silty SAND, some fine to medium gravel	SM			

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB - 36	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny 70-80 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	70'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 78.61'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	6/23/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 6/24/04	
DRILLER / HELPER:	Bob/Steve				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		48	0	0		Brown silty sand with a medium to coarse GRAVEL, subgrade of parking lot (Fill)	SM		No physical/visual evidence of impacts	
2										
4		46	0	0		Light brown silty SAND, with medium to fine gravel (Fill)				
6						Black FILL material with brick and concrete (Fill)	FILL			
8						CONCRETE (Fill)				
10		38	0	0		Brown and gray black FILL with glass, brick, & concrete (Fill)				
12						CONCRETE (Fill)				
14						Reddish brown silty SAND (Fill)			Coal fragments	
16		40	0	0		Brown gray FILL with brick and concrete (Fill)			Coal fragments	
18	GCSB-36 (14-16), Blind Dup					Light brown silty SAND with little medium to fine gravel (Fill)				
20		38	0	0		Brown to light brown to gray silty SAND, with fill (brick & concrete) material (Fill)			No physical/visual evidence of impacts	
22						Light brown silt SAND with little medium to fine gravel (Fill)				
24	GCSB-36 (22-24), MS, MSD	38	0	0		Light brown silty SAND with little fine to medium gravel (Fill)				
26						Dark brown SILT and sand (Fill)			Coal fragments	
28		20	0	0		Light brown silty SAND, moist	SM		No physical/visual evidence of impacts	
30										
32	GCSB-36 (30-32)	20	0	0		Olive sandy SILT, wet Dark brown with black SILT with trace sand, trace root mass, wet				
34						Yellowish brown crushed STONE				
36		23	0	0		Light brown fine SAND, trace silt	SP			
38	GCSB-36 (34-36)									

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB - 36	
PROJECT NUMBER: 2522.012.024			WEATHER: Sunny 70-80 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 70'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 78.61'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: 6/23/04		
DRILLING METHOD: GeoProbe			DATE COMPLETED: 6/24/04		
DRILLER / HELPER: Bob/Steve					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
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36						Light brown SILT	ML			
38	36	0	0			Light brown silty SAND, some medium to fine gravel	SM			
40										
42	22	0	0			Light brown silty SAND, some medium to fine gravel				
44										
46	29	0	0			Light brown silty SAND, some medium to fine gravel				
48										
50	22	0	0			Light brown silty SAND, some medium to fine gravel				
52										
54	21	0	0			Yellowish brown SAND with medium to fine gravel, trace silt	SP			
56	20	0	0			Light yellowish brown (tan), clayey SAND Light yellow medium SAND, fine to medium gravel Light brown sandy CLAY	SC			
58	18	0	0			Light red/yellowish brown medium SAND, with trace clay Brown medium SAND, little silt and clay	SC			
60	21	0	0			Brown medium to coarse SAND, some medium to fine gravel, trace silt	SM			
62	21	0	0			Brown medium to coarse SAND, some medium to fine gravel, trace silt, with 3" blue gray rock fragments	SP			
64	18	0	0			Brown medium SAND, some fine to medium gravel, trace silt				
66	GCSB-36 (66-68)					Brown medium SAND, some fine to medium gravel, trace silt				
68	18					No recovery				
70										

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB - 37	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny and Humid 80
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	70'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 79.40'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	6/30/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 7/1/04	
DRILLER / HELPER:	Bob/Steve				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		48	0	0		Railroad bed material, blue stone GRAVEL, topsoil (Fill)	FILL		No physical/visual evidence of impacts	
2			0	0		Reddish brown silty SAND little fine to medium gravel (Fill)				
4		42	0	0		Brown SILT, fine sand, little fine to medium gravel (Fill)				
6			0	0		Black top and subgrade of previous parking lot fill material (Fill)				
8										
10	GCSB-37 (9-11)	29	0	0		Dark brown black SILT and SAND, with brick and blacktop fill material (Fill)				
12		43	0	0		Reddish brown medium SAND, with fine to medium gravel, trace silt (Fill) Dark brown black SILT and SAND, fill with brick (Fill)			No physical/visual evidence of impacts	
14			0	0		Light brown fine to medium SAND, little gravel, trace silt (Fill)				
16										
18		28	0	0		Light brown fine to medium SAND, trace silt (Fill)				
20										
22	GCSB-37 (22-24)	20	0	0		Light brown medium SAND, little gravel, trace silt (Fill) Dark brown black fine to medium SAND, little fine gravel (Fill) Light brown medium SAND, little gravel, trace silt (Fill)			Coal fragments and slag	
24				0		Dark brown black SILT (organic)(Fill)				
26										

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB - 37	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny and Humid 80
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	70'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 79.40'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	6/30/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 7/1/04	
DRILLER / HELPER:	Bob/Steve				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
28		16		0		Dark brown black SILT (organic)(Fill)			Coal fragments and slag	
				0		Light brown medium SAND	SP			
30		7		0		Light brown silty SAND, little fine gravel, trace clay, moist	SM			
						Brown medium SAND, little gravel trace silt	SP			
32						Light brown SILT	ML			
						Brown silty SAND, little fine gravel, trace medium to coarse gravel, trace clay lenses, moist	SM		No physical/visual evidence of impacts	
34		10	0	0		Reddish brown coarse SAND, fine gravel			Slight Septic-like Odor	
		15	0.03	0		Dark gray coarse SAND, fine gravel, wet	SP			
36	GCSB-37 (36-38)		15.5	0		Light gray coarse to fine SAND			Blebs, Sheen, Coated and Saturated at bottom, Moderate Naphthalene-like Odor	
			29.4							
			34.6							
			40.9							
38			1.5/1.9	0		Light brown fine SAND	SM		Sheen, Moderate Naphthalene-like Odor	
		15	1.8/2.6	0		Brown silty SAND				
40		22	60.1	0		Brown medium SAND			Staining, Moderate Naphthalene-like Odor	
				0		Brown medium to coarse GRAVEL, coarse sand			6" Saturated section, Strong Naphthalene-like Odor	
			14.4	0		Brown medium SAND, little fine gravel	SP			
42			8.2	0		Light brown coarse SAND			Strong Naphthalene-like Odor, bottom 3" exhibits Sheen	
		17	1.9	0		Light brown medium to fine SAND, little fine gravel, trace silt			Sheen, Slight Naphthalene-like Odor	
			1.7							
			0.9							
44										
						Light brown silty SAND, little fine to medium gravel	SM		Slight Naphthalene-like Odor	
46	GCSB-37 (46-48)	19	0	0		Light brown silty SAND, little fine to medium sand, trace clay			No physical/visual evidence of impacts	
			1.1	0						
			1.8							
48		20	0	0		Light brown silty SAND, little fine to medium sand, trace clay				
50		16	0	0		Light brown silty SAND, little fine to medium sand, trace clay				
52		18	0	0		Light brown medium to coarse SAND, little fine gravel, trace silt	SP			

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB - 37	
PROJECT NUMBER: 2522.012.024			WEATHER: Sunny and Humid 80		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 70'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 79.40'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: 6/30/04		
DRILLING METHOD: GeoProbe			DATE COMPLETED: 7/1/04		
DRILLER / HELPER: Bob/Steve					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
54		22	0	0		Light brown silty SAND, little fine gravel	SM			
56		24	0	0		Light brown medium to coarse SAND, fine gravel Light brown fine to medium SAND, trace, fine gravel, trace silt	SP			
			0	0		Light brown silty SAND				
58			0	0		Light brown silty SAND, little fine to medium gravel	SM			
		22	0	0		Light brown medium to fine SAND, trace silt	SP			
60			0	0		Light brown silt and SAND, little fine gravel	SM			
			0	0		Light brown fine to medium SAND, little fine gravel				
		20		0		Light brown silty SAND, little fine gravel	SP			
62		21	0	0		Light brown fine to medium SAND, little fine gravel	SM			
			0	0		Light brown silty SAND	SP			
64		20	0	0		1" rock fragments black/gray Light brown silty SAND, little gravel	SM			
		21	0	0		Light brown silty SAND, little fine to medium gravel				
66		16								
		21	0	0		Light brown silty SAND, little fine to medium gravel				
68	GCSB-37 (68-70)	18					SP			
		18	0	0		Light brown fine to medium SAND, little fine gravel, light brown silty sand, some fine to medium gravel				
70				0		Light brown fine to medium SAND, little fine gravel, light brown silty sand, some fine to medium gravel				













Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -38	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny 19-25 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	52'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.70'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	1/8/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 1/9/04	
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio/Colleen Hunter				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		60	0	0		Brown fine to coarse silty SAND, some fine to medium gravel, roots, leaves, biomass, loose, moist (Fill)	SM		No physical/visual evidence of impacts	
2										
4		29	0	0						
6	GCSB-38 (6-8)					Dark brown fine to medium SAND, some fine to medium gravel, loose, light gray clayey sand mottle @ 7', moist (Fill)	SP			
8		35	0	0						
10						Light brown fine to coarse SAND, trace silt, some fine to medium gravel, loose, moist (Fill) Dark gray silty SAND, fill with ash, cinders, coal fragments, brick, slag (Fill)			Ash, cinders, slag and coal fragments	
12					▼	Very dark brown fine silty SAND, medium dense, wet (Fill)	FILL			
14	GCSB-38 (14-16)		0 8.6 4.3 6.3	0		Dark brown to gray fine to medium silty SAND with some fine to medium gravel, medium dense, wet Light gray to brownish yellow fine to medium sandy CLAY, trace fine gravel, dense, wet	SM		Saturated, Sheen, Strong MGP-like Odor Slight Petroleum-like Odor	
16		36	0	0					Sheen, Slight Petroleum-like Odor	☒ ☒ ☒
18						Dark gray to dark brown fine to medium silty SAND, trace fine gravel, dense, wet Brownish yellow fine silty SAND, trace fine gravel, dense, wet			Slight Petroleum-like Odor	
20		30	0	0		Brownish yellow fine to coarse SAND, trace fine to medium gravel, loose, wet	SP			
22						Light brown to dark gray fine to coarse SAND, some fine to medium gravel, loose, wet Brownish yellow fine silty SAND, some fine gravel, medium dense, wet			No physical/visual evidence of impacts	
24		35	0	0		Brownish yellow fine to coarse SAND, trace silt, some fine to medium gravel, dense, wet reddish brown rock fragments at bottom	SM			
26						Light brown fine to medium silty SAND, some fine to medium gravel, dark gray fine silty lenses, dense, wet, coarse sand zone @ 26.9', angular, dense, wet	SM			
28		34	0	0						
30						Brown fine to coarse silty SAND, some fine to medium gravel, dense, wet Light brown fine to coarse SAND, some fine gravel, loose, wet	SP			
32										

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB -38	
PROJECT NUMBER: 2522.012.024			WEATHER: Sunny 19-25 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 52'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.70'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: 1/8/04		
DRILLING METHOD: GeoProbe			DATE COMPLETED: 1/9/04		
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio/Colleen Hunter					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
		29.5	0	0						
		1.7								
		1.6								
34		1.5				Olive gray fine to medium silty SAND, some trace gravel, medium dense, wet	SM		Slight Unknown Odor	
36		25	0	0						
							SP		No physical/visual evidence of impacts	
38						Light brown fine to coarse SAND, trace fine gravel, loose, wet				
						Light brown to gray fine silty SAND, medium dense, wet	SM			
40		28	0	0						
42						Brown fine to coarse silty SAND, gravel zone @ 42'				
						Brown fine silty SAND, medium dense, wet, 0.5" gravel zone				
44		31	0	0						
46						Brown with black flecks, fine to medium silty SAND, fine to coarse silty sand, some fine to medium gravel, medium dense, wet				
48		34	0	0						
50	GCSB-38 (50-52)					Brown fine to medium silty SAND, trace fine to medium gravel, medium dense, wet				
52										

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB - 39	
PROJECT NUMBER:	2522.012.024			WEATHER: SP	Overcast to sunny 80 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	70'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 78.86'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	6/25/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 6/29/04	
DRILLER / HELPER:	Bob/Jeff/Steve				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		48	0	0		Blacktop subgrade, brown medium sand little silt, some F/M gravel (Fill)	FILL		No physical/visual evidence of impacts	
2										
4										
6		44	0	0		Brown SAND with silt (Fill)				
8						Blacktop and subgrade (Fill)				
				0		Yellowish brown medium SAND (Fill)				
				0		Brown SAND, with silt and brick/ash fill material (Fill)			Ash and fill material	
10		32	0	0		Dark brown/black FILL consisting of medium sand, brick, glass, concrete (Fill)			Coal and ash fill material	
12										
14		28	0	0		Black coal, ash, slag, roots (Fill)			Coal, ash, and slag fill material	
16										
18	GCSB-39 (18-20)	20	0	0		Black coal, ash, slag, roots (Fill)			Coal, ash, and slag fill material	
20			1.1	0		Brown silty SAND, with fine to medium gravel, fill material with brick and old railroad tie in tip (Fill)			Moderate creosote odor in lower 10" of soil, old railroad tie found in tip	
22		2	0	0		Brick and light yellowish brown medium SAND, little fine to medium gravel, trace silt	SP		No physical/visual evidence of impacts	









Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB - 39	
PROJECT NUMBER:	2522.012.024			WEATHER: SP	Overcast to sunny 80 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	70'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 78.86'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	6/25/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 6/29/04	
DRILLER / HELPER:	Bob/Jeff/Steve				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
24										
26	GCSB-39 (26-28)	22	0	0		Light brown fine to medium SAND, little fine to medium gravel, trace silt, moist				
28										
30			0	0	▼	Light brown fine to medium SAND, little fine to medium gravel, trace silt, moist	SM			
32		28	0	0		Dark gray organic layer of SILT with little medium sand, fine to medium gravel, wet				
34	GCSB-39 (34-36)	32	0	0		Olive brown medium SAND, some fine to medium gravel	SP			
			0	0		Light gray clayey SAND				
			0	0		Light brown medium SAND, some fine to medium gravel	SC			
36			0	0		Black band of medium SAND in middle of last 12" section	SP			
38		22	0	0		Brown medium SAND, some fine to medium gravel				
40			0	0		Brown silty SAND, little fine to medium gravel	SM			
42		16	0	0		Brown medium SAND, some fine to medium gravel, trace silt, yellowish brown and black rock fragments	SP			
44		18	0	0		Brown medium SAND, some fine to medium gravel				
46		16	0	0		Brown medium SAND, some fine to medium gravel				
			0	0		Brown medium SAND, trace silt				
		21	0	0		Yellowish brown medium SAND, trace silt				
			0	0		Light brown medium SAND, some fine to medium gravel, little silt				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB - 39	
PROJECT NUMBER: 2522.012.024		WEATHER: SP		Overcast to sunny 80 deg. F	
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 70'			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 78.86'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: 6/25/04			
DRILLING METHOD: GeoProbe		DATE COMPLETED: 6/29/04			
DRILLER / HELPER: Bob/Jeff/Steve					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
48										
	18	0	0			Brown silty SAND, some fine to medium gravel	SM			
50										
	17	0	0			Brown medium SAND, some fine to medium gravel, little silt	SP			
52										
	16	0	0			Brown medium SAND with fine to medium gravel, little silt				
54										
	18	0	0			Brown medium SAND with fine to medium gravel, little silt				
	16	0	0			Brown fine to medium SAND, little fine to medium gravel, little silt				
56										
		0	0			Brown fine to medium SAND, little fine to medium gravel, little silt				
58										
	22	0	0			Brown fine to medium SAND, little fine to medium gravel, little silt				
60										
	21	0	0			Brown medium SAND, some fine to medium gravel, trace silt				
62										
	21	0	0			Brown medium SAND, some fine to medium gravel, trace silt				
64										
	14	0	0			Brown medium SAND, some fine to medium gravel, trace silt				
66										
	21	0	0			Brown medium SAND, little fine gravel, trace silt				
68	GCSB-39 (68-70)	21	0	0		Brown medium SAND, some fine to medium gravel				
70										

<b>Paulus, Sokolowski &amp; Sartor</b>	<b>BORING LOG</b>	BOREHOLE NUMBER - GCSB - 40
PROJECT NUMBER:	2522.012.024	WEATHER: Rain/sun 35 deg. F
PROJECT NAME:	Glen Cove Former MGP Site	TOTAL DEPTH: 70'
LOCATION:	Glen Cove, Long Island, NY	GROUND SURFACE ELEVATION: 57.32'
DRILLING CO:	Zebra Environmental Corp.	DATE BEGUN: 1/5/04
DRILLING METHOD:	GeoProbe	DATE COMPLETED: 1/8/04
DRILLER / HELPER:	Bob/Luke	
ENVIRONMENTAL SCIENTIST:	JRT/CH	

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0			0	0		Light brown fine to medium SAND, medium to large cobbles, gravel (Fill)	SP		No physical/visual evidence of impacts	
2										
4		24	0	0		Brown fine to medium SAND, some fine to medium gravel, loose, moist (Fill)				
		41	0	0		Brown fine to medium silty SAND, olive gray fine to medium silty sand, some fine to medium gravel, dense, moist (Fill)	FILL		Fill material: ash, cinders, and coal fragments	
	GCSB-40 (5-7)					Light brown to light reddish brown clayey SAND (3") (Fill)				
6						Dark gray silty SAND (Fill)				
8										
10		28	0	0	▼	Fill material, concrete, gravel, mica fragments (12") (Fill)			Coal fragments	
			4	0		Dark brown fine SAND, some medium to coarse gravel, bottom fine to coarse sand, dense, wet	SP		No physical/visual evidence of impacts	
12										
		32	0	0		Brown fine to coarse SAND, some fine to medium gravel, wet			Saturated with Tar-like Substance, Sheen, Slight to Moderate Tar-like Odor	
14										
		32				Brown fine silty SAND, wet	SM		Sheen, Slight Tar-like Odor	
16										
	GCSB-40 (17-19)		11.3 1.6	0		Brown fine to coarse SAND, trace fine to medium gravel, medium dense, with mica fragments, wet	SP			
18			0.6 0.1	0		Brown fine silty SAND, some cobble fragments, medium dense, wet	SM		No physical/visual evidence of impacts	
20										
		28	2.5 7.9	0 0		Olive gray fine to medium silty SAND, trace fine gravel, dense, wet Olive gray to light brown fine to medium SAND, cobble @ 22.5'	SP		Pockets of NAPL Saturation, Gray Tar-like Banding, Sheen, Tar-like Odor	
22										
		35	0.2	0		Light brown fine to medium silty SAND, some fine gravel, dense, wet	SM			
24									No physical/visual evidence of impacts	

















<b>Paulus, Sokolowski &amp; Sartor</b>	<b>BORING LOG</b>	BOREHOLE NUMBER - GCSB - 40
PROJECT NUMBER: 2522.012.024	WEATHER: Rain/sun 35 deg. F	
PROJECT NAME: Glen Cove Former MGP Site	TOTAL DEPTH: 70'	
LOCATION: Glen Cove, Long Island, NY	GROUND SURFACE ELEVATION: 57.32'	
DRILLING CO: Zebra Environmental Corp.	DATE BEGUN: 1/5/04	
DRILLING METHOD: GeoProbe	DATE COMPLETED: 1/8/04	
DRILLER / HELPER: Bob/Luke		
ENVIRONMENTAL SCIENTIST: JRT/CH		

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
26			0	0		Light brown fine to medium SAND, some fine gravel, dense, wet	SP			
			0	0		Light brown fine SAND, with reddish brown clay mottles				
28	31	0.6 8.0	0			Olive gray to light brown clayey fine SAND, trace fine to coarse sand, dense, wet	SC		1" in tip of Saturated sand, Coated, Blebs, Sheen, Slight to Moderate Tar-like Odor	
			0.3	0		Light brown silty SAND, trace fine to medium gravel, dense, wet	SM			
30									No physical/visual evidence of impacts	
			0	0		Medium sized quartz gravel, 3" zone w/fine to coarse dark gray SAND & GRAVEL, bottom light brown silty sand				
32	0					Olive gray/reddish brown fine to medium SAND, some fine to medium gravel	SP		Blebs, Slight Naphthalene-like Odor	
34										
36										
38	29	0	0			Brown fine to medium silty SAND, trace fine to medium gravel, dense, wet	SM		No physical/visual evidence of impacts	
40									Slight Naphthalene-like Odor	
42	32	0	0			Brown fine coarse SAND, mica, some fine gravel, medium dense	SP		No physical/visual evidence of impacts	
			0	0		Brown fine silty SAND, trace fine gravel, very stiff, dense, wet	SM			
44										
46	32	0	0			Brown fine silty SAND, trace fine to medium gravel, stiff, dense, wet				
48	28	0	0			Fine to coarse silty SAND, fine to medium gravel, wet Brownish gray fine silty SAND, mica, dense, wet				






<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB - 40	
PROJECT NUMBER: 2522.012.024		WEATHER: Rain/sun 35 deg. F			
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 70'			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 57.32'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: 1/5/04			
DRILLING METHOD: GeoProbe		DATE COMPLETED: 1/8/04			
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST: JRT/CH					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
50		12	0	0		Brown fine to medium silty SAND, trace fine to medium gravel, dense, wet, 1" diameter quartz rock				
52		21	0	0		Dark brown fine to medium silty SAND, trace fine gravel, dense, wet				
		17	0	0		Dark brown silty SAND, some fine gravel, dense, wet				
54										
			0	0		Brown fine to coarse SAND, some fine to medium gravel, dense, wet	SP			
56		19	0	0		Brown fine to coarse silty SAND, dense, fine gravel, wet	SM			
			0	0		Fine to coarse GRAVEL, brown w/dark brown banding silty sand, dense, wet	SP			
58		20.5	0	0		Brown fine silty SAND, mica flakes, medium dense, wet, fine gravel at bottom	SM			
60										
		17	0	0		Brown to light brown fine to coarse SAND, crushed rock (quartz), dark brown fine to medium silty sand, some fine to medium gravel, dense, wet	SP			
62		21	0	0		Brown fine to coarse silty SAND, some fine gravel, loose to medium dense, wet	SM			
64		17	0	0		Brown fine silty SAND, trace fine gravel, dense, wet				
			0	0		Dark brown with a 1" seam of reddish brown fine silty SAND, trace fine gravel, medium dense, wet				
66		19	0	0		Fine gravel lens at bottom w/dark brown fine silty SAND, dense				
68	GCSB-40 (67-68)									
	GCSB-40 (68-69)	12	0	0		Dark brown fine silty SAND, trace fine to medium gravel, dense, wet				
			0	0		Refusal at 69'				
70										

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -41	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny 36 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	82'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 51.55'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	2/17/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 2/19/04	
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		60		0		Brown and black medium to coarse SAND, some fine to coarse gravel and cobbles, moist/wet (Fill)	FILL		No physical/visual evidence of impacts	
2										
4										
6		25	0 0 0.3	0		Fill material (slag, ash, wood bits), dark brown/black SAND (Fill)			Slight MGP-like Odor	
8		40	0	0		Dark brown fill material (Fill)			No physical/visual evidence of impacts	
10			0	0		Olive silty SAND, white gray rock fragments (Fill)				
12			0	0		▼ Brown medium to coarse SAND and coarse to fine gravel, wet (Fill)	SP			
14		29	0	0		Olive to brown fine silty SAND, some fine to medium gravel (Fill)	SM			
16		38	0	0		Brown medium to coarse SAND, some fine gravel	SP			
18	GCSB-41 (18-20)									
20		34	0	0		Brown fine to coarse SAND, some silt			Sheen observed on bottom 4 inches, Blebs, Moderate Petroleum-like Odor	
22		34	0	0		Brown fine to coarse SAND, some rock fragments				
24									Sheen, Slight Unknown Odor	
26	GCSB-41 (26-28)	29	0	0		Brown coarse to medium silty SAND, some fine to medium gravel	SM		No physical/visual evidence of impacts	
28										
30		29	0	0		Brown coarse to medium silty SAND, some fine gravel				
32										

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -41	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny 36 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	82'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 51.55'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	2/17/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 2/19/04	
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
34		28	0	0		Brown medium to coarse SAND, some fine to medium gravel	SP			
36										
38		27	0	0		Brown fine to coarse SAND, some fine to medium gravel, some silt	SM			
40										
42		27	0	0		Brown fine to coarse silty SAND, some fine to medium gravel				
44										
46		30	0	0		Brown fine to coarse SAND, some fine to medium gravel	SP			
48										
50			0	0		Brown fine to medium SAND, some silt, some fine to medium gravel				
52		19	0	0		Brown fine to coarse SAND, some fine to medium gravel				
54		15	0	0		Brown fine to medium silty SAND, some fine to medium gravel	SM			
56		17	0	0		Brown silty SAND, rock fragments				
58	GCSB-41 (58-60)	17	0	0		Brown fine to coarse SAND, some fine gravel	SP			
60		17	0	0		Brown fine SAND, some silt, trace fine to medium gravel				
62		21	0	0		Brown fine to medium SAND, little silt				
64										

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -41	
PROJECT NUMBER: 2522.012.024		WEATHER: Sunny 36 deg. F			
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 82'			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 51.55'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: 2/17/04			
DRILLING METHOD: GeoProbe		DATE COMPLETED: 2/19/04			
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
66		16	0	0		Brown fine to coarse SAND, some fine gravel				
68		13	0	0		Brown SILT, trace fine to medium gravel	SM			
70		16	0	0		Brown fine SAND, some silt, some fine gravel	SP			
72		15	0	0		Brown fine SAND, some silt, trace fine to medium gravel				
74		14	0	0		Brown fine SAND, some fine to medium gravel				
76	GCSB-41 (74-76)	16	0	0		Brown fine SAND, some fine to medium gravel				
78		13	0	0		Brown fine SAND, some silt and little fine gravel				
		0	0	0		Light gray to light brown silty SAND with little to trace clay				
80		10	0	0		No recovery				
82	GCSB-41 (80-82)	0	0	0		Light gray and light reddish yellow with medium SAND				







Paulus, Sokolowski & Sartor		BORING LOG					BOREHOLE NUMBER - GCSB -42				
PROJECT NUMBER:		2522.012.024					WEATHER: Overcast 30 deg. F				
PROJECT NAME:		Glen Cove Former MGP Site					TOTAL DEPTH: 60'				
LOCATION:		Glen Cove, Long Island, NY					GROUND SURFACE ELEVATION: 57.81'				
DRILLING CO:		Zebra Environmental Corp.					DATE BEGUN: 3/9/04				
DRILLING METHOD:		GeoProbe					DATE COMPLETED: 3/10/04				
DRILLER / HELPER:		Bob/Luke									
ENVIRONMENTAL SCIENTIST:		Joseph Trocchio									
DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS	
0		60	0	0		Dark brown fine to medium SAND, some fine to medium gravel, loose, moist (Fill)	FILL		No physical/visual evidence of impacts		
2						Light Brown fine to medium SAND, dark gray silty sand, trace fine gravel, loose, moist			No physical/visual evidence of impacts		
4		37	0	0		Section of dark gray, reddish brown, olive gray silty sand (Fill)					
6						Olive gray to light brown fine to coarse silty SAND, fine gravel, black fill material (Fill)			Coal fragments, ash, slag, and tar, Moderate Tar-like Odor		
8		21									
10			9.5	0		Olive gray silty SAND, fine to medium gravel (Fill)			Slight to Strong Naphthalene-like Odor, Sheen, Staining and Coating		
12			33.8								
12			43.6	0		Black to olive fine to coarse SAND, fine to coarse gravel, olive fine to medium sand, little fine gravel, wet	SP		Sheen, Blebs, Strong Naphthalene-like Odor		
12		24	48.5						Saturated bands of reddish brown material, Strong Naphthalene-like Odor		
14	GCSB-42 (13-15)		38.5	0		Olive gray fine to medium SAND					
14			82.9								
14			89.5								
14			62.3								
16		32					SM				
18			16.5	0		Light brown clayey SILT, trace fine gravel			1" saturated band of reddish brown material, Strong Naphthalene-like Odor		
18			19.7			Brown fine to coarse SAND, little fine gravel	SP				
18			21.3	0							
20			11.5	0		Olive brown fine to coarse SAND, little fine gravel			2" saturated band of reddish brown material, Strong Naphthalene-like Odor		
20		27							Sheen, Slight Naphthalene-like Odor		
22			3.7	0		Yellowish brown coarse SAND, light brown fine to medium sand, some fine to medium gravel					
22			1.3			Light brown fine to medium silty SAND, some fine to medium gravel	SM		Slight Naphthalene-like Odor		
22			0.9	0							
22			1.2								
24	GCSB-42 (24-26)	28									
26						Light brown fine to medium silty SAND, some medium to fine gravel			No physical/visual evidence of impacts		
28		6									
30			0	0		Brown fine to medium silty SAND					
30		12									
32			0	0		Brown silty SAND, dense					
32		14									
32			0	0		Brownish yellow silty SAND, fine to medium gravel, loose					

Page 1 of 2

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -42	
PROJECT NUMBER: 2522.012.024		WEATHER: Overcast 30 deg. F			
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 60'			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 57.81'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: 3/9/04			
DRILLING METHOD: GeoProbe		DATE COMPLETED: 3/10/04			
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
34		18	0	0		Silty SAND, some fine to medium gravel, dense				
36		17	0	0		Silty SAND, some fine to medium gravel, dense				
38		17								
			0	0		Brown silty SAND, some fine to medium gravel, very dense				
40		19								
42		20	0	0		Brown silty SAND, some fine to medium gravel, dense				
			0	0		Brown silty SAND, trace clay, some fine to medium gravel, dense	CL			
44		18	0	0		Brown silty SAND, some fine gravel				
46		18	0	0		Brown silty SAND, trace clay, little fine gravel, dense				
48		20	0	0		Brown silty SAND, trace clay, little fine gravel, dense				
50		20	0	0		Brown silty SAND, trace clay, little fine gravel, dense				
52			0	0		Brown medium to coarse SAND, some fine to medium gravel, trace silt	SP			
54		21	0	0		Brown fine to coarse SAND, some fine gravel				
56			0	0		Brown medium to coarse SAND, some fine to medium gravel, loose				
58	GCSB-42 (58-60)	20	0	0		Brown medium to coarse SAND, some fine to medium gravel, trace silt, loose				
60										

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -43	
PROJECT NUMBER:	2522.012.024			WEATHER:	Ovrecast 30 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	52'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 64.30'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	1/13/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 1/13/04	
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		48	0	0		Dark brown fine to medium SAND, little silt, some fine to medium gravel, organic material (Fill)	FILL		No physical/visual evidence of impacts	
2						Light brown fine to medium SAND, little silt, some fine to medium gravel, trace coarse gravel (Fill)			No physical/visual evidence of impacts	
4		33	0	0		Light brown fine to coarse SAND, fine to medium gravel, trace silt (Fill)			No physical/visual evidence of impacts	
6						Concrete (Fill)			No physical/visual evidence of impacts	
8		48	0	0		Light brown fine to coarse SAND, some fine to medium gravel, trace silt (Fill) Dark brown fine to medium SAND, silt, fine to medium gravel, organic material (Fill)			No physical/visual evidence of impacts Coal fragments & organic material	
10						Light brown fine to medium SAND, little fine gravel, and silt	SP		No physical/visual evidence of impacts	
12		48	0	0		Light brown fine to coarse SAND, some fine to medium gravel			No physical/visual evidence of impacts	
14						Light brown to brown fine to coarse SAND, some fine to coarse gravel, cobbles			No physical/visual evidence of impacts	
16						Dark brown fine to medium SAND, silt, organic material			Coal fragments, organic material	
18	GCSB-43 (17-19)	27	24.7	0		Greenish gray fine to medium SAND, mica fragments, reddish brown mottling			Slight fuel like odor, sheen	
20			3.8	0		Yellowish brown medium to coarse SAND, some fine gravel,			Very slight unknown odor	
22		30	0	0		Yellowish brown medium to coarse SAND, some fine to medium gravel			No physical/visual evidence of impacts	
24	GCSB-43 (22-24)		0	0		Brown silty SAND, trace fine to medium gravel, weathered rock fragments @ 23.8'	SM		No physical/visual evidence of impacts	
26		32	0	0		Brown silty SAND, trace clay, some fine to medium gravel			No physical/visual evidence of impacts	
28										
30		36	0	0		Brown silty SAND, trace clay, some fine to medium gravel			No physical/visual evidence of impacts	
32		40	0	0		Brown silty SAND, trace clay, some fine to medium gravel			No physical/visual evidence of impacts	

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB -43	
PROJECT NUMBER: 2522.012.024			WEATHER: Ovrecast 30 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 52'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 64.30'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: 1/13/04		
DRILLING METHOD: GeoProbe			DATE COMPLETED: 1/13/04		
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
34										
36										
38		24	0	0		Brown fine to coarse silty SAND, trace clay, some fine to medium gravel			No physical/visual evidence of impacts	
40										
42		24	0	0		Brown fine to coarse silty SAND, some fine to medium gravel			No physical/visual evidence of impacts	
44										
46		36	0	0		Brown fine to coarse silty SAND, some fine to medium gravel, trace clay			No physical/visual evidence of impacts	
48										
50	GCSB-43 (50-52)	30	0	0		Brown fine to coarse silty SAND, some fine to medium gravel			No physical/visual evidence of impacts	
52			0	0		Brown medium to coarse SAND, pinkish white/light red fine sand, trace clay	SP		No physical/visual evidence of impacts	

<b>Paulus, Sokolowski &amp; Sartor</b>	<b>BORING LOG</b>	BOREHOLE NUMBER - GCSB - 44	
PROJECT NUMBER:	2522.012.024	WEATHER:	Sunny
PROJECT NAME:	Glen Cove Former MGP Site	TOTAL DEPTH:	60'
LOCATION:	Glen Cove, Long Island, NY	GROUND SURFACE ELEVATION: 57.58'	
DRILLING CO:	Zebra Environmental Corp.	DATE BEGUN:	1/21/04
DRILLING METHOD:	GeoProbe	DATE COMPLETED: 2/03/04	
DRILLER / HELPER:	Bob/Luke		
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio		

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		32	0	0		Very dark brown SILT with organic material (Fill)	FILL		No physical/visual evidence of impacts	
2						Brown fine to medium SAND, trace silt, light brown fine to medium sand, some fine to medium gravel (Fill)				
4										
6		36	0	0		Brown fine to medium SAND, some fine to medium gravel (Fill) Olive clayey SAND (Fill)			Tar, Moderate Naphthalene-like Odor, coal fragments, slag, ash	
8						Very dark brown/black fine to medium SAND, moist at tip of core (Fill)				
10	GCSB-44 (8-10)	36	57.5 58.1	0 0		Olive clayey SILT (Fill) Olive fine to medium SAND, coarse to fine gravel (Fill)				
12			42.3 37.5	0 0		Fill material, dark brown/black silt (Fill) Brown clayey/silty SAND (Fill) 2" band of olive silty SAND (Fill)			Coal fragments Blebs and Sheen, Strong Naphthalene-like Odor Saturated, Moderate Naphthalene-like Odor	
14		36	5.5 14.9	0		Brown/black fine to coarse SAND, fine to coarse gravel (Fill)				
16	GCSB-44 (15-17)	28	14.3 5.7	0		Brown silty SAND	SM		Blebs and Sheen, Strong Naphthalene-like Odor Blebs, Sheen, Moderate Naphthalene-like Odor	
18		14	2.9	0		Brown silty SAND, some fine to medium gravel				
20							SP		Saturated in top of core	
22										
24			12.2 7.1	0 0		Greenish gray fine to coarse SAND, fine to coarse gravel Olive silty SAND, fine to medium gravel	SM			
26		15	1.9 2.7	0		Brown silty SAND, fine to medium gravel			Moderate Naphthalene-like Odor	
28		20	0.3	0		Fine to medium SAND, trace silt, trace fine to medium gravel	SP		Slight Naphthalene-like Odor	
30			0.2	0		Silty SAND, fine to coarse gravel, very dark				
32		18	0.1	0		Light brown fine to medium SAND, olive mica-schist	SM SP		Slight Naphthalene-like Odor	
34		17	0.2 0.1	0		Light brown silty SAND, some fine to medium gravel	SM		No physical/visual evidence of impacts	

<b>Paulus, Sokolowski &amp; Sartor</b>	<b>BORING LOG</b>	BOREHOLE NUMBER - GCSB - 44	
PROJECT NUMBER:	2522.012.024	WEATHER:	Sunny
PROJECT NAME:	Glen Cove Former MGP Site	TOTAL DEPTH:	60'
LOCATION:	Glen Cove, Long Island, NY	GROUND SURFACE ELEVATION: 57.58'	
DRILLING CO:	Zebra Environmental Corp.	DATE BEGUN:	1/21/04
DRILLING METHOD:	GeoProbe	DATE COMPLETED: 2/03/04	
DRILLER / HELPER:	Bob/Luke		
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio		

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
34	GCSB-44 (32-34)	12	0.9 0.9	0		Light brown fine to medium SAND, some fine to medium gravel	SP			
36		15	0	0		Light brown fine to medium SAND, some fine to medium gravel			Slight Napthalene-like Odor	
38		12	0.8	0		Light brown fine to medium SAND, some fine to medium gravel			Slight Napthalene-like Odor	
38	GCSB-44 (38-40)		0.3	0		Silty SAND w/fine to medium gravel	SM		Slight Napthalene-like Odor and Sheen	☒ · ☒ ☒
40		12	1.3	0		Light brown fine to medium SAND, some fine to medium gravel	SP			
40		15	1.9	0		Light brown silty SAND, fine to medium gravel	SM			
42		14	0.8 0.6 0	0		Brown silty SAND, some fine to medium gravel, very dense			Slight Napthalene-like Odor	
44						Light brown silty SAND, fine to medium gravel			No physical/visual evidence of impacts	
46		15	0	0		Light brown fine to medium SAND, some fine to medium gravel	SP		Slight Napthalene-like Odor	
46						Light brown silty SAND, dense	SM			
48		18	0.4 0.1	0		Light brown silty SAND, some fine to medium gravel			No physical/visual evidence of impacts	
48	GCSB-44 (48-50)	22	0	0		Light brown silty SAND, some fine to medium gravel				
50		16	0 0.1 0.1	0		Light brown silty SAND, some fine to medium gravel				
52										
54		16	0	0		Light brown silty SAND, some fine to medium gravel				
56										
58	GCSB-44 (58-60)	12	0	0		Light brown silty SAND, some fine to medium gravel				
60										
62										

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -45	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny 35 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	42'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.84'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	2/10/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 2/11/04	
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		48	0	0		Reddish brown fine to medium SAND, some silt, some fine to coarse gravel, moist (Fill)	SP		No physical/visual evidence of impacts	
2										
4										
6		34	0	0		Reddish brown fine to medium SAND, little fine to medium gravel (Fill) Olive fine to medium SAND, little fine to medium gravel (Fill)				
8						Black silty SAND (Fill)	SM		Slight Naphthalene-like Odor	
10		34	0	0		Reddish brown medium to coarse SAND, some fine to medium gravel (Fill) Olive silty SAND (Fill)	SP		No physical/visual evidence of impacts	
			0	0		Concrete (Fill)	SM			
12			21.4	0		Black fine to medium SAND (Fill) Fine SAND, some silt and some F/M gravel, wet (Fill)	FILL		Stained, Moderate Petroleum-like Odor	
		41	22.4	0		Olive fine to medium SAND, wet (Fill)	SP		Sheen, Slight Naphthalene-like Odor	
14	GCSB-45 (14-16)		2.7	0		Olive silty SAND (Fill)	SM			
			1.4	0		Light gray silty SAND (Fill)				
16			86.5	0		Gray silty SAND (Fill)			Strong Naphthalene-like Odor, Saturated, Blebs Moderate to Strong Naphthalene-like Odor, Bands of Saturation	
18		29	0.8	0		Olive medium to coarse SAND with fine gravel	SP			
			0	0		Brown fine SAND, some silt				
20			0	0		Brown coarse to medium SAND			Slight Naphthalene-like Odor	
22	GCSB-45 (20-22)	36	0	0		Brown fine to medium SAND, some fine to medium gravel			No physical/visual evidence of impacts	
						Brown fine SAND, some silt				
24		16	0	0		Brown medium to fine SAND				
						Brown silty SAND	SM			
26			0	0		Brown silty SAND				

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -45	
PROJECT NUMBER: 2522.012.024		WEATHER: Sunny 35 deg. F			
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 42'			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 57.84'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: 2/10/04			
DRILLING METHOD: GeoProbe		DATE COMPLETED: 2/11/04			
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
28		16	0	0		Brown silty SAND, brown coarse/medium sand, coarse/medium gravel				
30	GCSB-45 (30-32)					Brown silty SAND				
32	GCSB-45 (32-34)	10	13.2	0		Coarse to medium SAND, some fine to medium gravel	SP			
		18	10.7	0		Brown fine to coarse SAND, some silt				
34		14	0	0		Brown silty SAND, some fine to coarse gravel	SM			
36		18	0	0		Brown coarse to medium SAND, some fine to medium gravel	SP			
						Brown silty SAND, some fine to medium gravel	SM			
38		15	0	0		Brown fine to medium SAND, some silt, little fine gravel	SP			
						Brown sandy SILT, little fine gravel	SM			
40	GCSB-45 (40-42)	17	0	0		Brown fine to medium SAND, some fine to coarse gravel	SP			
42										

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB -46	
PROJECT NUMBER: <b>2522.012.024</b>			WEATHER: <b>Sunny to overcast 35 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>60'</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>57.34'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>2/11/04</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>2/12/04</b>		
DRILLER / HELPER: <b>Bob/Luke</b>					
ENVIRONMENTAL SCIENTIST: <b>JRT</b>					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		60		0		Reddish brown medium to coarse SAND, some medium to coarse gravel and cobbles (Fill)	SP		No physical/visual evidence of impacts	
2										
4		42	0	0		Light brown medium to coarse SAND, some medium to coarse gravel and cobbles (Fill)				
6			0	0		Olive brown fine SAND, some silt and some fine to medium gravel, 4" rock fragments (Fill)				
						Fill material with black silt (Fill)	FILL		Fill material - coal, ash, and slag	
8		43	0	0		Reddish brown fine SAND, some silt, moist	SP			
			0	0		Olive fine SAND, some silt and some rock fragments				
10	GCSB-46 (10-12)		90.5	0					Saturated with NAPL like material, Moderate to Strong Naphthalene and Petroleum- like Odor	
			38	0	▼	Olive medium to fine SAND				
12						Reddish brown coarse to medium SAND				
		33	27	0		Reddish brown fine to medium SAND			Bands of NAPL Saturation, Moderate Naphthalene and Petroleum-like Odor	
14			7	0		Light brown medium to coarse SAND				
			3.6	0		Medium to coarse SAND, some fine to medium gravel				
16			7.3	0		Reddish brown silty SAND	SM		Blebs, Moderate Naphthalene-like Odor	
		36	35.4	0		Reddish brown silty SAND				
			1.4	0						
18			1.3	0		Reddish brown, fine SAND, some silt	SP		No physical/visual evidence of impacts	
20		34	1.2	0		Light brown medium to coarse SAND, some fine to medium gravel				
			1.1							
22			20.1	0		Light brown medium to coarse SAND				
			22.4							
24			3.0	0		Dark silty SAND	SM		Slight Naphthalene-like Odor	
			1.4							
26		36	3.1	0		Brown fine to medium SAND	SP		No physical/visual evidence of impacts	
			1.4	0		Black rock fragments				
28			0.4	0		Brown medium to coarse SAND, some fine to medium gravel				
			0.3							
30		16	0.1	0		Brown fine to coarse SAND, some fine to medium gravel			Slight Naphthalene-like Odor, 2" bands of Staining in this interval	
			0							
			0							
		18	0	0		Brown fine to medium SAND, little fine to medium gravel				
						Brown silty SAND, little fine gravel and 2" yellowish brown, off-white,	SM		No physical/visual evidence of impacts	

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB -46	
PROJECT NUMBER: 2522.012.024			WEATHER: Sunny to overcast 35 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 60'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.34'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: 2/11/04		
DRILLING METHOD: GeoProbe			DATE COMPLETED: 2/12/04		
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST: JRT					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
32		20	0	0		and yellow rock fragments Brown silty SAND, little fine to medium gravel				
34			0.7 0.2	0		Brown fine to coarse SAND, some fine to medium gravel	SP		Slight Unidentifiable Odor	
36		15	2.5 8.8 1.5			Brown fine to medium SAND, 2" band of olive rock fragments			Weathered rock zone with a Slight Naphthalene-like Odor	
38		14	0			Brown fine SAND, some silt, little fine to medium gravel, bottom 2" band of rock fragments			No physical/visual evidence of impacts	
40		12	0			Brown medium to fine SAND, some fine to medium gravel, little clay				
42		10	0			Brown coarse to medium SAND, some ine fine to coarse gravel	SP			
44		15	0			Brown fine to medium SAND, little fine to medium gravel				
44	GCSB-46 (44-46)	18	65.9 4.9			Brown fine to medium SAND, little fine to medium gravel				
46		18	0.2 0.2			Brown fine to coarse SAND, some fine to medium			1" Saturated band (tar like material), Moderate Naphthalene-like Odor	
48	GCSB-46 (48-50)	13	0			Brown fine to medium SAND, little fine to medium gravel, 1" band of black rock fragments			No physical/visual evidence of impacts	
50			0							
52		11	0			Brown fine to medium SAND, some fine to coarse gravel				
54		12	0 0.1			Brown medium to coarse SAND, some fine gravel				
56		17	0			Brown fine to medium SAND, some fine gravel				
58		17	0			Brown medium to coarse SAND, some fine to coarse gravel				
60	GCSB-46 (58-60)	20	0			Brown fine to medium SAND, some fine gravel				

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -47	
PROJECT NUMBER:	2522.012.024			WEATHER:	Overcast ~40
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	60'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.06'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	2/19/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 2/23/04	
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		60	0	0		Brown black medium to coarse SAND, some fine to coarse gravel, cobbles (Fill)	FILL			
2										
4									Slag material	
6		21	0	0		Brown fine to coarse SAND, some fine to coarse gravel and rock fragment (Fill)			No physical/visual evidence of impacts	
8			0	0		4" band of rock fragments (Fill) Brown fine SAND (Fill) Fill material				
10										
12		19				Fill material			Fill material - Slag, brick, and coal	
14	GCSB-47 (14-16)	46	12.3 4.1 9.6	0 0		Fill material Brown olive fine to medium SAND	SP		No physical/visual evidence of impacts	
16			2.8	0		Reddish brown fine SAND			Saturated, Blebs, Sheen and Strong Naphthalene-like Odor Sheen, Slight Naphthalene-like Odor Sheen, Slight Naphthalene-like Odor	
18		34	0.1 0.2	0 0		Olive fine to medium SAND Brown fine SAND, some silt				
20			0	0		Brown medium to coarse SAND, some fine to medium gravel			Sheen, Slight Naphthalene-like Odor	
22		30	0.1	0		Brown medium to coarse SAND				
24	GCSB-47 (24-26)		0	0		Brown medium to coarse SAND, fine to coarse gravel			No physical/visual evidence of impacts	
26		27	0	0		Brown medium to coarse SAND, some fine to medium gravel				
28			0	0		Brown fine SAND, little silt, dense				
30			0	0		Brown coarse to medium SAND				
			0	0		Brown fine SAND, little silt, dense				
		16	0	0		Brown silty SAND, fine to medium gravel	SM			
							SP			
		14	0	0		Brown fine to coarse SAND, some fine to coarse gravel				

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -47	
PROJECT NUMBER:	2522.012.024			WEATHER:	Overcast ~40
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	60'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.06'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	2/19/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 2/23/04	
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
32										
	15	0	0			Brown fine to coarse SAND, some fine to coarse gravel				
34	0	0	0			No recovery, rock in sample core				
36	14	0	0	0		Brown coarse to medium SAND, some fine to medium gravel				
		0	0			Brown silty SAND	SM			
38		0	0			Brown fine to medium SAND	SP			
	16	0	0			Brown medium to coarse SAND, some fine gravel				
		0	0			Brown silty SAND	SM			
40							SP			
42	8	0	0			Brown fine to coarse SAND, some coarse to fine gravel and little rock fragments, 1" black band consisting of rock fragments				
44	7	0	0			Brown fine SAND, fine to medium gravel, wet				
	14	0	0			Light brown fine SAND, little fine gravel				
		0	0			Light brown silty SAND, trace clay and reddish rock fragments	SM			
46	15	0	0			Light brown fine SAND, little fine gravel				
		0	0			Brown fine to medium SAND, little fine gravel	SP			
48										
	12	0	0			Brown fine to medium SAND, trace fine gravel				
50										
	12	0	0			Rock fragments, black and olive mottling				
52		0	0			Brown fine to medium SAND, some fine to coarse gravel				
	13	0	0			Light brown fine to medium SAND, some fine gravel				
54										
	15	0	0			Brown fine to medium SAND, some fine gravel and trace silt, dense				
56										
	15	0	0			Brown fine to medium SAND, some fine gravel and some silt, dense				
58	GCSB-47 (58-60)									
	15	0	0			Brown fine to medium SAND, some fine gravel and some silt, dense, 1" band of black/light brown rock fragments				
60										




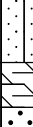



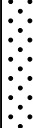

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -48	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny 40 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	60
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.40'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	2/23/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 2/25/04	
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		60		0		Brown coarse to fine SAND, some fine to coarse gravel, cobbles (Fill)	SP		No physical/visual evidence of impacts	
2										
4		37	0	0		Brown fine to medium SAND, some fine gravel, loose (Fill)				
6			0.1	0		Olive fine to medium SAND, some fine to medium gravel, 2" badn of white rock fragments (Fill)			No physical/visual evidence of impacts	
8									Slight MGP-like Odor	
10	GCSB-48 (10-12)	32	0	0		Brown fine to medium SAND (Fill)			No physical/visual evidence of impacts	
						Light brown medium to coarse SAND, some fine/medium gravel, loose (Fill)			Slight MGP-like Odor	
12						Dark brown silty SAND, dense, 2" light gray rock	SM			
14		42	0.2	0		Brown fine SAND, some silt, loose			Slight MGP-like Odor	
			0.1	0		Olive fine to coarse GRAVEL, silty sand				
			0	0		Light brown fine to coarse GRAVEL with silty sand			No physical/visual evidence of impacts	
						Brown fine to medium SAND, little fine to medium gravel, very dense	SP			
16		19	0	0		Light brown medium to coarse SAND, some fine gravel and trace silt, loose				
18		6	0	0		Olive fine to medium SAND, some silt, loose				
20		4	0	0		Light brown medium to coarse SAND and fine to coarse gravel				
22	GCSB-48 (22-24)		0	0		Olive fine to coarse GRAVEL, silty sand, wet	SM			
		20	0	0		Brown fine to coarse SAND, some fine to medium gravel, wet	SP			
24		18	0	0		Brown medium to coarse SAND, some fine gravel				
26		20	0	0		Brown fine to coarse SAND, dense				
						Brown fine to medium SAND, little fine gravel, dense				
28		18	0	0		Brown fine SAND, some silt, dense				
						Brown silty SAND, little fine to medium gravel, very dense				
30		15	0	0		Brown silty SAND, dense	SM			

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -48	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny 40 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	60
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.40'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	2/23/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 2/25/04	
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
32						Band of fine to medium GRAVEL				
	16	0	0			Brown fine SAND, some silt, loose, 1" rock fragments Brown medium to coarse SAND, some fine to medium gravel, loose	SP			
34										
	14	0	0			Brown medium to coarse SAND, very loose Brown fine to medium GRAVEL Brown silty SAND, loose	SM			
36										
	15	0	0			Brown silty SAND, little rock fragments, 1" band of fine gravel, dense				
38										
	10	0	0			Brown SILT, very stiff, 1" rock fragments				
40						Brown SILT, 1" band of rock fragments white, little fine gravel, dense, 1" band of black rock fragments at tip of core No recovery	SP			
42										
	7	0	0			Brown medium to coarse GRAVEL Brown fine to medium SAND, some fine to medium gravel, loose Brown fine SAND, some silt, dense				
44										
	16	0	0			Brown fine SAND, some silt, some fine to medium gravel, loose				
46										
		0	0							
48										
	13	0	0			Brown fine to medium SAND, some fine to medium gravel, loose				
50										
	13	0 0 0 1.0	0			Brown fine to coarse SAND, some fine to medium gravel, loose				
52						Brown medium to coarse SAND, some fine gravel				
54						Brown medium to coarse SAND, little fine gravel Brown silty SAND, stiff	SM			
56						Brown medium to coarse SAND, some fine gravel, wet, loose Brown silty SAND, stiff, little fine to medium gravel	SP			
	16	0	0				SM			
58							SP			
						Brown fine to medium SAND, some fine to medium gravel, dense				
60	GCSB-48 (58-60)	15	0	0		Brown fine SAND, little fine to coarse gravel, dense				

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB -49	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny 50
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	58'
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 58.02'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	3/2/04
DRILLING METHOD:	GeoProbe			DATE COMPLETED: 3/4/04	
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:	Joseph Trocchio				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		60	0	0		Yellowish brown fine to coarse SAND, fine to medium gravel (Fill)	SP		No physical/visual evidence of impacts	
2										
4			0	0		Gray silty SAND, clay, fine to medium gravel (Fill)	SM			
6	31					Light brown silty SAND, fine gravel, loose (Fill)				
8						Dark brown/black fill with brick and concrete, fine to medium sand, fine gravel, very dense (Fill)	SP			
10	37		0	0		Brown silty SAND, with wood fragments, loose (Fill)	SM		5" black stiff tar, Strong MGP-like Odor, Strong Naphthalene-like Odor	
12		2.7	0			Light gray concrete (Fill)	FILL			
14		27.4	0			Light brown fine to medium SAND	SP			
16	GCSB-49 (13-15)	34	4.2	0		Brown fine to medium SAND, dense			Moderate Naphthalene-like Odor	
18			48.5	0	▼				6" Saturation band of, reddish brown material, Sheen, Strong Naphthalene-like Odor	
20			12.7	0		Brown fine to medium silty SAND, little fine to medium gravel	SM		Moderate Naphthalene-like Odor	
22			4.1							
24		26	0	0		Olive brown medium to coarse SAND, fine to coarse gravel, dense	SP		Slight Naphthalene-like Odor	
26			0	0		Light brown fine to coarse SAND, little silt, fine gravel			Slight Naphthalene-like Odor	
28	GCSB-49 (20-22)	30	0	0		Brown fine to coarse SAND, fine to medium gravel, dense			No physical/visual evidence of impacts	
30										
32										
34										
36		4	0	0		Brown fine to medium SAND, trace medium gravel	SM			
38		13	0	0		Brown silty fine to medium SAND, fine to coarse gravel, dense				
40		16	0	0		Brown medium to coarse SAND, loose				
42			0	0		Brown fine to medium silty SAND, trace fine gravel				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB -49	
PROJECT NUMBER: <b>2522.012.024</b>			WEATHER: <b>Sunny 50</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>58'</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>58.02'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>3/2/04</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>3/4/04</b>		
DRILLER / HELPER: <b>Bob/Luke</b>					
ENVIRONMENTAL SCIENTIST: <b>Joseph Trocchio</b>					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
32		17	0	0		Brown fine to coarse silty SAND, fine to medium gravel and black rock fragments, dense				
		14	0	0		Brown fine to medium SAND, trace fine gravel, loose	SP			
			0	0		Black rock fragments				
34		20	0	0		Brown fine to medium silty SAND, little fine to medium gravel, dense	SM			
			0	0						
			0	0		Brown fine to medium SAND, some fine to medium gravel, trace silt	SP			
			0	0		Black and light brown rock fragments				
36						Brown fine to medium SAND, some fine to medium gravel, little silt				
							SM			
		14	0	0		Brown fine to medium silty SAND, some fine gravel, firm				
38							SP			
		14	0	0		Light brown fine to coarse SAND, fine to medium gravel, loose				
40		18	0	0		Light brown medium SAND, some fine gravel, loose				
			0	0		Brown fine to medium silty SAND, some fine to medium gavel, dense	SM			
42		20	0	0		Light brown fine to medium SAND, some fine to medium gravel, little silt, loose	SP			
			0	0		Brown fine to medium silty SAND, fine to medium gravel, dense	SM			
44										
		14	0	0		Brown fine to medium silty SAND, fine to medium gravel, dense				
46										
		16	0	0		Light brown fine to medium silty SAND, trace clay, fine to medium gravel, 6" of loose material and remaining 10" of dense material				
48										
		20	0	0		Light brown fine to medium SAND, little silt, some fine to medium gravel, 3" brownish silt pocket, soft				
50			0	0		Light brown fine to medium silty SAND, some fine to medium gravel	SM			
		17	0	0		Light brown fine to coarse SAND, some fine to medium gravel, trace silt, loose	SP			
52		19	0	0		Grayish brown silty SAND, little clay, little fine gravel, loose	SM			
			0	0		Brown fine to medium SAND, some silt, little fine to medium gravel, dense				
54	GCSB-49 (54-58)	20	0	0		Brown fine to medium SAND, some fine to medium gravel, little silt, dense	SP			
56										
58										

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB - 50	
PROJECT NUMBER: 2522.012.024		WEATHER: Partly Sunny, 50 deg. F			
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 52 Ft.			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 58.10'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: April 20, 2005			
DRILLING METHOD: GeoProbe		DATE COMPLETED: April 20, 2005			
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		48	0.0	0.0		Moderate Brown Coarse to Very Coarse SAND, fine gravel (Fill)	SP			
2			0.0	0.0		Light Brown Coarse to Very Coarse SAND, fine and coarse gravel (Fill)				
4	17	0.0	0.0			Medium Gray to Dark Gray Sandy CLAY, non-plastic, with some fine gravel (Fill)	CL			
						Dark Yellowish Brown Coarse to Very Coarse SAND, fine and coarse gravel, wet (Fill)	SP			
6										
			2.9	0.0		Grayish Black Medium to Coarse SAND, Coal Fragments, wet (Fill)				
			2.7	0.0		Yellowish Gray Medium to Coarse SAND, very coarse sand to fine gravel (Fill)				
8	46	8.2	0.0			Dark Gray sandy CLAY, non-plastic (Fill)	CL			
						Dark Yellowish Brown Coarse to Very Coarse SAND, fine and coarse gravel, wet (Fill)	SP			
			0.0			Dark Gray Soft CLAY, highly plastic, little fine to medium sand, trace of coarse gravel (Fill)	CL			
10										
			1.6	0.0		Dark Yellowish Brown Coarse to Very Coarse SAND, fine and coarse gravel, wet	SP			
			1.5	0.0						
			2.0	0.0		Medium Dark Gray Coarse to Very Coarse SAND, fine and coarse gravel, wet				
12	37	0.0	0.0			Dark Yellowish Orange Medium to Very Coarse SAND, fine to coarse gravel.	SC			
			0.0	0.0		Pale Yellowish Orange Fine to Coarse Clayey SAND, wet				
14			0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, fine to coarse gravel.				
			0.2	0.0						

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB - 50	
PROJECT NUMBER:	2522.012.024			WEATHER:	Partly Sunny, 50 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	52 Ft.
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION:	58.10'
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	April 20, 2005
DRILLING METHOD:	GeoProbe			DATE COMPLETED:	April 20, 2005
DRILLER / HELPER:	Bob/Luke				
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
16	42		0.7	0.0		Olive Gray Fine to Coarse Clayey SAND, some very coarse sand.				
			2.0	0.0						
18			0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, some fine to coarse gravel.				
			0.0	0.0		Pale Yellowish Brown Medium to Very Coarse SAND, some fine gravel, trace clay.	SP			
			0.0	0.0		Dark Yellowish Brown Fine to Medium Clayey SAND, very coarse sand to fine gravel.	SC			
			0.0	0.0		Pale Yellowish Brown Medium to Coarse SAND, some fine gravel	SP			
20	30		0.7	0.0		Dark Yellowish Brown Fine to Medium Clayey SAND, very coarse sand to fine gravel	SC			
			0.4	0.0		Light Olive Gray Fine to Medium SAND, trace clay and mica.	SP			
			0.0	0.0						
			0.0	0.0		Grayish Orange Medium to Coarse Clayey SAND.	SC		Slight Naphthalene-Like Odor	
22	GCSB-50 (21.5-22)		18.9	0.0		Pale Yellowish Brown Silty CLAY, non- plastic.	CL		Soil Stained	
			2.9	0.0		Pale Yellowish Brown Coarse to Very Coarse SAND, fine gravel, wet	SP		No physical/visual evidence of impacts	
			3.3	0.0		Dark Yellowish Brown and Light Brown Medium to Very Coarse SAND, some fine gravel, trace of clay.	SP			
			2.6	0.0		Moderate Yellowish Brown Medium to Very Coarse Clayey SAND.	SC			
24	27		0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, fine gravel, wet	SP			
			0.0	0.0						
			0.0	0.0		Moderate and Pale Yellowish Brown Medium to Very Coarse Clayey SAND, trace fine gravel.	SC			
			2.2	0.0						
28	23		5.4	0.0		Dark Yellowish Brown Medium to Very Coarse SAND, some fine gravel with reddish brown iron oxide staining.	SP			
			0.0	0.0		Moderate Yellowish Brown Fine to Very Coarse SAND, fine and coarse gravel.				
			0.0	0.0						
			0.0	0.0						












<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB - 50	
PROJECT NUMBER: 2522.012.024		WEATHER: Partly Sunny, 50 deg. F			
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 52 Ft.			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 58.10'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: April 20, 2005			
DRILLING METHOD: GeoProbe		DATE COMPLETED: April 20, 2005			
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
30			0.0	0.0		Moderate to Dark Yellowish Brown Medium to Very Coarse Clayey SAND, fine and coarse gravel.	SC			
			2.4	0.0						
			2.2	0.0						
32	17	0.0	0.0	0.0		Dark Yellowish Brown Medium to Very Coarse Clayey SAND, some fine gravel.	SC			
			0.0	0.0						
34			0.0	0.0					No physical/visual evidence of impacts	
			0.0	0.0		Moderate Yellowish Brown Fine to Very Coarse Clayey SAND, fine to coarse gravel.				
36	37	0.0	0.0	0.0		Dark Yellowish Brown Medium to Coarse Clayey SAND, fine gravel; thin layers of moderate yellowish brown coarse to very coarse sand with fine gravel.				
	GCSB-50 (37-37.5)		0.0	0.0						
38			0.0	0.0						
			0.0	0.0						
40	34	0.0	0.0	0.0		Dark Yellowish Brown Medium to Coarse Clayey SAND, fine and coarse gravel.				
			0.0	0.0						
42			0.0	0.0		Dark Yellowish Brown Medium to Very Coarse SAND, some fine gravel, wet	SP			
			0.0	0.0		Moderate Yellowish Brown Coarse to Very Coarse SAND, fine gravel, wet				
44										

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB - 50	
PROJECT NUMBER: 2522.012.024		WEATHER: Partly Sunny, 50 deg. F			
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 52 Ft.			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 58.10'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: April 20, 2005			
DRILLING METHOD: GeoProbe		DATE COMPLETED: April 20, 2005			
DRILLER / HELPER: Bob/Luke					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
46		31	0.0	0.0		Dark Yellowish Brown and Light Moderate Brown Coarse to Very Coarse SAND, fine and coarse gravel, iron oxide staining, wet			No physical/visual evidence of impacts	
			0.0	0.0						
			0.2	0.0						
			0.0	0.0		Dark Yellowish Brown Fine to Coarse Clayey Micaceous SAND, some fine gravel.	SC			
48	18	0.0	0.0	0.0		Moderate to Dark Yellowish Brown Medium to Very Coarse Micaceous SAND, fine gravel. Moderate Yellowish Brown and Pale Yellowish Brown Medium to Very Coarse SAND, fine gravel and mica.	SP			
50	19	0.0	0.0	0.0		Dark Yellowish Orange to Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, some fine gravel. Moderate Yellowish Brown and Pale Yellowish Brown Fine to Very Coarse Clayey SAND, some fine gravel.	SC			
	GCSB-50 (51-52)	0.0	0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, fine and coarse gravel, wet	SP			
52										

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB51	
PROJECT NUMBER: <b>2522.012.024</b>			WEATHER: <b>Partly Sunny, 60 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>57.80'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>April 18, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>April 18, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0			0.0	0.0		Dusky Brown to Light Brown Medium to Very Coarse SAND, fine and coarse gravel (Fill)	SP		No physical/visual evidence of impacts	
2			0.0	0.0						
						Medium Dark Gray CLAY, medium plasticity, and medium to fine sand	SC			
4	22	0.0	0.0			Yellowish Gray CLAY, non-plastic, fine to medium sand some very coarse sand to fine gravel.	CL			
						Grayish Black Medium to Fine Silty SAND, some fine to coarse gravel, trace clay.	SP			
6			0.0	0.0						
			0.3	0.0						
			0.0	0.0						
8	44	0.0	0.0			Medium Dark Gray to Dark Gray Sandy CLAY, low to medium plasticity, some very coarse sand to fine gravel.	CL			
			0.0	0.0		Dark Gray Sandy CLAY, low to medium plasticity, some fine gravel			Slight Naphthalene-like Odor	
10	GCSB-51 (9.5-10.5)	1.6	0.0			Medium to Dark Gray Medium to Coarse SAND, some very coarse sand to fine gravel, little silt, trace clay.	SP		Slight to Moderate Petroleum-like Odor	
		26	0.0			Moderate Yellowish Brown Fine to Very Coarse SAND, fine and coarse gravel, moist				
		20	0.0			Dark Yellowish Brown Fine to Medium Clayey SAND	SC		Slight Petroleum-like Odor	
12	46	1.1	0.0							
		15.4	0.0			Medium Gray Fine to Coarse SAND, some clay				
		2.6	0.0			Dark Yellowish Brown Coarse to Very Coarse SAND, fine and coarse gravel, wet.	SP		No physical/visual evidence of impacts	
14		1.5	0.0			Moderate to Dark Yellowish Brown Medium to Very Coarse SAND, with some fine to coarse gravel, wet				
		0.0				Moderate Brown Medium to Very Coarse Clayey SAND, some fine to coarse gravel.	SC			
		0.7	0.0							

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB51	
PROJECT NUMBER:	2522.012.024			WEATHER:	Partly Sunny, 60 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	52 Ft.
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION:	57.80'
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	April 18, 2005
DRILLING METHOD:	GeoProbe			DATE COMPLETED:	April 18, 2005
DRILLER / HELPER:	Bob Burawa/Lucas Reiss				
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
16	GCSB-51 (18-19)	28	0.0			Moderate Yellowish Brown Medium to Very Coarse SAND, with thin layers of dark yellowish brown fine to medium micaceous clayey sand, wet				
			4.2	0.0						
			0.0	0.0		Moderate Yellowish Brown Fine to Medium Clayey SAND, little very coarse sand to fine gravel.				
			0.0	0.0						
18	GCSB-51 (18-19)		0.0	0.0		Grayish Orange Fine to Coarse Clayey SAND, wet				
						Dark Yellowish Brown Fine to Coarse Clayey SAND, very coarse sand to fine gravel, some mica.				
			0.3	0.0		Dark Yellowish Brown Coarse to Very Coarse SAND, fine to coarse gravel, wet	SP			
20		35	0.0	0.0		Moderate Yellowish Brown Fine Clayey SAND, some fine gravel.	SC		No physical/visual evidence of impacts	
			0.0	0.0		Grayish Black Biotite MICA with coarse to very coarse sand.	SP			
22			0.0	0.0		Moderate to Dark Yellowish Brown Medium to Very Coarse Clayey SAND, some fine to coarse gravel, wet	SC			
			0.9	0.0						
			0.3	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, some fine gravel, little mica, wet	SP			
24	29		0.0	0.0		Moderate Yellowish Brown Medium to Coarse Clayey Micaceous SAND, little fine gravel.	SC			
			0.0	0.0		Grayish Black Biotite MICA, coarse to very coarse sand.	SP			
26						Pale to Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, fine and coarse gravel, wet	SC			
						Dark Yellowish Brown Fine to Coarse Clayey SAND, little very coarse sand to fine gravel.				
28	31		5.1	0.0						
						Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, some fine gravel; thin layers of moderate yellowish brown medium to very coarse sand with fine gravel.				
			1.3	0.0						

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB51	
PROJECT NUMBER:	2522.012.024			WEATHER:	Partly Sunny, 60 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	52 Ft.
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION:	57.80'
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	April 18, 2005
DRILLING METHOD:	GeoProbe			DATE COMPLETED:	April 18, 2005
DRILLER / HELPER:	Bob Burawa/Lucas Reiss				
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
30			2.8	0.0						
			4.7	0.0						
			2.7	0.0						
			2.4	0.0						
32	37		0.0	0.0		Moderate to Dark Yellowish Brown Medium to Coarse Clayey SAND, mica, some fine gravel.				
			0.0	0.0						
	GCSB-51 (33.5-34.5)					Grayish Orange Medium to Very Coarse SAND, little fine gravel, wet	SP			
34			1.3	0.0		Moderate to Dark Yellowish Brown Fine to Medium SAND, some clay and fine gravel.			No physical/visual evidence of impacts	
			1.2	0.0		Moderate to Dark Yellowish Brown Medium to Coarse Clayey SAND, with mica, some fine gravel.	SC			
			0.6	0.0						
			0.5	0.0						
36	40									
			0.4	1.0						
			0.3	0.0						
38			0.0	0.0						
			0.0	0.0		Dark Yellowish Orange to Moderate Yellowish Brown Coarse to Very Coarse SAND, fine gravel, wet	SP			
40	22		0.0	0.0		Moderate Yellowish Brown Fine to Coarse Micaceous Clayey SAND, some fine gravel.	SC			
						Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, some fine gravel.				
			0.0	0.0						
42			0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, some mica and fine gravel, wet	SP			
						Dark Yellowish Brown Medium to Coarse Clayey SAND, mica and some fine gravel.	SC			
44			0.5	0.0						

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB51	
PROJECT NUMBER: 2522.012.024		WEATHER: Partly Sunny, 60 deg. F			
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 52 Ft.			
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 57.80'			
DRILLING CO: Zebra Environmental Corp.		DATE BEGUN: April 18, 2005			
DRILLING METHOD: GeoProbe		DATE COMPLETED: April 18, 2005			
DRILLER / HELPER: Bob Burawa/Lucas Reiss					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
		17	0.0	0.0		Dark Yellowish Brown Fine to Coarse Clayey Micaceous SAND, little fine gravel, wet				
			0.0	0.0					No physical/visual evidence of impacts	
46		19	0.0	0.0		Dark Yellowish Brown Fine to Medium Micaceous SAND , some clay, wet	SP			
			0.0	0.0		Moderate Yellowish Brown Coarse to Very Coarse SAND, little fine gravel.				
			0.0	0.0		Dark Yellowish Brown Medium to Very Coarse Clayey SAND, fine gravel	SC			
48		21	0.0	0.0		Dark Yellowish Brown Fine to Medium Micaceous Clayey SAND, little very coarse sand to fine gravel.				
			0.0	0.0		Dark Yellowish Brown Medium to Very Coarse SAND, some fine gravel, wet	SP			
			0.0	0.0		Dark Yellowish brown Medium to Coarse Micaceous Clayey SAND.	SC			
50	GCSB-51 (50-51.5)	22	0.0	0.0		Moderate Yellowish Brown Medium to Coarse SAND, little very coarse sand to fine gravel, wet	SP			
			0.0	0.0						
			0.0	0.0		Grayish Black Biotite Mica with medium to coarse sand	SC			
52			0.0	0.0		Moderate Yellowish Brown Fine to Coarse Clayey SAND, mica, some fine gravel.	SP			
54										

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB52	
PROJECT NUMBER: 2522.012.024			WEATHER: Partly Sunny, 60 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 52 Ft.		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.55'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: April 22, 2005		
DRILLING METHOD: GeoProbe			DATE COMPLETED: May 2, 2005		
DRILLER / HELPER: Bob Burawa/Lucas Reiss					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0			0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, fine and coarse gravel (Fill)	SP		No physical/visual evidence of impacts	
2			0.0	0.0						
4		11	0.0	0.0		Dark Yellowish Orange Medium to Very Coarse SAND, with fine gravel (Fill)				
6			0.0	0.0						
8			0.5	0.0	▼	Grayish Black Silty Coarse SAND, coarse gravel, wet (Fill)				
		28	0.0	0.0		Grayish Black Medium to Very Coarse SAND, some fine gravel (Fill)			Tar, Moderate Naphthalene-like Odor	
			0.0	0.0		Dark Yellowish Brown Fine Clayey SAND, some mica some fine gravel.	SC		NAPL Saturated, Moderate to Strong Naphthalene-like Odor	
10	GCSB-52 (10-10.5)		230	0.0						
			185	0.0						
	GCSB-52 (11-11.5)		61	0.0		Dusky Yellowish Brown Fine SAND, fine to coarse gravel, some clay, wet	SP		Staining, Sheen, Moderate Naphthalene-like Odor	
			121	0.0		Grayish Black Coarse to Very Coarse SAND, fine gravel, wet			Stained, Saturated, Moderate Naphthalene-like Odor	
12		35	0.0	0.0		Moderate Brown and Yellowish Gray Medium to Very Coarse Micaceous SAND, fine and coarse gravel.			Stained, Saturated, Moderate Naphthalene-like Odor	
			35.5	0.0						
			200	0.0						
14			134	0.0		Moderate Brown Coarse to Very Coarse SAND, fine and coarse gravel.			Stained, Saturated, Moderate Naphthalene-like Odor	
	GCSB-52		77	0.0						







Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB52	
PROJECT NUMBER:	2522.012.024			WEATHER:	Partly Sunny, 60 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	52 Ft.
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION:	57.55'
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	April 22, 2005
DRILLING METHOD:	GeoProbe			DATE COMPLETED:	May 2, 2005
DRILLER / HELPER:	Bob Burawa/Lucas Reiss				
ENVIRONMENTAL SCIENTIST:					














DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
14.5-15			145	0.0		Brownish Black Coarse to Very Coarse SAND, fine gravel.			Stained, Blebs, Saturated, Strong Naphthalene-like Odor	
			4	1.0		Yellowish Gray Coarse to Very Coarse SAND, fine gravel, some clay.				
16	33	0.0	0.0			Dark Yellowish Brown Fine to Coarse Clayey SAND, some fine and coarse gravel, little mica, wet	SC			
			0.0	0.0						
18			3.2	0.0		Medium Gray to Yellowish Gray Coarse to Very Coarse SAND, fine and coarse gravel, iron oxide staining, wet	SP			
			2.2	0.0		Dark Yellowish Orange Coarse to Very Coarse SAND, fine and coarse gravel and yellowish gray sandy clay.				
			4	0.0						
			9	0.0						
20	34	0.0	0.0			Dark Yellowish Brown Fine to Medium Micaceous Silty SAND, wet.	SM			
			8.3	0.0						
			1.2	0.0						
22			3.2	0.0		Dark Yellowish Brown Fine to Coarse Clayey SAND, very coarse sand to fine gravel.	SC			
			4.1	0.0						
			6.7	0.0		Moderate to Dark Yellowish Brown Medium to Very Coarse SAND, some fine gravel, some clay.	SP			
			4.6	0.0						
24	37	0.0	0.0			Pale Yellowish Brown Medium to Very Coarse Clayey SAND; thin layers of pale yellowish brown to moderate brown Coarse to Very Coarse Sand, fine gravel, wet	SC			
			0.0	0.0						
26			0.0	0.0						
			0.7	0.0		Dark Yellowish Orange to Moderate Yellowish Brown Medium to Very Coarse SAND, some mica some silt.	SP			
			0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, fine gravel and mica.	SC			
28	32	0.0	0.0			Moderate to Dark Yellowish Brown Fine to Very Coarse Clayey SAND, fine to coarse gravel			No physical/visual evidence of impacts	
			0.0	0.0						

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB52	
PROJECT NUMBER:	2522.012.024			WEATHER:	Partly Sunny, 60 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	52 Ft.
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION:	57.55'
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	April 22, 2005
DRILLING METHOD:	GeoProbe			DATE COMPLETED:	May 2, 2005
DRILLER / HELPER:	Bob Burawa/Lucas Reiss				
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
30			0.0	0.0		Dark Yellowish Brown Coarse to Very Coarse Clayey SAND, fine and coarse gravel, wet				
			0.0	0.0						
32	35	0.0	0.0			Moderate Yellowish Brown and Moderate Brown Medium to Very Coarse SAND, fine gravel, wet Moderate Yellowish Brown Medium to Very Coarse SAND, fine to coarse gravel, some clay.	SP			
			0.0	1.0						
34	GCSB-52 (34-34.5)	0.9	0.0			Moderate to Dark Yellowish Brown Medium to Very Coarse SAND, fine gravel, wet				
		0.4	0.0			Moderate Yellowish Brown Fine to Coarse Micaceous SAND, fine gravel, some clay.				
		0.5	0.0			Moderate Yellowish Brown Coarse to Very Coarse SAND, some fine gravel and thinly layered moderate yellowish brown sandy clay				
36	34					Moderate to Dark Yellowish Brown Medium to Very Coarse Clayey SAND, fine gravel, some mica.	SC			
			0.0	0.0						
38		0.0	0.0			Moderate Brown Medium to Very Coarse SAND, fine gravel, wet	SP			
			0.0	0.0		Dark Yellowish Brown Fine to Very Coarse Clayey Micaceous SAND, fine gravel.	SC			
40	32	0.0	0.0			Moderate Yellowish Brown Fine to Coarse SAND, fine gravel, little clay.	SP			
			0.0	0.0						
42		0.0	0.0			Dark Yellowish Orange to Dark Yellowish Brown Medium to Very Coarse SAND, fine to coarse gravel and mica, wet			No physical/visual evidence of impacts	
			0.0	0.0						
44										






















<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB52	
PROJECT NUMBER: 2522.012.024			WEATHER: Partly Sunny, 60 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 52 Ft.		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.55'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: April 22, 2005		
DRILLING METHOD: GeoProbe			DATE COMPLETED: May 2, 2005		
DRILLER / HELPER: Bob Burawa/Lucas Reiss					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
		19	0.0	0.0		Moderate Yellowish Brown Medium to Coarse Clayey Micaceous SAND, little fine gravel, wet	SC			
			0.0	0.0						
46		20	0.0	0.0		Moderate Yellowish Brown Fine to Very Coarse Clayey SAND, some fine gravel, wet				
			0.0	0.0						
48		19	0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, fine gravel. wet Moderate Yellowish Brown Fine to Coarse Clayey Micaceous SAND, some fine gravel. Moderate Yellowish Brown Fine to Very Coarse Clayey Micaceous SAND.	SP SC	 		
			0.0	0.0						
50		0	0.0	0.0		Moderate to Dark Yellowish Brown Fine to Coarse SAND, some mica, wet Moderate Yellowish Brown Fine to Coarse Clayey SAND, some fine gravel.	SP SC	 		
52										
54										

Paulus, Sokolowski & Sartor			BORING LOG				BOREHOLE NUMBER - GCSB53				
PROJECT NUMBER:						WEATHER: Partly Sunny, 45 deg. F					
PROJECT NAME: Glen Cove Former MGP Site						TOTAL DEPTH: 64 Ft.					
LOCATION: Glen Cove, Long Island, NY						GROUND SURFACE ELEVATION: 55.77'					
DRILLING CO: Zebra Environmental Corp.						DATE BEGUN: April 12, 2005					
DRILLING METHOD: GeoProbe						DATE COMPLETED: April 25, 2005					
DRILLER / HELPER: Bob Burawa/Lucas Reiss											
ENVIRONMENTAL SCIENTIST:											
DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS	
0			0.0	0.0		Imported Fill Material to raise grade to complete boring (Fill)	SP		No physical/visual evidence of impacts		
2			0.0	0.0							
4	26		0.0	0.0		Medium Gray Medium to Very Coarse SAND, coarse gravel (Fill)	SP				
6						Moderate Yellowish Brown Medium to Very Coarse SAND, some fine gravel, wet (Fill)					
						Coal (Fill)	FILL		Coal Fragments		
8	26		0.0	0.0		Fill Material consisting of Coal and Clinkers, wet (Fill)			Coal and Clinker		
10			0.0	0.0							
12	30		0.0	0.0							
14	GCSB-53 (14-14.5)		0.8	0.0		Grayish Black CLAY, soft, medium plasticity, coarse to very coarse sand, wet (Fill)	CL		Slight MGP-like Odor		
			44.9	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, some fine gravel (Fill)	SP		Sheen, Slight MGP-like Odor		
			0.0	0.0		Light Brown Fine to Medium Clayey SAND, little fine to coarse gravel.	SC				
16	36		0.0	0.0		Pale Yellowish Brown and Dark Yellowish Orange Fine to Very Coarse SAND, fine to coarse gravel and clay.	SP				

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







<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB53	
PROJECT NUMBER:			WEATHER: <b>Partly Sunny, 45 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>64 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>55.77'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>April 12, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>April 25, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
18			0.0	0.0		Moderate Brown and Moderate Yellowish Brown Medium to Very Coarse Micaceous Clayey SAND, fine gravel.	SC			
						Moderate Yellowish Brown Fine Micaceous Clayey SAND.				
20	29	0.0	0.0			Moderate Yellowish Brown Medium to Very Coarse Clayey Micaceous SAND.				
			0.0	0.0						
22										
			0.0	0.0						
24	34	0.0	0.0			Moderate to Dark Yellowish Brown Medium to Coarse Micaceous SAND, some coarse gravel, trace silt. Moderate to Dark Yellowish Brown Medium to Coarse Micaceous SAND, some coarse gravel, trace silt.	SP			
						Moderate Yellowish Brown Medium to Very Coarse Micaceous SAND, some fine gravel.				
26		0.0	0.0			Dark Yellowish Brown Fine to Coarse Clayey SAND, fine gravel; thin beds of coarse to very coarse pale yellowish brown sand with fine to coarse gravel.	SC			
										
28	34	0.0	0.0			Moderate Yellowish Brown Coarse to Very Coarse SAND, some fine gravel.	SP			
			0.0	0.0						
			1.6	0.0		Dark Yellowish Brown Medium to Very Coarse SAND, clay, some fine gravel.				
30		4.3	0.0							
			6.5	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, little fine gravel, wet				
			9.5	0.0						
			2.7	0.0						
32	22	0.0	0.0			Dark Yellowish Brown Fine to Medium Clayey Micaceous SAND, little coarse gravel.	SC			
										
34	GCSB-53 (34-35)	1.2	0.0			Moderate Yellowish Brown Coarse to Very Coarse Micaceous SAND, some fine gravel, wet	SP			
		4.3	0.0							

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB53	
PROJECT NUMBER:			WEATHER: <b>Partly Sunny, 45 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>64 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>55.77'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>April 12, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>April 25, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
36	31		1.2	0.0						
			0.0	0.0		Dark to Dusky Yellowish Brown Very Coarse to Coarse SAND, fine gravel, some mica, wet				
38			0.0	0.0		Moderate Yellowish Brown Fine Clayey Micaceous SAND.	SC			
						Moderate Yellowish Brown Micaceous Silty CLAY.	CL			
	29		2.2	0.0		Moderate Yellowish Brown Fine Micaceous SAND, some silt.	SP			
			2.1	0.0		Dark Yellowish Brown Fine Micaceous Clayey SAND, little to trace very coarse sand to fine gravel.	SC			
40			0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse Micaceous SAND, some fine to coarse gravel, little to trace silt.	SP			
42			0.0	0.0						
	31		1.8	0.0						
			13.7	0.0		Moderate Yellowish Brown Medium to Coarse Clayey SAND, some very coarse sand.	SC			
44			1.8	0.0		Moderate Yellowish Brown Medium to Very Coarse Micaceous SAND, some fine to coarse gravel.	SP			
			0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse Micaceous SAND, some fine to coarse gravel.				
46	29		0.0	0.0		Pale Yellowish Brown Coarse to Very Coarse Clayey SAND, some fine to coarse gravel.	SC			
			3.3	0.0						
			2.9	0.0						
			2.7	0.0		Moderate to Dark Yellowish Brown Coarse to Very Coarse SAND, fine gravel, wet.	SP			
48	20		0.0	0.0		Moderate Yellowish Brown Fine Micaceous Clayey SAND, very coarse sand to fine gravel.	SC			
50			0.0	0.0		Moderate to Dark Yellowish Brown Very Coarse to Coarse SAND, fine gravel, wet.	SP			
			1.2	0.0						
	GCSB-53 (51-52)		1.2	0.0						
			3.4	0.0						
52			0.0	0.0		Pale Yellowish Brown Medium to Very Coarse SAND, wet.				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB53	
PROJECT NUMBER:			WEATHER: <b>Partly Sunny, 45 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>64 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>55.77'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>April 12, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>April 25, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
54	15	0.0	0.0			Moderate to Dark Yellowish Brown Coarse to Very Coarse Clayey SAND, fine to coarse gravel. Moderate Yellowish Brown Fine to Very Coarse Clayey SAND trace coarse gravel.	SC			
56	19	0.0	0.0			Moderate Yellowish Brown Medium to Very Coarse SAND, fine to coarse gravel, wet Pale Yellowish Brown Medium to Very Coarse SAND, wet.	SP			
		1.9	0.0							
		0.6	0.0			Moderate to Dark Yellowish Brown Medium to Very Coarse Clayey SAND, little fine gravel, wet	SC			
58	18	1.0	0.0							
		0.8	0.0			Pale Yellowish Brown Sandy CLAY, soft, low plasticity, mica and some very coarse sand. Moderate Yellowish Brown Medium to Coarse Clayey SAND, some very coarse sand to fine gravel.	CL			
60	22	0.0	0.0			Moderate Yellowish Brown Coarse to Very Coarse Clayey SAND, some fine gravel. Pale to Moderate Yellowish Brown CLAY, coarse sand to fine gravel, wet	SC			
							CL			
						Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, some fine gravel, wet.	SC			
62	15	0.2	0.0			Moderate Yellowish Brown Medium to Very Coarse SAND, some fine to coarse gravel, wet Moderate Yellowish Brown Coarse to Very Coarse SAND, fine and coarse gravel, wet	SP			
64						Moderate Yellowish Brown Medium to Coarse SAND, some mica, little clay, wet Moderate Yellowish Brown to Dark yellowish orange Medium to Very Coarse SAND, mica, wet.				

Paulus, Sokolowski & Sartor		BORING LOG					BOREHOLE NUMBER - GCSB54				
PROJECT NUMBER:		2522.012.024					WEATHER:		Partly Sunny, 45 deg. F		
PROJECT NAME:		Glen Cove Former MGP Site					TOTAL DEPTH:		52 Ft.		
LOCATION:		Glen Cove, Long Island, NY					GROUND SURFACE ELEVATION:		51.33'		
DRILLING CO:		Zebra Environmental Corp.					DATE BEGUN:		April 12, 2005		
DRILLING METHOD:		GeoProbe					DATE COMPLETED:		April 12, 2005		
DRILLER / HELPER:		Bob Burawa/Lucas Reiss									
ENVIRONMENTAL SCIENTIST:											
DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS	
0			0.0	0.0		Light Brown to Moderate Yellowish Brown Fine to Medium Silty SAND, some clay (Fill)	SM		No physical/visual evidence of impacts		
2			0.0	0.0							
4	23	0.0	0.0			Dusky Yellowish Brown Medium to Coarse SAND, some silt (Fill)	SP				
6		2.4	0.0			Coal fragments with coarse gravel (Fill)	FILL				
		0.0	0.0								
		2.2	0.0			Dusky Yellowish Brown Medium to Fine Clayey SAND (Fill)	SC				
		2.2	0.0			Grayish Orange Medium to Very Coarse Clayey SAND, wet (Fill)					
8	30	0.0	0.0			Dark Yellowish Brown CLAY, high plasticity, fine gravel, some medium to coarse sand.	CL		Slight MGP-like Odor		
	GCSB-54 (9-10)	0.0	0.0								
10		0.0	0.0								
		4.5	0.0			Yellowish Gray to Grayish Orange Very Coarse SAND, fine gravel to coarse gravel , wet	SP				
		7.7	0.0								
		15.6	0.0								
12	40	0.0	0.0			Moderate Yellowish Brown Medium to Very Coarse SAND, fine gravel, wet			Sheen, Strong Petroleum-like Odor		
	GCSB-54 (12.5-13)	108	0.0			Yellowish Gray Medium to Very Coarse SAND, wet.					
		1.3	0.0			Light Brown Medium to Coarse SAND, some very coarse sand and clay.					
		2.5	0.0								

Page 1 of 4

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB54	
PROJECT NUMBER:	2522.012.024			WEATHER:	Partly Sunny, 45 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	52 Ft.
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION:	51.33'
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	April 12, 2005
DRILLING METHOD:	GeoProbe			DATE COMPLETED:	April 12, 2005
DRILLER / HELPER:	Bob Burawa/Lucas Reiss				
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
14			1.1	0.0						
			4.3	0.0		Moderate Yellowish Brown Coarse to Very Coarse SAND, fine gravel, wet.				
			0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, some fine gravel and clay, wet.				
16	34		0.0	0.0		Moderate Yellowish Brown Coarse to Very Coarse SAND, fine gravel, wet				
18			0.0	0.0		Moderate Yellowish Brown Fine Micaceous SAND, wet.				
						Moderate Yellowish Brown Fine Micaceous Clayey SAND.	SC			
						Moderate Brown Medium to Coarse Clayey SAND, trace silt.				
20	23		0.0	0.0		Moderate Brown Medium to Coarse Clayey SAND, trace silt.				
22			0.0	0.0		Dark Yellowish Brown Medium to Very Coarse Clayey SAND, trace fine gravel, wet				
						Moderate Yellowish Brown Medium to Coarse SAND, some mica, wet	SP			
24	31		0.0	0.0		Moderate Yellowish Brown Fine to Medium Micaceous SAND, fine to coarse gravel, some clay. Moderate Yellowish Brown Medium to Coarse Clayey SAND, fine to coarse gravel, wet.	SC			
26			0.0	0.0		Grayish Orange Coarse to Very Coarse SAND, some mica, wet.	SP			
						Pale Yellowish Brown CLAY, medium to coarse sand and mica.	CL			
			7.0	0.0		Pale Yellowish Brown Fine Silty Micaceous SAND, some clay, little fine gravel,	SP			

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB54	
PROJECT NUMBER: <b>2522.012.024</b>			WEATHER: <b>Partly Sunny, 45 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>51.33'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>April 12, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>April 12, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
28		32	0.0	0.0						
						Moderate Yellowish Brown Medium to Coarse SAND, some very coarse sand to fine gravel and mica, wet.				
30			0.0	0.0						
						Pale Yellowish Brown Coarse to Very Coarse SAND, some mica and fine gravel, wet.				
	GCSB-54 (31.5-32)	82.2	0.0	0.0						
32		26	0.0	0.0		Moderate Yellowish Brown Fine to Medium Clayey Micaceous SAND, some fine gravel.	SC			
34			0.0	0.0						
			5.7	0.0						
36		23	0.0	0.0		Moderate Yellowish Brown Fine to Medium Micaceous Clayey SAND, some fine gravel.				
						Moderate to Dark Yellowish Brown Coarse to Very Coarse SAND, fine gravel, wet.	SP			
38			0.0	0.0		Pale Yellowish Brown Medium to Very Coarse Micaceous SAND, some fine to coarse gravel.				
40		35	0.0	0.0		Moderate to Dark Yellowish Brown Fine to Very Coarse Micaceous SAND; thin layers of coarse to very coarse sand, clay and fine gravel.				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB54	
PROJECT NUMBER: 2522.012.024			WEATHER: Partly Sunny, 45 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 52 Ft.		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 51.33'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: April 12, 2005		
DRILLING METHOD: GeoProbe			DATE COMPLETED: April 12, 2005		
DRILLER / HELPER: Bob Burawa/Lucas Reiss					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
42			0.0	0.0		Moderate Yellowish Brown Coarse to Very Coarse SAND, fine to coarse gravel, some to little clay, wet.				
44	27		17.2 0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse Micaceous Clayey SAND, some fine gravel.	SC			
46			0.0	0.0						
48	23		0.0	0.0		Moderate Yellowish Brown Coarse to Very Coarse SAND, fine gravel, trace silt, wet.  Moderate Yellowish Brown Medium to Coarse SAND, mica, some fine gravel, wet.	SP			
50			0.0	0.0		Dark Yellowish Brown Medium to Very Coarse SAND, fine to coarse gravel, some mica, wet.				
52	GCSB-54 (51-52)									





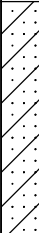


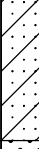

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB55	
PROJECT NUMBER: 2522.012.024			WEATHER: Partly Sunny, 60 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 52 Ft.		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 51.48		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: May 16, 2005		
DRILLING METHOD: GeoProbe			DATE COMPLETED: May 17, 2005		
DRILLER / HELPER: Bob Burawa/Lucas Reiss					
ENVIRONMENTAL SCIENTIST: JRT/					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		33	29.4	0.0		Moderate and Dusky Brown Peat, fine sand and organic material	PEAT			
			23.7	0.0		Moderate Brown to Moderate Yellowish Brown Medium to Very Coarse SAND, some fine gravel.	SP			
			50	0.0						
			29.4	0.0						
2						Dark Gray Coarse to Very Coarse SAND, fine gravel and mica				
			30	0.0		Moderate Brown Medium to Very Coarse Clayey SAND, some fine gravel, some mica.	SC			
			0.0	0.0						
			0.0	0.0						
4		22	0.0	0.0		Moderate Brown Medium to Very Coarse Clayey SAND, little fine gravel.				
6			54	0.0						
			112	0.0		Moderate Yellowish Brown to Pale Yellowish Brown Medium to Very Coarse Clayey SAND, some fine gravel, moist				
			99.1	0.0						
	GCSB-55 (7.5-8)		89.3	0.0	▼	Grayish Black Medium to Very Coarse SAND, fine gravel, wet	SP		Slight Unidentifiable Odor	
8		26	0.0	0.0		Dark Yellowish Orange to Moderate Yellowish Brown Fine to Coarse SAND, some fine and coarse gravel, some mica, wet				
10			0.0	0.0						
			20.5	0.0						
			18.9	0.0						
			28.5	0.0		Moderate Brown and Dark Gray Fine to Very Coarse Silty SAND, fine to coarse gravel and mica, wet.	SM			
12		36	0.0	0.0		Moderate Brown Coarse to Very Coarse SAND, fine and coarse gravel, wet	SP			
						Dark Yellowish Brown and Moderate Brown Medium to Very Coarse SAND, fine and coarse gravel and mica, wet.				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB55	
PROJECT NUMBER: <b>2522.012.024</b>			WEATHER: <b>Partly Sunny, 60 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>51.48</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>May 16, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>May 17, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST: <b>JRT/</b>					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
14			9.4	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, fine gravel, wet.				
			7.7	0.0						
			3.0	0.0		Moderate Yellowish Brown Medium to Coarse Clayey SAND, little very coarse sand to fine grave.	SC			
			17.6	0.0						
16		33	0.0	0.0		Moderate Yellowish Brown Medium to Coarse Clayey SAND, some fine gravel.				
18	GCSB-55 (18-19)					Moderate Yellowish Brown Medium to Very Coarse SAND, fine gravel, wet; layers of dark yellowish brown medium to coarse clayey sand.	SP			
			30.9	0.0						
			59.1	0.0		Moderate to Dark Yellowish Brown Medium to Coarse Clayey SAND, some very coarse sand to fine gravel.	SC			
			27.1	0.0						
20		37	0.0	0.0		Moderate Yellowish Brown Fine Micaceous Clayey SAND, some fine to coarse gravel.				
						Moderate Yellowish Brown Coarse to Very Coarse SAND, fine and coarse gravel, wet.	SP			
22			0.0	0.0						
						Moderate Yellowish Brown Fine to Very Coarse Micaceous Clayey SAND, wet.	SC			
24		37	0.0	0.0		Moderate Yellowish Brown Medium to Fine Micaceous Clayey SAND, fine to coarse gravel.				
						Pale Yellowish Brown Coarse to Very Coarse SAND, wet.	SP			
26			0.0	0.0		Moderate Yellowish Brown Fine to Medium Micaceous Clayey SAND; thin layers of moderate yellowish brown coarse to very coarse sand, wet.	SC			
			44.9	0.0						
			59.5	0.0						
			98.7	1.0		Dark Gray Bitotite MICA, some fine to medium sand. Moderate Yellowish Brown Fine to Medium Micaceous Clayey SAND.	SP			

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB55	
PROJECT NUMBER:	2522.012.024			WEATHER:	Partly Sunny, 60 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	52 Ft.
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 51.48	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	May 16, 2005
DRILLING METHOD:	GeoProbe			DATE COMPLETED: May 17, 2005	
DRILLER / HELPER:	Bob Burawa/Lucas Reiss				
ENVIRONMENTAL SCIENTIST:	JRT/				

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
28		35	0.0	0.0		Moderate Yellowish Brown Fine to Medium Clayey SAND, fine and coarse gravel.	SC			
30			12.1	0.0		Pale to Moderate Yellowish Brown Coarse to Very Coarse SAND, coarse gravel; pockets of moderate brown fine clayey sand.	SP			
			96.6	0.0						
			134	0.0		Moderate Yellowish Brown Fine Clayey SAND, fine to coarse gravel and mica.	SC			
32		29	0.0	0.0		Pale to Moderate Yellowish Brown Medium to Very Coarse SAND, some fine gravel.	SP			
34	GCSB-55 (34-35)		0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse Clayey SAND; thin layers of moderate yellowish brown medium to very coarse sand, wet.	SC			
36		32	0.0	0.0		Medium to Dark Gray Sandy CLAY, Moderate Yellowish Brown Medium to Very Coarse SAND, fine to coarse gravel, little clay.	CL SP	 		
38			0.0	0.0						
						Moderate Yellowish Brown Medium to Coarse Clayey SAND, some fine and coarse gravel.	SC			
40		30	0.0	0.0		Moderate Yellowish Brown Medium to Coarse SAND, fine to coarse gravel, wet.	SP			

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB55	
PROJECT NUMBER: <b>2522.012.024</b>		WEATHER: <b>Partly Sunny, 60 deg. F</b>			
PROJECT NAME: <b>Glen Cove Former MGP Site</b>		TOTAL DEPTH: <b>52 Ft.</b>			
LOCATION: <b>Glen Cove, Long Island, NY</b>		GROUND SURFACE ELEVATION: <b>51.48</b>			
DRILLING CO: <b>Zebra Environmental Corp.</b>		DATE BEGUN: <b>May 16, 2005</b>			
DRILLING METHOD: <b>GeoProbe</b>		DATE COMPLETED: <b>May 17, 2005</b>			
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST: <b>JRT/</b>					
















DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
42			1.6	0.0						
			3.8	0.0		Moderate Yellowish Brown Coarse to Very Coarse Clayey SAND, fine to coarse gravel.	SC			
44	34	0.0	0.0	0.0		Pale Yellowish Brown Coarse to Very Coarse SAND, some clay. Moderate Yellowish Brown Fine to Medium Clayey SAND, some mica.	SP SC			
46			0.0	0.0		Moderate Yellowish Brown Fine Micaceous Clayey SAND, some fine and coarse gravel; thin lenses of moderate yellowish brown clay, low plasticity, trace silt,.				
48	30	0.0	0.0	0.0		Pale Yellowish Brown Coarse to Very Coarse SAND, some clay and fine gravel.	SP			
50			0.0	0.0		Moderate Yellowish Brown Fine to Medium Micaceous Clayey SAND, some fine and coarse gravel with large mica fragments.	SC			
GCSB-55 (51-52)						Moderate Yellowish Brown Fine to Coarse Micaceous SAND, some fine gravel, little silt and clay.	SP			
52										

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB56	
PROJECT NUMBER:			WEATHER: <b>Sunny, 55 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>51.37'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>May 17, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>May 18, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		16	0.0	0.0		Dusky Brown Fine Silty SAND, topsoil and organic material	SP			
2			0.0	0.0		Moderate Brown Medium to Very Coarse Micaceous SAND, fine and coarse gravel.				
4		22	0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, fine and coarse grave and mica.				
6			0.0	0.0						
8		31	0.0	0.0		Dark Yellowish Brown Medium to Very Coarse Clayey SAND, fine gravel, wet	SC			
10			0.0	0.0		Dark Yellowish Brown Medium to Very Coarse Clayey SAND, fine gravel, wet				
						Pale Yellowish Brown Medium to Very Coarse SAND, fine gravel, some silt, wet.	SP			
	GCSB-56 (11-11.5)					Grayish Black and Moderate Brown Coarse to Very Coarse SAND, some fine gravel, wet.				
						Pale Yellowish Brown Fine to Medium Micaceous SAND, wet.				
12		35	0.0	0.0		Moderate and Dark Yellowish Brown Coarse to Very Coarse SAND, fine to coarse gravel, some clay, wet.				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB56	
PROJECT NUMBER:			WEATHER: <b>Sunny, 55 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>51.37'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>May 17, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>May 18, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
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14			0.0	0.0		Pale Yellowish Brown and Yellowish Gray Medium to Fine Micaceous SAND, some clay, wet. Light Brown Fine to Coarse GRAVEL, wet.	GP			
						Moderate Yellowish Brown Fine to Medium Clayey SAND, some fine gravel, wet.	SC			
16		35	0.0	0.0		Moderate Yellowish Brown Medium to Coarse Clayey SAND, little fine gravel, some mica.				
	GCSB-56 (17-18)					Moderate Yellowish Brown Fine Micaceous SAND, some clay, wet	SP			
						Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, fine gravel.	SC			
18			0.0	0.0		Moderate Yellowish Brown Silty to Fine Sandy Micaceous CLAY, non-plastic.	CL			
						Moderate Yellowish Brown Medium to Coarse Clayey SAND, some fine gravel and mica.	SC			
20		39	0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, some fine gravel.				
						Dark Yellowish Brown Medium to Coarse SAND, some very coarse sand to fine gravel, wet.	SP			
22			0.0	0.0		Moderate Yellowish Brown Medium to Coarse Micaceous Clayey SAND, fine gravel; pockets of moderate yellowish brown medium to coarse sand, wet; and moderate yellowish brown clay, non-plastic.	SC			
						Moderate Yellowish Brown Medium to Fine Micaceous SAND, some clay, wet.	SP			
24		35	0.0	0.0		Moderate Yellowish Brown Fine to Coarse Micaceous Clayey SAND.	SC			
										
						Moderate Yellowish Brown Medium to Coarse SAND, fine and coarse gravel, wet.	SP			
26			0.0	0.0		Moderate Yellowish Brown Fine to Medium Micaceous Clayey SAND.	SC			

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB56	
PROJECT NUMBER:			WEATHER: Sunny, 55 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 52 Ft.		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 51.37'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: May 17, 2005		
DRILLING METHOD: GeoProbe			DATE COMPLETED: May 18, 2005		
DRILLER / HELPER: Bob Burawa/Lucas Reiss					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
28		35	0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse SAND, fine and coarse gravel, wet	SP			
						Yellowish Gray Fine SAND and SILT.	SM			
						Moderate Yellowish Brown Medium to Very Coarse SAND, fine and coarse gravel, wet	SP			
30			0.0	0.0		Moderate Yellowish Brown Medium to Coarse Micaceous SAND, wet.				
						Pale to Moderate Yellowish Brown and Dark Yellowish Orange Coarse to Very Coarse SAND, some fine gravel, wet.				
32		37	0.0	0.0		Moderate Yellowish Brown Fine Micaceous Silty Clayey SAND, wet.	SM			
						Moderate Yellowish Brown Fine Micaceous SAND, wet.	SP			
34	GCSB-56 (34-35)		0.0	0.0		Moderate Yellowish Brown Fine Micaceous Clayey SAND.	SC			
						Moderate Yellowish Brown Fine to Very Coarse Clayey SAND, fine and coarse gravel.				
36		34	0.0	0.0		Moderate Yellowish Brown and Dark Yellowish Orange Medium to Coarse SAND, some mica, little clay.	SP			
						Grayish Orange to Pale Yellowish Brown Medium to Fine SAND, little clay and mica.				
						Moderate Yellowish Brown and Moderate Brown Coarse to Very Coarse SAND, fine and coarse gravel, wet.				
38			0.0	0.0		Moderate Yellowish Brown Medium to Coarse Clayey SAND.	SC			
						Moderate Yellowish Brown Medium to Very Coarse SAND, fine and coarse gravel, little clay, wet.	SP			
40		34	0.0	0.0		Moderate Yellowish Brown Coarse to Very Coarse SAND, some fine				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB56	
PROJECT NUMBER:			WEATHER: <b>Sunny, 55 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>51.37'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>May 17, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>May 18, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
						gravel, wet.				
42			0.0	0.0		Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, some fine gravel, lenses of mica, wet	SC			
						Moderate Yellowish Brown Fine to Coarse Clayey SAND, some fine gravel and mica.				
44	39	0.0	0.0			Moderate and Pale Brown Fine to Coarse Clayey SAND, fine and coarse gravel.				
46			0.0	0.0		Moderate Yellowish Brown Fine to Medium Clayey SAND, fine gravel, wet; thin lenses of moderate yellowish brown medium to very coarse sand.				
48	37	0.0	0.0			Moderate Yellowish Brown Medium to Very Coarse Clayey SAND, fine gravel, wet Moderate Yellowish Brown Medium to Fine Clayey SAND, some very coarse sand to fine gravel.				
50	GCSB-56 (49-50)		0.0	0.0		Moderate Yellowish Brown Medium to Coarse Clayey SAND, fine gravel, wet. Moderate Yellowish Brown Medium to Fine Micaceous Clayey SAND, little coarse to very coarse sand.				
52										

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB57	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 75 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52'</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>42.91'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 20, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 26, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		0	0.0	0		Dusky Brown Fine Silty SAND, topsoil and organic material	SM			
2			0.0	0						
4	43	0.0	0			Medium Dark Gray Fine to Coarse Micaceous Silty SAND.				
						Grayish Orange to Medium Gray Fine to Very Coarse Micaceous SAND, some fine & coarse gravel, little silt.	SP			
						Olive Gray & Moderate Yellowish Brown Fine to Coarse Silty Clayey SAND, mica.	SM			
6		0.0	0			Moderate Brown, Dark & Pale Yellowish Brown Medium to Very Coarse SAND, some silt & fine to coarse gravel, moist to wet.	SP			
8	18	0.0	0			▼ Moderate to Dark Yellowish Brown Fine to Coarse Silty SAND, mica, wet.	SM			
10		0.0	0							
12	39	0.0	0			Moderate Yellowish Brown Medium to Very Coarse Silty Clayey SAND, some mica.				
						Moderate Yellowish Brown Coarse to Very Coarse SAND, fine gravel.	SP			
						Moderate Yellowish Brown Fine to Coarse Silty Clayey SAND, some mica, little to trace fine gravel.	SM			

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB57	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 75 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52'</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>42.91'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 20, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 26, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
14			0.0	0						
						Moderate Yellowish Brown Medium to Fine SAND, some mica, trace of fine gravel, wet.	SP			
16		36	0.0	0		Moderate Yellowish Brown Fine to Coarse SAND, some silt and mica.				
	GCSB-57 (17-18)									
18			0.0	0		Moderate to Dark Yellowish Brown Fine to Coarse Micaceous Clayey SAND, trace fine gravel.	SC			
20		40	0.0	0		Pale Yellowish Brown Fine to Coarse Silty Clayey SAND.	SM			
						Moderate Yellowish Brown Fine to Coarse SAND, trace mica and silt, wet.	SP			
22			0.0	0		Pale Yellowish Brown Fine Silty Clayey SAND, some fine gravel and mica.	SM			
						Moderate Yellowish Brown Fine Clayey SAND, some mica and fine to coarse gravel.	SC			
24		33	0.0	0		Moderate Yellowish Brown Fine to Very Coarse Clayey SAND, some silt and mica.				
26			0.0	0		Moderate to Dark Yellowish Brown Fine Clayey SAND, fine to coarse gravel, some mica.				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB57	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 75 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52'</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>42.91'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 20, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 26, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
28		38	0.0	0		Moderate Yellowish Brown Fine to Coarse Clayey SAND, silt, some fine to coarse gravel.				
30			0.0	0		Moderate Yellowish Brown Fine Clayey Micaceous SAND, little fine to coarse gravel				
32		33	0.0	0		Moderate Yellowish Brown Fine to Very Coarse Clayey SAND, mica and fine to coarse gravel.				
	GCSB-57 (33-33.5)			0						
				26						
34			0.0	0		Moderate to Dark Yellowish Brown Medium to Very Coarse SAND, fine gravel, some mica, wet.	SP			
	GCSB-57 (35-36)			0						
36		31	0.0	0		Moderate Yellowish Brown Medium to Very Coarse SAND, fine to coarse gravel.				
38			0.0			Moderate to Dark Yellowish Brown Fine to Coarse Clayey SAND, fine to coarse gravel and mica.				
40		32	0.0	0		Moderate Yellowish Brown Medium to Very Coarse SAND, some fine gravel, little mica, wet.	SC			
						Very Pale Orange and Pale Grayish Orange Fine to Coarse Silty SAND, some clay and mica; thin lense of Yellowish Gray very soft clay with medium to coarse sand.	SM			
						Moderate Yellowish Brown Fine to Very Coarse Clayey SAND, some fine gravel.	SC			

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB57	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 75 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52'</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>42.91'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 20, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 26, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
42			0.0	0						
						Moderate Yellowish Brown Fine to Very Coarse Silty SAND, little clay, trace mica.	SM			
44		37	0.0	0		Moderate Yellowish Brown Fine to Very Coarse Silty SAND, fine and coarse gravel, trace clay, wet.				
						Moderate Yellowish Brown Fine to Medium SAND, some mica, wet.	SP			
46			0.0	0		Moderate to Dark Yellowish Brown Fine to Very Coarse Silty SAND, some clay, mica and fine to coarse gravel.	SM			
48		38	0.0	0		Moderate Yellowish Brown Fine to Coarse Micaceous Clayey SAND, some fine and coarse gravel.	SC			
50	GCSB-57 (50-52)		0.0	0		Moderate Yellowish Brown Fine to Very Coarse SAND, fine and coarse gravel, trace of silt, wet.	SP			
52						Moderate to Pale Yellowish Brown Fine to Coarse SAND, mica, trace silt, wet.				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB58	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 80 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>55 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>46.14'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 28, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 28, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		0	0.0	0		Dusky Brown Very Fine to Coarse Silty SAND, topsoil and organic material, some peat, trace of fine to coarse gravel.	SM			
2			0.0	0						
4			0.0	0						
52						Moderate Brown Fine to Coarse Silty SAND, some mica, trace of fine gravel. Dusky Yellowish Brown Medium to Very Coarse Silty SAND, some organic matter, trace of fine gravel				
6			2.7	0		Pale Yellowish Orange & Dark Yellowish Orange Fine to Medium Clayey Micaceous SAND, trace of very coarse sand to fine gravel; lenses of grayish orange medium to very coarse sand.	SC			
8			0.0	0	▼	Moderate Brown Fine to Coarse Clayey MicaceousSAND, trace of fine gravel, wet.				
10	36		0.0	0		Moderate to Dark Yellowish Brown Fine to Coarse Clayey Micaceous SAND, some very coarse sand to fine gravel, wet				
12			0.0	0						

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB58	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 80 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>55 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>46.14'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 28, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 28, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
14			0.0	0						
	34					Moderate Yellowish Brown Fine to Coarse Silty SAND, some clay and mica, trace of fine gravel.	SM			
16			0.0	0						
18	GCSB-58 (18-19)			0		Moderate Yellowish Brown Fine Silty Micaceous SAND, trace of very coarse sand, wet.	MH			
			0.1			Moderate Yellowish Brown Fine to Very Coarse Silty SAND, little clay, trace of fine gravel.	SM			
20	31		0.1			Very Pale Orange to Grayish Orange Fine to Very Coarse Clayey SAND.	SC			
			0.0	0		Moderate to Dark Yellowish Brown Fine to Very Coarse Clayey SAND some mica and fine gravel: thinly bedded medium to coarse sand.				
22			0.0	0						
24			0.0	0						
	36					Moderate to Dark Yellowish Brown Fine Clayey Micaceous SAND, some very coarse sand to fine gravel, wet.				
						Moderate Yellowish Brown Fine to Coarse Clayey SAND, some very coarse sand, trace of mica and fine sand.				
26			0.0	0						

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB58	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 80 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>55 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>46.14'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 28, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 28, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
28			0.0	0						
						Dark Yellowish Orange Coarse to Very Coarse SAND, with mica & trace of fine to coarse gravel.	SP			
30		32	0.0	0		Moderate Yellowish Brown Fine to Coarse Clayey SAND, little to trace of fine gravel.	SC			
						Moderate Yellowish Brown Fine to Very Coarse SAND, with fine gravel.	SP			
32			0.0	0						
	GCSB-58 (33-34)									
34			0.0	0						
		38				Moderate Yellowish Brown Fine to Medium Silty SAND, some clay and mica.	SM			
						Moderate Yellowish Brown Fine Clayey SAND, some fine gravel and mica.	SC			
36			0.0	0						
38			0.0	0		Dark Yellowish Brown Coarse to Very Coarse SAND, fine gravel. Moderate Yellowish Brown Fine Clayey SAND, some fine gravel and mica.	SP			
							SC			
						Moderate Yellowish Brown Fine to Coarse SAND, some mica and fine gravel, trace of silt, wet.	SP			
40		39	0.0	0		Moderate Yellowish Brown Medium to Very Coarse SAND, fine to coarse gravel, some mica.				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB58	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 80 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>55 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>46.14'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 28, 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 28, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
42			0.0	0		Moderate Yellowish Brown Silty CLAY, non plastic.				
						Moderate to Dark Yellowish Brown Fine SAND, some mica, trace of fine gravel and silt, wet.	OL			
							SP			
44			0.0	0		Grayish Oragne to Dark Yellowish Brown Medium to Very Coarse SAND, fine gravel, trace of silt, wet.				
	36					Moderate Yellowish Brown Medium to Very Coarse SAND				
46			0.0	0						
						Moderate Yellowish Brown Fine to Coarse Silty SAND, some clay, trace of mica	SM			
						Grayish orange to Dark Yellowish Orange Medium to Very Coarse SAND, trace of silt, wet.	SP			
48			0.0	0		Moderate Yellowish Brown Fine Micaceous Silty SAND, little clay, trace of fine gravel, wet	SM			
							SP			
	GCSB-58 (49-50)									
50	27		0.0	0		Moderate Yellowish Brown Medium to Very Coarse SAND, some fine gravel, trace of silt, wet.				
						Moderate Yellowish Brown Fine Sand to Silty CLAY, low plasticity.	CL			
52						Moderate to Dark Yellowish Brown Fine to Very Coarse SAND, some fine grave and silt, wet.	SW			

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB59	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 90 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>50.02'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 27 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 27, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		0	0.0	0		Dark to Dusky Yellowish Brown Fine Silty SAND, topsoil and organic material.	SM			
2			0.0	0						
4	23	0.0	0			Dark Yellowish Brown Fine to Medium SAND, trace fine gravel.	SP			
						Moderate Yellowish Brown Soft Micaceous CLAY, medium plasticity.	OL			
6		0.0	0			Dark Yellowish Orange to Moderate Yellowish Brown Fine to Coarse Clayey SAND, fine gravel, some mica, trace coarse gravel.	SC			
8	37	0.0	0			Moderate Yellowish Brown and Light Brown Fine to Coarse Clayey SAND, some fine gravel.				
						Light Brown Fine to Medium Clayey SAND, some mica, little fine gravel.				
10		0.0	0							
						Dark Yellowish Brown to Grayish Orange Medium to Coarse SAND. Moderate Yellowish Brown Fine to coarse Clayey SAND; lenses of medium to very coarse dark yellowish brown silty sand, wet.	SP			
							SM			
12	38	0.0	0			Moderate Yellowish Brown Fine to Very Coarse Silty Clayey SAND, some fine to coarse gravel.	SM			












<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB59	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 90 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>50.02'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 27 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 27, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
14			0.0	0						
16		32	0.0	0		Moderate Yellowish Brown Fine to Coarse Micaceous Clayey SAND, some silt, trace fine gravel..	SC			
18			0.0	0						
20	GCSB-59 (19-20)	34	0.0	0		Moderate Yellowish Brown Fine to Coarse Clayey SAND, some mica and fine gravel: thinly bedded coarse to very coarse sand and fine gravel.				
22			0.0	0						
24	GCSB-59 (24-24.5)	23	0.0	0		Dark Yellowish Orange to Moderate Yellowish Brown Medium to Very Coarse Silty SAND, trace clay and fine gravel. Moderate Yellowish Brown Fine to Coarse Clayey SAND, some fine gravel and mica. Grayish Orange Fine to Coarse Clayey Silty SAND, some fine gravel. Dark to Dusky Yellowish Brown Fine to Coarse Silty Micaceous SAND. Pale to Moderate Yellowish Brown Fine to Coarse Clayey SAND, some mica.	SM SC SM SC			
26			0.0	15						



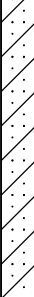





<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB59	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 90 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>50.02'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 27 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 27, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
28		32	0.0	0		Moderate Yellowish Brown Fine to Coarse Clayey SAND, some mica, trace mica.				
30			0.0	0		Moderate Yellowish Brown Medium to Fine Micaceous SAND, trace silt, wet.	SP			
						Moderate Yellowish Brown Fine to Coarse Micaceous Clayey SAND.	SC			
32		29	0.0	0		Moderate to Dark Yellowish Brown Fine to Medium Micaceous SAND, trace silt, wet.	SP			
						Moderate Yellowish Brown Fine to Coarse Micaceous Silty SAND.	SM			
	GCSB-59 (33-34)									
34			0.0	0		Moderate to Dark Yellowish Brown Fine to Coarse Clayey SAND; Thin lenses of moderate yellowish brown medium to coarse sand and mica.	SC			
36		32	0.0	0		Moderate Yellowish Brown Fine to Very Coarse Micaceous Clayey SAND.				
38			0.0	0						
				0		Moderate Yellowish Brown Fine to Very Coarse Silty SAND, some clay, mica, trace fine gravel, wet.	SM			
40		29	0.0	0	2	Moderate Yellowish Brown Fine to Very Coarse Micaceous Silty SAND, wet.				
						Grayish Yellow to Pale Yellowish Brown Fine Clayey Micaceous SAND.	SC			
						Moderate Yellowish Brown Fine to Coarse Micaceous Clayey SAND, trace fine gravel.				
				22						

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB59	
PROJECT NUMBER:			WEATHER: <b>Sunny Hot, Humid 90 deg. F</b>		
PROJECT NAME: <b>Glen Cove Former MGP Site</b>			TOTAL DEPTH: <b>52 Ft.</b>		
LOCATION: <b>Glen Cove, Long Island, NY</b>			GROUND SURFACE ELEVATION: <b>50.02'</b>		
DRILLING CO: <b>Zebra Environmental Corp.</b>			DATE BEGUN: <b>July 27 2005</b>		
DRILLING METHOD: <b>GeoProbe</b>			DATE COMPLETED: <b>July 27, 2005</b>		
DRILLER / HELPER: <b>Bob Burawa/Lucas Reiss</b>					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
42			0.0	0		Dark Yellowish Brown Medium to Very Coarse SAND, some mica, trace silt, wet.	SP			
						Moderate to Dark Yellowish Brown Fine to Coarse Micaceous Silty SAND, some clay and fine gravel.	SM			
44	34	0.0	0			Grayish Orange Fine to Very Coarse Silty SAND, some clay and mica.				
				16		Moderate Yellowish Brown to Dark Yellowish Orange Fine to Very Coarse Silty SAND, some clay, little fine gravel, wet.				
46		0.0	0							
						Moderate Yellowish Brown Fine Micaceous Clayey SAND.	SC			
48	19	0.0	0			Moderate Yellowish Brown Fine to Coarse Clayey SAND, some fine gravel, wet.				
						Moderate Yellowish Brown Medium to Coarse SAND, some fine to coarse gravel and silt.	SP			
50		0.0	0			Moderate Yellowish Brown Medium to Very Coarse SAND, trace silt, fine gravel and mica.				
	GCSB-59 (51-52)					Moderate to Dark Yellowish Brown Fine SAND, some mica, trace of silt.				
52										

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB60	
PROJECT NUMBER: 2522.012.024			WEATHER: Sunny, 80 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 64 Ft.		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 79.11'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: September 6, 2005		
DRILLING METHOD: GeoProbe			DATE COMPLETED: September 7, 2005		
DRILLER / HELPER: Bob Burawa/Lucas Reiss/ Chris Berotti					
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0		0	0.0	0		Fill Material, asphalt and crushed gravel (Fill)	FILL		No physical/visual evidence of impacts	
2			2.1	0		Moderate Yellowish Brown Fine to Medium Clayey SAND, very coarse sand to fine gravel (Fill)	SC			
			0.8							
4			0.0	0						
	45					Dark Yellowish Brown Fine to Coarse Clayey SAND, fine gravel, some coarse gravel (Fill)				
6			0.0	0						
8			0.0	0						
			9.2			Olive Gray CLAY, non plastic, fine to medium sand, little fine gravel, with black asphalt-like material (Fill)	CL			
10	39		0.0	0		Dark and Dusky Yellowish Brown Medium to Very Coarse SAND, fine gravel, some clay (Fill)	SC			
12			0.0	0						
						Olive Gray CLAY, non plastic, fine to medium sand, silt, fine gravel, some mica (Fill)	CL			
						Grayish Black Fine to Very Coarse Silty SAND, fine gravel, wood fragments (Fill)	SM			
14			0.0	0		Grayish Black and Dark Yellowish Brown Fine to Very Coarse Silty SAND, fine and coarse gravel, trace clay (Fill)				
	37					Dark Yellowish Brown Fine to Very Coarse Silty Micaceous SAND, fine and coarse gravel (Fill)				
16				0						
18			0.0	0						

Paulus, Sokolowski & Sartor		BORING LOG		BOREHOLE NUMBER - GCSB60	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny, 80 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	64 Ft.
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 79.11'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	September 6, 2005
DRILLING METHOD:	GeoProbe			DATE COMPLETED: September 7, 2005	
DRILLER / HELPER:	Bob Burawa/Lucas Reiss/ Chris Berotti				
ENVIRONMENTAL SCIENTIST:					

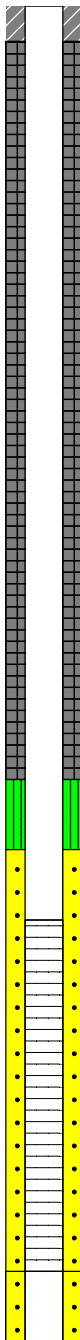
DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
20		40	0.0	0		Light Brown to moderate Yellowish Brown CLAY, some silt, low to medium plasticity, little fine gravel (Fill) Moderate Yellowish Brown Fine to Coarse SAND, fine and coarse gravel, mica, coal fragments (Fill)	CL SP		Coal Fragments	
22			0.0	0		Dark Yellowish Orange Fine to Very Coarse SAND, some fine gravel and mica, trace silt (Fill)	SM			
24			0.0	0		Dusky Yellowish Brown Fine to Medium silty micaceous SAND, trace coarse gravel (Fill) Moderate to Dark Yellowish Brown silty CLAY, low plasticity, some fine gravel (Fill) Moderate Yellowish Brown Fine to Very Coarse SAND, fine and coarse gravel, some mica, trace silt (Fill)	CL SP			
26		25	0.0	0		Moderate Yellowish Brown Fine to Coarse SAND, silt, clay fine and coarse gravel (Fill)	SM			
28			0.0	0		Dark Yellowish Brown Fine to Coarse Silty SAND, some fine gravel and clay (Fill) Pale yellowish brown Silty CLAY, non plastic (Fill)	CL			
30		20	0.0	0		Wood (Fill)	FILL			
32		12	0.0	0		Dark Yellowish Orange to Moderate Yellowish Brown Fine to Coarse SAND, fine gravel, trace silt.	SP			
34	GCSB60 (34-35)		0.5	0		Dark Greenish Gray Fine to Coarse Silty SAND, fine gravel, some mica, wet	SM		Sheen, Stained, Slight Napthalene-like Odor	
36		29	1.0	0		Light Olive Gray and Yellowish Gray Silty CLAY, non plastic, fine gravel. Moderate Brown Fine to Very Coarse Clayey SAND, some very coarse sand to fine gravel. Medium Light Gray Fine to Coarse Clayey SAND, fine gravel.	CL SC		No physical/visual evidence of impacts	

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB60	
PROJECT NUMBER:	2522.012.024			WEATHER:	Sunny, 80 deg. F
PROJECT NAME:	Glen Cove Former MGP Site			TOTAL DEPTH:	64 Ft.
LOCATION:	Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 79.11'	
DRILLING CO:	Zebra Environmental Corp.			DATE BEGUN:	September 6, 2005
DRILLING METHOD:	GeoProbe			DATE COMPLETED: September 7, 2005	
DRILLER / HELPER:	Bob Burawa/Lucas Reiss/ Chris Berotti				
ENVIRONMENTAL SCIENTIST:					

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
38	GCSB60 (38-40)		0.4			Moderate to Dark Yellowish Brown Fine to Coarse Clayey SAND, fine gravel .				
			1.4	0						
			4.8							
			5.7							
40		32	3.8			Moderate Yellowish Brown Fine to Coarse Clayey SAND, some fien gravel.				
			0.0	0						
			0.4							
			0.3	0						
42			3.2			Moderate to Dark Yellowish Brown Fine to Very Coarse Clayey SAND, some fine gravel, wet.				
			1.1							
44		33	0.0	0						
46			0.0	0		Moderate Yellowish Brown Fine to Coarse Clayey Micaceous SAND, some fine gravel.				
48		31	0.0	0		Moderate to Dark Yellowish Brown Fine to Coarse Micaceous Silty SAND, some clay, trace fine gravel.	SM			
50	GCSB60 (50-51.5)		0.0	0						
							SP			
52		31	0.0	0		Moderate Yellowish Brown Fine to Coarse Micaceous SAND, some fine gravel, trace silt, wet. Dark Yellowish Brown Silty CLAY, some fine gravel.	CL			
							SC			
54			0.0	0		Moderate Yellowish Brown Fine to Coarse Clayey Micaceous SAND, some fine gravel.				

<b>Paulus, Sokolowski &amp; Sartor</b>		<b>BORING LOG</b>		BOREHOLE NUMBER - GCSB60	
PROJECT NUMBER: 2522.012.024			WEATHER: Sunny, 80 deg. F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 64 Ft.		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 79.11'		
DRILLING CO: Zebra Environmental Corp.			DATE BEGUN: September 6, 2005		
DRILLING METHOD: GeoProbe			DATE COMPLETED: September 7, 2005		
DRILLER / HELPER: Bob Burawa/Lucas Reiss/ Chris Berotti					
ENVIRONMENTAL SCIENTIST:					

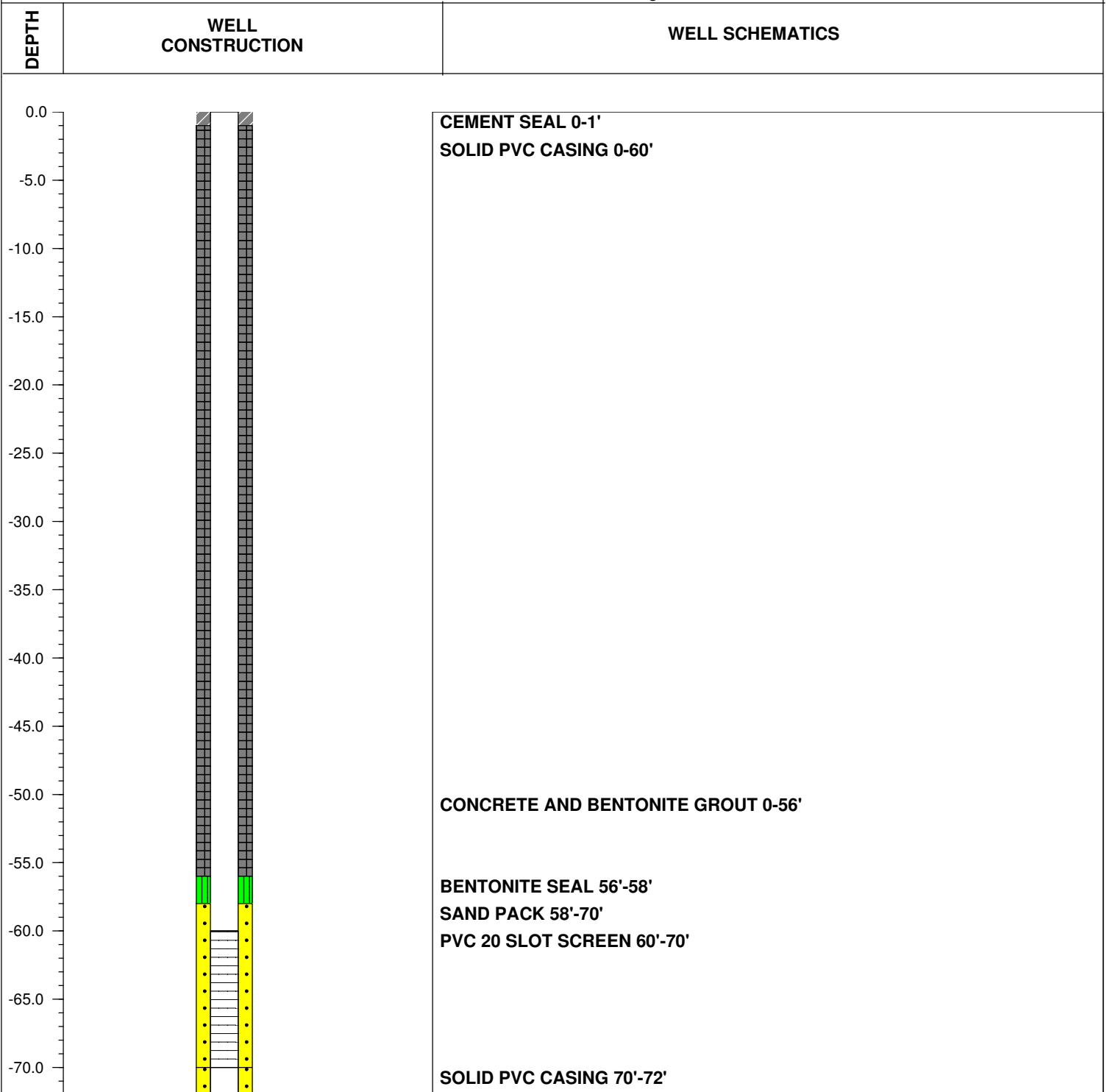
DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
56		41	0.0	0		Moderate Yellowish Brown Fine to Coarse Silty Micaceous SAND, little clay and fine gravel. Moderate to Dark Yellowish Brown Fine to Very Coarse Clayey SAND, some mica. Moderate to Dark Yellowish Brown Fine to Coarse SAND, some fine gravel.	SM SC SP			
58			0.0	0		Moderate yellowish brown Fine to Coarse Clayey Micaceous SAND, some fine gravel.	SC			
60		46	0.0	0		Moderate Yellowish Brown Fien to Corse Clayey SAND, mica, some fine gravel.				
62	GCSB60 (62-64)	19	0.0	0		Moderate Yellowish Brown Fine to Very Coarse SAND, some clay, wet. Moderate Yellowish Brown Fine to Coarse SAND, some fine gravel, mica, little clay, wet.	SP			
64		21	0.0	0		Moderate to Dark Yellowish Brown Medium to Coarse SAND, some fine gravel, trace silt, wet. Moderate Yellowish Brown Fine to Coarse Clayey Micaceous SAND: thinly bedded medium to coarse sand	SC			
66										

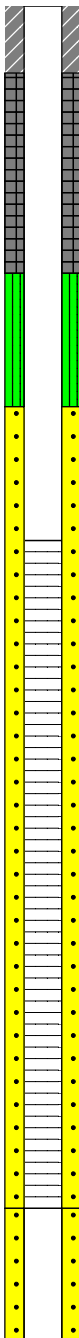
Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 08S	
PROJECT NUMBER: 2522.012.024				WEATHER : Sunny	
PROJECT NAME: Glen Cove Former MGP Site				TOTAL DEPTH: 38'	
LOCATION: Glen Cove, Long Island, NY				GROUND SURFACE ELEVATION: 78.80	
DRILLING CO: Delta Well & Pump Co., Inc.				DATE BEGUN: 7/14/04	
DRILLING METHOD: Hollow Stem Auger				DATE COMPLETED: 7/14/04	
DRILLER/HELPER : Michael Pellegrino/Pete Trembley					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 26'	
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC		LENGTH 2 - 10'	
PVC CASING (DIA.): 2"		MATERIAL 3 - Steel Casing with Concrete Pad		LENGTH 3 - 1'x1'	
DEPTH	WELL CONSTRUCTION		WELL SCHEMATICS		
0.0			CEMENT SEAL 0-1'		
-5.0			SOLID PVC CASING 0-26'		
-10.0			CONCRETE AND BENTONITE GROUT 1'-22'		
-15.0					
-20.0			BENTONITE SEAL 22'-24'		
-25.0			SAND PACK 24'-38'		
-30.0			PVC 20 SLOT SCREEN 26'-36'		
-35.0					
			SOLID PVC CASING 36'-38'		
Page 1 of 1					

PROJECT NUMBER: 2522.012.024  
PROJECT NAME: Glen Cove Former MGP Site  
LOCATION: Glen Cove, Long Island, NY  
DRILLING CO: Delta Well & Pump Co., Inc.  
DRILLING METHOD: Hollow Stem Auger  
DRILLER/HELPER : Michael Pellegrino/Pete Trembley  
ENVIRONMENTAL SCIENTIST: Joseph Trocchio

WEATHER : Sunny  
TOTAL DEPTH: 72'  
GROUND SURFACE ELEVATION: 78.83  
DATE BEGUN: 7/09/04  
DATE COMPLETED: 7/13/04

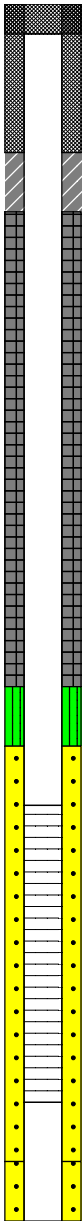
PVC CASING (DIA.) - 2"	MATERIAL 1 - Schedule 40 PVC	LENGTH 1 - 60'
SCREEN (DIA.) - 2"	MATERIAL 2 - Schedule 40 PVC	LENGTH 2 - 10'
PVC CASING (DIA.): 2"	MATERIAL 3 - Steel Casing with Concrete Pad	LENGTH 3 - 1'x1'

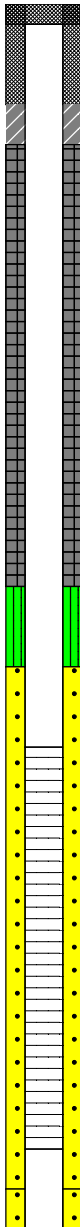


Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 09S	
PROJECT NUMBER: 2522.012.024				WEATHER : Sunny	
PROJECT NAME: Glen Cove Former MGP Site				TOTAL DEPTH: 20'	
LOCATION: Glen Cove, Long Island, NY				GROUND SURFACE ELEVATION: 57.31	
DRILLING CO: Delta Well & Pump Co., Inc.				DATE BEGUN: 3/26/04	
DRILLING METHOD: Hollow Stem Auger				DATE COMPLETED: 3/26/04	
DRILLER/HELPER : Michael Pellegrino/Pete Trembley					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 9.77'	
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC		LENGTH 2 - 10'	
PVC CASING (DIA.): 2"		MATERIAL 3 - Steel Casing with Concrete Pad		LENGTH 3 - 1'x1'	
DEPTH	WELL CONSTRUCTION		WELL SCHEMATICS		
0.0			CEMENT SEAL 0-1'		
			SOLID PVC CASING 0-8'		
			CONCRETE AND BENTONITE GROUT 1'-4'		
			BENTONITE SEAL 4'-6'		
-5.0			SAND PACK 6'-20'		
			PVC 20 SLOT SCREEN 8'-18'		
-10.0					
-15.0					
			SOLID PVC CASING 18'-20'		
-20.0					
Page 1 of 1					

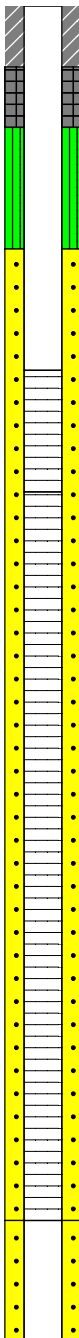
Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 09I	
PROJECT NUMBER: 2522.012.024			WEATHER : Sunny		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 38'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.29		
DRILLING CO: Delta Well & Pump Co., Inc.			DATE BEGUN: 3/29/04		
DRILLING METHOD: Hollow Stem Auger			DATE COMPLETED: 3/29/04		
DRILLER/HELPER : Michael Pellegrino/Pete Trembley					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 28'	
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC		LENGTH 2 - 10'	
PVC CASING (DIA.): 2"		MATERIAL 3 - Steel Casing with Concrete Pad		LENGTH 3 - 1'	
DEPTH	WELL CONSTRUCTION	WELL SCHEMATICS			
0.0		CEMENT SEAL 0-1'			
-5.0		SOLID PVC CASING 0-26'			
-10.0		CONCRETE AND BENTONITE GROUT 1'-22'			
-15.0					
-20.0					
-25.0		BENTONITE SEAL 22'-24'			
-30.0		SAND PACK 24'-38'			
-35.0		PVC 20 SLOT SCREEN 26'-36'			
		SOLID PVC CASING 36'-38'			

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Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG	WELL NUMBER - GCMW -10S
PROJECT NUMBER: 2522.012.024		WEATHER : Sunny	
PROJECT NAME: Glen Cove Former MGP Site		TOTAL DEPTH: 18'	
LOCATION: Glen Cove, Long Island, NY		GROUND SURFACE ELEVATION: 50.72	
DRILLING CO: Delta Well & Pump Co., Inc.		DATE BEGUN: 4/06/04	
DRILLING METHOD: Hollow Stem Auger		DATE COMPLETED: 4/07/04	
DRILLER/HELPER : Michael Pellegrino/Pete Trembley			
ENVIRONMENTAL SCIENTIST: Joseph Trocchio			
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC	LENGTH 1 - 15'
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC	LENGTH 2 - 5'
PVC CASING (DIA.): 4"		MATERIAL 3 - Steel	LENGTH 3 - 4'
DEPTH	WELL CONSTRUCTION	WELL SCHEMATICS	
0.0		STEEL OUTER CASING	
-5.0		CEMENT SEAL 0-1' SOLID PVC CASING +2-11' CONCRETE AND BENTONITE GROUT 1'-9'	
-10.0		BENTONITE SEAL 9'-10'	
-15.0		SAND PACK 10'-18'	
-20.0		PVC 20 SLOT SCREEN 11'-16'	
		SOLID PVC CASING 16'-18'	

Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 10I	
PROJECT NUMBER: 2522.012.024			WEATHER : Sunny		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 28'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 51.13		
DRILLING CO: Delta Well & Pump Co., Inc.			DATE BEGUN: 4/05/04		
DRILLING METHOD: Hollow Stem Auger			DATE COMPLETED: 4/06/04		
DRILLER/HELPER : Michael Pellegrino/Pete Trembley					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 20.75'	
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC		LENGTH 2 - 10'	
PVC CASING (DIA.): 4"		MATERIAL 3 - Steel		LENGTH 3 - 5'	
DEPTH	WELL CONSTRUCTION	WELL SCHEMATICS			
0.0		STEEL OUTER CASING SOLID PVC CASING +2.5'-16'			
-5.0		CEMENT 0-1'			
-10.0		CONCRETE AND BENTONITE GROUT 1'-12'			
-15.0		BENTONITE 12'-14'			
-20.0		SAND PACK 14'-28'			
-25.0		PVC 20 SLOT SCREEN 16'-26'			
-30.0		SOLID PVC CASING 26'-28'			

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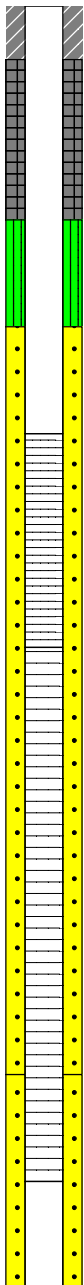
Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 11S	
PROJECT NUMBER: 2522.012.024				WEATHER : Sunny	
PROJECT NAME: Glen Cove Former MGP Site				TOTAL DEPTH: 22'	
LOCATION: Glen Cove, Long Island, NY				GROUND SURFACE ELEVATION: 57.83	
DRILLING CO: Delta Well & Pump Co., Inc.				DATE BEGUN: 4/16/04	
DRILLING METHOD: Hollow Stem Auger				DATE COMPLETED: 4/16/04	
DRILLER/HELPER : Pete Trembley/Pete Kaligeris					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 8'	
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC		LENGTH 2 - 14'	
PVC CASING (DIA.): 8"		MATERIAL 3 - Steel		LENGTH 3 - 1'	
DEPTH	WELL CONSTRUCTION		WELL SCHEMATICS		
0.0			CEMENT SEAL 0-1'		
			CONCRETE AND BENTONITE GROUT 1'-2'		
			SOLID PVC CASING 0-6'		
			BENTONITE SEAL 2'-4'		
-5.0			SAND PACK 4'-22'		
			PVC 10 SLOT SCREEN 6'-8'		
			PVC 20 SLOT SCREEN 8'-20'		
-10.0					
-15.0					
-20.0			SOILD PVC CASING 20'-22'		
Page 1 of 1					

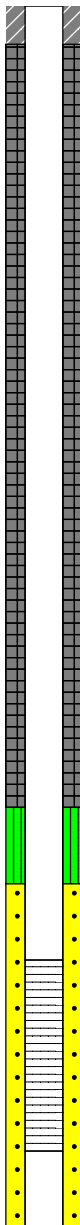
Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 11I	
PROJECT NUMBER: 2522.012.024			WEATHER : Sunny		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 30'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.84		
DRILLING CO: Delta Well & Pump Co., Inc.			DATE BEGUN: 4/19/04		
DRILLING METHOD: Hollow Stem Auger			DATE COMPLETED: 4/19/04		
DRILLER/HELPER : Pete Trembley/Pete Kaligeris					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 25'	
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC		LENGTH 2 - 5'	
PVC CASING (DIA.): 8"		MATERIAL 3 - Steel		LENGTH 3 - 1'	
DEPTH	WELL CONSTRUCTION		WELL SCHEMATICS		
0.0			CEMENT SEAL 0-1'		
			CONCRETE AND BENTONITE GROUT 1'-19'		
			SOLID PVC CASING 0-23'		
-5.0					
-10.0					
-15.0					
-20.0			BENTONITE SEAL 19'-21'		
			SAND PACK 21'-30'		
			PVC 20 SLOT SCREEN 23'-28'		
-25.0					
			SOLID PVC CASING 28'-30'		
-30.0					

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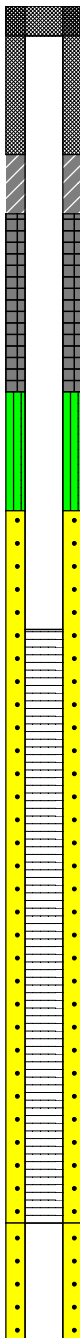
Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 12S	
PROJECT NUMBER: 2522.012.024			WEATHER : Sunny		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 28'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 64.19		
DRILLING CO: Delta Well & Pump Co., Inc.			DATE BEGUN: 4/08/04		
DRILLING METHOD: Hollow Stem Auger			DATE COMPLETED: 4/12/04		
DRILLER/HELPER : Pete Trembley/Pete Kaligeris					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 18'	
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC		LENGTH 2 - 10'	
PVC CASING (DIA.): 4"		MATERIAL 3 - Steel		LENGTH 3 - 4'	
DEPTH	WELL CONSTRUCTION	WELL SCHEMATICS			
0.0		CEMENT SEAL 0-1'			
-5.0		CONCRETE AND BENTONITE GROUT 1'-10'			
-10.0		SOLID PVC CASING +2'-14'			
-15.0		BENTONITE SEAL 10'-12'			
-20.0		SAND PACK 12'-26'			
-25.0		PVC 20 SLOT SCREEN 14'-24'			
		SOLID PVC CASING 24'-26'			

Page 1 of 1

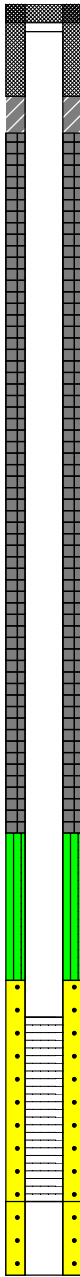
Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 13S	
PROJECT NUMBER: 2522.012.024				WEATHER : Sunny	
PROJECT NAME: Glen Cove Former MGP Site				TOTAL DEPTH: 22'	
LOCATION: Glen Cove, Long Island, NY				GROUND SURFACE ELEVATION: 57.99	
DRILLING CO: Delta Well & Pump Co., Inc.				DATE BEGUN: 4/22/04	
DRILLING METHOD: Hollow Stem Auger				DATE COMPLETED: 4/23/04	
DRILLER/HELPER : Pete Trembley/Pete Kaligeris					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 10'	
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC		LENGTH 2 - 12'	
PVC CASING (DIA.): 8"		MATERIAL 3 - Steel		LENGTH 3 - 1'	
DEPTH	WELL CONSTRUCTION		WELL SCHEMATICS		
0.0			CEMENT SEAL 0-1'		
			CONCRETE AND BENTONITE GROUT 1'-4'		
			SOLID PVC CASING 0-8'		
-5.0			BENTONITE SEAL 4'-6'		
			SAND PACK 6'-24'		
-10.0			PVC 10 SLOT SCREEN 8'-12'		
			PVC 20 SLOT SCREEN 12'-22'		
-15.0					
-20.0			SOLID PVC CASING 22'-24'		
-25.0					
Page 1 of 1					

Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 13I	
PROJECT NUMBER: 2522.012.024				WEATHER : Sunny	
PROJECT NAME: Glen Cove Former MGP Site				TOTAL DEPTH: 32'	
LOCATION: Glen Cove, Long Island, NY				GROUND SURFACE ELEVATION: 57.88	
DRILLING CO: Delta Well & Pump Co., Inc.				DATE BEGUN: 4/21/04	
DRILLING METHOD: Hollow Stem Auger				DATE COMPLETED: 4/23/04	
DRILLER/HELPER : Pete Trembley/Pete Kaligeris					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 27'	
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC		LENGTH 2 - 5'	
PVC CASING (DIA.): 8"		MATERIAL 3 - Steel Flushmount		LENGTH 3 - 1'	
DEPTH	WELL CONSTRUCTION		WELL SCHEMATICS		
0.0			CEMENT SEAL 0-1'		
-5.0			CONCRETE AND BENTONITE GROUT 1'-21'		
-10.0			SOLID PVC CASING 0-25'		
-15.0					
-20.0					
-25.0			BENTONITE SEAL 21'-23'		
-30.0			SAND PACK 23'- 32'		
-35.0			PVC 20 SLOT SCREEN 25'-30'		
			SOLID PVC CASING 30'- 32'		

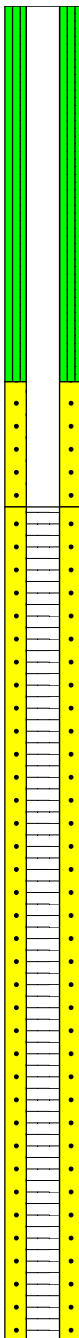
Page 1 of 1

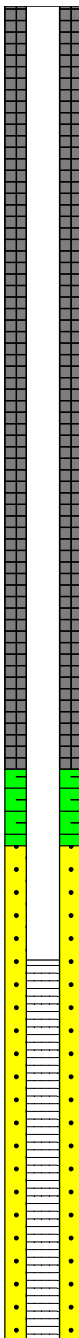
Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 14S	
PROJECT NUMBER: 2522.012.024			WEATHER : Sunny		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 20'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 57.03		
DRILLING CO: Delta Well & Pump Co., Inc.			DATE BEGUN: 4/12/04		
DRILLING METHOD: Hollow Stem Auger			DATE COMPLETED: 4/12/04		
DRILLER/HELPER : Michael Pellegrino/Pete Trembley					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 11.5'	
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC		LENGTH 2 - 10'	
PVC CASING (DIA.): 4"		MATERIAL 3 - Protective Steel Casing		LENGTH 3 - 5'	
DEPTH	WELL CONSTRUCTION	WELL SCHEMATICS			
		<div>STEEL OUTER CASING +2' TO GROUND SURFACE</div> <div>CEMENT SEAL 0-1'</div> <div>CONCRETE AND BENTONITE GROUT 1'-4'</div> <div>SOLID PVC CASING +2'-20'</div> <div>BENTONITE SEAL 4'-6'</div> <div>SAND PACK 6'- 20'</div> <div>PVC 20 SLOT SCREEN 8'-18'</div> <div>SOLID PVC CASING 18'-20'</div>			

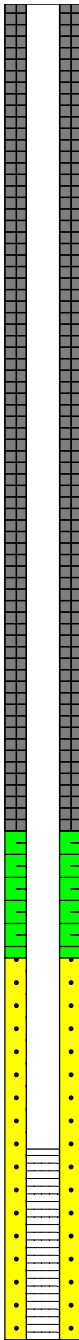
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Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 14I	
PROJECT NUMBER: 2522.012.024				WEATHER : Sunny	
PROJECT NAME: Glen Cove Former MGP Site				TOTAL DEPTH: 32'	
LOCATION: Glen Cove, Long Island, NY				GROUND SURFACE ELEVATION: 57.02	
DRILLING CO: Delta Well & Pump Co., Inc.				DATE BEGUN: 3/31/04	
DRILLING METHOD: Hollow Stem Auger				DATE COMPLETED: 3/31/04	
DRILLER/HELPER : Michael Pellegrino/Pete Trembley					
ENVIRONMENTAL SCIENTIST: Joseph Trocchio					
PVC CASING (DIA.) - 2"		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 28.25'	
SCREEN (DIA.) - 2"		MATERIAL 2 - Schedule 40 PVC		LENGTH 2 - 5'	
PVC CASING (DIA.): 4"		MATERIAL 3 - Steel		LENGTH 3 - 5'	
DEPTH	WELL CONSTRUCTION		WELL SCHEMATICS		
			<div>STEEL OUTER CASING</div> <div>CEMENT SEAL 0-1'</div> <div>CONCRETE AND BENTONITE GROUT 1'-20'</div> <div>SOLID PVC CASING 2 TO GROUND SURFACE AND +2'-25'</div> <div>BENTONITE SEAL 20'-24'</div> <div>SAND PACK 24'-32'</div> <div>PVC 20 SLOT SCREEN 25'-30'</div> <div>SOLID PVC CASING 30'-32'</div>		
Page 1 of 1					

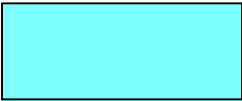

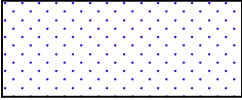
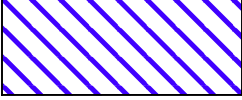


Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 15	
PROJECT NUMBER: 2522.012.024			WEATHER : Sunny, 55 deg F		
PROJECT NAME: Glen Cove Former MGP Site			TOTAL DEPTH: 16'		
LOCATION: Glen Cove, Long Island, NY			GROUND SURFACE ELEVATION: 51.57		
DRILLING CO: Zebra Environmental Corporation			DATE BEGUN: May 19, 2005		
DRILLING METHOD: GeoProbe			DATE COMPLETED: May 19, 2005		
DRILLER/HELPER : Bob Burawa/Luke Russ					
ENVIRONMENTAL SCIENTIST: Jeff Diamond					
PVC CASING (DIA.) - 1.75'		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 6'	
SCREEN (DIA.) - 1.75'		MATERIAL 2 - Stainless Steel		LENGTH 2 - 10'	
PVC CASING (DIA.): 2"		MATERIAL 3 - Steel Casing with Concrete Pad		LENGTH 3 - 1'x1'	
DEPTH	WELL CONSTRUCTION	WELL SCHEMATICS			
0.0		BENTONITE SEAL 0 - 4.5'			
		SOLID PVC CASING 0 - 6'			
-5.0		SAND PACK (#00) 4.5' - 6'			
		PVC 20 SLOT SCREEN 6 ' - 16'			
-10.0					
-15.0					
Page 1 of 1					

Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - GCMW - 16	
PROJECT NUMBER: 2522.012.024				WEATHER : Sunny, 55 deg F	
PROJECT NAME: Glen Cove Former MGP Site				TOTAL DEPTH: 16'	
LOCATION: Glen Cove, Long Island, NY				GROUND SURFACE ELEVATION: 51.03	
DRILLING CO: Zebra Environmental Corporation				DATE BEGUN: May 19, 2005	
DRILLING METHOD: GeoProbe				DATE COMPLETED: May 19, 2005	
DRILLER/HELPER : Bob Burawa/Luke Russ					
ENVIRONMENTAL SCIENTIST: Jeff Diamond					
PVC CASING (DIA.) - 1.75'		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 6'	
SCREEN (DIA.) - 1.75'		MATERIAL 2 - Stainless Steel		LENGTH 2 - 10'	
PVC CASING (DIA.): 2"		MATERIAL 3 - Steel Casing with Concrete Pad		LENGTH 3 - 1'x1'	
DEPTH	WELL CONSTRUCTION		WELL SCHEMATICS		
0.0			BENTONITE SEAL 0 - 4.5'		
			SOLID PVC CASING 0 - 6'		
-5.0			SAND PACK (#00) 4.5' - 6'		
			PVC 20 SLOT SCREEN 6 ' - 16'		
-10.0					
-15.0					
Page 1 of 1					

Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - PZ - 01A	
PROJECT NUMBER: 2522.012.024				WEATHER : Overcast 30 deg. F.	
PROJECT NAME: Glen Cove Former MGP Site				TOTAL DEPTH: 35'	
LOCATION: Glen Cove, Long Island, NY				GROUND SURFACE ELEVATION: 57.40	
DRILLING CO: Zebra Environmental Corporation				DATE BEGUN: March 11, 2004	
DRILLING METHOD: GeoProbe				DATE COMPLETED: March 11, 2004	
DRILLER/HELPER : Bob Burawa/Luke Russ					
ENVIRONMENTAL SCIENTIST: Joe Trocchio					
PVC CASING (DIA.) - 1.75'		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 25'	
SCREEN (DIA.) - 1.75'		MATERIAL 2 - Stainless Steel		LENGTH 2 - 10'	
PVC CASING (DIA.): 2"		MATERIAL 3 - Steel Casing with Concrete Pad		LENGTH 3 - 1'x1'	
DEPTH	WELL CONSTRUCTION		WELL SCHEMATICS		
0.0			CONCRETE AND BENTONITE GROUT 0 - 20'		
-5.0					
-10.0					
-15.0			SOLID PVC CASING 0 - 25'		
-20.0			BENTONITE SEAL 20' - 22'		
-25.0			SAND PACK 22' - 35'		
-30.0			STAINLESS STEEL 20 SLOT SCREEN 25' - 35'		
-35.0					
Page 1 of 1					

Paulus, Sokolowski, & Sartor		WELL CONSTRUCTION LOG		WELL NUMBER - PZ - 02A	
PROJECT NUMBER: 2522.012.024				WEATHER : Overcast 30 deg. F.	
PROJECT NAME: Glen Cove Former MGP Site				TOTAL DEPTH: 21'	
LOCATION: Glen Cove, Long Island, NY				GROUND SURFACE ELEVATION: 55.87	
DRILLING CO: Zebra Environmental Corporation				DATE BEGUN: March 11, 2004	
DRILLING METHOD: GeoProbe				DATE COMPLETED: March 11, 2004	
DRILLER/HELPER : Bob Burawa/Luke Russ					
ENVIRONMENTAL SCIENTIST: Joe Trocchio					
PVC CASING (DIA.) - 1.75'		MATERIAL 1 - Schedule 40 PVC		LENGTH 1 - 18'	
SCREEN (DIA.) - 1.75'		MATERIAL 2 - Stainless Steel		LENGTH 2 - 3'	
PVC CASING (DIA.): 2"		MATERIAL 3 - Steel Casing with Concrete Pad		LENGTH 3 - 1'x1'	
DEPTH	WELL CONSTRUCTION		WELL SCHEMATICS		
0.0					
-5.0					
-10.0			CONCRETE AND BENTONITE GROUT 0 - 13'		
-15.0			SOLID PVC CASING 0 - 18'		
-20.0			BENTONITE SEAL 13' - 15'		
			SAND PACK 15' - 21'		
			STAINLESS STEEL 20 SLOT SCREEN 18 ' - 21'		

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	Tar / Naphthalene-like Odors
	Tar Staining Sheen and Tar / Naphtha Odors
	Petroleum Odors
	Petroleum Sheen / Staining Odors
	Blebs, Globbs, Lenses, Coatings, Sheens and Tar / Naphtha Odors
	Tar Saturated

Glen Cove Former MGP Site		Visual Impact Key	
National Grid		Project	March 2010
			Figure 1



GEI Consultants, Inc.  
455 Winding Brook Road  
Glastonbury, CT 06033  
(860) 368-5300

CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

PAGE  
1 of 1

GC GEO-01

GROUND SURFACE ELEVATION (FT):

LOCATION:

NORTHING: EASTING:

TOTAL DEPTH (FT): 20.00

DRILLED BY: Zebra Environmental

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY: C. Berotti

DATE START / END: 2/4/2010 - 2/4/2010

DRILLING DETAILS: Geoprobe/5 ft long plastic sleeves / Geoprobe 6600

WATER LEVEL DEPTHS (FT): 7.00 2/4/2010

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)					
0		5.0	60	NM					Note: (0'- 5'): HAND CLEARED. (0'- 5') WIDELY GRADED SAND WITH GRAVEL (SW); ~70% sand, fine to coarse, ~25% gravel, ~5% fines; max. size 5 in., dry, brown, no odors or visual impacts observed.
5		5.0	34	0.0					(5'- 6.6') SILTY SAND (SM); ~80% sand, fine to coarse, ~15% fines, ~5% gravel; max. size 0.75 in., dry, brown, no odors or visual impacts observed.
				0.0					(6.6'- 7.9') WIDELY GRADED SAND (SW); ~85% sand, fine to coarse, ~10% gravel, fine to medium, ~5% fines; wet, brown, no odors or visual impacts observed.
				2.1					(7.9'- 10') SILTY SAND (SM); ~75% sand, fine to coarse, ~20% fines, ~5% gravel; moderate naphthalene-like odor, stained black. Sheen 9.4'- 9.6'.
				10.7			NLO		
10		5.0	35	8.0					(10'- 12.9') WIDELY GRADED SAND WITH SILT (SW-SM); ~10% fines; wet, tan - black, fine to medium sand.
				12.4					(10.8'- 12') Tar coated.
				28.3					(12'- 14.4') Moderate naphthalene-like odor, tar saturated.
				62.1			NLO		(12.9'- 15') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 1 in., wet, black.
				36.2					
				37.0			NLO		(14.4'- 15') Moderate naphthalene-like odor, tar stained.
15		5.0	60	10.2					(15'- 16.9') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 1 in., moderate naphthalene-like odor, wet, tan, sheen, tar coated.
				48.9			NLO		
				28.0					(16.9'- 20') NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% sand, fine, ~10% fines; moderate naphthalene-like odor, wet, tan, sheen.
				39.3					(16.9'- 17.1') Tar saturated.
				57.5					(17.1'- 17.3') Tar coated.
				25.4			NLO		(17.3'- 17.5') Tar saturated.
				15.0					(17.8'- 17.9') Tar saturated.
20				12.85					(18.1'- 18.2') Tar saturated.
									Bottom of borehole at 20.0 feet.

NOTES:

PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
REC = RECOVERY LENGTH OF SAMPLE  
PID = PHOTOIONIZATION DETECTOR READING (JAR HEADSPACE)

ppm = PARTS PER MILLION  
IN. = INCHES  
FT. = FEET

NLO = NAPHTHALENE LIKE ODOR  
PLO = PETROLEUM LIKE ODOR  
TLO = TAR LIKE ODOR  
CLO = CHEMICAL LIKE ODOR  
ALO = ASPHALT LIKE ODOR

CrLO = CREOSOTE LIKE ODOR  
OLO = ORGANIC LIKE ODOR  
SLO = SULFUR LIKE ODOR  
MLO = MUSTY LIKE ODOR

ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



GEI Consultants, Inc.  
455 Winding Brook Road  
Glastonbury, CT 06033  
(860) 368-5300

CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

PAGE  
1 of 1

GC GEO-02

GROUND SURFACE ELEVATION (FT):

LOCATION:

NORTHING: EASTING:

TOTAL DEPTH (FT): 20.00

DRILLED BY: Zebra Environmental

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY: C. Pray/C. Berotti

DATE START / END: 2/2/2010 - 2/3/2010

DRILLING DETAILS: Geoprobe/5 ft long plastic sleeves / Geoprobe 6600

WATER LEVEL DEPTHS (FT): 10.00 2/2/2010

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)					
0		5.0	60	NM					Note: (0'- 5'): HAND CLEARED. (0'- 5') WIDELY GRADED SAND WITH GRAVEL (SW); ~80% sand, medium to coarse, ~15% gravel, ~5% fines; max. size 2 in., dry, tan, FILL, no odors observed.
5		5.0	30	0.0					(5'- 7.3') WIDELY GRADED SAND (SW); ~85% sand, fine to medium, ~10% gravel, ~5% fines; max. size 1 in., dry, tan, FILL, no odors observed.
				0.0					
				0.2					
				0.2					(7.3'- 10') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.5 in., dry, black, FILL, coal chips.
				0.3					
				0.4					
10		5.0	37	0.0			PLO		(9.8'- 10') Slight petroleum-like odor.
				1.9			NLO		(10'- 11.5') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.5 in., moderate naphthalene-like odor, wet, black, FILL, mottled sheen.
				12.8					(11.5'- 12.6') WIDELY GRADED SAND WITH GRAVEL (SW); ~75% sand, medium to coarse, ~25% gravel; max. size 1 in., white - tan.
				9.4			NLO		(12.6'- 15') WIDELY GRADED SAND (SW); ~95% sand, fine to medium, ~5% fines; wet, tan.
				4.1					(12.8'- 14.1') Moderate naphthalene-like odor, sheen throughout.
15		5.0	60	3.5					(13.1'- 13.6') Tar coated.
				10.5			NLO		(14') Tar coated layer.
				10.2					(15'- 16.6') WIDELY GRADED SAND WITH GRAVEL (SW); ~75% sand, medium to coarse, ~20% gravel, ~5% fines; max. size 0.5 in., moderate naphthalene-like odor, wet, black, sheen, small tar blebs.
				3.4					(16.6'- 20') WIDELY GRADED SAND (SW); ~90% sand, fine to medium, ~5% gravel, ~5% fines; max. size 0.5 in., wet, tan, no odors observed.
				2.4					
				0.3					
				0.9					
20				0.0					

Bottom of borehole at 20.0 feet.

NOTES:

PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
REC = RECOVERY LENGTH OF SAMPLE  
PID = PHOTOIONIZATION DETECTOR READING (JAR HEADSPACE)

ppm = PARTS PER MILLION  
IN. = INCHES  
FT. = FEET

NLO = NAPHTHALENE LIKE ODOR  
PLO = PETROLEUM LIKE ODOR  
TLO = TAR LIKE ODOR  
CLO = CHEMICAL LIKE ODOR  
ALO = ASPHALT LIKE ODOR

CrLO = CREOSOTE LIKE ODOR  
OLO = ORGANIC LIKE ODOR  
SLO = SULFUR LIKE ODOR  
MLO = MUSTY LIKE ODOR

ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



GEI Consultants, Inc.  
455 Winding Brook Road  
Glastonbury, CT 06033  
(860) 368-5300

CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

PAGE  
1 of 1

GC GEO-03

GROUND SURFACE ELEVATION (FT):

57.52

LOCATION:

NORTHING: 251699.78

EASTING: 1088510.37

TOTAL DEPTH (FT): 20.00

DRILLED BY: Zebra Environmental

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY: C. Pray/C. Berotti

DATE START / END: 2/3/2010 - 2/3/2010

DRILLING DETAILS: Geoprobe/5 ft long plastic sleeves / Geoprobe 6600

WATER LEVEL DEPTHS (FT):  $\nabla$  10.00 2/3/2010

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)					
0		5.0	60	NM					Note: (0'- 5'): HAND CLEARED. (0'- 5') WIDELY GRADED SAND WITH GRAVEL (SW); ~60% sand, fine to coarse, ~35% gravel, ~5% fines; max. size 8 in., dry, brown, no odors or visual impacts observed.
5		5.0	29	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0					(5'- 9') WIDELY GRADED SAND (SW); ~85% sand, fine to medium, ~10% gravel, ~5% fines; max. size 0.5 in., dry, brown, FILL, no odors or visual impacts observed.
10		5.0	11	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0					(9'- 10') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.5 in., dry, black, FILL, brick fragments. No odors or visual impacts observed. (10'- 15') WIDELY GRADED SAND WITH SILT (SW-SM); ~80% sand, fine to medium, ~10% gravel, ~10% fines; max. size 0.5 in., wet, black, no odors or visual impacts observed.
15		5.0	60	15.4 19.5 24.6 47.5 103.0 97.0 77.6 113 98.7				GEO-03 (15-20)	(15'- 17.1') Tar blebs.  (17.1'- 17.9') Tar saturated.  (17.9'- 18.3') Tar coated. (18.3'- 18.9') Tar saturated.  (19.3') Tar coated lens.
20									Bottom of borehole at 20.0 feet.

NOTES:

PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
REC = RECOVERY LENGTH OF SAMPLE  
PID = PHOTOIONIZATION DETECTOR READING (JAR HEADSPACE)

ppm = PARTS PER MILLION  
IN. = INCHES  
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NLO = NAPHTHALENE LIKE ODOR  
PLO = PETROLEUM LIKE ODOR  
TLO = TAR LIKE ODOR  
CLO = CHEMICAL LIKE ODOR  
ALO = ASPHALT LIKE ODOR

CrLO = CREOSOTE LIKE ODOR  
OLO = ORGANIC LIKE ODOR  
SLO = SULFUR LIKE ODOR  
MLO = MUSTY LIKE ODOR

ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



GEI Consultants, Inc.  
455 Winding Brook Road  
Glastonbury, CT 06033  
(860) 368-5300

CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

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GC GEO-04

GROUND SURFACE ELEVATION (FT):

LOCATION:

NORTHING: EASTING:

TOTAL DEPTH (FT): 20.00

DRILLED BY: Zebra Environmental

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY: C. Pray/C. Berotti

DATE START / END: 2/2/2010 - 2/2/2010

DRILLING DETAILS: Geoprobe/5 ft long plastic sleeves / Geoprobe 6600

WATER LEVEL DEPTHS (FT): 10.00 2/2/2010

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)					
0		5.0	60	NM					Note: (0'- 5'): HAND CLEARED. (0'- 5') WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~65% sand, fine to coarse, ~25% gravel, ~10% fines; max. size 5 in., dry, brown, FILL, no odors or visual impacts observed.
5		5.0	34	6.3					(5'- 7.5') WIDELY GRADED SAND (SW); ~95% sand, fine to medium, ~5% fines; dry, tan, FILL, no odors observed.
				0.3					
				0.4					
				0.5			PLO		(7.5'- 10') WIDELY GRADED SAND (SW); ~90% sand, medium to coarse, ~10% gravel; max. size 1 in., slight petroleum-like odor, dry, black, FILL, coal chips and clinkers.
				0.2					
10		5.0	29	0.5					(10'- 10.5') SILTY SAND WITH GRAVEL (SM); ~25% gravel; max. size 1.25 in., wet, dark brown, fine to coarse sand, fine to coarse gravel. No odors or visual impacts observed.
				0.8			PLO		(10.5'- 12.5') SILTY SAND WITH GRAVEL (SM); ~25% gravel; max. size 1.25 in., slight petroleum-like odor, wet, brown, fine to coarse sand, fine to coarse gravel. No visual impacts observed.
				4.0					(11.5'- 12.5') Moderate petroleum-like odor, sheen.
				3.0					(12.5'- 15') SILTY SAND WITH GRAVEL (SM); ~25% gravel; max. size 1.25 in., wet, tan - brown, fine to coarse sand, fine to coarse gravel. No odors or visual impacts observed.
				1.0					
15		5.0	60	47.8			PLO		(15'- 16.8') NARROWLY GRADED SAND WITH GRAVEL (SP); moderate petroleum-like odor, wet, coarse sand, fine gravel. Sheen throughout.
				21.7					
				26.8					
				15.6					(16.8'- 19.5') SILTY SAND (SM); ~5% gravel; wet, brown, fine gravel. No odors or visual impacts observed.
				8.3					
				7.8					
				7.2					
				6.5					
20				6.5					(19.5'- 20') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; wet, brown, no odors or visual impacts observed. Bottom of borehole at 20.0 feet.

NOTES:

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REC = RECOVERY LENGTH OF SAMPLE  
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ppm = PARTS PER MILLION  
IN. = INCHES  
FT. = FEET

NLO = NAPHTHALENE LIKE ODOR  
PLO = PETROLEUM LIKE ODOR  
TLO = TAR LIKE ODOR  
CLO = CHEMICAL LIKE ODOR  
ALO = ASPHALT LIKE ODOR

CrLO = CREOSOTE LIKE ODOR  
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ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



GEI Consultants, Inc.  
455 Winding Brook Road  
Glastonbury, CT 06033  
(860) 368-5300

CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

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GC GEO-05

GROUND SURFACE ELEVATION (FT):

LOCATION:

NORTHING: EASTING:

TOTAL DEPTH (FT): 20.00

DRILLED BY: Zebra Environmental

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY: C. Pray/C. Berotti

DATE START / END: 2/3/2010 - 2/4/2010

DRILLING DETAILS: Geoprobe/5 ft long plastic sleeves / Geoprobe 6600

WATER LEVEL DEPTHS (FT): 10.00 2/3/2010

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)					
0		5.0	60	NM					Note: (0'- 5'): HAND CLEARED. (0'- 5') WIDELY GRADED SAND (SW); ~85% sand, fine to medium, ~10% gravel, ~5% fines; max. size 1 in., dry, tan, FILL, no odors observed.
5		5.0	23	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0					(5'- 7') WIDELY GRADED SAND (SW); ~85% sand, fine to medium, ~10% gravel, ~5% fines; max. size 1 in., dry, brown, FILL, no odors or visual impacts observed.  (7'- 10') WIDELY GRADED SAND (SW); dry, black, FILL, medium to coarse sand. Coal fragments. No odors or visual impacts observed.
10		5.0	24	14.9  21.6  4.8					(10'- 14.2') WIDELY GRADED SAND WITH GRAVEL (SW); ~70% sand, medium to coarse, ~25% gravel, ~5% fines; max. size 1 in., moderate naphthalene-like odor, wet, tan. (11.4'- 12') Tar coated. (12'- 13.1') Sheen.  (13.1'- 13.5') Tar coated.
15		5.0	60	2.1 7.9 6.0 2.6 1.6 1.0 0.8 0.1 0.1					(14.2'- 15') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; moderate naphthalene-like odor, wet, tan - brown. (15'- 17') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.5 in., moderate naphthalene-like odor, wet, tan, mottled sheen. (17'- 19.3') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; wet, tan, no odors or visual impacts observed.
20									(19.3'- 20') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.5 in., wet, tan, no odors or visual impacts observed. Bottom of borehole at 20.0 feet.

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ppm = PARTS PER MILLION  
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TLO = TAR LIKE ODOR  
CLO = CHEMICAL LIKE ODOR  
ALO = ASPHALT LIKE ODOR

CrLO = CREOSOTE LIKE ODOR  
OLO = ORGANIC LIKE ODOR  
SLO = SULFUR LIKE ODOR  
MLO = MUSTY LIKE ODOR

ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



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455 Winding Brook Road  
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(860) 368-5300

CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

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GC GEO-06

GROUND SURFACE ELEVATION (FT):

LOCATION:

NORTHING: EASTING:

TOTAL DEPTH (FT): 20.00

DRILLED BY: Zebra Environmental

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY: C. Pray/C. Berotti

DATE START / END: 2/2/2010 - 2/2/2010

DRILLING DETAILS: Geoprobe/5 ft long plastic sleeves / Geoprobe 6600

WATER LEVEL DEPTHS (FT): 9.00 2/2/2010

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)					
0		5.0	60	NM					Note: (0'- 5'): HAND CLEARED. (0'- 0.2') ASPHALT. (0.2'- 1') NARROWLY GRADED GRAVEL (GP); FILL, fine to coarse gravel in a coarse sand matrix. (1'- 5') WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~65% sand, fine to coarse, ~25% gravel, ~10% fines; max. size 8 in., FILL, no odors or visual impacts observed.
5		5.0	38	0.2 0.0 0.4 0.3 0.9 22.0 7.3					(5'- 6.8') WIDELY GRADED SAND (SW); ~85% sand, fine to medium, ~10% gravel, ~5% fines; max. size 1 in., dry, gray, FILL, no odors or visual impacts observed.  (6.8'- 10') WIDELY GRADED SAND (SW); ~95% sand, fine to medium, ~5% fines; black, FILL, coal chips.  (8.3'- 10') Moderate naphthalene-like odor, staining.
10		5.0	38	11.5 92.0 17.4 11.1 73.0 45.0				GEO-06 (10-11 + 15-19)	(10'- 11.7') WIDELY GRADED SAND (SW); strong naphthalene-like odor, wet, FILL, medium to coarse sand. Coal chips. (11.2'- 11.7') Tar saturated. (11.7'- 12.6') NARROWLY GRADED SAND (SP); ~95% sand, fine, ~5% fines; moderate naphthalene-like odor, wet, gray, heavy staining. (12.6'- 15') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 1 in., moderate naphthalene-like odor, wet, gray, staining.
15		5.0	60	44.0 30.0 61.0 25.0 12.0 12.2 24.0 22.5					(15'- 16.6') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.5 in., moderate naphthalene-like odor, wet, black, sheen. (16.3'- 16.8') Tar saturated. (16.6'- 20') WIDELY GRADED SAND (SW); ~95% sand, fine to medium, ~5% fines; wet, tan, sheen on surface throughout.  (18.3'- 18.4') Tar saturated. (18.4'- 18.7') Tar coated.
20									Bottom of borehole at 20.0 feet.

NOTES:

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FT. = FEET

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PLO = PETROLEUM LIKE ODOR  
TLO = TAR LIKE ODOR  
CLO = CHEMICAL LIKE ODOR  
ALO = ASPHALT LIKE ODOR

CrLO = CREOSOTE LIKE ODOR  
OLO = ORGANIC LIKE ODOR  
SLO = SULFUR LIKE ODOR  
MLO = MUSTY LIKE ODOR

ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



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455 Winding Brook Road  
Glastonbury, CT 06033  
(860) 368-5300

CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

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GC GEO-07

GROUND SURFACE ELEVATION (FT):

LOCATION:

NORTHING: EASTING:

TOTAL DEPTH (FT): 20.00

DRILLED BY: Zebra Environmental

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY: C. Pray/C. Berotti

DATE START / END: 2/1/2010 - 2/2/2010

DRILLING DETAILS: Geoprobe/5 ft long plastic sleeves / Geoprobe 6600

WATER LEVEL DEPTHS (FT): 10.00 2/2/2010

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)					
0		5.0	60	0.2					Note: (0'- 5'): HAND CLEARED. (0'- 0.8') FILL, ROOT MATERIAL. No odors or visual impacts observed. (0.8'- 5') WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~75% sand, fine to coarse, ~15% gravel, ~10% fines; max. size 8 in., FILL, no odors or visual impacts observed.  (5'- 8.6') WIDELY GRADED SAND WITH GRAVEL (SW); ~70% sand, fine to coarse, ~25% gravel, ~5% fines; max. size 1 in., FILL, no odors or visual impacts observed.  (8.6'- 10') FILL, COAL CHIPS.  (10'- 10.7') dry, black, FILL, COAL CHIPS. (10.7'- 10.8') NARROWLY GRADED SAND (SP); coarse; light tan, shell fragments. (10.8'- 15') SILTY SAND (SM); ~5% gravel; ~5% clay, moderate naphthalene-like odor, wet, reddish brown to brown tan, fine to coarse sand. Fine gravel. Mottled black stain and mottled sheen throughout.  (15'- 18.4') WIDELY GRADED SAND (SW); ~5% fines; strong petroleum-like odor, wet, gray / tan, fine to medium sand. Moderate sheen in top half of sample.  (18.4'- 20') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.5 in., wet, tan, no odors observed.  Bottom of borehole at 20.0 feet.
				0.2					
				0.2					
				0.2					
				0.2					
				0.2					
				0.2					
				0.2					
				0.2					
				0.2					
5		5.0	40	0.0					
				0.0					
				0.0					
				0.0					
				0.2					
				0.3					
				0.4					
10		5.0	30	0.2					
				6.1					
				9.3					
				6.0					
15		5.0	58	1.0					
				3.2					
				1.0					
20									

NOTES:

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ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



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CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

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GC GEO-08

GROUND SURFACE ELEVATION (FT): 56.78

LOCATION:

NORTHING: 251642.6 EASTING: 1088485.81

TOTAL DEPTH (FT): 20.00

DRILLED BY: Zebra Environmental

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY: C. Pray/C. Berotti

DATE START / END: 2/1/2010 - 2/1/2010

DRILLING DETAILS: Geoprobe/5 ft long plastic sleeves / Geoprobe 6600

WATER LEVEL DEPTHS (FT): 10.00 2/1/2010

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)					
0		5.0	60	0.0					<p>Note: (0'- 5'): HAND CLEARED. (0'- 0.3') ASPHALT, with concrete. (0.3'- 5') WIDELY GRADED SAND WITH GRAVEL (SW); ~65% sand, fine to coarse, ~30% gravel, fine to coarse, ~5% fines; max. size 3 in., dry, brown, FILL, no odors or visual impacts observed.</p> <p>(5'- 7.9') WIDELY GRADED SAND WITH SILT (SW-SM); ~75% sand, fine to coarse, ~20% fines, ~5% gravel; max. size 0.75 in., brown to gray brown, FILL, no odors or visual impacts observed.</p> <p>(7.9'- 9.1') FILL, Asphalt-fill material.</p> <p>(9.1'- 10') WIDELY GRADED SAND WITH SILT (SW-SM); ~75% sand, fine to coarse, ~20% fines, ~5% gravel; max. size 0.75 in., tan, no odors or visual impacts observed. (10'- 12.4') WIDELY GRADED SAND (SW); ~90% sand, fine to medium, ~5% gravel, ~5% fines; moderate naphthalene-like odor, black, sheen on bottom 1 ft. of sample.</p> <p>(12.4'- 13.8') WIDELY GRADED SAND WITH GRAVEL (SW); ~70% sand, medium to coarse, ~25% gravel, ~5% fines; moderate naphthalene-like odor, tan, sheen throughout.</p> <p>(15'- 15.9') WIDELY GRADED SAND (SW); ~90% sand, fine to coarse, ~5% gravel, ~5% fines; wet, tan, no odors or visual impacts observed. (15.9'- 17.8') SILTY SAND (SM); fine to medium; ~5% compacted clay, wet, no odors or visual impacts observed.</p> <p>(17.8'- 20') WIDELY GRADED SAND (SW); ~90% sand, fine to coarse, ~5% gravel, ~5% fines; wet, tan, no odors or visual impacts observed.</p> <p>Bottom of borehole at 20.0 feet.</p>
				0.0					
				0.0					
				0.0					
				0.0					
				0.0					
				0.0					
				0.0					
				0.0					
				0.0					
				0.0					
				0.0					
				0.0					
5		5.0	35	0.2					
				0.3					
				0.4					
				0.2					
				0.4					
				0.2					
				0.2					
				0.2					
10		5.0	35	0.4				GEO-08 (10-14)	
				1.8			NLO		
				1.5					
				1.9			NLO		
				1.1					
15		5.0	56	0.4					
				0.3					
				0.5					
				0.5					
				0.3					
				0.2					
				0.1					
				0.1					
				0.1					
20				0.1					

NOTES:

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ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



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CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

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GC GEO-09

GROUND SURFACE ELEVATION (FT):

57.3

LOCATION:

NORTHING: 251651.85

EASTING: 1088524.2

TOTAL DEPTH (FT): 20.00

DRILLED BY: Zebra Environmental

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY: C. Pray/C. Berotti

DATE START / END: 2/1/2010 - 2/1/2010

DRILLING DETAILS: Geoprobe/5 ft long plastic sleeves / Geoprobe 6600

WATER LEVEL DEPTHS (FT):  $\nabla$  10.00 2/1/2010

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)					
0		5.0	60	0.2					Note: (0'- 5'): HAND CLEARED. (0'- 0.5') ASPHALT, with ~4 in. of concrete. (0.5'- 5') WIDELY GRADED SAND WITH GRAVEL (SW); ~60% sand, fine to coarse, ~35% gravel, fine to coarse, ~5% fines; max. size 4.5 in., dry, brown, no odors or visual impacts observed.
				0.2					
				0.2					
				0.2					
				0.2					
				0.2					
				0.2					
				0.2					
				0.2					
				0.2					
5		5.0	56	0.1					(5'- 7') SILTY SAND (SM); ~80% sand, fine to coarse, ~15% fines, ~5% gravel; dry, brown - tan, no odors or visual impacts observed.
				0.1					
				0.1					(7'- 7.6') WIDELY GRADED SAND WITH GRAVEL (SW); ~70% sand, fine to coarse, ~25% gravel, ~5% fines; asphalt. No odors or visual impacts observed.
				0.2					(7.6'- 10') WIDELY GRADED SAND WITH GRAVEL (SW); ~90% sand, fine to coarse, ~10% gravel; max. size 0.5 in., wet, brown.
				0.2					
				0.1					
$\nabla$ 10		5.0	36	12.3			NLO NLO		(9.8'- 10') Moderate naphthalene-like odor, black stain and sheen observed.
				9.2					(10'- 11') WIDELY GRADED SAND WITH GRAVEL (SW); ~85% sand, fine to coarse, ~10% gravel, ~5% fines; max. size 0.75 in., moderate naphthalene-like odor, wet, tan - brown, black staining. Sheen throughout and sheen on surface of soil inside liner throughout.
				14.1					(11'- 15') WIDELY GRADED SAND WITH GRAVEL (SW); ~85% sand, fine to coarse, ~10% gravel, ~5% fines; max. size 0.75 in., wet, tan - brown.
				7.7					
				9.0					
				6.2					
15		5.0	60	2.6				GEO-09 (15-20)	(15'- 16.6') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; tan.
				10.0					
				9.5					
				12.6			NLO		(16.6'- 17.5') Moderate naphthalene-like odor, tar blebs throughout with black-gray staining.
				4.8					(17.5'- 20') WIDELY GRADED SAND (SW); ~95% sand, fine to medium, ~5% fines; tan.
				4.0					
				3.1					
				3.0					
20									Bottom of borehole at 20.0 feet.

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CLO = CHEMICAL LIKE ODOR  
ALO = ASPHALT LIKE ODOR

CrLO = CREOSOTE LIKE ODOR  
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MLO = MUSTY LIKE ODOR

ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



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CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

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GCMW-1712

GROUND SURFACE ELEVATION (FT): 57.51

LOCATION:

NORTHING: 251710.79 EASTING: 1088502.71

TOTAL DEPTH (FT): 47.00

DRILLED BY: Zebra Environmental

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY:

DATE START / END: 2/4/2010 - 2/5/2010

DRILLING DETAILS: Geoprobe / Geoprobe 8040

WATER LEVEL DEPTHS (FT): 9.00 2/4/2010

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION	WELL CONSTRUCTION DETAILS
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)						
0		5.0	60	NM					Note: (0'- 5'): HAND CLEARED. (0'- 5') WIDELY GRADED SAND WITH GRAVEL (SW); ~70% sand, fine to coarse, ~25% gravel, ~5% fines; max. size 5 in., dry, brown, no odors or visual impacts observed.	
5		5.0	25	0.8					(5'- 9') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.5 in., tan - black, FILL.	
				0.6						
				0.6						
				0.5						
				1.6						
10		5.0	37	0.4			NLO		(9'- 10') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.5 in., moderate naphthalene-like odor, wet, tan - black, FILL.	
				0.0					(9.6'- 10') Stained.	
				0.6			NLO		(10'- 13.4') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 1 in., moderate naphthalene-like odor, wet, black, brick and coal fragments.	
				0.7					(11.5'- 13.1') Stained with marbled tar blebs.	
				19.0					(13.4'- 15') WIDELY GRADED SAND WITH SILT (SW-SM); ~80% sand, fine to medium, ~10% gravel, ~10% fines; max. size 1 in., wet, tan - gray.	
15		5.0	60	2.5			NLO	GCMW-1712 (15-17)	(13.9'- 15') Moderate naphthalene-like odor, sheen and tar coated.	
				14.2					(15'- 20') WIDELY GRADED SAND WITH SILT (SW-SM); ~85% sand, fine to coarse, ~10% fines, ~5% gravel; max. size 0.5 in., moderate naphthalene-like odor, wet, brown - black.	
				78.0					(15'- 17') Sheen with tar blebs throughout.	
				14.9			NLO		(18.3'- 19') Tar saturated.	
				11.9						
				58.0						
				20.0						
20				15.5						

NOTES:

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REC = RECOVERY LENGTH OF SAMPLE  
PID = PHOTOIONIZATION DETECTOR READING (JAR  
HEADSPACE)

ppm = PARTS PER MILLION  
IN. = INCHES  
FT. = FEET

NLO = NAPHTHALENE LIKE ODOR  
PLO = PETROLEUM LIKE ODOR  
TLO = TAR LIKE ODOR  
CLO = CHEMICAL LIKE ODOR  
ALO = ASPHALT LIKE ODOR

CrLO = CREOSOTE LIKE ODOR  
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SLO = SULFUR LIKE ODOR  
MLO = MUSTY LIKE ODOR

ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION	WELL CONSTRUCTION DETAILS	
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)							
20		5.0	60	3.1 1.6 3.6			NLO	GCMW-1712 (25-27)	(20'- 22.4') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; wet, tan - black, sheen. (20.6'- 22.4') Tar blebs. (21'- 21.2') Moderate naphthalene-like odor, tar saturated. (22.4'- 23.3') WIDELY GRADED SAND (SW); ~95% sand, medium to coarse, ~5% fines; moderate naphthalene-like odor, wet, tan. (23.3'- 25') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; moderate naphthalene-like odor, wet, tan - black. (25'- 30') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; wet, brown, no odors or visual impacts observed. Liner jammed, sample banged out of macro core.		
				2.4			NLO				
				2.3			NLO				
				2.0			NLO				
				2.1							
25		5.0		NM							
30		5.0	56	0.2 0.2 0.2 0.3 11.9 2.4			NLO			(30'- 33') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.5 in., moderate naphthalene-like odor, wet, tan, tar saturated layer at bottom.	
				2.3 2.3 25.2			NLO			(33'- 35') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; moderate naphthalene-like odor, wet, tan, bleb at top. (34.5'- 34.8') Tar coated. (34.8'- 35') Tar saturated. (35'- 40') WIDELY GRADED SAND WITH SILT (SW-SM); ~85% sand, fine to medium, ~10% fines, ~5% gravel; max. size 0.5 in., moderate naphthalene-like odor, wet, tan, mottled sheen throughout. Tar blebs in top 4 in. Liner jammed, sample banged out of macro core.	
35		5.0		20.5							
40		5.0	43	0.0 0.2 0.3						(40'- 43.1') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; wet, tan, no odors or visual impacts observed.	

**NOTES:**



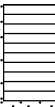
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MLO = MUSTY LIKE ODOR

ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10

		GEI Consultants, Inc. 455 Winding Brook Road Glastonbury, CT 06033 (860) 368-5300		CLIENT: <b>National Grid</b>				BORING LOG		
				PROJECT: <b>Glen Cove Former MGP Site</b> CITY/STATE: <b>Glen Cove, New York</b> GEI PROJECT NUMBER: <b>093270-3-1306</b>				PAGE 3 of 3		<b>GCMW-1712</b>
DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION	WELL CONSTRUCTION DETAILS
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)						
45				0.3 0.3				GCMW-1712 (43-45)	(43.1'- 45') WIDELY GRADED SAND (SW); ~90% sand, medium to coarse, ~5% gravel, ~5% fines; max. size 0.25 in., wet, tan, no odors or visual impacts observed.	
Bottom of borehole at 47.0 feet.										
<b>NOTES:</b> PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL    ppm = PARTS PER MILLION    NLO = NAPHTHALENE LIKE ODOR    CrLO= CREOSOTE LIKE ODOR REC = RECOVERY LENGTH OF SAMPLE    IN. = INCHES    PLO = PETROLEUM LIKE ODOR    OLO = ORGANIC LIKE ODOR PID = PHOTOIONIZATION DETECTOR READING (JAR    FT. = FEET    TLO = TAR LIKE ODOR    SLO = SULFUR LIKE ODOR HEADSPACE)    ALO = ASPHALT LIKE ODOR    CLO = CHEMICAL LIKE ODOR    MLO = MUSTY LIKE ODOR										



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Glastonbury, CT 06033  
(860) 368-5300

CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

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GCMW-19I2

GROUND SURFACE ELEVATION (FT): 58.84

LOCATION:

NORTHING: 251725.51 EASTING: 1088509.13

TOTAL DEPTH (FT): 47.00

DRILLED BY: Zebra Environmental

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY:

DATE START / END: 2/5/2010 - 2/8/2010

DRILLING DETAILS: Geoprobe / Geoprobe 8040

WATER LEVEL DEPTHS (FT):

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION	WELL CONSTRUCTION DETAILS
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)						
0		5.0	60	0.0					Note: (0'- 5'): HAND CLEARED. (0'- 5') WIDELY GRADED SAND (SW); ~85% sand, fine to coarse, ~10% gravel, fine to coarse, ~5% fines; max. size 2 in., dry, brown, no odors or visual impacts observed.	
5		5.0	22	0.0					(5'- 5.7') WIDELY GRADED SAND (SW); fine to coarse; dry, dark brown, organics. No odors or visual impacts observed. (5.7'- 9.5') WIDELY GRADED SAND (SW); ~85% sand, fine to coarse, ~10% gravel, fine to coarse, ~5% fines; max. size 0.75 in., dry, brown, no odors or visual impacts observed.	
10		5.0	29	0.0					(9.5'- 10') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; dry, dark brown, coal fragments. No odors or visual impacts observed. (10'- 11.7') NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% sand, fine, ~10% fines; wet, tan - gray, FILL, coal chips. No odors or visual impacts observed. (11.7'- 15') WIDELY GRADED SAND WITH GRAVEL (SW); ~75% sand, medium to coarse, ~20% gravel, ~5% fines; max. size 1 in., wet, brown - black, FILL, no odors or visual impacts observed.	
15		5.0	42	0.1					(15'- 18') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.25 in., moderate naphthalene-like odor, wet, gray.	
				0.4						
				5.9						
				13.0					(17.4'- 18.7') Sheen and tar coating.	
				7.7					(18'- 20') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; moderate naphthalene-like odor, wet, gray.	
				6.0						
20										

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ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



GEI Consultants, Inc.  
455 Winding Brook Road  
Glastonbury, CT 06033  
(860) 368-5300

CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

PAGE  
2 of 3

GCMW-1912

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION	WELL CONSTRUCTION DETAILS	
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)							
20		5.0		60					(19.9'- 20') Tar saturated.		
				53.0					(20'- 21.7') Tar saturated.		
				67.0							
				37.0			NLO		(21.7'- 22') Tar coated.		
				78.5							
				47.8				GCMW-1912 (23-25)			
				73.4			NLO		(23.6'- 24.1') Tar saturated.		
				32.0					(24.1'- 24.2') Tar coated.		
25		5.0	47	11.5				GCMW-1912 (25-27)	(25'- 30') WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~70% sand, medium to coarse, ~20% gravel, ~10% fines; max. size 0.5 in., moderate naphthalene-like odor, wet, tan - black.		
				3.8					(26.9'- 28.2') Tar blebs.		
				3.2							
				5.5			NLO				
				2.8					(28.2'- 28.7') Tar saturated.		
				3.3					(28.7'- 30') Mottled sheen.		
				3.1							
30		5.0		0.7					(30'- 35') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; moderate naphthalene-like odor, wet, tan, sheen on water from sample. Liner jammed, sample had to be banged out of the tube.		
							NLO				
35		5.0	60	0.1					(35'- 36.8') WIDELY GRADED SAND (SW); ~95% sand, medium to coarse, ~5% fines; wet, tan, no odors or visual impacts observed.		
				0.1							
				0.1					(36.8'- 40') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; tan, no odors or visual impacts observed.		
				0.1							
				0.1							
				0.1							
40		5.0	52	0.0					(40'- 41.5') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; wet, tan, no odors or visual impacts observed.		
				0.0					(41.5'- 45') WIDELY GRADED SAND WITH GRAVEL (SW); ~75% sand, medium to coarse, ~20% gravel, ~5% fines; max. size 1 in., tan, no odors or visual impacts observed.		
				0.0							
				0.0							
				0.0							
				0.0							

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ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10

		GEI Consultants, Inc. 455 Winding Brook Road Glastonbury, CT 06033 (860) 368-5300		CLIENT: <b>National Grid</b>			<b>BORING LOG</b>			
				PROJECT: <b>Glen Cove Former MGP Site</b> CITY/STATE: <b>Glen Cove, New York</b> GEI PROJECT NUMBER: <b>093270-3-1306</b>			PAGE 3 of 3		<b>GCMW-19I2</b>	
DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION	WELL CONSTRUCTION DETAILS
	TYPE and NO.	PEN FT.	REC FT.	PID (ppm)						
45				0.0				GCMW-19I2 (43-45)		
				0.0						
				0.0						
				0.0						
Bottom of borehole at 47.0 feet.										
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CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

PAGE  
1 of 3

SB102

GROUND SURFACE ELEVATION (FT): 56.01

LOCATION:

NORTHING: 251660.14 EASTING: 1088521.77

TOTAL DEPTH (FT): 49.40

DRILLED BY: Fenley & Nicol Environmental, Inc.

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY: C. Pray

DATE START / END: 2/12/2010 - 2/16/2010

DRILLING DETAILS: Hollow Stem Auger / Mobile Drill

WATER LEVEL DEPTHS (FT): 10.00 2/12/2010

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	Blows (/6 in.)				
0								Note: Hand cleared to 5'.
5	S1	2.0	16	5-6-7-12				S1 (5'- 7') SILTY SAND (SM); 63% sand, fine to medium, 30% fines, 7% gravel; max. size 0.25 in., dry, black, FILL, medium dense. No odors or visual impacts observed.
	S2	2.0	2	9-12-7-5			NLO	S2 (7'- 9') WIDELY GRADED SAND WITH SILT (SW-SM); ~80% sand, fine to medium, ~10% gravel, ~10% fines; max. size 0.25 in., moderate naphthalene-like odor, moist, black - dark brown, FILL, medium dense. No visual impacts observed.
10	S3	2.0	20	2-1-1-3			NLO	S3 (9'- 11') WIDELY GRADED SAND WITH SILT (SW-SM); ~85% sand, fine to medium, ~10% fines, ~5% gravel; max. size 0.25 in., strong naphthalene-like odor, wet, gray - black, ALLUVIUM, very loose. Tar staining.
	S4	2.0	14	9-14-28-23			NLO	S4 (11'- 13') WIDELY GRADED SAND WITH SILT (SW-SM); ~80% sand, fine to medium, ~10% gravel, ~10% fines; max. size 0.5 in., strong naphthalene-like odor, wet, black - dark brown, ALLUVIUM, dense. Tar coated.
	S5	2.0	16	35-35-35-20			NLO	S5 (13'- 15') WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~55% sand, medium to coarse, ~40% gravel, ~5% fines; max. size 1 in., strong naphthalene-like odor, wet, black, ALLUVIUM, very dense. Tar coated.
15	S6	2.0	10	22-27-16-15			NLO	S6 (15'- 17') WIDELY GRADED SAND WITH SILT (SW-SM); ~80% sand, fine to medium, ~10% gravel, ~10% fines; max. size 0.5 in., moderate naphthalene-like odor, wet, black - dark brown, ALLUVIUM, dense. Sheen and tar blebs.
	S7	2.0	12	8-24-24-21			NLO	S7 (17'- 19') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; moderate naphthalene-like odor, wet, dark brown, ALLUVIUM, dense. Mottled sheen.
20	S8	2.0	24	18-30-30-28			NLO	S8 (19'- 21') WIDELY GRADED SAND WITH SILT (SW-SM); ~80% sand, medium to coarse, ~10% gravel, ~10% fines; moderate naphthalene-like odor, wet, dark brown, ALLUVIUM, dense. Tar coated on 2 in. of recovered sample.
	S9	2.0	20	10-18-27-31			NLO	S9 (21'- 23') WIDELY GRADED SAND WITH SILT (SW-SM); ~80% sand, fine to coarse, ~10% gravel, ~10% fines; max. size 0.25 in., moderate

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ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



GEI Consultants, Inc.  
455 Winding Brook Road  
Glastonbury, CT 06033  
(860) 368-5300

CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

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SB102

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	Blows (/6 in.)				
25							NLO	naphthalene-like odor, wet, dark brown, ALLUVIUM, dense. Mottled sheen.
	S10	2.0	24	21-27- 29-29				S10 (24'- 26') SILTY SAND (SM); 74% sand, fine to medium, 19% fines, 7% gravel; wet, dark brown, ALLUVIUM, dense. No odors or visual impacts observed.
30								
	S11	2.0	21	23-25- 21-34				S11 (29'- 31') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; wet, dark brown, ALLUVIUM, dense. No odors or visual impacts observed.
35								
	S12	2.0	0	14-27- 48-40				S12 (34'- 36') NO RECOVERY.
40								
45								

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ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10

	GEI Consultants, Inc. 455 Winding Brook Road Glastonbury, CT 06033 (860) 368-5300		<b>CLIENT:</b> National Grid		<b>BORING LOG</b>	
	<b>PROJECT:</b> Glen Cove Former MGP Site		<b>PAGE</b> 3 of 3			
	<b>CITY/STATE:</b> Glen Cove, New York		<b>SB102</b>			
	<b>GEI PROJECT NUMBER:</b> 093270-3-1306					

DEPTH FT.	SAMPLE INFO				STRATA	VISUAL IMPACTS	ODOR	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	Blows (/6 in.)				
	S13	0.4	8	100/5"			NLO	S13 (49'- 49.4') SILTY SAND (SM); 65% sand, fine to coarse, 25% fines, 10% gravel, fine; slight naphthalene-like odor, wet, brown, very dense. No visual impacts observed. Bottom of borehole at 49.4 feet.

**NOTES:**

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REC = RECOVERY LENGTH OF SAMPLE	IN. = INCHES	PLO = PETROLEUM LIKE ODOR	OLO = ORGANIC LIKE ODOR
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CLIENT: National Grid  
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GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

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1 of 3

SB103

GROUND SURFACE ELEVATION (FT): 55.95 LOCATION:  
NORTHING: 251659.83 EASTING: 1088494.32 TOTAL DEPTH (FT): 54.00  
DRILLED BY: Fenley & Nicol Environmental, Inc. DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone  
LOGGED BY: M. Weier DATE START / END: 2/18/2010 - 2/19/2010  
DRILLING DETAILS: Hollow Stem Auger / Mobile Drill  
WATER LEVEL DEPTHS (FT):  $\nabla$  10.00 2/18/2010

DEPTH FT.	SAMPLE INFORMATION					STRATA	VISUAL IMPACTS	ODOR	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	Blows (/6 in.)	PID (ppm)				
0									
5	S-1	2.0	4	5-3-3-3	0.0 0.0				S-1 (4'- 6') SILTY SAND WITH GRAVEL (SM); 55% sand, fine to coarse, 24% fines, 21% gravel, fine to coarse, rounded; wet, brown, FILL, hardened piece of coal ash at 4 in.
	S-2	2.0	9	18-10-8-5	0.1 0.8			PLO	S-2A (6'- 7') SILTY SAND (SM); ~50% sand, coarse, ~30% fines, ~20% gravel, fine to coarse, rounded; max. size 1 in., wet, brown, FILL. S-2B (7'- 8') ASH AND COAL FRAGMENTS; slight petroleum-like odor, moist.
	S-3	2.0	4	5-1-2-4	0.1			PLO	S-3 (8'- 10') WIDELY GRADED SAND WITH SILT (SW-SM); ~80% sand, fine to coarse, ~10% gravel, fine to coarse, ~10% fines; max. size 0.75 in., slight petroleum-like odor, moist to wet, black, FILL, coal fragments.
10	S-4	2.0	2	3-1-1-7	0.8			PLO	S-4 (10'- 12') WIDELY GRADED SAND WITH GRAVEL (SW); ~50% sand, fine to coarse, ~45% gravel, fine to coarse, crushed, ~5% fines; moderate petroleum-like odor, wet, black, FILL, coal fragments. Odor mixed with moderate naphthalene odor. Slight sheen or coating.
	S-5	2.0	10	5-8-8-8	2.4 0.3 0.2			PLO	S-5A (12'- 13') WIDELY GRADED GRAVEL WITH SILT AND SAND (GW-GM); ~60% gravel, fine to coarse, angular, ~30% sand, fine to coarse, ~10% fines; moderate petroleum-like odor, wet, black, FILL, slight staining and sheen.
	S-6	2.0	12	13-18-10-15	0.4 1.4 1.7			PLO	S-5B (13'- 14') WIDELY GRADED SAND WITH GRAVEL (SW); ~75% sand, fine to coarse, ~25% gravel, fine to coarse, angular to subrounded; moderate petroleum-like odor, wet, FILL, coal fragments. Slight staining and sheen.
15	S-7	2.0	0	27-25-30-24	NA			PLO	S-6A (14'- 15') WIDELY GRADED SAND WITH GRAVEL (SW); ~75% sand, fine to coarse, ~25% gravel, fine to coarse, angular to subrounded; moderate petroleum-like odor, wet, FILL, coal fragments. Slight staining and sheen.
	S-8	2.0	10	13-8-8-15	0.1 0.1			NLO	S-6B (15'- 16') NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% sand, fine to medium, ~10% fines; moderate petroleum-like odor, wet, brown, ALLUVIUM, red sand lens.
20								NLO	S-7 (16'- 18') NO RECOVERY. S-8A (18'- 19.6') SILTY SAND (SM); ~70% sand, fine to medium, ~25% fines, ~5% gravel, coarse; max. size 1 in., slight naphthalene-like odor, wet, brown. S-8B (19.6'- 20') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; slight naphthalene-like odor, wet, dark brown, appears some of the sample may have dropped out of the bottom.

NOTES:

PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
REC = RECOVERY LENGTH OF SAMPLE  
PID = PHOTOIONIZATION DETECTOR READING (JAR HEADSPACE)

ppm = PARTS PER MILLION  
IN. = INCHES  
FT. = FEET

NLO = NAPHTHALENE LIKE ODOR  
PLO = PETROLEUM LIKE ODOR  
TLO = TAR LIKE ODOR  
CLO = CHEMICAL LIKE ODOR  
ALO = ASPHALT LIKE ODOR

CrLO = CREOSOTE LIKE ODOR  
OLO = ORGANIC LIKE ODOR  
SLO = SULFUR LIKE ODOR  
MLO = MUSTY LIKE ODOR

ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10



GEI Consultants, Inc.  
455 Winding Brook Road  
Glastonbury, CT 06033  
(860) 368-5300

CLIENT: National Grid  
PROJECT: Glen Cove Former MGP Site  
CITY/STATE: Glen Cove, New York  
GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

PAGE  
2 of 3

SB103

DEPTH FT.	SAMPLE INFORMATION					STRATA	VISUAL IMPACTS	ODOR	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	Blows (/6 in.)	PID (ppm)				
25	S-9	2.0	17	27-46- 50-48	0.1 0.4 0.0				S-9A (24'- 25.5') NARROWLY GRADED SAND (SP); ~85% sand, fine to medium, ~10% gravel, fine to coarse, angular, ~5% fines; max. size 1 in., wet, gray to brown, coarse 1 in. circular broken piece of gravel at bottom. S-9B (25.5'- 26') SILTY SAND (SM); ~75% sand, fine to coarse, ~20% fines, ~5% gravel, fine; brown, reddish gravel.
30	S-10	2.0	12	29-32- 45-70	0.1 0.2			NLO	S-10A (29'- 30.2') NARROWLY GRADED SAND (SP); ~95% sand, fine to medium, ~5% fines; slight naphthalene-like odor, wet, grayish brown. S-10B (30.2'- 31') WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~70% sand, fine to coarse, ~20% gravel, fine to coarse, rounded, ~10% fines; max. size 1 in., slight naphthalene-like odor, wet, tan, gravel broken by spoon. Spoon was extremely full, half of the sample was heaving sand.
								NLO	
35									
40	S-11	2.0	17	9-6-6-12	0.0 0.0				S-11 (39'- 41') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; layered, wet, tan, silty fine sand lens at 5-7". Coarse 1 in. gravel piece in shoe.
45	S-12	2.0	16	68-37- 25-40	0.0 0.1 0.0				S-12 (44'- 46') SILTY SAND (SM); 75% sand, fine to coarse, 15% fines, 10% gravel, fine to coarse, broken; layered, max. size 1 in., wet, brown.

NOTES:

PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
REC = RECOVERY LENGTH OF SAMPLE  
PID = PHOTOIONIZATION DETECTOR READING (JAR HEADSPACE)

ppm = PARTS PER MILLION  
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NLO = NAPHTHALENE LIKE ODOR  
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MLO = MUSTY LIKE ODOR

ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10

GEI Consultants, Inc.  
455 Winding Brook Road  
Glastonbury, CT 06033  
(860) 368-5300

**CLIENT:** National Grid

**PROJECT:** Glen Cove Former MGP Site

**CITY/STATE:** Glen Cove, New York

**GEI PROJECT NUMBER:** 093270-3-1306

## BORING LOG

**PAGE**  
**3 of 3**

**SB103**[illegible]

Bottom of borehole at 54.0 feet.

**NOTES:**

PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
REC = RECOVERY LENGTH OF SAMPLE  
PID = PHOTOIONIZATION DETECTOR READING (JAR HEADSPACE)

ppm = PARTS PER MILLION  
IN. = INCHES  
FT. = FEET

NLO = NAPHTHALENE LIKE ODOR  
PLO = PETROLEUM LIKE ODOR  
TLO = TAR LIKE ODOR  
CLO = CHEMICAL LIKE ODOR  
ALO = ASPHALT LIKE ODOR

CrLO= CREOSOTE LIKE ODOR  
OLO = ORGANIC LIKE ODOR  
SLO = SULFUR LIKE ODOR  
MLO = MUSTY LIKE ODOR



GEI Consultants, Inc.  
455 Winding Brook Road  
Glastonbury, CT 06033  
(860) 368-5300

CLIENT: National Grid

PROJECT: Glen Cove Former MGP Site

CITY/STATE: Glen Cove, New York

GEI PROJECT NUMBER: 093270-3-1306

BORING LOG

PAGE  
1 of 1

SB104

GROUND SURFACE ELEVATION (FT): 56.71

LOCATION:

NORTHING: 251619.5 EASTING: 1088525.65

TOTAL DEPTH (FT): 20.00

DRILLED BY: Fenley & Nicol Environmental, Inc.

DATUM VERT. / HORZ.: NGVD 29 / NAD83 NY Long Island Zone

LOGGED BY: C. Pray

DATE START / END: 2/9/2010

DRILLING DETAILS: Hollow Stem Auger / Mobile Drill

WATER LEVEL DEPTHS (FT): 11.00 2/9/2010

DEPTH FT.	SAMPLE INFO				STRATA	SOIL / BEDROCK DESCRIPTION
	TYPE and NO.	PEN FT.	REC FT.	Blows (/6 in.)		
0						Note: Hand cleared to 5'.
5	S1	2.0	12	10-22- 28-34		S1 (5'- 7') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 0.25 in., dry, black, FILL, very dense. No odors or visual impacts observed.
	S2	2.0	8	10-6-4-8		S2 (7'- 9') WIDELY GRADED SAND (SW); ~85% sand, medium to coarse, ~10% gravel, ~5% fines; max. size 1 in., dry, black, FILL, loose. No odors or visual impacts observed.
10	S3	2.0	9	14-28- 19-6		S3 (9'- 11') POORLY GRADED SAND WITH GRAVEL (SP); ~75% sand, medium to coarse, ~20% gravel, ~5% fines; max. size 1 in., dry, dark brown, FILL, dense. No odors or visual impacts observed.
	S4	2.0	8	20-42- 41-36		S4 (11'- 13') WIDELY GRADED SAND (SW); ~90% sand, medium to coarse, ~5% gravel, ~5% fines; max. size 1 in., wet, brown, ALLUVIUM, very dense. No odors or visual impacts observed. Augers grinding from 11-12'. Piece of gravel stuck in spoon.
	S5	2.0	12	4-5-27- 20		S5 (13'- 15') WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); 66% sand, medium to coarse, 27% gravel, 7% fines; max. size 0.5 in., wet, brown, ALLUVIUM, dense. No odors or visual impacts observed.
15	S6	1.3	14	32-45- 50/4"		S6 (15'- 16.3') WIDELY GRADED SAND WITH GRAVEL (SW); ~75% sand, medium to coarse, ~20% gravel, ~5% fines; max. size 1 in., wet, light brown, ALLUVIUM, very dense. No odors or visual impacts observed.
						(17-20') Augered. Hard grinding.
20						(20') Augers broke apart. Bottom of borehole at 20.0 feet.

NOTES:

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REC = RECOVERY LENGTH OF SAMPLE  
PID = PHOTOIONIZATION DETECTOR READING (JAR  
HEADSPACE)

ppm = PARTS PER MILLION  
IN. = INCHES  
FT. = FEET

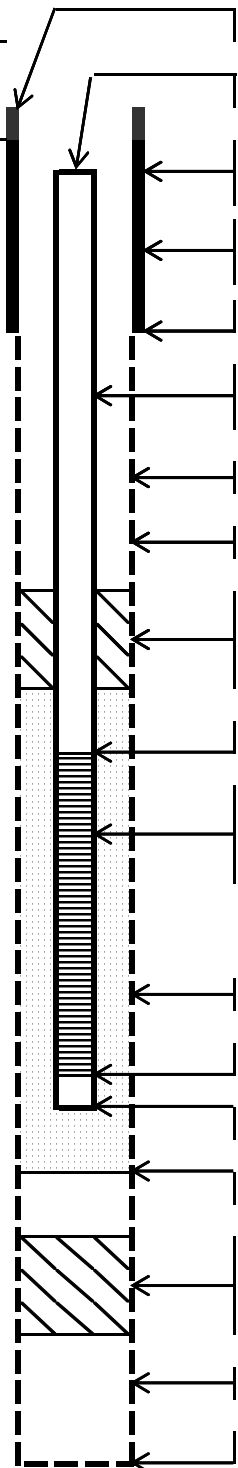
NLO = NAPHTHALENE LIKE ODOR  
PLO = PETROLEUM LIKE ODOR  
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MLO = MUSTY LIKE ODOR


ENVIRONMENTAL BORING LOG GLEN COVE.GPJ GEI CONSULTANTS.GDT 3/18/10

Groundwater Well Installation Log				GCMW-171	
<b>Project</b>		Glen Cove Former Manufactured Gas Plant Site		<b>GEI Proj. No.</b> 093270-3-1306	
<b>City / Town</b>		Glen Cove, New York		<b>Location</b>	
<b>Client</b>		National Grid		N 251710.80	
<b>Contractor</b>		Zebra Environmental		E 1088497.52	
<b>Driller</b>		Q. Brandt <b>GEI Rep.</b> C. Pray/C. Berotti		<b>Install Date</b> 2/9/2010	

<b>Survey Datum:</b> NGVD 29		Length of Surface Casing above Ground	0 ft
<b>Ground Elevation:</b> 57.15		Dist. Top of Surf. Casing to Top of Riser Pipe	0.4 ft
<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); padding: 5px;">General Soil Conditions (Not to Scale)</div> <div style="margin: 0 10px;">Soil was not logged.</div>  </div>		Type and Thickness of Seal around Surface Casing	~1 in. concrete
		ID of Surface Casing	locking flush mount
		Type of Surface Casing	
		Depth Bottom of Surface Casing	0.5 ft
		ID and OD of Riser Pipe	1 in. ID/1.25 in. OD
		Type of Riser Pipe	PVC
		Type of Backfill around Riser Pipe	grout
		Diameter of Borehole	3.25 in.
		Depth Top of Seal	21 ft
		Type of Seal	bentonite
		Depth Bottom of Seal	23 ft
		Depth Top of Screened Section	25 ft
		Type of Screen	PVC
		Description of Screen Openings	0.010 in. slots
		ID and OD of Screened Section	1 in. ID/1.25 in. OD
Type of Filter Material	#1 Morie sand		
Depth Bottom of Screened Section	27 ft		
Depth Bottom of Silt Trap	29 ft		
Depth Bottom of Filter Material	29 ft		
Depth Top of Seal	NA		
Type of Seal	NA		
Depth Bottom of Seal	NA		
Type of Backfill below Filter Material	NA		
Bottom of Borehole	29 ft		

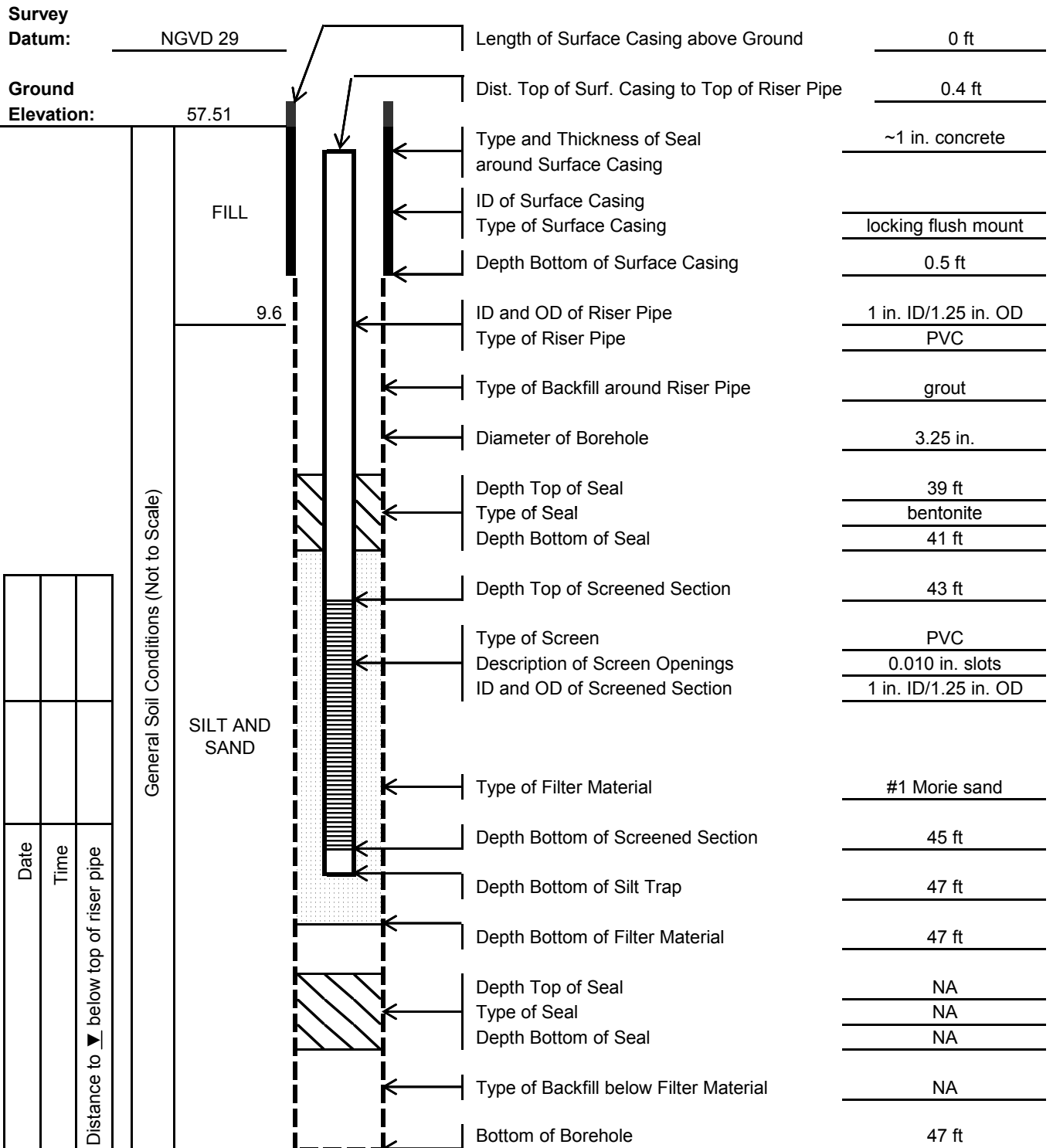
<b>Notes:</b> Location surveyed by GEI.			
Date	Time	Distance to ▼ below top of riser pipe	

# Groundwater Well Installation Log

**GCMW-1712**

**Project** Glen Cove Former Manufactured Gas Plant Site  
**City / Town** Glen Cove, New York  
**Client** National Grid  
**Contractor** Zebra Environmental  
**Driller** J. Cmil **GEI Rep.** M. Weier

**GEI Proj. No.** 093270-3-1306  
**Location**  
 N 251710.79  
 E 1088502.71  
**Install Date** 2/16/2010



**Notes:** Location surveyed by GEI.



Groundwater Well Installation Log				GCMW-18I	
<b>Project</b>		Glen Cove Former Manufactured Gas Plant Site		<b>GEI Proj. No.</b> 093270-3-1306	
<b>City / Town</b>		Glen Cove, New York		<b>Location</b>	
<b>Client</b>		National Grid		N 251715.26	
<b>Contractor</b>		Zebra Environmental		E 1088500.09	
<b>Driller</b>		J. Garcia		<b>Install Date</b> 2/11/2010	
		<b>GEI Rep.</b> C. Pray/M. Weier			

<b>Survey Datum:</b> NGVD 29		Length of Surface Casing above Ground		0 ft	
<b>Ground Elevation:</b> 57.52		Dist. Top of Surf. Casing to Top of Riser Pipe		0.3 ft	
<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small; margin-right: 10px;">General Soil Conditions (Not to Scale)</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">           Soil was not logged.         </div> </div>		Type and Thickness of Seal around Surface Casing		~1 in. concrete	
		ID of Surface Casing			
		Type of Surface Casing		locking flush mount	
		Depth Bottom of Surface Casing		0.5 ft	
		ID and OD of Riser Pipe		1 in. ID/1.25 in. OD	
		Type of Riser Pipe		PVC	
		Type of Backfill around Riser Pipe		grout	
		Diameter of Borehole		3.25 in.	
		Depth Top of Seal		21.5 ft	
		Type of Seal		bentonite	
		Depth Bottom of Seal		23.5 ft	
		Depth Top of Screened Section		25.5 ft	
		Type of Screen		PVC	
		Description of Screen Openings		0.010 in. slots	
		ID and OD of Screened Section		1 in. ID/1.25 in. OD	
Type of Filter Material		#1 Morie sand			
Depth Bottom of Screened Section		27.5 ft			
Depth Bottom of Silt Trap		29.5 ft			
Depth Bottom of Filter Material		29.5 ft			
Depth Top of Seal		NA			
Type of Seal		NA			
Depth Bottom of Seal		NA			
Type of Backfill below Filter Material		NA			
Bottom of Borehole		29.5 ft			

<b>Notes:</b> Location surveyed by GEI.					
---	--	--	--	--	--

# Groundwater Well Installation Log

**GCMW-1812**

**Project** Glen Cove Former Manufactured Gas Plant Site  
**City / Town** Glen Cove, New York  
**Client** National Grid  
**Contractor** Zebra Environmental  
**Driller** J. Cmil **GEI Rep.** C. Pray/M. Weier

**GEI Proj. No.** 093270-3-1306  
**Location**  
 N 251716.98  
 E 1088505.28  
**Install Date** 2/12/2010

<b>Survey Datum:</b> NGVD 29		Length of Surface Casing above Ground	0 ft
<b>Ground Elevation:</b> 57.83		Dist. Top of Surf. Casing to Top of Riser Pipe	0.4 ft
<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">General Soil Conditions (Not to Scale)</div> <div style="margin-left: 10px;"> </div> </div>		Type and Thickness of Seal around Surface Casing	~1 in. concrete
		ID of Surface Casing	
		Type of Surface Casing	locking flush mount
		Depth Bottom of Surface Casing	0.5 ft
		ID and OD of Riser Pipe	1 in. ID/1.25 in. OD
		Type of Riser Pipe	PVC
		Type of Backfill around Riser Pipe	grout
		Diameter of Borehole	3.25 in.
		Depth Top of Seal	39 ft
		Type of Seal	bentonite
		Depth Bottom of Seal	41 ft
		Depth Top of Screened Section	43 ft
		Type of Screen	PVC
		Description of Screen Openings	0.010 in. slots
		ID and OD of Screened Section	1 in. ID/1.25 in. OD
Type of Filter Material	#1 Morie sand		
Depth Bottom of Screened Section	45 ft		
Depth Bottom of Silt Trap	47 ft		
Depth Bottom of Filter Material	47 ft		
Depth Top of Seal	NA		
Type of Seal	NA		
Depth Bottom of Seal	NA		
Type of Backfill below Filter Material	NA		
Bottom of Borehole	47 ft		

**Notes:** Location surveyed by GEI.



# Groundwater Well Installation Log

**GCMW-19I**

**Project** Glen Cove Former Manufactured Gas Plant Site  
**City / Town** Glen Cove, New York  
**Client** National Grid  
**Contractor** Zebra Environmental  
**Driller** J. Cmil **GEI Rep.** C. Pray/M. Weier

**GEI Proj. No.** 093270-3-1306  
**Location**  
 N 251723.54  
 E 1088504.17  
**Install Date** 2/12/2010

<b>Survey Datum:</b> NGVD 29		Length of Surface Casing above Ground	0 ft
<b>Ground Elevation:</b> 58.63		Dist. Top of Surf. Casing to Top of Riser Pipe	0.3 ft
<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">General Soil Conditions (Not to Scale)</div> <div style="margin-left: 10px;"> </div> </div>		Type and Thickness of Seal around Surface Casing	~1 in. concrete
		ID of Surface Casing	
		Type of Surface Casing	locking flush mount
		Depth Bottom of Surface Casing	0.5 ft
		ID and OD of Riser Pipe	1 in. ID/1.25 in. OD
		Type of Riser Pipe	PVC
		Type of Backfill around Riser Pipe	grout
		Diameter of Borehole	3.25 in.
		Depth Top of Seal	21 ft
		Type of Seal	bentonite
		Depth Bottom of Seal	23 ft
		Depth Top of Screened Section	25 ft
		Type of Screen	PVC
		Description of Screen Openings	0.010 in. slots
		ID and OD of Screened Section	1 in. ID/1.25 in. OD
Type of Filter Material	#1 Morie sand		
Depth Bottom of Screened Section	27 ft		
Depth Bottom of Silt Trap	29 ft		
Depth Bottom of Filter Material	29 ft		
Depth Top of Seal	NA		
Type of Seal	NA		
Depth Bottom of Seal	NA		
Type of Backfill below Filter Material	NA		
Bottom of Borehole	29 ft		

**Notes:** Location surveyed by GEI.



# Groundwater Well Installation Log

**GCMW-1912**

**Project** Glen Cove Former Manufactured Gas Plant Site  
**City / Town** Glen Cove, New York  
**Client** National Grid  
**Contractor** Zebra Environmental  
**Driller** J. Cmil **GEI Rep.** M. Weier

**GEI Proj. No.** 093270-3-1306  
**Location**  
 N 251725.51  
 E 1088509.13  
**Install Date** 2/16/2010

<b>Survey Datum:</b>	NGVD 29	Length of Surface Casing above Ground	0 ft
<b>Ground Elevation:</b>	58.84	Dist. Top of Surf. Casing to Top of Riser Pipe	0.4 ft
<div> <div> <div>Date</div> <div>Time</div> <div>Distance to ▾ below top of riser pipe</div> </div> <div>General Soil Conditions (Not to Scale)</div> </div>	<div> <div>FILL</div> <div>15</div> <div>SILT AND SAND</div> </div>	Type and Thickness of Seal around Surface Casing	~1 in. concrete
		ID of Surface Casing	
		Type of Surface Casing	locking flush mount
		Depth Bottom of Surface Casing	0.5 ft
		ID and OD of Riser Pipe	1 in. ID/1.25 in. OD
		Type of Riser Pipe	PVC
		Type of Backfill around Riser Pipe	grout
		Diameter of Borehole	3.25 in.
		Depth Top of Seal	39 ft
		Type of Seal	bentonite
		Depth Bottom of Seal	41 ft
		Depth Top of Screened Section	43 ft
		Type of Screen	PVC
		Description of Screen Openings	0.010 in. slots
		ID and OD of Screened Section	1 in. ID/1.25 in. OD
		Type of Filter Material	#1 Morie sand
		Depth Bottom of Screened Section	45 ft
		Depth Bottom of Silt Trap	47 ft
		Depth Bottom of Filter Material	47 ft
		Depth Top of Seal	NA
		Type of Seal	NA
		Depth Bottom of Seal	NA
		Type of Backfill below Filter Material	NA
		Bottom of Borehole	47 ft

**Notes:** Location surveyed by GEI.



## **Appendix B**

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### **GeoTesting Express Lab Results**

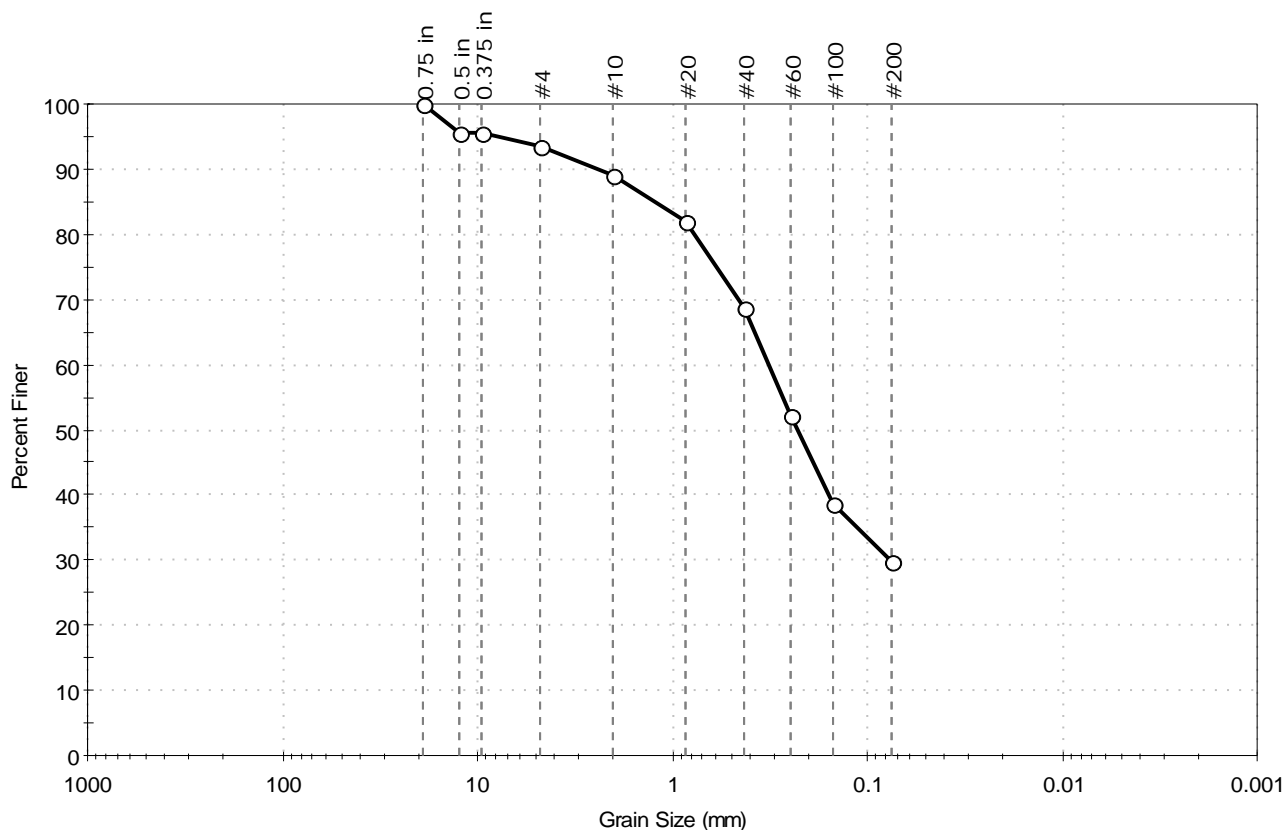
Client: GEI Consultants, Inc.  
Project: Glen Cove Former MGP Site  
Location: NY

Project No: GTX-9676

Boring ID: SB-102 Sample Type: jar Tested By: jbr  
Sample ID: S-1 Test Date: 03/01/10 Checked By: jdt  
Depth: 5.0-7.0 ft Test Id: 174539

Test Comment: ---  
Sample Description: Moist, olive brown silty sand  
Sample Comment: ---

## Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	6.6	63.5	29.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	95		
0.375 in	9.50	93		
#4	4.75	89		
#10	2.00	82		
#20	0.85	69		
#40	0.42	52		
#60	0.25	39		
#100	0.15	30		
#200	0.075	30		

### Coefficients

D<sub>85</sub> = 1.2224 mm D<sub>30</sub> = 0.0758 mm  
D<sub>60</sub> = 0.3220 mm D<sub>15</sub> = N/A  
D<sub>50</sub> = 0.2313 mm D<sub>10</sub> = N/A  
C<sub>u</sub> = N/A C<sub>c</sub> = N/A

### Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

### Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR  
Sand/Gravel Hardness : HARD

Client: GEI Consultants, Inc.  
Project: Glen Cove Former MGP Site  
Location: NY

Project No: GTX-9676

Boring ID: SB-102

Sample Type: jar

Tested By: jbr

Sample ID: S-10

Test Date: 03/01/10

Checked By: jdt

Depth: 24.0-26.0 ft

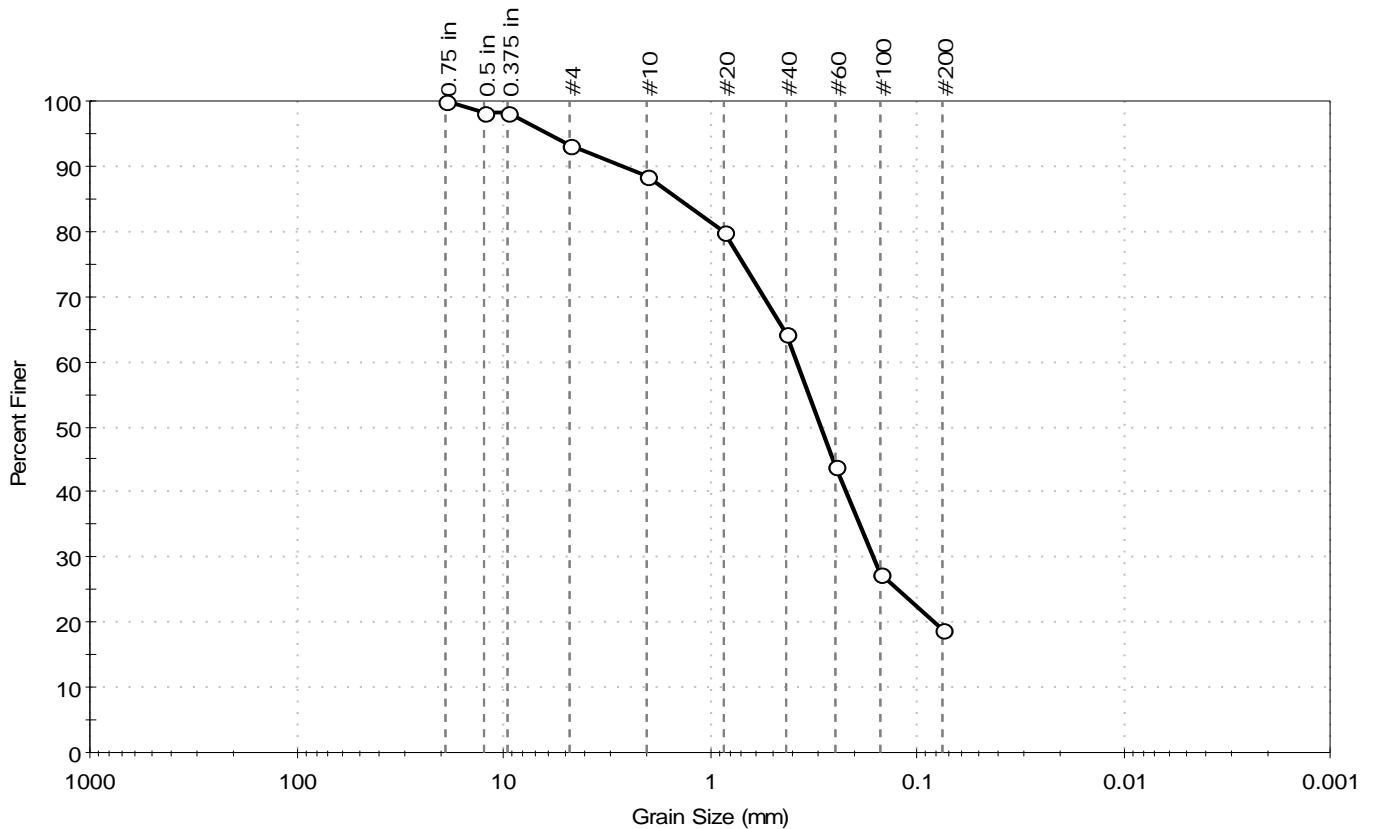
Test Id: 174540

Test Comment: ---

Sample Description: Moist, light brown silty sand

Sample Comment: ---

## Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	6.7	74.5	18.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	98		
0.375 in	9.50	98		
#4	4.75	93		
#10	2.00	89		
#20	0.85	80		
#40	0.42	64		
#60	0.25	44		
#100	0.15	27		
#200	0.075	19		

### Coefficients

$D_{85} = 1.4030$  mm       $D_{30} = 0.1622$  mm  
 $D_{60} = 0.3803$  mm       $D_{15} = \text{N/A}$   
 $D_{50} = 0.2928$  mm       $D_{10} = \text{N/A}$   
 $C_u = \text{N/A}$        $C_c = \text{N/A}$

### Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

### Sample/Test Description

Sand/Gravel Particle Shape: ANGULAR

Sand/Gravel Hardness: HARD

Client: GEI Consultants, Inc.  
Project: Glen Cove Former MGP Site  
Location: NY

Project No: GTX-9676

Boring ID: SB-102

Sample Type: jar

Tested By: jbr

Sample ID: S-13

Test Date: 03/01/10

Checked By: jdt

Depth: 39.0-41.0 ft

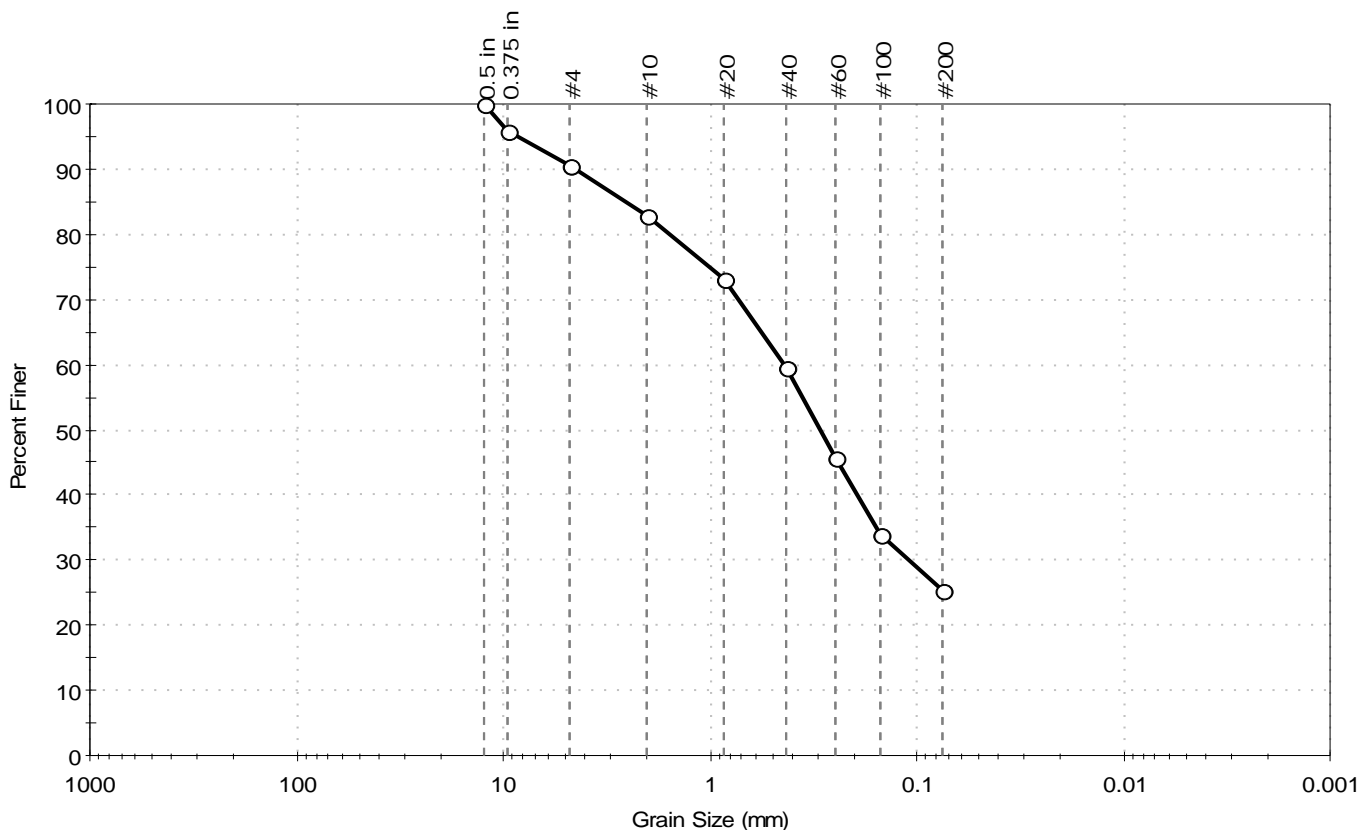
Test Id: 174541

Test Comment: ---

Sample Description: Moist, light brown silty sand

Sample Comment: ---

## Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	9.5	65.2	25.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	96		
#4	4.75	90		
#10	2.00	83		
#20	0.85	73		
#40	0.42	60		
#60	0.25	46		
#100	0.15	34		
#200	0.075	25		

### Coefficients

$D_{85} = 2.5729$  mm       $D_{30} = 0.1098$  mm  
 $D_{60} = 0.4342$  mm       $D_{15} = \text{N/A}$   
 $D_{50} = 0.2944$  mm       $D_{10} = \text{N/A}$   
 $C_u = \text{N/A}$        $C_c = \text{N/A}$

### Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

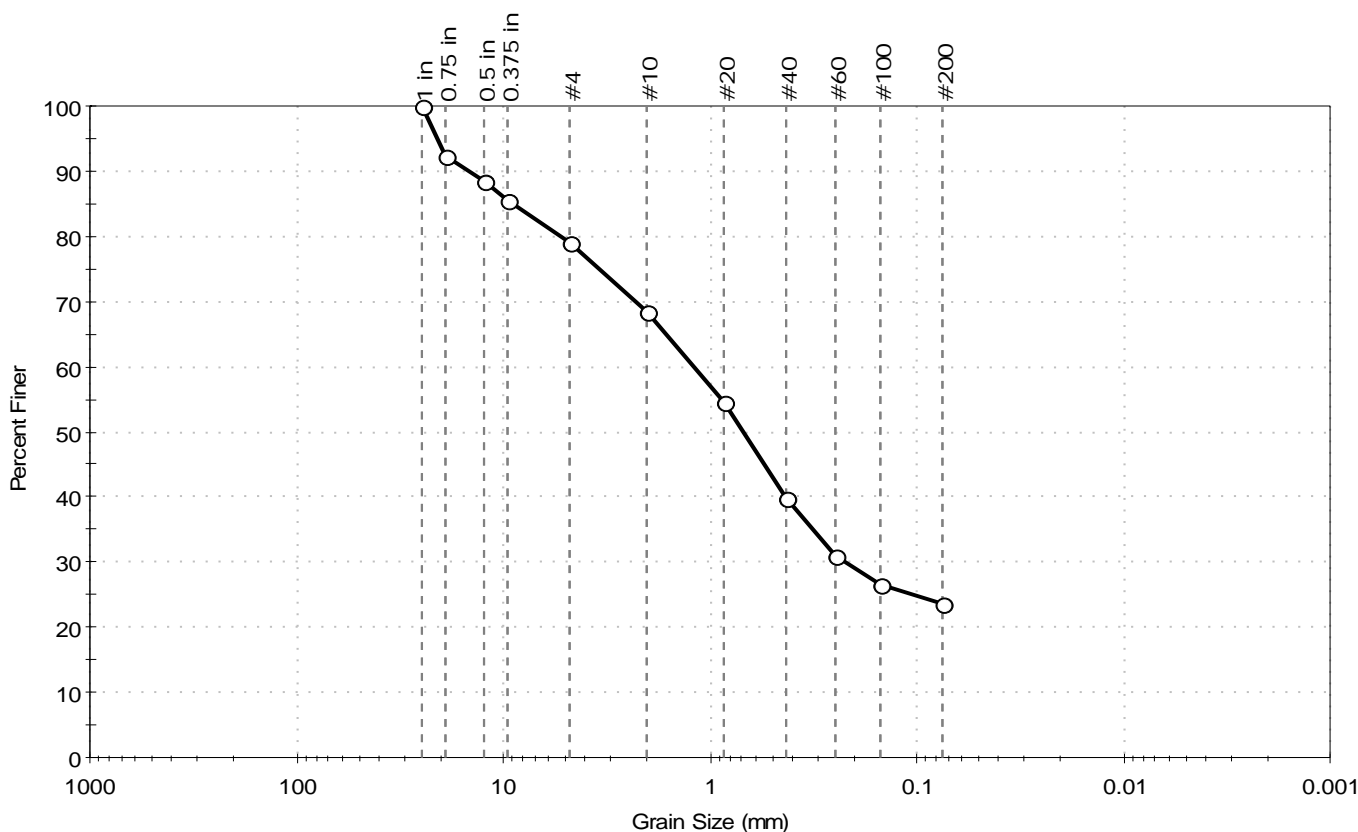
### Sample/Test Description

Sand/Gravel Particle Shape: ANGULAR

Sand/Gravel Hardness: HARD

Client: GEI Consultants, Inc.	Project No: GTX-9676
Project: Glen Cove Former MGP Site	Tested By: jbr
Location: NY	Checked By: jdt
Boring ID: SB-103	Sample Type: jar
Sample ID: S-1	Test Date: 03/01/10
Depth : 4.0-6.0 ft	Test Id: 174542
Test Comment: ---	
Sample Description: Moist, brown silty sand with gravel	
Sample Comment: ---	

## Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	20.8	55.5	23.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	92		
0.5 in	12.50	88		
0.375 in	9.50	86		
#4	4.75	79		
#10	2.00	68		
#20	0.85	55		
#40	0.42	40		
#60	0.25	31		
#100	0.15	27		
#200	0.075	24		

### Coefficients

D <sub>85</sub> = 8.8856 mm	D <sub>30</sub> = 0.2254 mm
D <sub>60</sub> = 1.1870 mm	D <sub>15</sub> = N/A
D <sub>50</sub> = 0.6844 mm	D <sub>10</sub> = N/A
C <sub>u</sub> = N/A	C <sub>c</sub> = N/A

### Classification

ASTM	N/A
AASHTO	Stone Fragments, Gravel and Sand (A-1-b (0))

### Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR  
Sand/Gravel Hardness : HARD

Client: GEI Consultants, Inc.  
Project: Glen Cove Former MGP Site  
Location: NY

Project No: GTX-9676

Boring ID: SB-103

Sample Type: jar

Tested By: jbr

Sample ID: S-12

Test Date: 03/01/10

Checked By: jdt

Depth: 44.0-46.0 ft

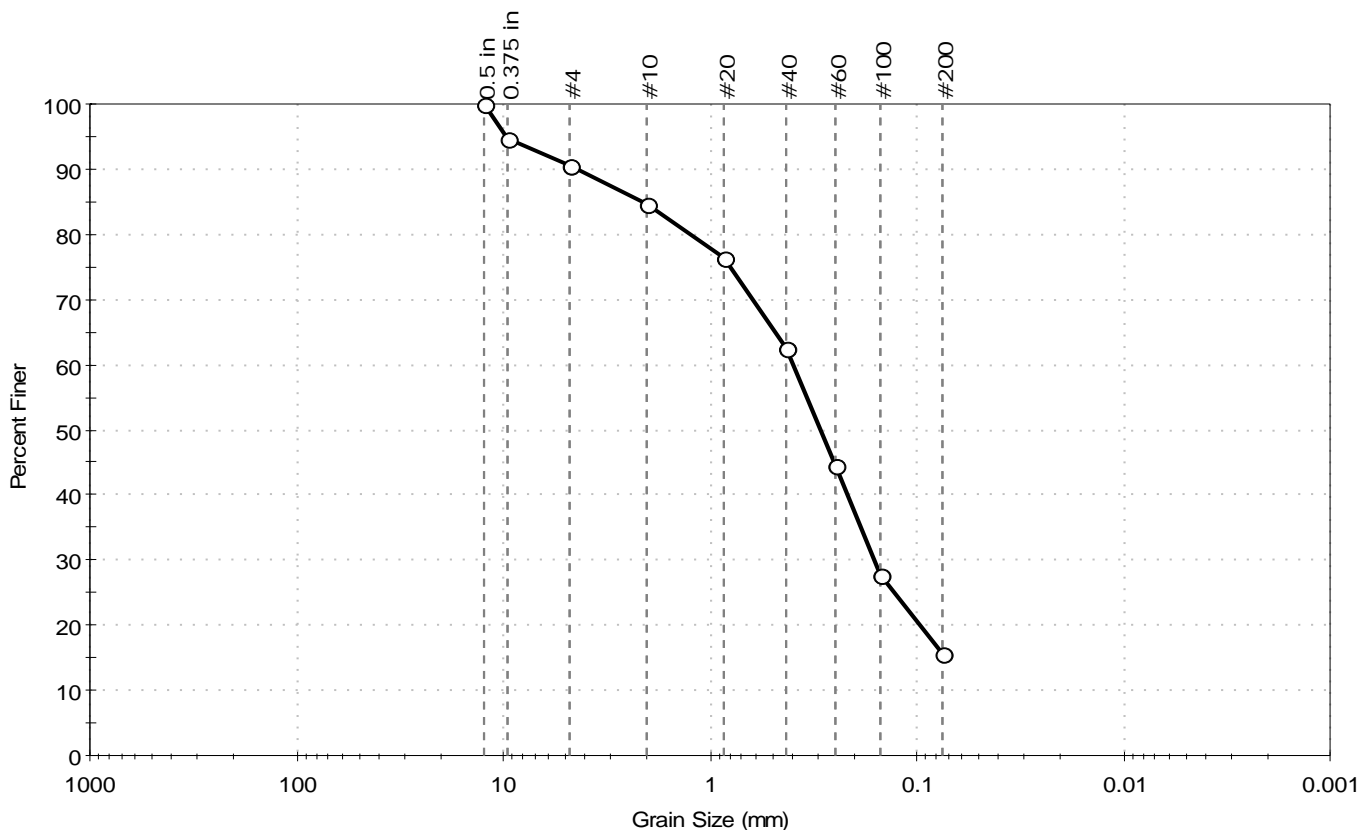
Test Id: 174543

Test Comment: ---

Sample Description: Moist, brown silty sand

Sample Comment: ---

## Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	9.5	75.0	15.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	95		
#4	4.75	91		
#10	2.00	85		
#20	0.85	76		
#40	0.42	62		
#60	0.25	44		
#100	0.15	28		
#200	0.075	16		

### Coefficients

$D_{85} = 2.1234$  mm       $D_{30} = 0.1611$  mm  
 $D_{60} = 0.3957$  mm       $D_{15} = \text{N/A}$   
 $D_{50} = 0.2947$  mm       $D_{10} = \text{N/A}$   
 $C_u = \text{N/A}$        $C_c = \text{N/A}$

### Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

### Sample/Test Description

Sand/Gravel Particle Shape: ANGULAR

Sand/Gravel Hardness: HARD

Client: GEI Consultants, Inc.  
Project: Glen Cove Former MGP Site  
Location: NY

Project No: GTX-9676

Boring ID: SB-104

Sample Type: jar

Tested By: jbr

Sample ID: S-5

Test Date: 03/01/10

Checked By: jdt

Depth: 13.0-15.0 ft

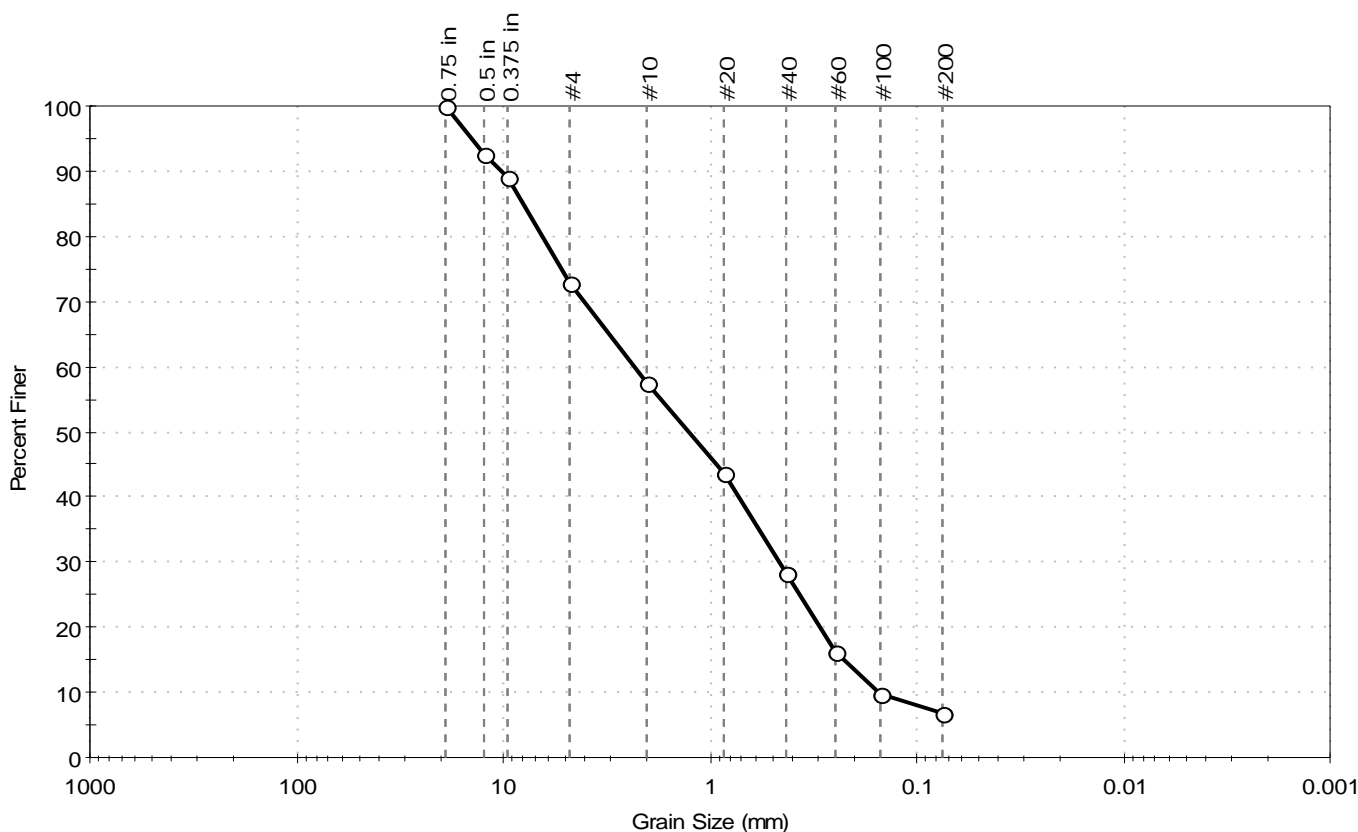
Test Id: 174544

Test Comment: ---

Sample Description: Moist, brown sand with silt and gravel

Sample Comment: ---

## Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	27.1	66.0	6.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	93		
0.375 in	9.50	89		
#4	4.75	73		
#10	2.00	58		
#20	0.85	44		
#40	0.42	28		
#60	0.25	16		
#100	0.15	10		
#200	0.075	7		

### Coefficients

$D_{85} = 7.9899$  mm       $D_{30} = 0.4605$  mm  
 $D_{60} = 2.2931$  mm       $D_{15} = 0.2280$  mm  
 $D_{50} = 1.2572$  mm       $D_{10} = 0.1533$  mm  
 $C_u = 14.958$        $C_c = 0.603$

### Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

### Sample/Test Description

Sand/Gravel Particle Shape: ANGULAR

Sand/Gravel Hardness: HARD

## **Appendix C**

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### **Remedial Action Phase I Contract Documents (electronic only)**



**NATIONAL GRID USA  
AND AFFILIATED COMPANIES**

**TERMS AND  
CONDITIONS**

**FOR**

**CONSTRUCTION  
PURCHASE ORDERS**

**DOCUMENT NO. 00700**

## GENERAL CONDITIONS - CONSTRUCTION

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## **GENERAL CONDITIONS**

### **1.0 Definitions**

Wherever used in the Agreement with initial capitalization, whether in the singular or the plural, these terms shall have the following meanings:

- 1.1. "Agreement" means the signed Agreement including all Contract Documents identified therein and attached thereto, including these General Conditions and any amendments thereto made pursuant to Article 6.0.
- 1.2. "Contract Documents" means all documents identified as such in the Agreement.
- 1.3. "Contract Price" means the total amount to be paid by the Owner to the Contractor as set forth in the Agreement.
- 1.4. "Contractor" means the party identified as such in the Agreement, and, if authorized by Owner, its successors and assigns.
- 1.5. "Day" means a calendar day, except that if an obligation of the Agreement falls due on a Saturday, Sunday or legal holiday in the jurisdiction where the Site is located such obligation shall be due the next regular working day.
- 1.6. "Dollars" and "\$" means United States of America dollars.
- 1.7. "Drawings" means those drawings listed in the Specification. Said Drawings are incorporated by reference as if fully set forth in the Agreement.
- 1.8. "Engineer" means the technical representative of the Owner, if any.
- 1.9. "Field Representative" means the onsite representative of the Owner. Unless otherwise specified, all matters relating to the Agreement and coordination of Contractor activities with the Owner shall be directed through this individual.
- 1.10. "Final Acceptance" means that date when the Owner issues a certificate to the Contractor certifying that the Work has been fully performed in accordance with the terms and conditions of the Agreement.
- 1.11. "Owner" or "Owners" means the party or parties identified as such in the Agreement,
- 1.12. "Project" means the totality of an Owner defined venture, to be completed within a specified time and cost, and all things associated therewith, of which the Work performed under the Agreement may be the whole or a

part and which may include work performed by the Owner or its affiliates or by other contractors.

- 1.13. "Purchase Order" has the same meaning as Agreement.
- 1.14. "Purchase Order Number" means the number identified as such in the Agreement which may be used for Owner's internal accounting and document tracking.
- 1.15. "Services" means all the labor and services provided by Contractor in connection with the Agreement.
- 1.16. "Site" means the geographical location where the Work will be performed.
- 1.17. "Specification" means the technical requirements and procedures including any accompanying appendices contained in the Agreement and incorporated by reference as if fully set forth therein.
- 1.18. "Subcontractor" means any organization, firm or individual, regardless of tier, which the Contractor retains during the term of the Agreement to provide labor, materials, Services, and/or equipment in connection with the Agreement.
- 1.19. "Substantial Completion" means that date as certified by Owner when the construction of the Work, or a specified portion of the Work, is sufficiently completed in accordance with the Agreement so the Owner can occupy or utilize the Project, or a specified portion of the Project, for its intended purpose.
- 1.20. "Supplemental Conditions" means those terms and conditions, if included in the Agreement, which add to or modify other Contract Documents and are incorporated by reference as if fully set forth in the Agreement. In the case of a conflict between the Supplemental Conditions and any other Contract Document the Supplemental Conditions shall prevail.
- 1.21. "Work" means all duties, responsibilities, and obligations to be performed by the Contractor as specified, stated, indicated or implied, whether temporary or permanent, by the Agreement including, but not limited to, equipment, labor, services, apparatus, machinery, and/or material supplied.

## 2.0 Term

- 2.1. The Agreement shall become effective when executed by both parties and shall continue in full force and effect until the expiration of all guarantees, warranties and indemnities provided for therein.

### 3.0 Scope of Work

- 3.1. The Contractor agrees to perform all the Work and do all that is necessary to complete its portion of the Project in accordance with the Agreement including all Contract Documents and any attached schedules, exhibits and appendices which are incorporated by reference as if fully set forth therein.
- 3.2. The Contractor assumes full responsibility for the Work until its Final Acceptance.
- 3.3. In addition to other requirements set forth in the Agreement, the Contractor shall perform all the Work in conformance with all applicable permits, Federal, state, and local engineering, construction, safety, environmental, building and electrical codes, regulations, standards, directives, requirements, rules, regulations, laws and ordinances, whether the same are in force upon the execution of the Agreement or may in the future be passed, enacted or directed and any other requirements listed or referred to in the Agreement.
- 3.4. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences, procedures, safety and compliance programs in connection with the performance of the Work.
- 3.5. The Contractor shall supply and be fully responsible for temporary facilities. Such facilities shall be located only in approved areas if so designated by the Owner. Temporary facilities, located at the Site, shall be removed by the Contractor prior to final payment, unless otherwise authorized in writing by the Owner.

### 4.0 Personnel

- 4.1. The Contractor shall provide a competent full time superintendent and any necessary assistants, all satisfactory to the Owner, at the Site during the progress of the Work to ensure that the Work is being performed in accordance with the Agreement. The superintendent shall not be removed from the Project without the Owner's prior written approval. The superintendent shall represent the Contractor, and all directions given the superintendent shall be binding as if given to the Contractor.
- 4.2. The Contractor and all Subcontractors shall employ only competent and experienced personnel. The Contractor's personnel on the Site shall include, but not be limited to, a quality assurance representative, a safety representative and an individual knowledgeable in environmental rules and regulations. In the event that the Owner believes, in its sole judgment, that any of the Contractor's personnel are objectionable, the Owner shall so notify the Contractor, where upon the Contractor shall promptly investigate and take appropriate corrective action including, where requested by the Owner, removal of such personnel and

replacement with personnel acceptable to the Owner.

- 4.3. Whenever required by law, regulations, or code, or any applicable governmental approval, the Contractor shall employ only licensed and properly trained personnel in the performance of the Work.
- 4.4. The Contractor and all Subcontractors shall have full responsibility for all employees employed on or in connection with the Project and shall employ only such employees who shall cooperate with all other individuals working at the Site.
- 4.5. Contractor shall perform, and its personnel shall be subject to, background checks in accordance with Article 55.0, Personnel Background Checks.

## 5.0 Familiarity with Work

- 5.1. The Contractor represents that it has fully acquainted itself with, and has carefully examined all documents and conditions relevant to its Work and this Project to insure that they are sufficient to properly complete the Work; all relevant plans, surveys, measurements, dimensions, calculations, and estimates to be sure that they contain no errors or inaccuracies; the nature and location of the Work, the character of equipment, materials and facilities needed preliminary to and during the prosecution of the Work; the general and local conditions (including environmental conditions and labor relations); and all other matters which can in any way affect the Project and the Work and its cost under the Agreement. The Owner assumes no responsibility whatsoever for ascertaining for the Contractor any facts which the Contractor could have ascertained for itself through such investigation. The Contractor shall notify its Subcontractors of the requirements of this Section.
- 5.2. Lack of knowledge of any of the foregoing matters shall not constitute an excuse for delay or failure of performance under the Agreement, nor shall it justify any increase in the price as determined under the Agreement.
- 5.3. The Contractor hereby represents that it has all information and documentation with respect to equipment, materials, facilities or any other matters which are or will be necessary to enable the Contractor to safely and reliably perform the Work.
- 5.4. Except as is otherwise specified within the Agreement, all loss or damage to the Contractor arising out of its performance of the Work, whether due to the elements, unforeseen circumstances, subsurface conditions or otherwise, shall be sustained and borne by the Contractor at its sole cost and expense.
- 5.5. Items of materials, equipment or otherwise shall not be substituted for those specified, nor shall "or equal" items be furnished pursuant to the Agreement without the Owner's prior written approval. The Owner's

decision on item equality shall be final and binding on the parties.

- 5.6. The Owner and its engineers make no warranty for the detail, accuracy, or completeness of the Contract Documents including, but not limited to, the Specification and Drawings.

## 6.0 Changes in the Work

- 6.1. No additions to, deletions from, or alterations in the Work and no amendment or repeal of, and no substitution for any terms, conditions, provisions or requirements of the Agreement shall be made unless first authorized in writing by the Owner. No verbal changes in the Agreement shall be recognized by the Owner unless in accordance with Section 17.2.
- 6.2. The Owner may at any time make additions to or deletions from or changes in the Project and/or Work, including changes to the Specification, Drawings or the schedule. If such changes add to or deduct from the Contractor's cost of the Work or affect the schedule the Contractor shall notify the Owner in writing within five (5) Days of such change and provide a written estimate of such cost and/or schedule modifications and, if the Owner approves, the Agreement will be adjusted accordingly. Any claim for an extension in the schedule caused thereby shall be adjusted at the time of ordering such change and the value of any such change shall be determined as provided in Section 6.5.
- 6.3. If the Contractor desires a change in the Work necessary to complete the Work or believes that any order, instruction, request, clarification or interpretation of the Owner, or its representatives or compliance with any laws, orders or regulations, constitutes a substantial change in the Work, the Contractor shall submit, to the Owner, prior to performance of any such Work, and within five (5) Days of receipt or discovery thereof, a written claim specifying the nature of the change, any increase or decrease in the cost of performing the Work, and any resulting change in the schedule. Within thirty (30) Days of receipt of said notice, the Owner shall determine whether the claim constitutes a change in the Work and if so to what extent the Agreement should be modified. The Owner shall then notify the Contractor, in writing, of its decision. Any change in the schedule shall be specified in the Owner's notice and any change in price as determined under the Agreement shall be determined in accordance with Section 6.5 below.
- 6.4. The Owner may require the Contractor to proceed with Work which is the subject of a proposed or claimed change in the Work prior to the Owner's consent to any change in the price or schedule, in which event the Owner shall so notify the Contractor in writing, and the Contractor shall then proceed with the Work, and keep an accurate account as required under Section 6.5 (c), including but not limited to, submittal to the Field Representative by 10:00 a.m. of the next Day worked an accurate daily account of the cost and time thereof for each day worked on each proposed or claimed change, and the Contractor and the Owner shall

then negotiate in good faith with respect to said change.

- 6.5. If the Owner authorizes a change in the Work as set forth in this Article 6.0 which adds to or decreases the cost of the Work, the Contractor shall proceed with the Work as changed, and the Owner shall, in its sole discretion, adjust the price by (a) a mutually agreed upon lump sum or unit price, (b) a unit price as set forth in the Agreement or, (c) in accordance with the following:
  - 6.5.1. Reimbursement for all labor, based on the actual direct verifiable amount of time incurred in performing the changes, at the rates set forth in the Agreement. The rates shall include all indirect and overhead expenses, including, but not limited to, field supervision, an allowance for small tools and equipment with a value less than \$1,000.00 new, and light duty vehicles up to 1½ tons gross weight, and such items shall not be separately charged. Labor not anticipated by or itemized in the Agreement shall not be utilized without the Owner's prior written approval. The rates shall be reduced for each individual when that individual reaches the maximum annual FICA, FUI and SUI contribution limits;
  - 6.5.2. Except as otherwise provided in Section 6.5.1, reimbursement for Contractor owned tools and equipment not already employed at the Site (unless reimbursement is otherwise authorized by the Owner), based on the actual verifiable amount of time incurred in performing the changes, at the rates set forth in the Agreement, (The equipment rates shall include costs for fuel, oil, grease, repair, parts, taxes, insurance, service and maintenance of any kind and all necessary attachments, overheads and profit.). Reimbursement shall not be allowed for any equipment or tools with a new cost of the equivalent of one thousand Dollars (\$1,000.00) or less, each. Contractor owned or purchased equipment not anticipated by or itemized in the Agreement shall not be utilized without the Owner's prior written approval, and the rate for such equipment shall in no event exceed the rates published in the most current "Rental Rate Blue Book for Construction Equipment" then in effect for the same or like equipment;
  - 6.5.3. Reimbursement for rental of equipment, not set forth in the Agreement, based on the actual verifiable cost for rental and necessary attachments, to the extent actually incurred in performing changes, plus, if applicable, the hourly operating cost, less operator and any assistants included in 6.5.1, published in the then most current "Rental Rate Blue Book for Construction Equipment". (Reimbursement shall not be allowed for any equipment or tools with a new cost of the equivalent of one thousand Dollars (\$1,000.00) or less, each.);
  - 6.5.4. Reimbursement for all Subcontractor, subject to Owner's prior authorization to subcontract in each specific instance of change,

costs actually and reasonably incurred in performing changes. Applicable Subcontractor costs shall be subject to the same terms and conditions set forth in Sections 6.5.1 through 6.5.3, and 6.5.5 and 6.5.6, unless otherwise agreed to by Owner;

6.5.5. Reimbursement for the actual verifiable net (no mark-ups) cost of materials directly purchased in support of the extra Work as authorized by the Owner.

6.5.6. In the event that the Contractor is to be paid pursuant to Sections 6.5.1 through 6.5.5, the Contractor shall, on a daily basis, furnish the Field Representative with Daily Work Reports (in a format acceptable to the Owner) which briefly describe the Work rendered during the preceding day and which are itemized to reflect: the names of all the Contractor's and the Subcontractor's personnel who performed Work under this Section 6.5(c), their rate per hour, the individual and total number of hours worked, and the total labor cost for the day; equipment used, its rate per hour, the individual and total hours worked and the total equipment costs for the day; and quantity(ies) of Contractor furnished material(s) received and consumed for the day, and the cost thereof if requested by the Owner. All labor hours, equipment hours and material quantities shall be verified by signature of the Field Representative. A duplicate of the original signed Daily Work Report and receipts and invoices for Contractor furnished materials, rented equipment and Subcontractors shall accompany all invoices which the Contractor shall present for payment.

6.6. If the Owner authorizes a change in the Work which decreases the amount and cost of the Work, such decrease shall not constitute basis for a claim by the Contractor for any loss or damages including anticipated profit.

6.7. The Owner shall not accept any changes submitted by the Contractor pursuant to this Article 6.0 after final payment.

6.8. All additional work shall be performed in accordance with the terms and conditions of the Agreement insofar as they are applicable thereto.

## 7.0 Material and Services Furnished by the Owner

7.1. The Owner will provide the materials and services set forth in the Agreement.

## 8.0 Performance and Schedule

8.1. The Contractor shall submit a schedule and scheduling progress and update information as required and set forth in the Agreement.

- 8.2. The Contractor shall perform the Work in accordance with the schedule. Once commenced the Work shall be prosecuted continuously to completion unless otherwise agreed to by the Owner.
- 8.3. The Contractor shall maintain a labor force of sufficient size and competence to conform to and complete all Work on schedule and within the scheduled hours and days set forth in the schedule unless otherwise directed or approved by the Owner.
- 8.4. The Contractor shall limit its Work at the Site to eight (8) hours per day and forty (40) hours per week and normal working hours, between 7:00 a.m. - 5:00 p.m., Monday through Friday, unless otherwise specified elsewhere in the Agreement. Extended hours shall be subject to the Owner's written approval.
- 8.5. Time is of the essence as to performance by the Contractor of its obligations under the Agreement. If, at any time during the term of the Agreement, except for delays occurring pursuant to Sections 35.1 and 39.1, in the opinion of the Owner the Contractor does not meet the schedule, the Owner may for each incident of delay, at no additional cost to the Owner, at its sole option:
- 8.5.1. Require the Contractor to get back on schedule by working additional shifts and/or additional days and/or increasing its manpower, supervision, tools, and/or equipment.  
and/or
  - 8.5.2. Treat such failure as a material breach and repudiate and terminate the Agreement and recover damages in accordance with Article 36.0.  
and/or
  - 8.5.3. Require the Contractor to pay the Owner liquidated damages, as may be provided for in the Agreement, provided, however, once the Owner elects liquidated damages for an incident of delay its right to invoke the remedies under 8.5.1 or 8.5.2 for said delay shall be extinguished.
- 8.6. Any failure by the Owner to invoke any of the provisions of Section 8.5 shall not constitute a waiver of its right to subsequently invoke said provisions or its entitlement to any other damages provided for elsewhere in this Agreement.
- 8.7. No request for extension of time for completion of the Work, or any other change to an approved schedule, shall be granted to the Contractor unless in a signed writing and except as provided in Article 6.0 and Sections 35.1 and 39.1.

- 8.8. Notwithstanding the foregoing, if the Contractor incurs delays and believes that changes in the Project or changed conditions beyond the Contractor's control are the cause of the delay, the Contractor shall provide prompt written notice to the Owner in the manner set forth in Section 6.3 of the changes or changed conditions that justify excusing the Contractor from meeting the schedule. If the Owner agrees with the Contractor, the Owner will, in accordance with Section 6.3, approve an extension of time for completion of the Work. Such extensions of time however shall not include any additional payment for extended overhead.
- 8.9. When necessary to accommodate the Owner's operating requirements, the Owner shall have the option to order any portion of the Project performed at times other than normal working hours or on weekends or holidays, in which event extra costs, if any, for such work shall be paid to the Contractor in accordance with Section 6.5.

#### 9.0 Delivery, Unloading and Storage

- 9.1. The Contractor shall deliver, receive, unload, store in a secure place, and deliver from storage all equipment and material, whether Owner or Contractor furnished, required for the performance of the Work in accordance with the Agreement, and all manufacturers' recommendations. Receiving of equipment and materials, whether Contractor or Owner furnished, shall include inspection for correctness of quantity, quality, and damage, all of which shall be reported in accordance with Article 15.0.
- 9.2. Deliveries shall be made between the hours of 7:00 am and 2:00 pm, Monday through Friday, unless otherwise arranged with the Field Representative.
- 9.3. The Contractor shall be solely responsible for storage and protection of equipment and material, whether Owner or Contractor furnished, against deterioration or damage from any cause, vandalism, and theft until Final Acceptance.

#### 10.0 Contract Price

- 10.1. The Contract Price, as set forth in the Agreement, shall be equitably adjusted to cover any additions, deletions or changes to the Project pursuant to Article 6.0 and for any adjustments required under Article 35.0.
- 10.2. The Contract Price shall include sales, use and similar taxes, unless otherwise provided for in the Agreement.
- 10.3. The Owner shall not be responsible for any Federal, state, and/or local, personal property, license, privilege, or other like taxes, which may now or hereafter be applicable to the transactions under the Agreement.

- 10.4. The Contractor shall pay or cause to be paid all taxes and employer contributions imposed by present and future Federal, state, and local laws with respect to compensation of employees of the Contractor and all interest and penalties payable under said laws as a result of noncompliance therewith, and the Contractor shall indemnify and hold harmless the Owner from and against any and all claims, liabilities and expenses with respect to the foregoing.

#### 11.0 Payment

- 11.1. The Contractor shall submit invoice(s) in accordance with the Agreement. Each invoice shall reference the Owner's Purchase Order Number. Said invoice(s) shall include cost breakdowns and unit quantities as specified by the Owner. The Contractor shall submit a completed and properly executed Partial Lien Release, as set forth in the Agreement, with each invoice, for the Work included in said invoice.
- 11.2. In addition to the specific requirements for each payment, the Contractor's submittal of an invoice shall represent a certification that it has complied with: a) the quality assurance requirements set forth in Article 30.0; b) all scheduling requirements set forth in Article 8.0; c) the safety requirements set forth in Article 32.0; d) all environmental requirements set forth in Article 34.0; and e) all other terms and conditions of the Agreement.
- 11.3. Ten percent (10%) of each invoice shall be retained by the Owner until Final Acceptance by the Owner.
- 11.4. Except as otherwise expressly provided for in the Agreement, all invoices, less monies withheld under Section 11.3, shall be due and payable thirty (30) Days from receipt by the Owner of a proper invoice and any required supporting documentation, subject to the Owner's right to contest, in good faith, all or any part of the charges set forth therein.
- 11.5. Payment by the Owner shall not relieve the Contractor of any responsibility or obligation under the Agreement, nor shall it constitute a waiver by the Owner of any claim arising hereunder.
- 11.6. No payment made hereunder, except for the final payment, shall be considered as acceptance of any Work. All payments shall be subject to correction or adjustment in subsequent payments.
- 11.7. The Owner shall, without waiver or limitation of any rights or remedies, be entitled from time to time to deduct from any amounts due or owing the Contractor under the Agreement any and all amounts owed by the Contractor to the Owner or an Owner's affiliate, whether or not in connection with the Agreement.

## 12.0 Payments Withheld Prior to Final Acceptance of Work

- 12.1. Notwithstanding any other provision of the Agreement, prior to Final Acceptance of the Work, the Owner may withhold or nullify the whole or part of any payment to such extent as may be necessary to protect itself from loss caused by, but not limited to:
- (a) Defective work not remedied;
  - (b) Claims filed or reasonable evidence indicating probable filing of claims against the Owner or by the Owner or other parties against the Contractor;
  - (c) Failure of Contractor or Subcontractors (of any tier) to make payments properly to Subcontractors (of any tier) or for material or labor or for any taxes due;
  - (d) Damage to another contractor;
  - (e) Removal and replacement of condemned work and/or material;
  - (f) Incomplete documentation;
  - (g) Inadequate insurance coverage;
  - (h) Disputed work;
  - (i) Environmental damage;
  - (j) Bonding of Contractor lien;
  - (k) Failure to properly clean up the site;
  - (l) Damage to utilities;
  - (m) Damage to public or private property; and
  - (n) Liquidated damages assessed to the Contractor.
- 12.2. When the above grounds are removed or the Contractor provides a surety bond satisfactory to the Owner which protects the Owner in the amount withheld, payment shall be made within thirty (30) Days thereafter to the Contractor for the amount withheld.

## 13.0 Final Acceptance and Final Payment

- 13.1. Upon receipt of written notice from the Contractor that the Work is completed and ready for final inspection and acceptance, the Owner shall inspect the Work and determine if the Work has been fully performed in accordance with the terms and conditions of the Agreement.

- 13.2. If the Owner determines the Work is not complete, its written notice of rejection shall include a list of items that the Contractor shall finish in order for the Work to be complete under the terms and conditions of the Agreement. The Contractor shall within two (2) Days of said notice provide for the Owner's review and approval a schedule detailing when all defects will be corrected and/or the Work completed. Upon approval by the Owner, the Contractor shall remedy such defective and incomplete portions of the Work. The steps in Sections 13.1 and this Section 13.2 shall be repeated until the Owner accepts the Work as complete and so notifies the Contractor of its acceptance.
- 13.3. Upon acceptance, the Contractor shall deliver to the Owner a complete set of as-built drawings, and shall satisfy the Owner through the execution and filing with the Owner of the Release and Agreement form, as set forth in the Agreement, that all bills for labor, materials, licenses, taxes and other expenses and claims for which the Owner might be sued or for which a lien might be filed on account of the Agreement have been fully satisfied. Upon the Owner's acceptance of the Work and the Contractor's satisfactory fulfillment of the requirements of this Section 13.3 and Section 43.3, the Owner will notify the Contractor of its Final Acceptance of the Work.
- 13.4. Upon Final Acceptance, final payment, including money retained in accordance with Section 11.3, will be made.
- 13.5. Acceptance of the final payment shall constitute a waiver of all claims by the Contractor.
- 13.6. Final payment shall not relieve the Contractor of any warranty, guarantee or other continuing obligations under the Agreement.

14.0 Inquiries, Communication, and Regulatory Inspections

- 14.1. The Contractor shall immediately notify the Owner of all communications from regulatory agencies including, but not limited to, notices, postings, letters, telephone calls or visits.
- 14.2. The Contractor shall immediately notify the Owner of any inquiries from the media. Requests for information from the media shall be reviewed and approved by the Owner prior to response by the Contractor.
- 14.3. The Contractor shall immediately notify the Owner of any calls or other communications from the public. Requests for information from the public shall be reviewed and approved by the Owner prior to response by the Contractor.
- 14.4. The Contractor shall notify the Owner as soon as the Contractor becomes aware of a current or scheduled regulatory inspection. The Owner will arrange a time for the inspection and designate an Owner representative who will accompany the regulatory inspectors. The Contractor shall also

designate a representative who will accompany the regulatory inspectors.

The Contractor shall fully cooperate with the Federal, state, and local regulatory agencies during inspections or other official functions. If an inspector from a Federal, state or local regulatory agency arrives at a location unannounced and wishes to conduct an inspection, the Contractor shall obtain and subsequently submit to the Owner the inspector's name, agency and telephone number and shall accommodate the inspector. If the conduct of an inspection will, for reasons such as safety considerations, put the inspector or the Contractor's representative at risk of injury, the Contractor shall attempt to reschedule the inspection at a date and time acceptable to all parties.

- 14.5. During an inspection, the inspector may request permission to sample fluids, soils or other materials. If samples are taken, the inspector shall be requested by the Contractor to provide duplicate samples which should then be forwarded to the Owner as soon as possible. The Contractor shall request the inspector to provide duplicate copies of all photographs and/or such other records or reports taken during or generated by an inspection and shall submit them to the Owner upon their receipt by the Contractor.
- 14.6. If a Notice of Noncompliance or any other official correspondence is received by the Contractor from a regulatory agency, a copy of the notice or correspondence shall be provided to the Owner within twenty four (24) hours of its receipt.

#### 15.0 Meetings and Reports

- 15.1. The Contractor shall attend Project meetings as often as deemed necessary by the Owner during the term of the Agreement.
- 15.2. By 10:00 a.m. of the next day worked the Contractor shall submit a written daily report to the Field Representative for each day worked, which shall include, but not be limited to the date, weather, listing of all Contractor's and Subcontractor's construction force (itemized by craft, supervisory, and employer), Work performed (type, amounts, locations), equipment used (idle equipment so noted), materials received, delays encountered and their cause, recordable and "Lost Time" accidents or incidents, instructions given to Contractor, general remarks, and Project Site visitors. The Contractor shall also submit to the Owner a daily report for all days not worked by the end of the next day worked which shall include, but not be limited to, the date, weather, and the reason no work was performed.
- 15.3. The Contractor shall notify the Owner of an occurrence as set forth in the Agreement. The Contractor shall submit to the Owner a written report of each accident/incident involving personal injury or property damage. This report shall include, but not be limited to: the date, names of injured individuals, Contractor and Subcontractors involved, any third parties involved, employer, supervisor's name, description of injury and/or

property damage, description of how accident/incident occurred, names of witnesses, social security number or tax identification number of all individuals involved, and safety equipment employed or not utilized. The Contractor may suggest preventative procedures to be implemented to prevent reoccurrence.

- 15.4. The Contractor shall submit to the Owner specific reports as maybe required elsewhere in the Agreement.

#### 16.0 Documents

- 16.1. The Contractor shall supply all documents in quantities and types, at times, according to instructions, and in the manner set forth in the Agreement. Upon the Owner's request, any other documents prepared by the Contractor in connection with the Project shall be delivered to the Owner upon completion, cancellation or termination of the Agreement.
- 16.2. Any document, which is prepared by the Contractor in connection with the Agreement, shall be submitted in accordance with the Agreement, with sufficient time for the Owner to review and comment.
- 16.3. The Owner's review of or comments on any document shall not relieve the Contractor of its sole responsibility for the correctness and adequacy of the Contractor's Work, including but not limited to the correctness of design, detail, dimensions, or erection or any other obligation of the Contractor hereunder.
- 16.4. All documents furnished by the Owner, including but not limited to the Specification and Drawings and copies thereof and documents produced by the Contractor for the Owner shall be the property of the Owner, shall be used by the Contractor only for performance of the Project, shall not be used on any other jobs, shall not be delivered to any third parties except as is necessary for performance of the Project hereunder, and shall be returned to the Owner upon completion, cancellation or termination of the Agreement.
- 16.5. The Contract Documents including, but not limited to, the Specification and Drawings may not be complete in every detail. The Contractor shall comply with their manifest intent and general purpose, taken as a whole, and shall not ignore or misuse any errors or omissions therein to the detriment of the Project. Should any error, omission, conflict or discrepancy appear in the Contract Documents, referenced documents, or codes, standards or instructions, the Contractor shall immediately notify the Owner in writing and the Owner shall issue written instructions, however, unless otherwise instructed the more stringent requirement shall apply. If the Contractor proceeds with any of the work in question prior to receiving such instructions, then required corrections shall be at the Contractor's expense.
- 16.6. If the Contractor observes that any requirement specified in the

Agreement is at variance with any governing laws, ordinances, rules, regulations, permits or licenses it shall promptly notify the Owner in writing before incurring any further liability, expense or obligation for the Contractor or the Owner.

- 16.7. All documents prepared, procured, or developed by the Contractor and furnished to the Owner in connection with the Project shall be the property of the Owner and may be used by the Owner without restriction, whether during the term of the Agreement or thereafter.

#### 17.0 Discrepancies and Claims

- 17.1. If the Contractor, in the course of the Work, finds any discrepancy between the Agreement, or what could have been reasonably inferred or interpreted there from, and the physical conditions of the locality, or any errors or omissions in the Agreement or in the layout as given by survey points and instructions, or if the Contractor believes, determines or observes that performance of any part of the Project as required by the Agreement would or might result in the Project being deficient or unsafe or failing to comply with standard practice, law or regulation, the Contractor shall immediately notify the Field Representative in writing and shall suspend that part of the Work until otherwise directed by the Owner. Any Work done after such discovery or after the Contractor should have been reasonably expected to make such discovery, until authorized by the Owner, shall be done at the Contractor's risk, and the Contractor shall be liable for all costs arising there from, unless otherwise authorized in writing by the Owner.
- 17.2. Except in an emergency endangering life or property, if the Contractor claims that any instructions, written or verbal, or by Drawings or other media issued after the date of the Agreement involve extra cost and/or an extension of time, it shall give the Owner written notice thereof as set forth in Section 6.3. No such claim shall be valid unless so made.

#### 18.0 Changed Conditions

- 18.1. The Contractor shall promptly, and before such conditions are disturbed, give the Field Representative written notice in accordance with Section 6.3 of subsurface or latent physical conditions at the Site differing materially from those indicated in the Agreement. The Owner shall promptly investigate the conditions, and if it finds that the Owner bears the risk under the terms of the Agreement of such unanticipated conditions and that such conditions do so materially differ and cause an increase or decrease in the cost of, or the time required for, performance of the Agreement, an equitable adjustment shall be made in accordance with Article 6.0. Any claim of the Contractor for adjustment hereunder shall not be allowed unless it has given notice as above required and before such conditions are disturbed.

## 19.0 Surveys

- 19.1. If specified, the Owner will furnish the primary control to be used for establishing lines and grades required for the Work. The Contractor shall preserve all monuments, benchmarks, reference points and stakes. From the information provided by the Owner, the Contractor shall develop and make all detail surveys needed for the performance of the Work.

## 20.0 Delivery of Clear Title

- 20.1. The Contractor shall deliver all equipment to the Owner with good, clear and marketable title, free from any defects, liens or encumbrances of any kind; shall indemnify and hold harmless the Owner and its affiliates and warrant and defend title against any claims or demands of third parties; and shall take such action at the Contractor's sole expense as may be necessary to discharge any defect in title, or lien or encumbrance on the Equipment.

## 21.0 Warranty

- 21.1. The Contractor warrants: (a) that it is aware of the purpose for which its Work is being used and that its work shall be suitable for said purpose; (b) that all Work shall conform to the Drawings, Specification, and other requirements of the Agreement; (c) that all Services shall be performed by qualified and competent personnel, and in accordance with the highest standards of care, skill, and diligence, and consistent with recognized and sound engineering and construction practices and procedures; (d) that all Work shall be of specified quality or, if not specified, of the best quality appropriate for its intended purpose; (e) that all Work shall be free from faults and defects of any kind, including faults and defects in design, engineering, workmanship, construction, erection, and/or materials; (f) that all equipment is installed to meet current OSHA regulations; and (g) that all equipment and material shall be new, current production, fit for the purpose for which they are intended, of size, capability, and materials sufficient to meet in all respects the requirements and conditions specified in the Agreement.
- 21.2. If the Contractor breaches any of the warranties set forth above, the Owner shall have available all remedies at law and equity.
- 21.3. Not limiting the foregoing, if prior to the expiration of two (2) years from the date of Final Acceptance, or such longer period if contained in a warranty furnished to or obtained by the Contractor from any Subcontractors, as provided in Section 21.7, the Owner gives the Contractor written notice that any part of the Contractor's Work fails to comply with the warranties set forth in Section 21.1, at the option of the Owner, (a) the Contractor shall promptly repair, replace, or otherwise cure or have cured, replaced, or repaired such nonconforming, defective, or erroneous Work to the Owner's satisfaction at no additional cost to the

Owner; (b) the Contractor shall refund the amount of money paid by the Owner attributable to such noncomplying, defective, or erroneous Work; or (c) the Owner shall have said nonconforming, defective, or erroneous Work remedied by a third-party and have the Contractor reimburse the Owner for the cost thereof.

- 21.4. If the Contractor should fail or refuse to commence or diligently proceed with any repair, replacement, or cure required by this Article 21.0, after having received notice from the Owner to do so, the Owner may, after a reasonable time but in any event not less than five (5) Days thereafter, repair, replace, or otherwise cure said Work or have said Work repaired, replaced, or otherwise cured without impairing the warranties stated herein, and the Contractor shall reimburse the Owner for the cost of such repair, replacement, or cure.
- 21.5. If the Owner selects Section 21.3 (a) or (c) or if Section 21.4 is applicable, repair, replacement or cure of the defective Work shall include but not be limited to the cost of material, transportation (if necessary), labor and equipment expenses, the Owner's administrative costs and incidentals for the removal and replacement of the affected Work. The Owner may require the Contractor to use overtime work at no cost to the Owner if such additional effort will shorten the time the Work is nonconforming.
- 21.6. If any warranty Work is required under this Article 21.0, the Contractor's warranties and responsibilities shall recommence upon all such Work and shall be in effect for the duration of the warranty period specified in Section 21.3 or for twenty four (24) months after the warranty Work is completed, whichever is later, as if such Work was initially performed without defect and no warranties were required.
- 21.7. The Contractor shall obtain from each Subcontractor, and extend to the Owner for its benefit, warranties for all Work performed or supplied by such Subcontractor. Any such warranties shall be in addition to and shall not be limited by or themselves limit, the warranties of the Contractor otherwise provided in the Agreement. The Contractor shall deliver to the Owner copies of any Subcontractor's warranties.
- 21.8. All warranty Work performed by the Contractor shall be scheduled by and at times acceptable to the Owner.
- 21.9. Notwithstanding any other provision of the Agreement, this Article 21.0 shall survive the termination or expiration of the Agreement.

## 22.0 Liability and Indemnification

- 22.1. If any act or omission to act on the part of the Contractor or its Subcontractors or any person under their control causes in whole or part, death or injury to any person, including but not limited to the Owner's or the Owner's affiliates' employees, or any damage to, environmental contamination of, or destruction of any property, including but not limited

to property of the Owner or the Owner's affiliates, the Contractor shall be liable for any claims, losses, damages and costs (including legal expenses) arising therefrom.

- 22.2. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless, and at the Owner's option, defend the Owner, its affiliates and their officers, directors, employees, agents, successors, assigns, and servants, from and against any and all claims and/or liability for damage to property, injury or death of any person, including, but not limited to, the Contractor's employees, Subcontractors, and the Subcontractor's employees, or any other liability incurred by the Owner or its affiliates, including expenses, legal or otherwise, caused wholly or in part, by any act or omission, negligent or otherwise of the Contractor, its Subcontractors and their officers, directors, employees, agents, servants, or assigns, arising out of or connected with the Agreement, regardless of whether caused in part by a party indemnified hereunder.
- 22.3. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless, and at the Owner's option, defend the Owner and its affiliates and their officers, directors, employees, agents, servants, and assigns from and against any liability, loss, or expense arising by reason of claims by any third party, including, but not limited to, the Contractor's employees, Subcontractors, and Subcontractors' employees as the result of the actual or asserted failure, omission, or neglect of the Contractor to comply with the Agreement.
- 22.4. The obligations under Article 22.0 shall not be limited in any way by any limitation on the Contractor's insurance or by a limitation on the amount or type of damages. In addition, the obligations under Section 22.2 and 22.3 shall not be limited in any way by any compensation or benefits payable by or for the Contractor or any Subcontractor under worker's compensation acts, disability benefit acts or other employee acts.
- 22.5. The Owner shall not be liable to the Contractor for consequential, special, incidental, multiple, or punitive damages (including attorney's fees or litigation costs) for performance or non-performance of the Agreement or for any actions undertaken in connection with or related to the Agreement, including without limitation damage claims based on causes of action for breach of contract, tort (including negligence), Massachusetts Chapter 93A, or any other theory of recovery.
- 22.6. Except to the extent that an element of profit is included in the price for Work as determined under the Agreement and such amounts are past due and owing to the Contractor for Work actually performed, the Owner shall not be liable to the Contractor for claims of lost profits, whether such claims of lost profits are categorized under the Agreement as direct or consequential damages, or whatever the theory of recovery (including without limitation negligence, breach of contract, or actions under Massachusetts Chapter 93A, if applicable.).
- 22.7. In no case shall the Owner's liability to the Contractor exceed the price for

Work as determined under the Agreement.

- 22.8. Notwithstanding any other provision of the Agreement, this Article 22.0 shall survive the termination or expiration of the Agreement.

23.0 Royalties and Patents

- 23.1. Royalties and fees for patents covering materials, articles, apparatus, devices, equipment or processes used in the Work shall be included in the Contract Price. Contractor shall satisfy all demands that may be made at any time for such royalties or fees.
- 23.2. The Contractor guarantees that all Work provided by the Contractor under the Agreement shall be free from claims of patent, copyright, and/or trademark infringement.
- 23.3. The Contractor shall indemnify, hold harmless, and, at the Owner's option, defend the Owner and its affiliates and their officers, directors, employees, agents, servants, successors and assigns from and against all claims, losses, costs, damages, suits, actions, and proceedings for actual or alleged infringement of any patent, copyright, or trademark resulting from any sale, use, or manufacture of any item delivered hereunder, and pay and discharge all judgments, decrees, and awards rendered therein and bear all expenses and legal fees associated therewith.
- 23.4. In the event of any adjudication that the Work, or any part thereof, infringes any patent, copyright, or trademark or in the event that the use of any part of the Project is enjoined as a result of any claim that the Work infringes any patent, copyright, or trademark the Contractor shall, at its sole expense, either: (a) procure for the Owner the right to continued use; or (b) without impairing performance capability, replace the infringed Work with substantially equivalent noninfringing Work; or modify such Work so it can become noninfringing.
- 23.5. The Contractor shall obtain from its Subcontractors, for the Owner's benefit, agreements similar to those contained in this Article 23.0.
- 23.6. Notwithstanding any other provision of the Agreement, this Article 23.0 shall survive the termination or expiration of the Agreement.

24.0 Passage of Title and Risk of Loss

- 24.1. Unless otherwise expressly stated herein or agreed to in writing, executed by both parties, title to all equipment, or portions thereof, shall pass to Owner upon its delivery to the Site. Passage of title shall not be construed to impair any rights which the Owner may otherwise have to recover damages or reject equipment which does not meet the requirements of the Agreement.

- 24.2. The Contractor shall bear all risk of loss or damage of any kind to the Work until Final Acceptance by the Owner, regardless of whether title has passed to the Owner.
- 24.3. The Contractor shall bear the cost of all packaging and shipment of equipment and material to the Site, of all unloading, storage, protection and installation of equipment and material at the Site, and of any insurance on the equipment prior to Final Acceptance by the Owner, regardless of whether title has passed to the Owner.
- 24.4. The Contractor shall bear the risk of loss or damage to any Work during its repair, replacement, or cure if the Contractor is responsible for such repair, replacement or cure.
- 24.5. The Contractor shall be responsible for the security of all (1) materials and equipment under its custody and control, and unless otherwise stated in the Agreement, (2) the Site. The Contractor shall cooperate with the Owner regarding all security measures instituted at the Site.
- 24.6. The Contractor shall at all times conduct operations in a manner to ensure the safety of the general public and to avoid the risk of loss, theft, or damage by vandalism, sabotage, or any other means. The Contractor shall continually inspect the Project, materials, and equipment to discover and determine any conditions that might involve such risks and shall be solely responsible for discovery, determination, and correction of any such conditions.

#### 25.0 Contractor's Insurance

- 25.1. From the commencement of the Agreement, through final expiration or longer where specified below, the Contractor shall provide and maintain, at its own expense, insurance policies, intended to be primary (with no right of contribution by any other coverage available to National Grid USA its direct and indirect parents, subsidiaries and affiliates (the "Insured Entities")), covering all Operations, Work and Services to be performed under or in connection with this Agreement, issued by reputable insurance companies with an A.M. Best Rating of at least B+, which at least meet or exceed the requirements listed herein:

- (a) **Workers' Compensation and Employers Liability insurance** as required by the State in which the work activities under this Agreement will be performed. If applicable, Coverage shall include the U.S. Longshoreman's and Harbor Workers Compensation Act, and the Jones Act. The employer's liability limit shall be at least \$500,000 each per accident, per person disease, and disease by policy limit.

In the event any employee of the Contractor is loaned or leased to the Insured Entities, the Contractor will have an "alternate

employer” endorsement added to its workers’ compensation policy in favor of such Insured Entity. In the event such endorsement has not been added to the policy at the time a claim arises, the Contractor shall indemnify and hold harmless the Insured Entities from any liability that would have otherwise been covered had that endorsement been added.

If the Contractor is exempt from having to obtain and maintain workers’ compensation coverage due to their legal status as a sole proprietor or partnership, Contractor shall obtain:

1. Long term disability insurance covering any illness or injury incurred in connection with this Agreement that prevents the Contractor from working, with benefits of at least 50% of the Contractors monthly income on the last day before the disability begins.
2. Health Care Insurance, covering any loss occasioned by bodily injury, sickness or disease, and medial expense, with limits, coverage, deductibles, co-insurance payments, and any other cost sharing features customarily maintained by other Contractors of a similar size and business nature.

(b) **Commercial General Liability (CGL) Insurance**, covering all operations to be performed by or on behalf of Contractor under or in connection with this Agreement, with minimum limits of:

Bodily Injury (BI)	- \$1,000,000 per occurrence
Property Damage (PD)	- \$ 500,000 per occurrence
OR	
Combined Single Limit	- \$1,000,000 per occurrence
OR	
BI & PD per Occurrence	- \$1,000,000
General Aggregate & Product Aggregate	- \$2,000,000 each

- Coverage shall include: contractual liability (with this Agreement, and any associated verbal agreements, being included under the definition of “Insured Contract” thereunder), products/completed operations, and if applicable, explosion, collapse and underground (XC&U).
- If the products-completed operations coverage is written on a claims-made basis, the retroactive date shall not precede the effective date of this Agreement and coverage shall be maintained continuously for the duration of this Agreement and for at least two years thereafter.
- Additional Insured as required in Article 25.3 below.
- The policy shall contain a separation of insureds condition.
- A liability insurance policy containing an annual aggregate limit of liability shall be amended to reflect that the annual aggregate limit applies on a per project basis.

Bodily Injury (BI)	- \$1,000,000 per occurrence
Property Damage (PD)	- \$ 500,000 per occurrence
OR	
Combined Single Limit	- \$1,000,000 per occurrence

This coverage shall apply on a per project basis.

This requirement may be satisfied by providing either this CPL policy, which would include naming the Insured Entities, including their officers and employees, as additional insured's as outlined in Article 25.3 below; **OR** by providing coverage for sudden and accidental pollution liability under the CGL and commercial automobile insurance policies required above - limited solely by the Insurance Services Organization (ISO) standard pollution exclusion, or its equivalent.

In the event the Contractor is unable to secure and/or maintain any or all of this sudden and accidental pollution liability coverage, the Contractor agrees to indemnify and hold the Insured Entities harmless against any and all liability resulting from any coverage deficiency that is out of compliance with this insurance requirement.

- (h) **Risk of Loss:** The Contractor shall be responsible for all risk of loss to its equipment and materials, and any other equipment and materials owned by its employees or by other third parties that may be in their care, custody and control. If this coverage is excluded from the Commercial General Liability policy, then Owner will accept coverage under the Contractor's property policy.

In the event that any equipment or materials (Goods) are supplied by the Insured Entities, Owner will provide the insurable value of the Goods to the Contractor in writing, both cumulatively and on a maximum per item basis. The Contractor will provide replacement cost insurance for these Goods under a blanket builder's risk policy, an equipment floater, or other equivalent coverage, while such Goods are under the care, custody and control of the Contractor. Such insurance shall cover all Goods outlined in the Agreement or as noted on subsequent contract amendments. The coverage limit shall apply on either a per location basis or a maximum per item basis, and shall name the Insured Entities, as a Loss Payee with respect to their insurable interest as required in Article 25.3 below.

- (i) The Contractor shall provide **professional liability** coverage with a limit of liability as required by Owner. However, this requirement will only apply if the limit of liability was either requested before this Agreement was executed, or added later by way of a mutually agreed contract change amendment.
- (j) **Limits:** Any combination of Commercial General Liability, Automobile Liability and Umbrella Liability policy limits can be used to satisfy the limit requirements in items 25.1 b, c & d above.

If the term of this agreement is longer than five (5) years, in the fifth year, and every five (5) years thereafter, the Commercial General Liability and Umbrella/Excess Liability insurance limits required above shall be increased by the percentage increase in the Consumer Price Index from the month the Agreement was executed to the month immediately preceding the first month of the year in which the increase is required.

- 25.2. **Self-Insurance:** Proof of qualification as a qualified self-insurer, if approved in advance in writing by Owner, will be acceptable in lieu of securing and maintaining one or more of the coverages required in this Insurance Section. Such acceptance by Owner shall become a part of this insurance provision by reference herein.

For Workers' Compensation, such evidence shall consist of a copy of a current self-insured certificate for the State in which the work will be performed.

In order for self insurance to be accepted, the Contractors unsecured debt must have a financial rating of at least investment grade. For purposes of this section, "Investment Grade" means (i) if the Contractor has a Credit Rating from both S&P and Moody's then, a Credit Rating from S&P equal to or better than "BBB-" and a Credit Rating from Moody's equal to or better than "Baa3"; (ii) if the Contractor has a Credit Rating from only one of S&P and Moody's, then a Credit Rating from S&P equal to or better than "BBB-" or a Credit Rating from Moody's equal to or better than "Baa3; or (iii) if the Parties have mutually agreed in writing on an additional or alternative rating agency, then the equivalent credit rating assigned to an entity by such additional or alternative rating agency that is equal to or better than "BBB-" from S&P and/or "Baa3" from Moody's.

- 25.3. **Additional Insured, Loss Payee and Alternate Employer:** The intent of the Additional Insured requirement under the CGL, Auto, CPL, Umbrella/Excess, Aircraft and Watercraft policies is to include the Insured Entities, their directors, officers and employees, as Additional Insured's for liabilities associated with, or arising out of, all operations, work or services to be performed by or on behalf of the Contractor, including ongoing and completed operations, under this Agreement. The following language should be used when referencing the additional insured status: **National Grid USA, its subsidiaries and affiliates shall be named as additional insured.**

For the "alternate employer" endorsement, the following language should be used: **National Grid USA, its subsidiaries and affiliates.**

The Loss Payee language, as required in article 25.1.h, shall read as follows: **National Grid USA, its subsidiaries and affiliates shall be included as a Loss Payee as their interest may appear.**

To the extent the Contractor's insurance coverages do not provide the full Additional insured coverage as required herein, the Contractor agrees to indemnify and hold harmless the Insured Entities against any and all liability resulting from any deficiency in the Contractor's insurance coverage that may be out of compliance with this insurance requirement.

- 25.4. **Waiver of Recovery:** The Contractor and its insurance carrier(s) shall waive all rights of recovery against the Insured Entities and their directors, officers and employees, for any loss or damage covered under those policies referenced in this insurance provision, or for any required coverage that may be self-insured by the Contractor. To the extent the Contractor's insurance carriers will not waive their right of subrogation against the Insured Entities, the Contractor agrees to indemnify the Insured Entities for any subrogation activities pursued against them by the Contractor's insurance carriers. However, this waiver shall not extend to the gross negligence or willful misconduct of the Insured Entities or their employees, subcontractors or agents.

- 25.5. **Subcontractors:** In the event the Contractor uses subcontractors in connection with this Agreement, it is expressly agreed that the Contractor shall have the sole responsibility to make certain that all subcontractors are in compliance with these insurance requirements and remain in compliance throughout the course of this Agreement, and thereafter as required. The Contractor shall remain liable for the performance of the subcontractor, and such sub-contract relationship shall not relieve the Contractor of its obligations under this agreement.

Unless agreed to in writing the by the Risk Management Department of National Grid USA Service Company, any deductible or self insured retentions maintained by any subcontractor, which shall be for the account of the subcontractor, shall not exceed \$100,000. In addition, subcontractor shall name both the Contractor and National Grid USA, (including their subsidiaries, affiliates, officers and employees), as additional insured's under the Commercial General Liability and Umbrella/Excess Liability insurance. If requested by Owner, the Contractor shall provide Owner with an insurance certificate from its subcontractor evidencing this coverage.

In the event any subcontractor is unable to maintain all of the same insurance coverage as required in this insurance article, the Contractor agrees to indemnify and hold the Insured Entities harmless against any and all liability resulting from any deficiency in subcontractor's insurance coverage that may be out of compliance with these insurance requirements.

- 25.6. **Insurance Certification:** Prior to starting work, the Contractor shall promptly provide Owner with (a) **Certificate(s) of Insurance** for all coverages required herein at the following address:

National Grid  
Attn: Risk Management Bldg. B-3  
300 Erie Boulevard West  
Syracuse, NY 13202

Such certificates, and any renewals or extensions thereof, shall outline the amount of deductibles or self-insured retentions which shall be for the account of the Contractor. Such deductibles or self-insured retentions shall not exceed \$100,000 unless agreed to in writing by the Risk Management Department of National Grid USA Service Company, whose approval shall not be unreasonably withheld, delayed or conditioned.

The Contractor shall provide Owner with at least 30 days prior written notice of any cancellation or diminution of the insurance coverage required in this insurance article.

- 25.7. **Insurance Obligation:** If any insurance coverage is not secured, maintained or is cancelled before Final Payment by the Contractor to the Owner, or the completion of all services, work or obligations provided for under this Agreement, whichever is later, and the Contractor fails immediately to procure other insurance as specified, Owner has the right, but not the obligation, to procure such insurance and to deduct the cost thereof from any sum due the Contractor under this Agreement or invoice the Contractor for said coverage.

- 25.8. **Incident Reports:** The Contractor shall furnish the Risk Management Department of National Grid USA Service Company with copies of any non-privileged accident or incident report(s)(collectively, the "Documents") sent to the Contractor's insurance carriers covering accidents, incidents or events occurring as a result of the performance of all operations, work and services to be performed by or on behalf of the Contractor under or in connection with this Agreement, excluding any accidents or incidents occurring on the Contractor property. If Owner is named in a lawsuit involving the operations and activities of the Contractor associated with this Agreement, the Contractor shall promptly provide copies of all insurance policies relevant to this accident or incident if requested by Owner. However, in the event such Documents are deemed privileged and confidential (Attorney Client Privilege), the Contractor shall provide the relevant facts of the accident or incident in a format that does not violate such Attorney Client Privilege.

- 25.9. **Other Coverage:** These requirements are in addition to any which may be required elsewhere in this Agreement. In addition, the Contractor shall comply with any governmental site specific insurance requirements even if not stated herein. This includes providing evidence of insurance and additional insured status, if necessary, to any third party property owner on which the Contractor's work activities associated with this Agreement may be taking place.

- 25.10. **Coverage Representation:** The Contractor represents that it has the required policy limits available, and shall notify National Grid USA Service Company's Risk Management Department in writing when the minimum coverages required in this article herein have been reduced as a result of claims payments, expenses, or both. However, this obligation does not apply to any claims that would be handled solely with in the Contractor's deductible or self-insured retention.
- 25.11. **Responsibility:** The complete or partial failure of the Contractor's insurance carrier to fully protect and indemnify the Insured Entities, or the inadequacy of the insurance shall not in any way lessen or affect the obligations of the Contractor to Owner and the Insured Entities.
- 25.12. **Coverage Limitation:** Nothing contained in this article is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from all operations, work and services to be performed by or on behalf of the Contractor under or in connection with this Agreement, or limiting, diminishing, or waiving the Contractor's obligation to indemnify, defend, and save harmless Owner and the Insured Entities in accordance with this Agreement.

#### 26.0 Assignment and Subcontracting

- 26.1. The Contractor shall not assign the Agreement or any part thereof or any rights or any monies due or to become due thereunder without the prior written consent of the Owner. The Owner may assign the Agreement or any part thereof to any affiliated company. Any assignment of the Agreement in violation of the foregoing shall be void at the option of the Owner.
- 26.2. If the Contractor terminates its existence as a corporate entity or if the Contractor is part of a merger, acquisition, sale, consolidation or take-over, or if all or substantially all of the Contractor's assets are transferred to another person, or business entity, the Owner shall, in its sole discretion, have the right to terminate the Agreement as set forth in Article 36.0 or to require the Contractor's successor to carry out the duties and obligations of the Contractor under the Agreement.
- 26.3. The Contractor shall not subcontract any of the Work under the Agreement without the prior written consent of the Owner. Any subcontracting of the Agreement in violation of the foregoing shall be at the option of Owner void.
- 26.4. If the Contractor proposes to subcontract any of the Work, it shall give written notice thereof to the Owner specifying the name, address, qualifications, and experience of the Subcontractor, and the specific Work which the Subcontractor is to perform. If the Owner consents in writing, the Contractor may subcontract the specific Work to the Subcontractor. All Work performed for the Contractor by a Subcontractor shall be pursuant to an agreement between the Contractor and Subcontractor which binds the Subcontractor to the applicable terms and conditions of

the Agreement for the benefit of the Owner and its affiliates.

- 26.5. If at any time during the performance of the Project, the Owner determines that any Subcontractor is not performing in accordance with the Agreement, the Owner may so notify the Contractor who shall take immediate steps to remedy the performance or to cancel the subcontract, whichever the Owner so requests.
- 26.6. All Subcontractors shall be subject to the foregoing provisions, and nothing contained in the Agreement shall create any contractual relation between any Subcontractor and the Owner or its affiliates, nor relieve the Contractor of any obligation to perform the Work. The Contractor shall be fully responsible to the Owner for the acts and/or omissions of any Subcontractor and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by the Contractor as if no Subcontractors were in place. Any obligation imposed by the Agreement upon the Contractor, where applicable, shall be equally binding upon and shall be construed as having application to any Subcontractor.
- 26.7. No Subcontractor is intended to be or shall be deemed a third-party beneficiary of the Agreement. As a condition of any subcontract, the Contractor shall require any Subcontractor to remove any claim it might have, in law or equity directly against the Owner or its affiliates.

#### 27.0 Subcontractor's Insurance and Indemnification

- 27.1. To the fullest extent permitted by law, the Contractor shall require Subcontractors to indemnify, defend at Owner's option, and hold the Owner and its affiliates and their officers, directors, employees, agents, servants, and assigns harmless from and against any and all claims, demands, actions, losses, damages and expenses, including attorney's fees and other expenses, resulting from or arising out of any of its Subcontractors' performance of Work, unless said loss is caused solely by the negligence of the Owner and provided that the Subcontractor is at least in part at fault. The complete or partial failure of any insurance carrier to fully protect and indemnify the Owner and its affiliates, or the inadequacy of the insurance, shall not in any way lessen or affect the obligation of the Contractor or its Subcontractors to indemnify the Owner and its affiliates.
- 27.2. Notwithstanding any other provision of the Agreement, Section 27.1 shall survive the termination or expiration of the Agreement.

#### 28.0 Independent Contractor

- 28.1. The Contractor is, and shall at all times remain, an independent Contractor.

## 29.0 Examination, Inspection and Testing

- 29.1. The Contractor shall inspect all Work and make or cause to be made all tests required by the Agreement.
- 29.2. At any time during the term of the Agreement, the Owner or its designated representative shall be entitled to: (1) conduct and/or witness any test required by the Agreement; (2) otherwise inspect, witness and/or test the Work; (3) review the Contractor's and Subcontractor's procedures and documents pertaining to inspection, testing or witnessing of tests; and (4) review the Contractor's and Subcontractor's documents pertaining to the Work. For such purposes the Owner and its representatives shall be provided access to the Contractor's or Subcontractors' facilities or Work. In the event the Contractor employs Subcontractors for any part of the Work, the Contractor shall require Subcontractors to comply with the provisions of this Section 29.2.
- 29.3. The Contractor shall provide and maintain an examination, inspection and testing system acceptable to the Owner as required by the Agreement. The Contractor shall submit to the Owner the results of all such examinations, tests and inspections and shall maintain records of the same and make them available to the Owner.
- 29.4. In addition to any notice requirements otherwise set forth in the Agreement, the Contractor shall give the Owner (a) five (5) days prior written notice of any tests and inspections required by the Agreement, the Owner or its representatives' instructions, laws, regulations or ordinances to be witnessed or approved by the Owner, (b) timely notice of all other tests and inspections, and (c) forty-eight (48) hours additional notice prior to actual performance of any test or inspection. Inspections by the Owner shall be made promptly, and where practicable at the source of supply. If such Work should be covered up without approval or consent of the Owner, it shall, if required by the Owner, be uncovered for examination and properly restored at the Contractor's expense.
- 29.5. In all cases other than those specified in Section 29.4 (a), if the Owner requests Work to be uncovered for re-examination, the Contractor shall so comply. If such Work is found to be in accordance with the Agreement, the Owner shall pay the cost of re-examination and replacement. If such Work is not in accordance with the Agreement, the Contractor shall pay such cost. If the Owner is required to reimburse the Contractor for this Work, it shall be on the basis of Section 6.5.
- 29.6. All testing and inspections required under the Agreement shall be done in accordance with the Agreement. The Owner may perform technical inspection of the Work as may be set forth more fully in the Specification. The Field Representative shall have authority to reject all Work and materials which do not conform to the Agreement and respond to questions which arise in the execution of the Work.

- 29.7. Neither the Owner's nor its representative's inspection or testing, or witnessing of tests or inspections of the Work nor its failure to perform, require or approve tests or inspections shall (1) affect the warranties and guarantees of the Contractor, (2) relieve the Contractor from any responsibility or liability with respect to workmanship, materials or equipment, (3) constitute an acceptance of the Work by the Owner or an agreement by the Owner that the Work meets specified requirements, (4) impair the Owner's right to reject nonconforming or defective Work, (5) constitute a waiver by the Owner of any rights under the Agreement, or (6) relieve the Contractor of any of its obligations under the Agreement, notwithstanding the Owner's opportunity to inspect the Work, the Owner's knowledge of the nonconformance or defect, or the Owner's failure to earlier reject the Work.
- 29.8. The Owner shall have the right to inspect all materials, supplies, and equipment that are to be incorporated in the Project and make or cause to be made all tests required by the Agreement. The making of such inspections and tests by the Owner shall not relieve the Contractor of its responsibility for inspection and testing.
- 29.9. If the Owner determines that any Work has not satisfactorily passed any test or inspection or does not meet the requirements of the Agreement or that the Contractor has not conducted or has improperly conducted any required test or inspection, the Owner shall have the right, in addition to any other rights set forth in the Agreement, to (1) reject the Work and (2) stop the Work in accordance with Article 31.0.
- 29.10. The Owner reserves the right to inspect all Work prior to shipment. The Contractor shall notify the Owner in writing of all shipments not less than ten (10) Days prior to the date of shipment.

### 30.0 Quality Assurance

- 30.1. The Contractor shall maintain a formal quality assurance program throughout the duration of the Work. The quality assurance program shall provide continual inspection of construction operations and shall include coordination of the various trades involved in the Work.
- 30.2. The Owner shall have the right at any time during the term of the Agreement to review the Contractor's quality assurance program and to have the Contractor's Work tested and inspected by a third party. If such Work is found to be in accordance with the Agreement, the Owner shall pay the cost of re-examination and replacement. If such Work is not in accordance with the Agreement, the Contractor shall pay such cost.
- 30.3. The Owner shall have the right at any time during the term of the Agreement to review the Contractor's quality assurance program and to require the Contractor to remove and/or correct any Work at the Contractor's expense that is not performed in compliance with the Contractor's quality assurance program.

- 30.4. The Contractor shall retain all quality assurance documents, including but not limited to nondestructive examination records and testing records for the term of the Agreement. Upon Final Acceptance, termination, cancellation, expiration or as may be otherwise required by the Agreement, or sooner if requested by the Owner, the Contractor shall submit copies of all such documents to the Owner.
- 30.5. The Contractor shall designate a quality control representative who shall be responsible for the administration and performance of the quality control program. This person shall be authorized to stop the Work or any portion thereof without fear of retribution.

#### 31.0 Default

- 31.1. If, during the term of the Agreement, the Owner notifies the Contractor that any part of the Work is defective or deficient or not in accordance with any provision of the Agreement, regardless of the stage of its completion or the time or place of discovery of such errors and regardless of whether Owner has previously accepted it, the Owner may order the Contractor to stop performing the Work until such defect or default has been corrected at the Contractor's sole expense. If the Contractor does not correct the default or defect within ten (10) Days of notice, the Owner may suspend its performance until such defect or default is corrected and/or remove and replace the defective Work at the Contractor's expense.
- 31.2. The Contractor shall, at its sole expense, promptly remove from the Project all Work condemned by the Owner as failing to meet the requirements of the Agreement, whether incorporated in the Project or not. The Contractor shall, at its sole expense, promptly replace and re-execute the condemned Work in accordance with the Agreement and shall make good all portions of the Project damaged by such removal and/or correction, including the work of other contractors.
- 31.3. If the Contractor does not take action to remove such condemned Work within ten (10) Days after written notice from the Owner, the Owner may remove said Work and store it at the Contractor's expense. If the Contractor does not pay the expense of such removal and storage within ten (10) Days thereafter, the Owner may, upon written notice, remove such Work, which cost shall be borne by the Contractor, or sell such Work at auction or at private sale and retain the proceeds.
- 31.4. If the Owner corrects Work or has Work corrected that has been damaged or that was not done in accordance with the Agreement, the Owner may deduct the cost from the price as determined under the Agreement or invoice Contractor for such costs, at its sole option. If Owner elects to invoice Contractor, Contractor shall remit to Owner such invoiced amount within thirty Days of the date of the invoice.

- 31.5 The Contractor shall not be entitled to an extension of time by reason of its Work being found defective, deficient or in any way not in accordance with the requirements of the Agreement.

32.0 Safety

- 32.1. The Contractor shall be solely responsible and assume all liability for the safety and supervision of its employees and other persons engaged in the Work or on the Site. The Contractor shall establish and effectively and continuously implement a safety program. The Contractor shall, and shall require its Subcontractors and their employees to comply with all applicable Federal, state and local safety directives, requirements, rules, regulations, laws and ordinances, whether the same are in force upon the execution of the Agreement or may in the future be passed, enacted or directed, including without limitation, compliance with the safety regulations and standards adopted under the Occupational Safety and Health Act of 1970 (OSHA), as amended from time to time. The Contractor shall continually inspect the Project and supervise its personnel to determine and enforce compliance with the above provisions.
- 32.2. The Contractor shall, and shall require its Subcontractors and their employees to comply with the Owner's Safety Requirements and all established Project safety rules as they may be amended from time to time and to take all necessary safety and other precautions to protect property and persons from damage or injury arising out of performance on the Project, whether the same are in force at the execution of this Agreement or may in the future be passed, enacted or directed.
- 32.3. The Contractor shall provide adequate safeguards, safety devices and protective equipment and enforce their use and take any other needed actions to protect the life, health and safety of the public and to protect property in connection with its performance on the Project.
- 32.4. The Contractor shall be responsible for providing adequate fire protection, shall take all necessary measures to prevent fire from occurring at the Site, and shall be responsible for all fires associated with or affecting its Work. The Contractor shall comply with the good practices recommended in National Fire Prevention Association Standard 241 and other national consensus standards for fire safety on construction projects.
- 32.5. The Contractor shall at its sole expense provide adequate first aid facilities and shall make those facilities available for the treatment of persons who may be injured or become ill at the Site or while engaged in the performance of Work.

### 33.0 Permits, Licenses, Laws, and Regulations

- 33.1. Permits and licenses of a temporary nature necessary for the prosecution of the Work shall be secured and paid for by the Contractor. Unless otherwise specified, permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Owner. In either case the Contractor shall be responsible for prosecuting its Work in accordance with the provisions of all applicable permits and licenses.
- 33.2. The Contractor shall complete the Work so that it complies with all applicable laws, rules, regulations, requirements, orders, directives, ordinances, codes and standards of all Federal, state, and local governmental agencies having jurisdiction over the Owner and its affiliates, the Contractor, the Subcontractors, or the Project, whether the same are in force at the execution of this Agreement or may in the future be passed, enacted or directed.
- 33.3. The Contractor shall not enter into negotiations with any governmental authority or agency for acceptance of variations from or revisions to safety or health, or air, water or noise pollution laws or regulations relating to the Agreement or to the performance thereof, without the Owner's prior written consent.
- 33.4. The Contractor shall, at its sole expense, defend, indemnify and hold harmless the Owner and its affiliates and their officers, directors, employees, agents, servants and assigns from and against all liabilities to third parties (including governmental entities) and all costs and expenses incurred by the Owner or its affiliates as a result of the Contractor's noncompliance with this Article 33.0.

### 34.0 Environmental Protection

- 34.1. The Contractor shall comply with all permit conditions, the Owner's policies set forth in the Agreement, and all applicable Federal, state and local environmental laws, requirements, orders, directives, rules, regulations, ordinances, and codes whether the same are in force at the execution of this Agreement or may in the future be passed, enacted or directed. The Contractor shall immediately notify the Owner of any citations or notices incurred on the Project and forward copies thereof immediately upon receipt to the Owner.
- 34.2. The Contractor shall conduct all operations in such a manner to minimize the impact upon the natural environment and shall comply with all solid waste, hazardous waste, health and safety, notice, training, and environmental protection laws, rules, regulations, requirements, orders, directives, ordinances, codes and standards, of all Federal, state, and local governmental agencies having jurisdiction over the Owner and its affiliates, the Contractor, the Subcontractors, or the Project, whether the

same are in force at the execution of this Agreement or may in the future be passed, enacted or directed ("hazardous waste" includes all substances which are or may be identified as such in 40 C.F.R. Part 261).

- 34.3. The Contractor shall provide the Owner with Material Safety Data Sheets covering all materials furnished under or otherwise associated with the Work under the Agreement, or provide the Owner with a document certifying that the Material Safety Data Sheets are not required for each such material. The Contractor shall submit a list to the Owner of all chemicals and other materials or products designated as hazardous in accordance with the OSHA hazardous Communication Standard and the EPA Superfund Amendments and Reauthorization Act, Title III that it brings on to the Site or any other property of the Owner, and the associated quantities. The Contractor shall handle, store, use and dispose of chemicals and hazardous products in accordance with the Agreement. The Contractor shall comply with all provisions of the OSHA, EPA and state regulations concerning Hazard Communication and Employee Right to Know Laws which cover training requirements for employees and communications requirements with employees, emergency responders and other potentially affected parties concerning toxic and otherwise hazardous materials or environments.
- 34.4. If any violation of environmental permits, licenses, and other environmental regulations or statutes occurs, the Contractor shall take immediate action to mitigate any further violation. The Contractor shall immediately notify the Owner of the violation and wait for further instructions from the Owner. If the Owner instructs the Contractor to remedy the violation, the Contractor shall contact the appropriate government agencies as required by law and report to the Owner, in writing, what actions it has performed and intends to take to remedy the violation. The Contractor shall also report to the Owner its intended procedures for preventing recurrence of such violations.
- 34.5. The Contractor shall, at its expense, take all actions necessary to protect the Owner, its affiliates and all third parties, including without limitation employees and representatives of the Owner, from any exposure to, or hazards of, hazardous and/or toxic wastes or substances, and the Contractor shall defend, indemnify, and hold harmless the Owner and its affiliates from any acts, claims, or damages claimed by the Contractor's employees, Subcontractors, and Subcontractors' employees, or any other liability incurred by the Owner, its affiliates or third parties arising from a discharge of, exposure to, handling, disposition or transportation of hazardous or toxic materials or waste.
- 34.6. In the event of a release or discovery of hazardous waste or substance, the Contractor shall respond in accordance with the Agreement.
- 34.7. If the Contractor fails to correct an environmental violation when directed by the Owner to do so, the Owner may direct a third party to do so at the Contractor's expense.

- 34.8. The Owner will notify the Contractor of any observed non-compliance; however, failure of the Owner to recognize or notify the Contractor of any non-compliance shall not relieve the Contractor of its contractual and legal responsibility for such non-compliance and to protect the environment.
- 34.9. The Contractor shall, at its sole expense, defend, indemnify and hold harmless the Owner and its affiliates and their officers, directors, employees, agents, servants and assigns from and against all liabilities to third parties (including governmental entities), whether civil or criminal, and all costs and expenses incurred by the Owner, its affiliates, third parties including other contractors and the Contractor as a result of the Contractor's noncompliance with this Article 34.0.

35.0 Owner's Right to Suspend Work

- 35.1. The Owner may at its sole discretion interrupt, suspend or delay execution of all or any part of the Project for any reason whatsoever upon written notice to the Contractor specifying the nature and expected duration of the interruption, suspension or delay. The Owner's notice of suspension shall designate the amount and type of labor and equipment to be committed to the Work, if any, during the period of suspension. The Contractor shall utilize its labor, equipment and any other resources so that costs are minimized during the suspension. Except as provided in Section 44.6, if, in the Contractor's opinion, such interruption would result in substantially increased cost, the Contractor shall promptly notify the Owner in writing in accordance with Article 6.0.
- 35.2. The Contractor shall immediately resume any of the Work so interrupted, suspended or delayed when directed to do so by the Owner. Except as provided in Section 35.4, the schedule and price as determined under the Agreement shall be revised to compensate for the interruption, suspension or delay. Adjustments to the price shall be adequate to compensate the Contractor for any verifiable reasonable costs or expenses the Contractor actually incurs as a direct result of the interruption, suspension or delay despite reasonable efforts to mitigate such costs and expenses. Said adjustment to the price and schedule shall constitute full settlement to Contractor for the suspension, however in no event shall the total paid to the Contractor exceed the Contract Price as set forth in the Agreement. In no event shall Contractor be entitled to any damages, including loss of anticipated profits.
- 35.3. In its notice of suspension, the Owner will designate what Work, if any, is to be continued. Upon receipt of such notice, the Contractor shall, unless otherwise directed by the Owner:
- (a) Immediately discontinue the Work on the date and to the extent specified in the notice;

- (b) Place no further orders or subcontracts for or in connection with the Project other than to the extent required in the notice of suspension;
- (c) Promptly make every reasonable effort to obtain suspension upon terms satisfactory to the Owner of all orders and subcontracts to the extent required by the suspension; and
- (d) Continue to protect and preserve the Project.

35.4. Notwithstanding any other provision of the Agreement, no compensation or extension of time will be granted to the Contractor for any suspension to the extent that the suspension is caused directly or indirectly by the Contractor's acts or failure to act, including, but not limited to, Contractor's failure to comply with the safety and environmental protection provisions of the Agreement or to the extent that an equitable adjustment is provided for or excluded under any other provision of the Agreement.

35.5. Notwithstanding the foregoing, if the Work may directly affect the continuity of electrical service, the Owner, at its option, may from time to time immediately suspend the Contractor's Work without prior written notice in order to avoid problems such as safety hazards or interruption of service.

#### 36.0 The Owner's Right to Terminate Agreement for Cause

36.1. Notwithstanding any other provision of the Agreement, if the Contractor: (1) fails to prosecute the Work with diligence or has fallen behind the schedule and if in the opinion of the Owner, fails to take all necessary steps to get back on schedule; (2) fails to make prompt payment when due to Subcontractors; (3) fails to comply with any of the terms or conditions of the Agreement; (4) sells or transfers all or substantially all of its assets without the Owner's prior written consent; (5) enters into any voluntary or involuntary bankruptcy proceeding or receivership; (6) makes a general assignment for the benefit of its creditors; (7) should be experiencing a labor dispute which threatens adversely to affect the progress or cost of the Project hereunder or the Owner's operation; (8) abandons the Work; (9) loses control of the Work from any cause; (10) refuses or neglects to provide sufficient and properly skilled or other labor or sufficient materials of proper quality; or (11) directly or indirectly causes a disruption of the Project, or should its presence result in a disruption of the project or the Owner's operation, then the Owner shall have the right, without prejudice to any other right or remedy and after giving the Contractor written notice, to terminate the Agreement, in whole or part, and thereupon the Contractor shall be released, in whole or part, from the Agreement. Such termination shall be effective upon the date set forth in the written notice and the Contractor shall immediately discontinue its Work to the extent specified in said notice. The Owner may exercise its right of partial termination under the Agreement any number of times.

- 36.2. In the event the Owner terminates all or any part of the Agreement for cause, the Owner may finish the Work or have the Work finished by a third party by whatever method it may deem expedient. The Owner shall not be required to obtain the lowest price for completion of the Work, but may make such reasonable expenditures as may best accomplish said completion; and the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price as determined under the Agreement exceeds the expense of finishing the Work, including compensation for additional managerial and administrative services and all other costs and expenses actually incurred by the Owner as a direct result of the breach and termination, such excess shall be paid to the Contractor. If such expenses exceed the unpaid balance, the Contractor shall pay the difference to the Owner within thirty (30) Days of the Owner's notice thereof to the Contractor.
- 36.3. If all or any part of the Agreement is terminated for cause, the Owner shall be entitled, at its option, to (a) retain any Work previously delivered to the Project or paid for by the Owner, (b) require delivery of any Work and/or documents, regardless of their stage of completion which are in the Contractor's possession or control, (c) require the Contractor to assign to the Owner all or any of the Contractor's rights with respect to orders or subcontracts which relate to the Project, (d) reject all or any of the Work, regardless of whether it has been delivered to the Project, (e) require the Contractor to cooperate with a new contractor for the period of time necessary to familiarize the new contractor with the Project, (f) have another contractor complete the Agreement at the Contractor's expense, (g) require completion according to the terms of the Agreement of any Work which has not been terminated, and (h) take possession of all or part of the Contractor's equipment located at the Site for the purpose of completing the Work. The Contractor shall be required to refund to the Owner any payments theretofore made for rejected Work. The Owner shall be entitled to withhold from any payment otherwise due to the Contractor under this Article 36.0 an amount sufficient to protect the Owner from any outstanding or anticipated liens or claims in connection with Work which has not been rejected or anticipated costs to complete the Work in excess of the remaining Contract Price. The Owner shall not be liable for any loss or damage (including, but not limited to, special, indirect, incidental, or consequential damages or anticipated profits) incurred by reason of termination for cause of the Agreement.
- 36.4. No amount shall be paid or payable by the Owner for the Contractor's termination costs including, but not limited to, demobilization costs, costs associated with the transfer or termination of personnel or loss of anticipated profit.
- 36.5. All warranties and guarantees set forth in Article 21.0 shall survive termination of the Agreement to the extent that they relate to Work which has not been rejected or terminated, and any other provisions of the Agreement which survive the date of termination shall continue to be binding upon the Contractor.

- 36.6. In the event that a termination by the Owner of all or part of the Agreement under this Article 36.0 is determined to have been made without cause, such termination shall thereafter be treated as termination for convenience under Article 37.0.

37.0 The Owner's Right to Terminate Agreement for Convenience

- 37.1. Notwithstanding any other provision of the Agreement, the Owner may, at its sole discretion, at any time, for any reason, by notice to the Contractor, terminate the Agreement in whole or in part without cause, and such termination shall not constitute a breach of contract. Such termination shall be effective upon the date set forth in the written notice and the Contractor, unless otherwise directed by the Owner, shall immediately:

- (a) Stop its Work hereunder on the date and to the extent specified in said notice;
- (b) Place no further orders or subcontracts for any part of the Project other than for Work which has not been terminated;
- (c) Terminate, as directed by the Owner, all orders and subcontracts to the extent that they relate to Work which has been terminated;
- (d) Settle, with the approval or ratification of the Owner, to the extent the Owner may require, all outstanding liabilities and claims arising out of the Contractor's termination of orders and subcontracts pursuant to Section 37.1 (c);
- (e) Assign to the Owner, as required by the Owner, any and all of the Contractor's rights with respect to orders or subcontracts which relate to terminated Work;
- (f) Deliver to the Owner, as required by the Owner, any or all Work or documents, technical data or other information and materials regardless of their stage of completion, which are in the Contractor's possession or control;
- (g) Use its best efforts to sell, transfer or otherwise dispose, for the Owner's credit, in the manner, at the times, to the extent and at the prices directed or authorized by the Owner, any or all of the Work, provided that the Contractor (a) shall not be required to extend credit to any buyer, and (b) may acquire any such Work upon the same terms as it would be entitled to sell or transfer such Work to a third party;
- (h) Work with a new contractor for the period of time necessary to familiarize the new contractor with the Project;
- (i) Complete any Work which has not been terminated pursuant to said notice; and

- (j) Take whatever action may be necessary to preserve and protect the Work and to mitigate the Contractor's damages in connection with the partial or complete termination of the Agreement.
- 37.2. If a Notice to Proceed has been issued, the Contractor may be entitled to payment ("Partial Performance Payment") for any Work actually performed prior to termination under this Article 37.0. In no event shall the total of the "Partial Performance Payment" and/or "Termination Costs" (as defined in Section 37.6) exceed the price as determined under the Agreement.
- 37.3. The Contractor's claim for "Partial Performance Payment" and/or "Termination Costs" shall be contingent upon Contractor's good faith diligent compliance with the provisions of Section 37.1 (a) through (j) inclusive, to the Owner's satisfaction which will not be unreasonably withheld, and shall be submitted to the Owner within three (3) months of the effective date of termination under this Article 37.0. If said claim is not submitted within three (3) months, the Contractor waives any right to the claim for "Partial Performance Payment" and/or "Termination Costs".
- 37.4. All warranties and guarantees set forth in Article 21.0 shall survive termination of the Agreement to the extent that they relate to Work which has not been rejected or terminated, and any other provisions of the Agreement which survive the date of termination shall continue to be binding upon the Contractor.
- 37.5. A termination for convenience shall not entitle the Contractor to damage remedies that would normally arise as a result of breach of contract, whether such damage remedies are categorized as direct, special, indirect, incidental or consequential damages. Rather, the Contractor's rights are exclusively limited to "Partial Performance Payment" and/or "Termination Costs".
- 37.6. The Contractor's "Termination Costs" shall be limited to: (1) reasonable documented direct costs that are directly associated with termination responsibilities identified in Section 37.1 (d), (f), (g), (h), and (j); and (2) reasonable demobilization costs incurred within thirty days of the date of termination. In no case shall the Contractor be entitled to recover lost profits. In no case shall the Contractor be entitled to recover any costs and expenses associated with the inability of the Contractor to find work for idle employees and equipment that have been rendered idle as a result of termination of the Agreement.

#### 38.0 Removal of Equipment

- 38.1. In the case of termination of the Agreement, the Contractor, if notified to do so by the Owner, shall promptly, but in any event not to exceed seven (7) Days, remove any part or all of its equipment, material, and supplies from the Site, failing which the Owner shall have the right to remove such equipment and supplies at the expense of the Contractor.

## 39.0 Force Majeure

- 39.1. Except as provided in Sections 31.1 and 44.6, any delay of either party in the performance of its required obligations hereunder shall be excused if and to the extent caused by unprecedented weather conditions, fire, explosion, riot, war, strike by the Owner or its affiliates' employees, court injunction or order, Federal and/or state law or regulation, or order by any Federal or state regulatory agency, but only to the extent that: (1) such events are beyond the reasonable control of the party affected; (2) such events were unforeseeable by the affected party and the effects were beyond its reasonable efforts to prevent, avoid or mitigate; (3) said affected party uses every reasonable effort to prevent, avoid or mitigate the effects; (4) prompt written notice of such delay be given by such affected party to the other; and (5) the party affected uses its best efforts to remedy the resulting effects in the shortest practicable time. Upon receipt of said notice, if necessary, the time for performing the affected activities shall be extended for a period of time reasonably necessary to overcome the effect of such delays. Notwithstanding the foregoing, the Owner shall have the right to terminate the Agreement under Article 36.0.
- 39.2. The Contractor shall not be entitled to additional compensation by reason of the Contractor having been delayed in performance of its obligations due to a force majeure event; nor shall the Contractor be entitled to any damages, including anticipated profits; an extension of time shall constitute the Contractor's sole remedy.
- 39.3. The written notice required under Section 39.1 shall be sent by the affected party within five (5) Days of the commencement of any such delay and shall specify the nature, cause, date of commencement and anticipated extent of such delay or nonperformance and whether it anticipates that any delays in scheduled delivery or performance will result. Such notice shall be submitted in ample time to permit full investigation and evaluation of any claimed delay or nonperformance. Failure to provide such notice shall constitute a waiver of any claim.
- 39.4. Within thirty (30) Days after the termination of any delay occasioned by an event of force majeure, the affected party shall give written notice to the other party specifying the actual duration and impact of the delay.
- 39.5. Notwithstanding the foregoing, neither the Contractor's inability to obtain required permits on schedule, nor strikes and/or labor disputes involving the Contractor's and its Subcontractors' employees shall be considered a force majeure event.

## 40.0 Extensions of Time

- 40.1. The Owner shall extend the schedule for changes in the Project, as provided in Article 6.0, for force majeure events, as provided in Article 39.0, or for suspension of Work, as provided in Article 35.0. Unless

pursuant to Articles 6.0 or 35.0, extensions of time shall not be a basis for any increased payment under the Agreement.

- 40.2. The Contractor shall give the Owner prompt written notice of any occurrence or conditions which in the Contractor's opinion entitle it to an extension of time. Such notice shall be submitted in ample time to permit full investigation and evaluation of the Contractor's claim. Failure to provide such notice shall constitute a waiver by the Contractor of any claim. The Owner shall acknowledge receipt of the Contractor's notice within ten (10) Days of its receipt.

#### 41.0 Publicity

- 41.1. Notwithstanding any other provision of the Agreement, the Contractor shall not, without the Owner's prior written consent, publish any information pertaining to the Agreement, whether during the term of the Agreement or thereafter.
- 41.2. The Contractor shall not display any sign, posters or other advertising matter in or around the Site without prior written approval of the Owner.

#### 42.0 Proprietary and Confidential Information

- 42.1. Notwithstanding any other provision of the Agreement, the Contractor recognizes that the Owner, or its affiliates may find it necessary or desirable to make information available to the Contractor, its Subcontractors, or their employees which is deemed proprietary and/or confidential information. In this regard, it is agreed that neither the Contractor, nor its Subcontractors, nor their employees shall without the prior written approval of the Owner, at any time, disclose to third parties any information which may be disclosed to them or to which they are given access during the performance of the Agreement, or to publish this information or any photographs in any form, at any time, whether during the term of the Agreement or thereafter.
- 42.2. In no event shall data or information provided by the Contractor under the Agreement or generated as a result of performance of the Work thereunder be deemed as proprietary to the Contractor. Likewise, reports generated as a result of performance of the Work thereunder shall not be proprietary to the Contractor.

#### 43.0 Cleaning Up

- 43.1. The Contractor shall at all times keep its work areas in a neat, clean, and safe condition in accordance with the Agreement.
- 43.2. The Contractor shall clean up and remove from the Site and adjoining property and ways all waste materials and rubbish on a daily basis.

- 43.3. Upon completion of the Work, the Contractor shall remove all excess material, equipment, temporary facilities and rubbish; shall repair or replace, in an acceptable manner, all property which may have been damaged or destroyed at the Site; and shall leave the Site in a neat and presentable condition and return disrupted or damaged areas to the condition existing before the start of its Work. Site clean-up approval is required from the Owner prior to Final Acceptance.
- 43.4. Work shall be performed in a manner which minimizes to the greatest extent possible any disruption to the surrounding communities and general public.
- 43.5. In the event of the Contractor's failure to comply with this Article 43.0 the Owner shall be entitled to withhold from the Contractor, or obtain reimbursement from the Contractor for, any costs incurred in accomplishing the same.

#### 44.0 Labor Relations

- 44.1. The Contractor shall give the Owner prompt written notice of any labor dispute or anticipated labor dispute which may reasonably be expected to affect: (1) the cost, schedule or performance of the Project; (2) other activities at the Site; or (3) the Owner's ongoing operations.
- 44.2. The Contractor shall conduct its labor relations in accordance with its established labor agreements. The Contractor agrees to advise the Owner, prior to making any new commitments, whether the negotiation of new agreements or understandings with local or national labor organizations affect the Work to be performed under the Agreement.
- 44.3. In addition to the Contractor's legal obligations under the Labor Management Relations Act, in the event the Contractor is a subscriber to a multi-employer bargaining association or group, the Contractor shall, if the Owner so directs, participate to the fullest extent in the collective bargaining of that group with any of those labor organizations claiming jurisdiction over any portion of the Project under the Agreement or any subcontract.
- 44.4. To the extent applicable to Work being performed under the Agreement, the Contractor shall supply the Owner with copies of all national agreements to which it is a party. No later than thirty (30) Days before the expiration of any labor agreement which may affect the Project, the Contractor shall meet with the Owner to discuss the appropriate course of action.
- 44.5. The Contractor shall take any and all steps that may be available in connection with the resolution of violations of collective bargaining agreements and jurisdictional disputes, including, without limitation, the filing of appropriate process with any court or administrative agency having jurisdiction to settle, enjoin or to award damages resulting from

violations of collective bargaining agreements or jurisdictional disputes.

- 44.6. In the event of a labor dispute which threatens to adversely affect the progress or cost of the Project, the Owner reserves the right to restrict additional hiring of employees by the Contractor or any Subcontractors, or to suspend or delay the Project, or in the Owner's sole discretion to terminate the Agreement under Article 36.0, without incurring contractual liability to the Contractor or its Subcontractors or suppliers. This Section shall be applicable whether or not the Contractor or any Subcontractor is directly involved in said labor dispute and whether or not the dispute involves or affects employees or disputing parties standing in the proximate relation of employer and employee with the Contractor or Subcontractor.

#### 45.0 Rights of Various Interests

- 45.1. Whenever work being done by the Owner's or by other contractors' forces is contiguous to Work covered by the Agreement, the respective rights of the various interests involved shall be established by the Owner to secure the completion of the various portions of the Project in an orderly and timely manner. At no time shall Contractor restrict the movement of other personnel and/or equipment in the performance of their work.
- 45.2. The Contractor shall be responsible for promptly notifying the Owner in the event that it shall be necessary to coordinate work between the Contractor and others.

#### 46.0 Additional Contracts

- 46.1. The Owner reserves the right to enter into other contracts related to the Agreement or the Project and may require any other contractor, including the Owner or its affiliates, to provide labor or materials to the Project, and such other contracts shall not be cause for the Contractor to claim a change in the Project under Article 6.0. The Contractor shall afford other contractors, the Owner or its affiliates reasonable opportunity for the introduction and storage of their materials and the execution of their work, and the Contractor shall cooperate with the Owner, its affiliates and any other contractors in coordinating their activities.
- 46.2. The Contractor acknowledges that coordination with other contractors, the Owner or its affiliates and occasional rescheduling of the Work or Project may be required and that minor delays in performance of the Work may result. Any difference or conflict which may arise between the Contractor and other contractors, or between the Contractor and workmen of the Owner or its affiliates, in regard to their work, shall be resolved as determined by the Owner. Notwithstanding any other provision of the Agreement, the Contractor acknowledges that such coordination, occasional rescheduling and minor delays shall not justify an increase in the price as determined under the Agreement or an

extension of time for delivery or performance.

- 46.3. The Contractor shall promptly make good, at its sole expense, any injury or damage that may be sustained by other contractors or the Owner and its affiliates as a result of the Contractor's activities under the Agreement.
- 46.4. If the Contractor's Work depends upon the work of others, the Contractor shall inspect and give the Owner prompt written notice of any defects in the work that renders it unsuitable for the Contractor to perform its Work.

#### 47.0 Liens

- 47.1. The Contractor, for itself, its Subcontractors and all other persons performing under the Agreement hereby waives, to the full extent permitted by law, all right to have filed or maintained any mechanics' or other liens or claims for or on account of the services, labor or materials to be furnished under the Agreement. The Contractor shall pay punctually for all labor, equipment and materials and all liabilities incurred by it in performance of the Agreement, and when requested shall furnish Owner with satisfactory evidence of such payment.
- 47.2. The Contractor shall (1) indemnify and save harmless the Owner and its affiliates and their officers, directors, employees, agents, servants, and assigns from all laborers', materialmen's, and mechanics' liens upon the real property upon which the Project is located arising out of the Services, equipment and materials furnished by the Contractor and its Subcontractors in connection with the Project, and (2) to the full extent permitted by law, keep said property free and clear of all liens, claims, and encumbrances arising from the performance of the Agreement by the Contractor and Subcontractors.
- 47.3. The Contractor shall give the Owner twenty (20) Days written notice prior to filing a lien on the property and shall use all reasonable efforts to give the Owner twenty (20) Days written notice prior to a Subcontractor filing a lien on the property.
- 47.4. If the Contractor places a lien on the Owner's or its affiliates' property or fails to provide a bond and subsequently discharge a Subcontractor lien, the Owner shall have the right to bond said lien or take other similar action to discharge the lien and withhold payment therefore from the Contractor as set forth in Section 12.1. The Contractor shall be liable to Owner for all costs and legal expenses incurred by Owner in discharging such liens.
- 47.5. If the Owner does not require a lien bond under Article 48.0 and if a lien is placed on the property by any Subcontractor, the Contractor shall within forty-eight (48) hours, or such other time as agreed to by the Owner, post a bond covering the lien and shall discharge the lien within thirty (30) Days.

- 47.6. The Contractor's indemnification obligations under this Article 47.0 shall survive the termination, cancellation or expiration of the Agreement.

48.0 Payment Bond, Performance Bond and Lien Bond

- 48.1. Within 15 Days of signing the Agreement, the Contractor shall, at the Owner's option, provide the Owner with a Payment Bond, a Performance Bond and a Lien Bond for the Work in the amount of the Contract Price covering the payment of, and performance of all obligations arising under the Agreement and to keep the Owner's property clear of any encumbrances relating to the Agreement. The Owner may require additional bonds if the value of the Agreement, in the Owner's opinion, is appreciably increased.
- 48.2. The Payment Bond and the Performance Bond form shall be AIA Document A312, as published by the American Institute of Architects, except that the definition of claimant, found in Section 15.1 of the Payment Bond, shall be modified to include all persons or entities, of any tier, having a direct contract with the Contractor or with a Subcontractor (including suppliers), of any tier, to furnish labor, materials or equipment for use in the performance of the Agreement. All other parts of the definition of claimant shall remain unmodified. The Lien Bond shall be on the form as set forth in the Agreement.
- 48.3. The Contractor shall furnish a copy of the Payment Bond to all Subcontractors (including suppliers) with whom it has a contract to furnish labor, equipment or materials for use in the performance of the Agreement, and shall require that all Subcontractors, of any tier, supply copies of the Payment Bond to their Subcontractors (including suppliers).

49.0 Records and Accounts

- 49.1. The Contractor shall, and shall require Subcontractors, for the Owner's benefit, at their own expense, to maintain a method of accounting in accordance with generally accepted accounting procedures and practices with respect to all matters pertinent to the Agreement. In so far as the Contractor's and Subcontractors' books, records, books of account, correspondence, contracts and subcontracts, and vouchers pertain to Work under the Agreement, or claims made by the Contractor for extension of time, costs, or expenses under any provisions of the Agreement, they shall be made available to the Owner or its authorized representative for inspection and audit and shall be kept in a manner which (1) adequately permits evaluation and verification of any invoices, payments or claims based on the Contractor's or Subcontractors' actual costs incurred in the performance of the Project and (2) permits the Contractor to furnish the Owner an accurate written allocation of the total amount paid for the Project and such further records as may be reasonably required by the Owner.

- 49.2. The Contractor shall maintain records during the term of the Agreement, including any records relating to the employment or hiring of minorities and/or females, until (1) three (3) years after the expiration of the last expiring warranty, or (2) the expiration of any period for which the Owner or its affiliates are required, by any regulatory agency, to have such records maintained, whichever is later. Additionally, records that relate to disputes, appeals, litigation, or the settlement of claims arising out of the performance of the Agreement shall be retained until such disputes, appeals, litigation, or claims have been finally settled. In lieu of retaining such records the Contractor may deliver such records to the Owner at any time after the expiration of the last expiring warranty. The Contractor agrees to make such records available to the Owner or its authorized representative at no cost to the Owner or its authorized representative for inspection or audit at any time during such period.
- 49.3. The Owner shall give the Contractor and Subcontractors reasonable notice of any intended inspection or audit of their records.
- 49.4. The Owner and its authorized representative shall have access, during normal working hours, to all necessary Contractor and Subcontractor facilities and shall be provided with an adequate and appropriate work space in order to conduct inspections and audits of such records.
- 49.5. The Contractor shall require Subcontractors to comply with the provisions of this Article 49.0 for the benefit of the Owner.
- 49.6. If the Owner's inspection or audit identifies any inconsistencies, errors or costs not expended in accordance with the Agreement, the Contractor shall make appropriate adjustments as may be required, including refund to the Owner.

50.0 Equal Employment Opportunity

- 50.1. The Contractor and Subcontractors shall comply with all applicable Federal, state and other anti-discrimination laws, the standards and regulations issued thereunder and the amendments thereto.
- 50.2. The Contractor and Subcontractors shall comply, to the extent applicable, with the provisions of the following Executive Orders, the standards and regulations issued thereunder and the amendments thereto:
- (a) Executive Order 11141, relating to discrimination based on age;
  - (b) Executive Order 11246, relating to equal employment opportunity;
  - (c) Executive Order 11625, relating to minority business enterprises;
  - (d) Executive Order 11701, relating to employment of veterans;

- (e) Executive Order 11758, relating to the employment of handicapped; and
- (f) for any of the Work performed in New York the Human Rights Law of New York (Article 15 of the Executive Law).

50.3. The Executive Orders mentioned in Section 51.2 and the regulations thereunder are incorporated herein by reference with the same force and effect as if set forth herein verbatim.

#### 51.0 Utilization of Small Business Concerns

51.1 It is the policy of the United States that small business concerns, veteran-owned small business concerns, service disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns shall have the maximum practicable opportunity to participate in performing contracts let by any Federal agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. It is further the policy of the United States that its prime contractors establish procedures to ensure the timely payment of amounts due pursuant to the terms of their subcontracts with small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns.

51.2 The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with efficient contract performance. The Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of the Contractor's compliance with this clause.

51.3 *Definitions.* As used in this contract—  
“HUBZone small business concern” means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

“Service-disabled veteran-owned small business concern”—

(1) Means a small business concern—

- (i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and
- (ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the

case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

- (2) Service-disabled veteran means a veteran, as defined in [38 U.S.C. 101\(2\)](#), with a disability that is service connected, as defined in [38 U.S.C. 101\(16\)](#).

“Small business concern” means a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto.

“Small disadvantaged business concern” means a small business concern that represents, as part of its offer that—

- (1) It has received certification as a small disadvantaged business concern consistent with 13 CFR part 124, Subpart B;
- (2) No material change in disadvantaged ownership and control has occurred since its certification;
- (3) Where the concern is owned by one or more individuals, the net worth of each individual upon whom the certification is based does not exceed \$750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and
- (4) It is identified, on the date of its representation, as a certified small disadvantaged business in the database maintained by the Small Business Administration (PRO-Net).

“Veteran-owned small business concern” means a small business concern—

- (1) Not less than 51 percent of which is owned by one or more veterans (as defined at [38 U.S.C. 101\(2\)](#)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and
- (2) The management and daily business operations of which are controlled by one or more veterans.

“Women-owned small business concern” means a small business concern—

- (1) That is at least 51 percent owned by one or more women, or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and
- (2) Whose management and daily business operations are controlled by one or more women.

51.4 Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as a small business concern, a veteran-owned small business concern, a service-disabled veteran-owned small business concern, a HUBZone small business concern, a small disadvantaged business concern, or a women-owned small business concern.

## 52.0 Jurisdiction and Governing Laws

- 52.1. Unless other governing laws and/or other jurisdictions are specifically established in this Agreement, this Agreement shall be deemed to be executed in the Commonwealth of Massachusetts and the Agreement shall be interpreted and enforced according to the Laws of the Commonwealth of Massachusetts; provided, however, that in the event that the Work is to be performed solely in the State of New York' then this Agreement shall be deemed to be executed in the State of New York and shall be interpreted and enforced according to the laws of the State of New York.
- 52.2. Unless otherwise specifically established in this Agreement, only the courts in the State as determined in Section 52.1 shall have jurisdiction over the Agreement and the Work and any controversies arising out of the Agreement or Work shall be submitted only to the courts of such State.
- 52.3. The Contractor hereby waives personal service by manual delivery and agrees that service of process on the Contractor in any action arising out of the Agreement may be made by registered or certified return receipt requested, directed to Contractor at the Contractor's address set forth in the Agreement.

## 53.0 Headings

- 53.1. Paragraph headings are for the convenience of the parties only and are not to be construed as part of the Agreement.

## 54.0 Severability

- 54.1. In the event any portion or part of the Agreement is deemed invalid, against public policy, void or otherwise unenforceable by a court of law, the parties shall negotiate in good faith an equitable adjustment in the affected provision of the Agreement; however, the validity and enforceability of the remaining parts thereof and any other part or provision of the Agreement shall be otherwise fully enforceable.

## 55.0 Waiver and Election of Remedies

- 55.1. Waiver by the Owner or the Contractor of any term, condition or provision of the Agreement shall not be considered a waiver of that term, condition or provision in the future.
- 55.2. The failure of either party to enforce any of the terms, conditions or provisions of the Agreement or to require compliance with any of its terms, conditions or provisions at any time during the pendency of the

Agreement, shall in no way affect the validity of the Agreement, or any part thereof, and shall not be deemed a waiver of the right of such party thereafter to enforce any term, condition or provision of the Agreement.

- 55.3. No waiver, consent or modification of any of the provisions of the Agreement shall be binding unless in writing and signed by an authorized representative of the Owner and of the Contractor.

#### 56.0 Personnel Background Checks

- 56.1. The Contractor shall, and shall require its Subcontractors to comply with the Owner's background check requirements as defined in the Owner's policies and procedures as set forth in this Agreement and as may be amended from time to time.
- 56.2. In the event of Contractor's non-compliance with any or all of these requirements, the Owner may cancel the Agreement for its convenience pursuant to the termination provisions contained in the Agreement except that in no event shall the Owner or its affiliates be liable for any termination cost/charges to the Contractor beyond compensation for goods or services provided up to the date of such cancellation.
- 56.3. The Contractor shall be wholly and solely responsible for all acts of its personnel while engaged in the Work. Any illegal acts, including but not limited to terrorism affecting property and/or personnel of National Grid USA, Contractor or third parties shall be considered grounds for finding the Contractor in default and terminating the Agreement in accordance with Article 36.0, in addition to all other rights and remedies available to National Grid USA under applicable law.

## ACCEPTANCE OF CONDITIONS

The Contractor hereby agrees that any Work (as defined in the Purchase Order) performed for Company in compliance with any order, written or verbal, shall be governed by the terms and conditions cited in the Purchase Order whether or not specific reference is made to the below noted Terms and Conditions by the Purchase Order unless the Purchase Order specifically contains terms and conditions other than those contained in said Terms and Conditions; then those terms will apply to the extent that they are different.

Receipt of the below noted Terms and Conditions is hereby acknowledged on the date executed below, and the undersigned agrees to be bound to same and the signatory represents complete authority to sign on behalf of the Contractor.

\_\_\_\_\_  
Contractor

By: \_\_\_\_\_

\_\_\_\_\_  
Title

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

\_\_\_\_\_  
Street Address

\_\_\_\_\_  
City, State, Zip Code

Reference Terms and Conditions Document No. 00700

Revision Date 9/30/08



**SUPPLEMENTAL CONDITIONS**

**TO**

**NATIONAL GRID**  
**REMEDIAL CONSTRUCTION**  
**PURCHASE ORDERS**

## SUPPLEMENTAL CONDITIONS – CONSTRUCTION

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**SUPPLEMENTAL CONDITIONS  
TO  
NATIONAL GRID PURCHASE ORDERS  
FOR REMEDIAL CONSTRUCTION**

**SC-1.0    SUPPLEMENTAL DEFINITIONS**

Whenever the words defined or pronouns used in their stead, occur in these Contract Documents, they shall have the meaning given below:

AUTHORIZATION FOR CONTRACT CHANGE (ACC) shall mean a written order to the Contractor, signed by the Engineer and National Grid on which is stated the addition, deletion, or revision in the Work, together with any adjustment in Contract price or Contract time. One or more ACCs may be incorporated into a Change Order for making payments to the Contractor.

BID shall mean the offer or proposal submitted, signed and sealed, in the form prescribed in the Contract Documents setting forth the prices for the Work to be performed.

BONDS shall mean any or all of the following: performance, payment, labor and material bonds and other instruments of security furnished by the Contractor and his surety or sureties in accordance with the Contract Documents.

CHANGE ORDER shall mean the formal document executed by National Grid incorporating any Authorization For Contract Change (ACC) into the Contract.

CLAIM shall mean a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between National Grid and the Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

CONTRACT or CONTRACT DOCUMENTS shall mean any or all of the following: the Request For Quotations, Information For Bidders, Bid, Agreement, General Conditions, Special Conditions, Technical Specifications, Payment Items, contract Drawings, all interpretations or Addenda thereto and Change Orders issued by National Grid or the Engineer with the approval of National Grid.

Anything shown on the Contract Drawings and not mentioned in the Specifications or mentioned in the Specifications and not shown on the Contract Drawings, shall have the same effect as if shown or mentioned, respectively, on both.

CONTRACT DRAWINGS shall mean those plans and drawings which show the scope and character of the Work and are specifically referred to as such in these Documents or in any Addendum or Addenda.

ENGINEER shall mean the Consulting Engineer or Engineers engaged by National Grid for the project and shall include any properly authorized assistants acting for the Consulting Engineer within the scope of the particular duties assigned to them.

SITE shall mean the area included within the property lines shown on the Contract Drawings including temporary easements, and other such areas adjacent thereto as may be designated by National Grid in writing.

SPECIFICATIONS shall mean any or all of the following: the General Conditions, Supplemental Conditions, Material and Performance Sections, Measurement for Payment Sections, and any addenda pertaining thereto.

SURETY or SURETIES shall mean the Bondsmen or party or parties who have made secure the fulfillment of the Contract by a Bond and whose signatures are attached to said Bond.

#### SC-2.0 CARE AND PROTECTION OF WORK

From the commencement until the acceptance of the Work, the Contractor shall be solely responsible for the care of the Work covered by the Purchase Order and for the materials, supplies and equipment delivered at the Site intended to be used in the Work; and all injury or damage to the same from whatever cause, shall be the responsibility of the Contractor. The Contractor shall provide suitable means of protection for and shall protect all materials intended to be used in the Work, all Work in progress, and all completed Work. The Contractor shall take all necessary precautions to prevent injury or damage to the Work by flood, fire, freezing or from inclemencies of the weather.

The Contractor shall neither load nor permit any part of a structure to be loaded with weights that will endanger the structure, and shall not subject any part of the Work to stresses or pressures that will endanger it.

In the event that National Grid must take occupancy and the Contractor is behind schedule, the provisions of the Section still apply.

#### SC-3.0 POLLUTION CONTROL

The Contractor shall not permit pollutants introduced to the Work site by the Contractor (harmful to humans, fish and other life), such as chemicals, fuels, lubricants, calcium chloride, sewage, water containing sediments and other deleterious, poisonous, toxic or oxygen demanding substances to enter or leach into streams, lakes, other surface waters or into the ground water.

#### SC-4.0 WATER PRIVILEGES

Where the public water supply is available and under control of National Grid, it will be furnished the Contractor, or, when there is more than one Contractor, the General Contractor. Such water supply shall be subject at all times to the control and supervision

of the superintendent or manager of the water utility, and at a cost to be paid by the Contractor, as determined by the schedule of charges on file at the offices of the utility. Prior to making use of any public water for any particular purpose, the Contractor shall obtain written permission from the utility's superintendent or manager.

Where the public water supply is owned or controlled by a private company, corporation or individual or municipality other than National Grid, the Contractor or, when there is more than one Contractor on the Project, the General Contractor shall make such arrangements to service with the owners thereof, as the Contractor requires.

#### SC-5.0 TEMPORARY SANITARY FACILITIES

Sanitary conveniences in sufficient numbers and convenient locations for the use of all persons employed on the Work, properly screened from public observation, shall be provided, maintained, and removed by the Contractor or by the General Contractor. The contents of the same shall be removed and disposed of in accordance with applicable laws codes and regulations. The Contractor shall rigorously prohibit the committance of nuisances within, on, or about the Work.

The Contractor and each Subcontractor shall supply sufficient drinking water to all of his employees.

The Contractor shall also obey and enforce such other sanitary regulations and orders and shall take such precautions against infectious diseases as may be deemed necessary by the responsible authority.

#### SC-6.0 FIELD CONTROL OF THE WORK

All Work shall be constructed in accordance with the lines, grades and elevations shown on the Contract Drawings or as given by the Engineer in the field. The Contractor shall be fully and solely responsible for maintaining alignment and grade.

Control lines and elevations will be established by the Engineer as outlined in the Special Conditions. The Contractor shall, without additional compensation, provide all stakes, grade boards, cleats, nails, and such other materials and give such assistance to the Engineer as may be required to establish control lines and elevations. The Contractor shall inform the Engineer in writing a reasonable time in advance of the times and places at which he intends to do work in order that control lines and elevations may be established with the minimum of inconvenience to the Engineer or delay to the Contractor.

The Contractor shall protect and safeguard all points, stakes, grade marks, monuments, and bench marks at the Site of the Work, and shall re-establish, at its expense, any marks which are removed or destroyed due to construction operations. The Contractor shall bear the entire expense of rectifying Work improperly installed due to not maintaining or protecting marks, or to removing, without the Engineer's written approval, any such established points, stakes, or marks.

#### SC-7.0 LAND AVAILABLE TO CONTRACTOR

National Grid will provide reasonable effort to furnish not later than the date when needed by the Contractor, reasonable access to the lands upon which the Work is to be done, rights-of-way for reasonable access thereto, and such other lands which are designated for the use of the Contractor. Land and easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by National Grid.

The Contractor shall provide at its expense all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

The Contractor shall confine its operations to such portions of the property of National Grid, as may be designated by National Grid from time to time for such use and to the rights-of-way or easements acquired for the Work. Private property adjacent to the Work shall not be entered upon or used by the Contractor for any purpose whatsoever without the written consent of National Grid thereof.

All Work in connection with the Purchase Order within or bordering on private or public property shall be conducted in such manner as will cause the minimum inconvenience and disturbance to it. No excavated materials or supplies of any kind shall be stored on private or public premises without National Grid's written consent and in accordance with all applicable regulations, and all walks and driveways shall be kept open to uninterrupted passage.

The Contractor shall at its expense whenever so required by National Grid, erect and maintain fences along the roadways and around the grounds occupied by the Contractor, which fences shall be sufficient for the protection of the adjoining property and all persons lawfully using the same.

#### SC-8.0 TRAVEL NOT TO BE OBSTRUCTED

The Contractor shall not allow travel upon any street, park, roadway, or alley to be hindered or inconvenienced needlessly, nor shall the same be wholly obstructed without the written permission of National Grid thereof. Upon receipt of such permission the Contractor shall cause plain and properly worded signs announcing such fact to be placed, with proper lighted barricades, at the nearest cross streets, upon each side of such obstructed portion, where travel can pass around the same in the shortest and easiest way.

The driveways to and from all fire department buildings and those required by all manufacturing plants, industrial establishments, and other business concerns for the proper continuance of their commerce shall be kept open and maintained in passable condition at all times unless modified by agreement between the Contractor and the property owner. The Contractor shall give reasonable notice to National Grid of all private ways before interfering with them.

The Contractor shall give reasonable written notice to concerned police, bus, fire, ambulance, and school bus departments before initiating any activity which will restrict public travel or access to private property.

## SC-9.0 MAINTAINING FLOW OF SEWERS, WATER LINES AND DRAINS

The Contractor shall, at its expense, provide for and maintain the flow of all sewers, drains, house inlet connections, and water courses which may be met with during the progress of the Work. The Contractor shall not allow the contents of any sewer, drain, or house inlet connection to flow into trenches, sewers, or other structures to be constructed under the Purchase Order, and shall at its expense, immediately remove from the vicinity of the Work and cart away to a proper disposal site all offensive matter.

The Contractor shall, at its expense, provide for and maintain the flow in all water mains or laterals which may be met with during the progress of the Work. When water mains or laterals are to be disturbed to the extent that the water will be shut off, the superintendent of the water utility and all parties being served by the lines involved shall be notified 72 hours in advance concerning time and duration of the shut-off period. In cases involving fire hydrants, the fire department shall be so notified.

In the case of accidental damage to a water or sewer line, gas main or electrical conduit, the repairs of such break shall have priority over all other operations. The parties whose services are affected by the break shall be notified at once and all assistance given to supply emergency water, gas, or electricity where necessary by temporary lines, tank truck, or other means. The Contractor shall have the obligation at its expense to assure that all water, gas, electric and sewer connections serving private or public property shall be promptly and correctly restored to the utility company's specifications.

## SC-10.0 SURFACE AND SUBSURFACE CONDITIONS

### 10.1 PROTECTION, EXISTING STRUCTURES

It shall be the sole responsibility of the Contractor and at its expense to protect adjacent and other property or premises from damage of any kind during the progress of the Work and shall erect and maintain guards around its Work in such a way as to afford protection to the public. The Contractor shall be held responsible for improper, illegal, or negligent conduct of itself, and its subcontractors, employees and agents in and about said Work or in the execution of the Work covered by this Purchase Order.

It shall be the sole responsibility of the Contractor, and at its expense to sustain in their places and permanently protect from direct or indirect injury any and all pipelines, subways, pavements, sidewalks, curbs, railways, buildings, trees, poles, wells, and other property in the vicinity of his Work, whether over- or underground, or which appear within the trench or excavations, and it shall assume all costs and expenses for direct or indirect damage which may be occasioned by injury to any of them.

The Contractor's liability shall also include the damage or injury sustained by any structure whatsoever due to settlement of trenches or excavations or to

settlement or lateral movement of the sides of such trenches or excavations, whether such movement occurs during or after excavation or backfilling of such trenches or excavations. The responsibility to so support and protect all such structures from damage or injury shall continue, without limitation, throughout the Purchase Order period and during the period of guarantee.

The Contractor shall at all times have available onsite suitable and sufficient material and shall use the same as may be necessary or required for sustaining and supporting any and all such structures which are uncovered, undermined, weakened, endangered, threatened, or otherwise materially affected.

In case injury occurs to any portion of a pipeline or structure, or to the material surrounding or supporting the same, through blasting or similar operations, the Contractor shall immediately notify the Engineer, and, at the Contractor's expense, shall remove such injured Work and shall rebuild the pipeline or structure and shall replace the material surrounding and supporting the same, or shall furnish such material and perform such work of repairs or replacements as the Engineer may order. In the case of utilities, the Contractor shall immediately notify the utility company, and provide all assistance for the repair of the utility by the utility company unless authorized to undertake such repairs directly by the utility company. Any damage whatsoever shall be promptly, completely, and satisfactorily repaired by the Contractor at its expense to the satisfaction of National Grid, or the owner of the utility.

## 10.2 EXISTING SUBSURFACE STRUCTURES

### (a) General

Certain existing subsurface structures likely to be encountered during the performance of the Work embraced in this Purchase Order or located in close proximity to the Work hereunder as to require special precautions and methods for their protection, such as sewers, drains, water mains, and conduits, together with appurtenances, are shown on the Contract Drawings. The sizes, locations, and depths shown are approximate.

It is the obligation of the Contractor to verify the accuracy and completeness of the information shown, and the Contractor agrees that it shall neither have nor assert against National Grid or Engineer any claim for damages or extension of time or relief from any obligation of this Purchase Order by reason of the inaccuracy, inadequacy, incompleteness, or other deficiency of the information given or the failure to furnish additional or further information in the possession of National Grid or Engineer, except as set forth in (b) and (c) below.

Contractor is hereby given notice that subsurface structures and facilities may be located on the site which are either not identified or are mislocated on the Contract Documents.

Where any existing subsurface structure such as a sewer, drain, gas pipe, water pipe, conduit, or other structure is found which is not anticipated

by the Contract Documents or which is found to be materially different in size, location, or depth from that anticipated by the Contract Documents, the Contractor shall immediately notify the Engineer, and also the superintendent of the utility, before disturbing the structure.

Contractor shall use due care to avoid damage to subsurface facilities identified, not identified or mislocated on Contract Documents.

If ordered by the Engineer, such structure shall be uncovered and supported by the Contractor, at its cost and expense, as constituting a part of the Purchase Order, and the Contractor shall not become entitled to claim any damages for or on account of the presence of such structure or the uncovering and supporting of same.

(b) Existing subsurface structures which require changes in the Work of the Purchase Order.

The Engineer will determine whether changes should be made in the Contract Documents for construction of the Work of the Purchase Order to avoid the subsurface structure, whether the Work of the Purchase Order can proceed without changes in the Contract Documents, or whether the structure should be removed, realigned, or changed.

Any increase in cost of the Work resulting from any changes in the Contract Documents necessitated by the unanticipated presence or difference in size, location, or depth of the subsurface structure will be adjusted in the manner provided herein for changes in Purchase Order amount.

(c) Existing subsurface structures which require changes in the existing structure

Where the size, location, or depth of the existing subsurface structure has been anticipated and the Contract Documents require removal, realignment, or change, all Work under this Purchase Order shall be done in accordance with the Contract Documents in mutual cooperation with the utility or other parties concerned.

Where the presence of the subsurface structure or its size, location, or depth is not anticipated by the Contract Documents, any work by the Contractor required to remove, realign, or change the structure shall be done under the provisions for changes in the Work for the removal, realignment, or change and shall be done as mutually agreed by the Contractor, Engineer, and utility or other parties concerned.

(d) Interruption of Service

Where it is necessary to interrupt water, gas, or other public utility service to remove, realign, or change a subsurface structure, the Work shall proceed with expedience and shall be continuous after interruption of service until completion of the removal, realignment, or change and return of the utility service to its normal state.

10.3 SUBSURFACE CONDITIONS OTHER THAN STRUCTURES FOUND DIFFERENT

Reference is made to the Article SC-19.0 of these Supplemental Conditions and the obligations of the Contractor to perform all necessary subsurface investigations prior to bidding. Furthermore, the Contractor shall not be entitled to rely upon the subsurface investigation performed by National Grid or the Engineer.

10.4 PROTECTION OF UTILITIES

All utilities whose facilities may be affected by the Work of the Purchase Order shall be notified by the Contractor at least 72 hours in advance of the start of any operations which might affect such facilities.

The removal, replacement, support, or other handling of private and public utilities coming within the lines of the Work shall be accomplished by the Contractor at its expense in accordance with arrangements satisfactory to National Grid or operator of the utility involved. The Contractor, at its expense, shall remove, replace, or support all utilities as required.

The Contractor shall not permit nor cause any hindrance to or interference with any individual, municipal department, public service corporation, or other company or companies in protecting its or their mains, pipes, poles, posts, or other structures, nor in shifting, removing, or replacing the same. The Contractor shall allow said individual, department, company, or companies to take all such measures as they may deem prudent to protect their structures.

10.5 REPLACEMENT OF PROPERTY

The Contractor shall replace all pavement, driveways, fences, shrubs, lawns, trees, and any other public or private property damaged as a result of the Work under this Purchase Order. All such replacement shall be done in accordance with the applicable specifications and no separate or extra payment will be made unless specifically provided for in the Payment Items. In all cases said replacement shall be new and at least equal to the original conditions.

## SC-11 PAYMENTS AND COMPLETION

### 11.1 ESTIMATED QUANTITIES

The Contractor agrees: 1) that it will make no claim of any nature against National Grid or Engineer because of a difference between the quantities for unit price items of Work actually furnished and the estimated quantities stated in the Bid even though the estimated quantities prove grossly different from the quantities actually used, and 2) that the quantity of any unit price item of Work may be increased or decreased as may be deemed necessary without alteration or modification of the Purchase Order.

In the event that the quantities of various items actually used are either higher or lower than the quantities stated in the Bid, the Contractor agrees as follows:

- a. Where the change in quantities for any item in the original bid does not exceed 15% of the original bid quantity, the applicable unit prices bid shall be the sole basis for computing payment.
- b. Where the change in quantities for any item in the original bid exceeds 15% of the original bid quantity, National Grid may review the unit price for said item to determine if a new unit price should be negotiated.

### 11.2 PRICES

The prices herein agreed to for the performance of the Work shown and as specified shall include not only the doing of the Work but also the furnishing of all labor, tools, and materials therefor, whether the same are required directly or indirectly, unless otherwise specified.

Where Work is to be measured for payment by units of length, area, volume, or weight (as stated in the Bid), only the net amount of Work actually done, as it shall appear in the finished Work and as measured only within the payment limits described in the Contract Documents or as is ordered, shall be paid for, local customs to the contrary notwithstanding.

Where a lump sum price is bid for an item in the Bid, the lump sum price shall be for the Work complete as described in the item and shall include the cost of all specified or implied equipment, materials, and labor incidental to the Work, complete and ready for service and in accordance with the Contract Documents.

### 11.3 BREAKDOWN OF LUMP SUM ITEMS

At least ten days prior to the submission of its first application for a progress payment, the Contractor shall present to the Engineer for its review a detailed schedule showing the breakdown of all lump sum bid prices in the Purchase Order. Such schedule shall contain the amount estimated for each part of the Work and an estimate of quantities for each part of the Work. Work to be performed by subcontractors shall be separately identified. Upon request of

the Engineer, said schedule shall be apportioned by the Contractor for labor and for materials. Such schedule shall be revised by the Contractor until the same shall be satisfactory to the Engineer and shall not be changed after the Engineer has approved the same without the express written consent of the Engineer. The approved schedule will be used in the preparation of the current estimate but will not be considered as fixing the basis for additions to or deductions from the Purchase Order.

#### 11.4 CURRENT ESTIMATES

National Grid will establish dates during the respective months of the Project on which National Grid will accept applications for payment.

At least ten days before each date set for consideration for payment, the Contractor shall submit to the Engineer for review an application for payment, filled out and signed by the Contractor and covering the Work completed as of the date of the application, in satisfactory form and supported by such data as National Grid and Engineer may reasonably require.

The Engineer will, within ten days after receipt of each application for payment, either indicate in writing its recommendation of payment and present the application to National Grid or return the application to the Contractor, indicating in writing his reasons for not recommending payment. In the latter case, the Contractor shall make the necessary corrections and resubmit the application.

The Engineer's recommendation of any payment request shall constitute its advice to National Grid: that to the best of its knowledge, information, and belief, based on the Engineer's on-site observations of the Work in progress and on its reliance upon application for payment and supporting data, the Work has progressed to the point indicated; that the quality of the Work appears to be in substantial compliance with the Contract Documents (subject to any subsequent tests and qualifications stated in his final review); and that the Contractor is entitled to the payment of the amount recommended. However, by recommending any such payment, the Engineer shall not thereby be deemed to have represented that it made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, that it has reviewed the means, methods, techniques and sequences, or that it has made any examination to ascertain how or for what purpose the Contractor has used the monies paid or to be paid to the Contractor on account of the Purchase Order price.

Where Work has been included in the current estimate recommended by the Engineer for payment, and where such Work is later found to be defective, and where such defective Work has not been corrected, the Engineer will recommend to National Grid that the value of such uncorrected Work be deducted from the amount due or to become due the Contractor.

The Engineer may decline to act upon requests for monthly payment if lists of vendors and subcontractors, shop drawings, samples, work schedules, instruction manuals, and breakdowns of lump sum bid items necessary for orderly prosecution of the Work, are not submitted as required.

## 11.5 PAYMENTS FOR MATERIALS DELIVERED TO SITE

In making estimates of the value of the Work done and materials incorporated in the Work, the Contractor may, subject to the approval of National Grid or as required by law, include in the current estimates the delivered cost, as modified below, of equipment and non-perishable materials which have been tested for adequacy and which have been delivered to the Site and adequately protected from fire, theft, vandalism, the effect of the elements, and any damage whatsoever, or similarly placed in approved storage facilities adjacent thereto. Such materials and equipment shall at all times be available for inspection by the Engineer and National Grid.

No progress payment shall, however, be made for said material and equipment until each of the following conditions has been fulfilled:

- a. The Contractor shall have furnished to the Engineer invoices establishing the value of the said materials and equipment with the full amount the Contractor agrees to pay the vendor. Such invoices shall be furnished at least ten days in advance of the date of preparation of monthly estimates as established by the Engineer.
- b. The Engineer shall have inspected said material and equipment and recommended payment therefor.
- c. The Contractor shall have furnished to National Grid the fire and other casualty insurance policies, as provided in this Purchase Order and with the broad form extended coverage endorsement, for said material and equipment in an amount equal to 100% of the value thereof and which policies shall be maintained, at the sole cost and expense of the Contractor, until said material and equipment has been incorporated into the Project and which shall name National Grid as an additional insured and loss payee and shall also name the Engineer as additional insured.

Contractor shall submit with each application for payment, satisfactory evidence that all suppliers, materialmen and subcontractors have been paid all amounts previously invoiced with respect to their services and agreeing to defend and hold National Grid harmless from any liens and encumbrances placed against the Project on account of Contractor's failure to promptly pay its suppliers, materialmen and subcontractors. Satisfactory evidence shall be: a canceled check in the correct amount and including identification of the invoice or invoices paid; a letter or telegram, from the vendor and signed by his properly authorized employee, stating the amounts and invoices that have been paid; or a receipted invoice. Neither National Grid nor the Engineer shall have an obligation to pay or see to the payment of money to a Subcontractor except as may otherwise be required by law.

Should the above evidence of payment not be furnished, the Engineer will recommend the deduction of any funds included in previous estimates for such

materials and equipment for which said evidence has not been furnished from the current estimate or subsequent current estimates.

Any payment made for materials and equipment delivered will not relieve the Contractor of any responsibility for furnishing all the necessary equipment and materials required for prosecution of the Work in the same manner as if such payments had not been made.

#### 11.6 NATIONAL GRID'S RIGHT TO WITHHOLD PAYMENTS

National Grid may withhold from the Contractor so much of any approved payments due it as may in the judgment of National Grid be necessary to assure the payment of any claims, liens or judgments against the Contractor, resulting from performance or non performance of the Work of the Purchase Order, which have not been suitably discharged. National Grid shall have the right as agent for the Contractor to apply any such amounts so withheld in such manner as National Grid may deem proper to satisfy such claims, liens or judgments. Such application of such money shall be deemed payments for the account of the Contractor.

National Grid may also withhold from the Contractor so much an amount of any payments due it as may in the judgment of National Grid be necessary:

- a. To protect National Grid from loss due to previous payment for Work subsequently found to deviate from the Purchase Order requirements and which has not been corrected by the Contractor, and
- b. To protect National Grid from loss due to previous payment for materials and/or equipment delivered to the Site for which evidence of payment to vendors has not been furnished by the Contractor.

#### 11.7 DEDUCTIONS FOR UNCORRECTED WORK

If National Grid deems it expedient to accept uncorrected Work, the Purchase Order price shall be decreased by an amount, determined by National Grid, which is equal to the difference in value of the Work as performed by the Contractor and the value of the Work had it been satisfactorily performed in accordance with the Purchase Order, or which is equal to the cost of performing the corrective Work, whichever shall be the higher amount.

#### 11.8 SUBSTANTIAL COMPLETION

The Work of the Purchase Order shall be deemed Substantially Complete when either of the following occurs:

- a. When the Work of the Purchase Order is at least 99% complete as evidenced by a list of minor items to be completed with estimated value equal to or less than 1% of the value of the Purchase Order payments as shown in current estimates of Work completed.

- b. When National Grid and Contractor reach mutual written agreement that the Work is Substantially Complete.

The Purchase Order will be considered as a single unit for determination of Substantial Completion except as follows:

- c. Where a division of major parts of the Purchase Order is set forth in the Special Provisions for purposes of separate determinations of Substantial Completion for each part.
- d. Where National Grid and Contractor reach mutual written agreement that a major part of the Purchase Order can be separately determined to be Substantially Complete.
- e. Where part of the Work of the Purchase Order has been previously accepted into Beneficial Occupancy.

The date of Substantial Completion shall be evidenced by a Certificate of Substantial Completion signed by the Contractor, Engineer, and National Grid.

#### 11.9 FINAL INSPECTION AND CERTIFICATE OF SUBSTANTIAL COMPLETION

National Grid, Engineer, and Contractor will make an inspection of the Work as soon as possible after written notification by the Contractor to National Grid that, in the judgment of the Contractor, the Work is 99% complete, or after National Grid and Contractor mutually agree that the Work appears Substantially Complete (the "Final Inspection"). Following said Final Inspection the Engineer will advise the Contractor of remaining items to be completed or corrected to arrive at completion of the Work inspected.

When the remaining items of Work to be completed or corrected are of sufficiently reduced value that Substantial Completion is indicated, the Engineer will prepare a detailed estimate (hereinafter referred to as Estimate of Work Remaining) of the value of said items showing each item's separate value as well as the total value of all items. The Contractor shall endorse said Estimate as evidence of agreement.

Substantial Completion will be evidenced by a Certificate of Substantial Completion signed by the Contractor, Engineer, and National Grid. The date of Substantial Completion shall be that date specified in the Certificate of Substantial Completion. The Estimate of Work Remaining will be attached to the Certificate of Substantial Completion.

#### 11.10 PAYMENT AT SUBSTANTIAL COMPLETION

The Application for Payment at Substantial Completion shall be in a form satisfactory to National Grid and shall be accompanied by the following documents:

- a. Certificate of Substantial Completion with Estimate of Work Remaining attached.
- b. A schedule endorsed by the Contractor showing time of completion of all remaining Work.
- c. An affidavit of the Contractor: 1) that the claims of all subcontractors, materialmen, laborers, and all other persons and parties furnishing labor and materials with respect to the Purchase Order have been paid in full except as noted; 2) that the Contractor will pay in full the exceptions stated from the proceeds of this payment; and 3) that the Contractor acknowledges that National Grid has made this payment in reliance upon this affidavit.
- d. Releases or receipts evidencing payment of all liens which may have been filed as a result of the performance of the Work of the Purchase Order.
- e. A written statement from Surety that the Labor and Material Bond and the Performance Bond, each in the amount of 100% of the value of the Purchase Order, are in force and will remain in force for a period of one year following the date of Substantial Completion or such later date as may be established by an extension of the guarantee period.

Payment at Substantial Completion will be an amount equal to the value of all of the Work of the Purchase Order which has been declared Substantially Complete including the estimated value of the minor items to be completed or corrected less an amount equal to twice the total Estimate of Work Remaining, less an amount withheld to satisfy any outstanding claims, liens, or judgments, less any charges for delay, and less all prior payments to or for the account of the Contractor. All prior estimates and payments including those related to Change Orders, shall be subject to correction by the payment at Substantial Completion.

#### 11.11 ACCEPTANCE OF WORK

Acceptance by National Grid of the Work of the Purchase Order will occur on the dates as follows:

- a. The date of Substantial Completion specified in the Certificate of Substantial Completion for all Work not included in b. or c. below.
- b. The date of Beneficial Occupancy for all Work taken into Beneficial Occupancy.
- c. The date of payment of the requisition of the Contractor at the time of 100% completion or correction for all Work included in the Estimate of Work Remaining.

#### 11.12 CONTRACTUAL RELEASE TO NATIONAL GRID

The submission by the Contractor of an Application for Payment at Substantial Completion shall be, and shall operate as, a release to National Grid of all further claims and liability to the Contractor for all things done or furnished in connection with the Purchase Order, and for every act and neglect of National Grid and others relating or arising out of the Purchase Order excepting the Contractor's requests for payment for completion or correction of Work items included in the Estimate of Work Remaining, the Application for Payment at Substantial Completion, and interest on said Payment if payment is improperly delayed. However, no Application for Payment, or payment of same, shall operate to release the Contractor from any obligations under the Purchase Order or the Surety bonds.

#### 11.13 PAYMENT FOR MINOR ITEMS WHEN COMPLETED OR CORRECTED

The minor items of Work contained in the Estimate of Work Remaining shall be completed or corrected by the Contractor in a timely manner in accordance with the schedule submitted with the application for Payment at Substantial Completion. Upon such completion or correction, and upon Application for Payment in a form satisfactory to National Grid, National Grid will pay an amount equal to the value, and only that value, of the item or items of Work completed or corrected. The remaining amount held as determined when making Payment at Substantial Completion will be retained by National Grid until the Contractor has completed all items of Work contained in the Estimate of Work Remaining and has submitted evidence that all claims, liens, and judgments have been satisfied. No payment will be made which is less than one thousand dollars, except upon 100% completion or correction of all items included in the Estimate of Work Remaining.

#### 11.14 NATIONAL GRID'S RIGHT TO COMPLETE THE WORK

During the time period extending from the date of Substantial Completion to a date six months thereafter or to mutually acceptable later date, the Contractor shall complete or correct all items contained in the Estimate of Work Remaining in accordance with the schedule established at Substantial Completion as such Estimate of Work Remaining and Schedule may be modified or supplemented prior to the end of the warranty period. Where Work items are not completed or corrected in accordance with the established schedule, and following reasonable notice by National Grid to the Contractor, National Grid may complete or correct said Work items. The cost for such completion or correction may be paid by National Grid, without review by the Contractor, and the Contractor shall reimburse National Grid for all costs so incurred.

It is hereby mutually agreed that six months following the date of Substantial Completion or the mutually acceptable later date, and at any time thereafter, National Grid (having given prior notice as set forth in the preceding paragraph) may, without additional notice to the Contractor, complete and correct any items contained in the Estimate of Work Remaining which are remaining to be completed or corrected. The cost for such completion and correction may be paid by National Grid, without review by the Contractor, and the Contractor shall reimburse National Grid for all costs so incurred. In the event that National Grid

commences legal proceedings to recover all costs not reimbursed, there shall be included as an item of damage all reasonable attorneys' fees.

Any funds previously held by National Grid at the time of payment at Substantial Completion may be applied by National Grid to offset the costs incurred for completion or correction of items contained in the Estimate of Work Remaining. All costs incurred by National Grid in excess of funds previously held will be billed to the Contractor, and the Contractor shall promptly reimburse National Grid for said costs. National Grid may add reasonable amounts for administrative, engineering, and supervisory services to the cost of construction for those items completed or corrected by National Grid. In the event that National Grid commences legal proceedings to recover all costs not reimbursed, there shall be included as an item of damage all reasonable attorneys' fees.

#### 11.15 BENEFICIAL OCCUPANCY

National Grid reserves the right to accept for Beneficial Occupancy any portion of the Work, whether or not Substantially Complete, at anytime without prejudice to National Grid in enforcing any provisions of the Purchase Order.

Beneficial Occupancy by National Grid shall occur when National Grid accepts a part of the Work, but not all Work of the Purchase Order, and places such accepted Work in the service therefor intended.

Upon Beneficial Occupancy by National Grid the following procedures will apply:

- a. The Engineer, with the approval of National Grid, will notify the Contractor as to what portion, or portions of the Work have been accepted into Beneficial Occupancy.
- b. The retained percentage for the completed Work taken into Beneficial Occupancy will be released.
- c. The guarantee period applicable to that portion of the Work accepted into Beneficial Occupancy will start as of the date of Beneficial Occupancy.
- d. As of the date of Beneficial Occupancy, National Grid will assume responsibility for maintenance, heat, utilities, and insurance on that portion of the Work accepted for occupancy.
- e. The Contractor shall subsequently complete or correct all unfinished items in the Work accepted by National Grid for Beneficial Occupancy.
- f. Such action by National Grid will in no way affect the obligations of the Contractor under the terms and provisions of the Purchase Order with respect to uncompleted Work.

- g. Upon completion of unfinished items in the Work beneficially occupied, sufficient to establish Substantial Completion as defined herein, all procedures set forth herein for Work deemed Substantially Complete shall apply.

#### 11.16 CONTRACTOR'S AUTHORITY TO SIGN

All Current Estimates, applications for payment, affidavits, and other documents required hereunder and the Certificate of Substantial Completion, shall be signed on behalf of the Contractor by a person evidencing its authority to do so and shall be acknowledged where required in form satisfactory to National Grid.

#### 11.17 CHARGES FOR DELAY CAUSED BY THE CONTRACTOR

It is hereby agreed that time is of the essence of the Purchase Order with respect to the Work to be performed and that National Grid will suffer damages from failure to complete the Work in the time specified. When the Work embraced in the Purchase Order is not 100% Completed on or before the date specified herein or on or before the later date to which the time of 100% Completion may have been extended in writing by National Grid, the engineering and inspection expenses incurred by National Grid, upon the Work from said date to the date of 100% Completion of the Work shall be charged to the Contractor and be deducted by National Grid from monies due the Contractor, and in addition, the Contractor shall be charged the liquidated damages stated in the Purchase Order for the same period, said sums being not in the nature of a penalty, but a part of the consideration of the Purchase Order.

National Grid shall have the right to deduct such amounts from any monies due or to become due the Contractor and the amount still owing, if any, after such deduction shall be paid on demand by the Contractor or its Surety. Such payment shall not relieve the Contractor or its Surety from any other obligation under this Purchase Order.

#### 11.18 DELAYS CAUSED BY OTHERS

If the Contractor is unreasonably delayed at any time in the progress of the Work by any act, omission, or neglect of National Grid or Engineer, its agents or employees which are beyond their control, or if the Contractor is delayed at any time in the progress of the Work by any act, omission or neglect of any separate contractor engaged by National Grid, or by strikes, fires, unusual delays in transportation, abnormal adverse weather conditions or unavoidable casualties not caused by the Contractor, or by any other cause beyond the Contractor's control, the time for Substantial Completion or 100% Completion, as applicable, shall be extended for the length of time that the substantial Completion or 100% Completion of the Work was actually delayed thereby and the Contractor shall not be charged with liquidated or actual damages for the delay during the period of such extension nor shall the Contractor be due compensation for extended general conditions expense, other expense related to the delay, overhead, or profit for the period covered by such extension. No extension shall be granted unless the Contractor demonstrates a delay in the Substantial Completion or

100% Completion of the Work, as applicable, by showing a delay on the critical path of the CPM schedule.

#### 11.19 NATIONAL GRID'S RIGHT TO ACCELERATE

If National Grid or National Grid's Representative elects to direct the Contractor to accelerate the work at no additional cost to National Grid to eliminate delays pursuant to Paragraph 11.18, above, the Contractor shall immediately implement the acceleration. Acceleration can be in the form of additional manpower, overtime and/or additional shift work or a combination thereof. If the Contractor refuses to immediately proceed with the directed acceleration, National Grid may exercise its right to declare the Contractor in default as stipulated General Condition -Article 36.

### SC-12.0 MATERIALS AND EQUIPMENT

#### 12.1 QUALITY AND WORKMANSHIP

All items of equipment and materials of like type furnished under one Purchase Order shall be the product of one manufacturer, unless otherwise specified.

All materials furnished or incorporated in the Work shall be new, unused, of the best quality, and especially adapted for the service required; whenever the characteristics of any material are not particularly specified, such material shall be utilized as is customary in first class work of a nature for which the material is employed.

All materials and workmanship shall be subject to inspection, examination, and tests by the Engineer and other representatives of National Grid at any and all times during manufacture or construction and at any and all places where such manufacture or construction are carried on.

The selection of bureaus, laboratories, and agencies for the inspection and tests of supplies, materials, and equipment shall be subject to the approval of the Engineer. Satisfactory documentary evidence that the material has passed the required inspection and tests shall be furnished to the Engineer by the Contractor prior to the incorporation of the material in the Work.

All laboratory and field testing shall be at the sole cost and expense of the Contractor unless specifically stated otherwise in the Contract Documents.

#### 12.2 EQUIVALENT PRODUCTS AND CHANGES TO SPECIFICATIONS

The words "similar and equal to," "or equal," "equivalent," and such other words of similar content and meaning (hereinafter, "or equal") shall, for the purposes of this Purchase Order, be deemed to mean similar and equivalent to one of the named products.

Whenever any product is specified in the Contract Documents by a reference to the name, trade name, make or catalog number of any manufacturer or supplier, the intent shall not be to limit competition, but to establish a standard of quality which the Engineer has determined is necessary for the project. If any product other than that specified is proposed for use by the Contractor, it shall submit to the Engineer either its certification that the "or equal" strictly conforms to the Specifications, or a statement specifically identifying all differences between the "or equal" and the Specifications. Any variation of a proposed "or equal" from the Specifications which is not specifically noted in the Shop Drawing or Contractor's submittal shall be at the sole risk and expense of Contractor. Engineer's review and stamping of Shop Drawings or Contractor submittals shall not be deemed to be, or constitute Engineer's acceptance of any such "or equal" or deviation from the Specifications which are not specifically noted on Contractor's submittal. In addition Contractor shall provide all the information that the Engineer requests concerning the product. The proposed product shall not be used until it is accepted by the Engineer. Any "or equal" incorporated into the Work without Engineer's written acceptance shall be at the Contractor's sole risk, and Engineer may require the removal and replacement of any unaccepted "or equal".

In all cases, the Engineer will be the sole judge as to whether a proposed "or equal" is acceptable, and the Contractor shall have the burden of proving, at its expense, to the satisfaction of the Engineer that the proposed "or equal" is similar and equal to the named product. In making such determination the Engineer may establish such criteria as it deems proper for acceptance of the "or equal".

Any requested change in the Specifications not pertaining to an "or equal" must be submitted to Engineer in writing and must be stated with sufficient clarity and detail to permit proper consideration by Engineer. Unless accepted by Engineer after submission as herein provided, any deviation from the Specifications, or the use of any product which varies from the Specifications, shall be at Contractor's sole risk and expense.

With respect to the acceptance or rejection of "or equal" by Engineer, neither the review and stamping of Shop Drawings and/or Contractor submittals as provided in Article 62.5, nor Engineer's failure to observe and note any variation from the Specifications (unless such variation is specifically noted and identified in Contractor's Submittal), shall reduce, transfer, or modify Contractor's responsibility to provide products which fully comply with the Specifications.

"Or equal" or changes to Specifications proposed by Contractor, which are judged by the Engineer to represent no-cost improvements or enhancements to the design, shall be reviewed without cost to Contractor. All other submissions of "or equal" or changes to the Specifications shall be considered after review of specific products submitted at the same time or earlier, and regardless of whether such "or equal" are accepted or rejected, Contractor shall reimburse National Grid for the costs (including labor costs) and expenses of Engineer incurred in the review of "or equal" or changes to the Specifications, including the cost of Engineer's conflict review, and any revisions made as a result of such review,

plus a 10% administrative charge. Contractor shall reimburse National Grid for such sums upon demand.

Where the Engineer accepts an "or equal" by the Contractor and such "or equal" requires a revision or redesign of any part of the Work covered by the Purchase Order, all such revision and redesign and all new drawings and details required therefor shall be acceptable to the Engineer and shall be provided by the Contractor at its expense. If an acceptable substitution of an "or equal" requires a different quantity or arrangement of duct work, piping, wiring, or any part of the Work from that in the Contract Documents, the Contractor shall provide the same at its expense.

### 12.3 SUPPLIERS

All supplies and equipment shall be furnished by manufacturers who shall have at least three years' experience in the design, production, assembly, and field service of equipment of like type, size, and capacity. Where required by the Engineer, the Contractor shall supply a list of at least three successful installations.

### 12.4 TOOLS, ACCESSORIES AND SPARE PARTS

The Contractor shall, unless otherwise stated, furnish with each type, kind, and size of equipment, one complete set of any special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment.

Each piece of equipment shall be provided with a substantial nameplate, which is securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, and principal rating data.

Where the Materials and Performance Specification Sections of this Purchase Order require spare parts to be furnished by the Contractor, said spare parts for each item of equipment shall be kept separate and tagged to identify the specific item of equipment to which they belong, shall be packaged so as to preclude damage from handling and storage, and shall be bagged or packaged together where items are small in dimension.

### 12.5 EQUIPMENT INSTALLATION

The Contractor shall have on hand sufficient proper equipment and machinery of ample capacity to facilitate the Work.

The General Contractor shall furnish, install, and protect all necessary concrete pads, which shall include guides, track rails, bearing plates, anchor and attachment bolts, and all other appurtenances needed for the installation of the devices included in the equipment specified. The location, size and templates for the concrete pads shall be furnished by the Contractor supplying the equipment along with all guides, track rails, bearing plates, anchor and attachment bolts and other appurtenances required.

Anchor bolts shall be made of ample size and strength for the purpose intended. Unless otherwise specified, anchor bolts in submerged locations shall be bronze or stainless steel; all other anchor bolts shall be cadmium plated. Substantial templates and working drawings for installation shall be furnished.

All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary connections can be made readily between the various units.

The Contractor shall furnish all oils and greases for initial operation of each item of equipment and shall furnish the lubricant chart as indicated in Paragraph 12.8. Insofar as possible, all lubricants shall be obtained from one manufacturer approved by National Grid. Each item of equipment shall be tagged to show the date lubricated, the name and type of lubricant used and the recommended frequency of lubrication.

All mechanical and electrical equipment shall be checked for correctness of installation by a qualified representative of the manufacturer, and the manufacturer shall certify in writing to the Engineer that the equipment was installed according to its specifications. Where multiple manufacturers have supplied components for a piece of equipment, the manufacturer that assembled the components shall supply the certification.

## 12.6 OPERATING INSTRUCTIONS AND MANUALS

The Contractor shall furnish the services of qualified manufacturers' technicians to instruct designated employees of National Grid in the operation and care of all equipment. The Contractor shall also furnish and deliver to the Engineer three complete sets of instructions, bulletins; diagrams, and other data and information required for the proper operation and maintenance of the equipment, including spare parts lists and ordering of spare parts. These operating manuals shall be furnished to the Engineer at such time as the equipment is delivered and shall include references to models and serial numbers of equipment furnished, assembly drawings, lubrication instructions, and service recommendations. Such data shall be bound in booklet form for easy reference and shall be accompanied by a transmittal sheet listing an inventory of items included.

## 12.7 STORAGE AND MAINTENANCE OF EQUIPMENT

Equipment containing moving parts or bearings which is subject to damage by exposure or improper storage shall be protected as set forth herein:

The Contractor shall require that the manufacturers of all equipment to be incorporated into the Work of this Purchase Order supply detailed instructions concerning storage and maintenance required to maintain the equipment in good condition until it is placed in operation. These instructions shall be acceptable to the Engineer and shall be strictly enforced. Such acceptance shall not relieve the Contractor of its obligation to properly store and maintain the equipment.

Equipment which is intended for outdoor installation may be stored outside subject to and in accordance with the manufacturer's instructions. Equipment intended for indoor installation shall be stored in heated and ventilated warehouses or in heated and ventilated enclosures on the Site of the Work. Equipment which is installed more than seven days prior to being placed in operation shall be protected in strict accordance with the manufacturers' recommendations and in a manner acceptable to the Engineer. Such protection, where dictated, shall consist of complete air-tight encapsulation with desiccants.

Equipment improperly stored or improperly protected after installation shall, at National Grid's option, be replaced by the Contractor at no cost to National Grid.

## 12.8 LUBRICATION CHART AND LUBRICATION

The Contractor shall furnish National Grid a lubrication chart(s) for all equipment furnished or installed by the Contractor. The chart(s) shall include the following for each item of equipment:

- name of the item;
- location of the item;
- each point of lubrication on the item;
- for each point of lubrication, the identification of the lubricant recommended and the recommended frequency of lubrication.

The information on the chart(s) shall be developed from manufacturers' printed data or from manufacturers' specific recommendations.

The identification of the lubricant by manufacturer's name and product identification number (such as Mobil X421) shall be furnished. Unless otherwise stated the name of the manufacturer to be used will be furnished to National Grid by the Contractor.

Following the initial operation of the equipment the Contractor shall relubricate, changing and adding lubricants, at the intervals or frequency as recommended by the manufacturer until acceptance.

## SC-13 SHOP DRAWINGS AND SAMPLES

### 13.1 LISTING OF ITEMS

Following execution of the Purchase Order by the Contractor, the Engineer will submit to the Contractor a list of equipment, materials, and other items for which shop drawings, layouts, samples, will be required. This listing shall not be construed to be all-inclusive and may be added to, or deleted from, as may be required in the opinion of the Engineer.

### 13.2 ACCEPTANCE OF MANUFACTURERS OR VENDORS

The Contractor, with such promptness and in such sequence as to cause no delay in the Work, shall submit to the Engineer the name of the manufacturer or vendor for each item on the list or addition to the list submitted. No awards shall be made by the Contractor, and no work under any item shall proceed, until acceptance of the manufacturer or vendor has been given by the Engineer. Such acceptance will be only on the basis of the manufacturer's or vendor's experience and reputation and will not imply that the shop drawings or samples for the item will be acceptable. Review of shop drawings for an item will depend upon full compliance with the Contract Documents as demonstrated by material submitted.

### 13.3 ELECTRICAL INTERCONNECTIONS

Where the Project includes electrical equipment and electrical control systems and where the Work of the Project involves more than one Contractor, it shall be the responsibility of the Electrical Contractor to coordinate and complete power, control, and electrical signal interconnections for all equipment included in the Project.

### 13.4 SHOP DRAWING SUBMITTAL REQUIREMENTS

Shop drawings and data shall be submitted to the Engineer for each item on the latest revised list determined from Paragraph 13.1, above. Submittals shall be made sufficiently in advance of the time when items included therein are to be incorporated into the Work to permit proper review, necessary revisions, and resubmittals without causing a delay in the performance of the Work.

Shop drawings shall present complete and accurate information relative to all working dimensions, equipment weights, assembly, and section views, and all necessary details pertaining to coordinating the Work of the Purchase Order, lists of materials and finishes, parts lists and the description thereof, lists of spare parts and tools where such parts or tools are required, and any other items of information that are required to demonstrate detailed compliance with the Contract Documents. Drawings for electrical equipment shall include elementary and interconnection diagrams.

Contractor's submittal of Shop Drawings shall constitute Contractor's representation that submitted Shop Drawings and the specifications pertaining thereto have been thoroughly reviewed by Contractor for consistency with the Specifications and that submitted Shop Drawings strictly comply with the requirements of the Contract Documents; that the Contractor has determined and verified all quantities, dimensions, field construction criteria, materials catalog numbers, and similar data, and that Contractor has reviewed or coordinated each shop drawing with the requirements of the Work and the Contract Documents. The return to Contractor of Shop Drawings stamped "Reviewed" shall in no way relieve Contractor from sole responsibility for strictly complying with the specifications in the Contract Documents. Contractor shall reimburse National Grid for the costs (including labor costs) and expenses of Engineer incurred in the review of Shop Drawings which have been twice before returned marked as "Rejected" or "Resubmit".

Unless otherwise permitted in specific cases, all data shall be transmitted to the Engineer by the Prime Contractor.

Each shop drawing submitted shall indicate the following:

1. Project name and Purchase Order number
2. Manufacturer of the equipment
3. Notation as to whether original submittal or resubmittal
4. Date received by Contractor from manufacturer or vendor
5. Date submitted to Engineer

Each shop drawing submittal shall be accompanied by a transmittal letter indicating the item or items submitted, with particular reference to latest revised list of equipment, materials, and other items described in Paragraph 13.1. above and the appropriate section of the Contract Documents to which the items apply. The transmittal letter shall also indicate whether the submittal constitutes a complete set of drawings for the item, a partial set of drawings for which additional submittals are to be expected by the Engineer, or a partial set of drawings to complete a previous submittal. In any case, the Contractor shall indicate by the transmittal letters when the submittals for an item are intended to be complete.

Unless otherwise stated in the Special Provisions, the Contractor shall submit at least five copies of drawings, catalog data, and similar items for review. This number includes one for return to the Contractor noted as "Reviewed" or request for amendment. If the Contractor desires more than one copy returned to it, it shall submit with the initial and any subsequent transmittals the additional number desired up to a maximum of three copies.

If the Engineer requires additional copies, it will so inform the Contractor upon return of the material noted as "Reviewed". Additional copies of "Reviewed" shop drawings will be requested in the cases where the subject matter shown thereon requires coordination of two or more prime Contracts. Copies of such drawings, when received, will be retransmitted by the Engineer.

A current file of "Reviewed" shop drawings will be maintained by the Engineer and, where so stated in the Special Provisions, said current file of "Reviewed" shop drawings will be at the job site. Any Contractor may have access to said "Reviewed" shop drawing file during normal office hours. It shall be the responsibility of each prime Contractor to avail itself of information in said "Reviewed" shop drawing file and to be aware of coordination requirements involving its work in the event it does not receive appropriate shop drawings from the Engineer.

### 13.5 ENGINEER'S REVIEW OF SHOP DRAWINGS

The Engineer's review of shop drawings is for general compliance with the Contract Documents only and is not a complete check of the method of assembly, erection, construction or detailed review of the specifications. Such review shall in no way be construed as permitting any departure whatsoever from the Contract Documents, except where the Contractor has previously requested and received written approval of the Engineer for such departure. When requested by Contractor, proposed departures from the Contract Documents will be considered by Engineer at Contractor's expense, whether or not accepted. The cost of Engineer's conflict review and any revisions made as a result of Contractor's requested departure shall be at the expense of Contractor. Contractor shall reimburse National Grid for the referenced costs and expenses of Engineer upon demand.

Review of shop drawings by the Engineer will be limited to completed submittals except where review of a partial submittal is specifically requested by the Contractor and where such review of a partial submittal is necessary for timely completion of the Work of the Purchase Order. Where shop drawings of related items are necessary for review of a particular submittal, the Engineer will so inform the Contractor, who will promptly submit such shop drawing of said related items.

Drawings and similar data will be reviewed and stamped by the Engineer as follows:

1. "Reviewed," if no change or rejection is made. All but four copies of the submitted data will be returned.
2. "Reviewed and Noted," if minor changes or additions are made but resubmittal is not considered necessary. All but four copies of the submitted data will be returned and all copies will bear the corrective marks.
3. "Resubmit," if the changes requested are extensive or if retransmittal of the submittal to another Contractor is required. In this case, the Contractor shall resubmit the items after correction, and the same number of copies shall be included in the resubmittal as in the first submittal. One copy of the first submittal will be retained by the Engineer and two copies will be returned to the Contractor.
4. "Rejected," if it is considered that the data submitted cannot, with reasonable revision, meet the requirements of the Contract Drawings and Specifications.

### 13.6 RESUBMITTALS

Any changes, other than those indicated as requested, made in drawings or other data shall be specifically brought to the attention of the Engineer upon resubmittal. Changes or additions shall not be made in, or to, "Reviewed" data without specific notice to the Engineer.

If, after reasonable correction and resubmittal of the shop drawings for an item of equipment, acceptance is not given, the Contractor shall submit the name of another manufacturer or vendor to supply the item. Should progress of the Work be delayed by the changing of the manufacturer or vendor, such a cause will not be considered an extenuating circumstance beyond the control of the Contractor, and charges for delay if otherwise applicable, will be levied and shall be born solely by the Contractor.

### 13.7 SAMPLES

Samples shall be submitted to the Engineer as required on the latest revised list determined from Paragraph 13.1. The samples shall be properly identified by tags and shall be submitted sufficiently in advance of the time when they are to be incorporated into the Work, so that rejections thereof will not cause delay. A letter of transmittal from the Contractor requesting review shall accompany such samples.

The procedures set forth in Paragraphs 13.5 and 13.6, above for shop drawings shall be used for processing samples.

## SC-14.0 TEMPORARY SERVICES

### 14.1 TEMPORARY HEAT

It is the obligation and responsibility of the Contractor to provide and maintain temporary heat by means of portable electric, oil or gas-fired units. The General Contractor shall provide and pay for all fuel and electricity used in the temporary facilities and shall provide proper smoke pipes or other means to prevent smoke or smudge from marking up walls, ceilings, or other parts of equipment.

Should the temporary heating facilities require electric service, the General Contractor shall provide the necessary wiring and power.

After their installation and testing of the permanent heating system facilities, they may be used for temporary heating purposes with concurrence of National Grid. Any temporary wiring or piping required and all power consumed shall be the obligation and responsibility of the General Contractor.

If the General Contractor elects to utilize the permanent heating facilities included in the Project for temporary heat, it shall be the responsibility of the Contractor to guarantee the heating system for a period of one year following final acceptance of the Purchase Order or Beneficial Occupancy, whichever comes first. It shall be the responsibility of the Contractor to replace all filters before the final acceptance of the Purchase Order.

It shall be the responsibility of the General Contractor to repair any damage to heating and ventilating equipment suffered as the result of use by the General Contractor.

After the buildings are enclosed excepting windows, doors and similar apertures, temporary enclosures for all apertures shall be provided and temperatures in the entire building shall be continuously maintained at not less than 40 degrees Fahrenheit unless specific permission is granted in writing by the Engineer. The General Contractor shall install on each floor, near the center of the building, a suitable, securely fastened, and properly protected thermometer.

National Grid will supply all heat after final acceptance of the Purchase Order or upon Beneficial Occupancy of a structure by National Grid.

#### 14.2 TEMPORARY ELECTRIC LIGHT AND POWER

It is the obligation and responsibility of the General Contractor to provide and maintain temporary facilities for furnishing light and power necessary for operations under the Purchase Order, and to make all necessary arrangements therefor, including all required connections, ordering the meter, and paying all fees and inspection charges.

The General Contractor shall make the temporary light and power facilities available to any and all subcontractors, for their use in connection with their contracts, and may charge each subcontractor for such service an amount not to exceed a fraction of the cost of the services, as billed by the utility, proportional to the value of the Project. Removal of temporary facilities shall be by the Contractor. The installation and meters shall remain until need for same has ceased or until completion of the Purchase Order.

#### 14.3 POWER, FUEL AND WATER FOR TESTING

The permanent electrical service, or any part thereof, shall not be connected until the tests on wiring and grounding systems have been successfully completed and test data reviewed by the Engineer.

Where tests on equipment require electric power for testing, such power shall be supplied through the permanent electrical service and through the permanent electrical distribution and control equipment. All power for testing will be provided by National Grid. The use by National Grid of the permanent electrical service, electrical distribution system, and/or control equipment for the purpose of testing shall not constitute acceptance of the Work.

Where tests are specified on fuel-burning equipment, or where tests are specified on other equipment, and require simultaneous operation of the fuel burning equipment, all fuel for such tests will be provided by National Grid.

Unless otherwise specified, water of acceptable quality for testing shall be furnished by the Contractor.

#### 14.4 TEMPORARY WATER FACILITIES

Where the public water supply is available and under control of National Grid, water will be furnished to General Contractor. Such water supply shall be subject at all times to the control and supervision of the superintendent or

manager of the water utility, and at a cost determined by the schedule of charges on a file at the office of the utility. Prior to making use of any municipal water, permission in writing to use the water for any particular purpose shall be obtained from the superintendent or manager. The cost, if any, of connection to the water supply shall be paid by the Contractor.

Where the public water supply is owned or controlled by a private company, corporation or individual or municipality other than National Grid, the Contractor shall make such arrangements at its cost for service with National Grids thereof as he requires.

The General Contractor shall make the temporary water service available to all subcontractors, for their reasonable use in connection with their Contracts. Removal of temporary facilities shall be the responsibility of the Contractor. The installation and meters shall remain until need for same has ceased or until completion of the Purchase Order. Each Contractor shall provide his own services after completion of the General Contract.

#### SC-15.0 WORK SCHEDULE

A Work Schedule shall be submitted to the Engineer by the Contractor a minimum of 10 days prior to the commencement of on-site activities. The work schedule shall be in the form of a neatly labeled bar graph and shall show the order and date on which the several salient tasks will be started and completed, including a block by block breakdown along the construction route. The Contractor is required to obtain written approval of the Work Schedule from the Engineer prior to initiating work at the Contract work area. The schedule shall be updated as needed (minimum of monthly), and resubmitted to the Engineer. As part of the required Work Schedule, the Contractor shall develop a detailed description of the proposed sequence of construction.

#### SC-16.0 PRE-CONSTRUCTION MEETINGS

Prior to the start of construction, a general information meeting shall be held with the Owner/Engineer, Contractor(s), Regulatory Agencies, and other interested parties in attendance. The meeting shall cover the general features of the project and the various requirements in the Contract(s).

#### SC-17.0 PROGRESS AND COORDINATION MEETINGS

Progress and coordination meetings will be held weekly or as scheduled by the Engineer at the project site to discuss the progress of the Work. Representatives of the Contractor who have decision-making authority shall be in attendance at these. A NYSDEC representative may also be in attendance.

In the preparation of the bid, the Contractor should assume participation in continuous coordination efforts with all on-site parties. Informal meetings will be held at the work sites. On-site representatives of the Contractor and Owner will attend these meetings to discuss day-to-day operations, schedule, health and safety items, outstanding issues,

and the general status of the project. Approximate weekly meetings will be held on-site among representatives of the Contractor, Owner, and Owner's Representative. These meetings will be held to discuss issues including, but not limited to, project status, schedule, scope of work, and overall project implementation issues.

At a minimum, Toolbox "safety meetings" will be held weekly at the project site to discuss the current safety precautions for work activity in accordance with the Health and Safety Plan.

#### SC-18.0 TEMPORARY SUPPORT FACILITIES

Upon mobilization to the Site and initiation of construction activities, the Contractor shall provide, but shall not be limited to, the following temporary facilities:

1. Field Office Trailers – The Contractor shall submit drawings within one week following award of Contract to the Engineer for review, showing the layout, furnishings, and facilities of the field office trailer and information concerning how the Contractor proposes to furnish the required utilities. Agency/Engineer and Contractor field office trailer shall be provided by the Contractor. The Agency's/Engineer's field office trailer shall be a minimum of 400 square feet of floor space and include the following:

- Three rooms
- Heat
- Air conditioning
- Electrical outlets
- Office furniture
- Office supplies

Maintenance of the trailer shall include setup, OSHA-approved stairs at each outside door, adequate heating and cooling, electrical power, and lighting.

2. Telephone Service - The Contractor shall provide and maintain separate telephone service and equipment including one telephone unit and one answering machine to each of the Contractor's field office trailers, the Engineer's/Agency's field office trailer. Long distance phone charges made from the Agency/Engineer Trailer shall be submitted by the Contractor for payment.
3. Computer Service - The Contractor shall provide and maintain separate telephone service for laptop computer users for the Contractor's and Engineer's field office trailers.
4. Facsimile Service - The Contractor shall provide and maintain separate facsimile service for the Contractor's and Engineer's field office trailer. The Contractor shall provide a dedicated telephone line to the Engineer's field office trailer for their use.

5. Temporary Water Service - The Contractor shall provide and maintain bottled drinking water service including one five-gallon capacity bottled drinking water cooler for each field office trailer (including Agency/Engineer's field office trailer). It is the Contractor's responsibility to provide potable water service as deemed necessary for construction activities.
6. Temporary Sanitary Facilities - The Contractor shall provide and maintain temporary sanitary facilities and enclosures as required by OSHA. Portable Toilets - The Contractor shall provide a minimum of two portable sanitary toilets. The Contractor will be responsible for the removal and disposal of sanitary wastes off site on a periodic basis as required and in accordance with applicable laws and regulations.
7. Project Sign – The project sign shall be painted with black letters and emblems as shown on the Contract Drawings and as specified herein. The Contractor shall submit a sketch of sign location and orientation. The Contractor shall provide any and all patching, painting, lettering, and bracing required to maintain the sign in good condition throughout the duration of the Contract.

#### SC-19.0 BORINGS AND OTHER SUBSURFACE INVESTIGATION

It shall be each Contractor's obligation to satisfy himself as to the nature, character, quality, and quantity of subsurface conditions likely to be encountered. Any reliance upon the subsurface conditions information made available by the Owner or the Engineer shall be at each Contractor's risk.

Each Contractor agrees that he shall neither have nor assert against the Owner/Engineer any claim for damages for extra work or otherwise for relief from any obligation of this Contract based upon the failure by the Owner/Engineer to obtain or to furnish additional subsurface conditions information or to furnish all subsurface conditions information in the Owner's/Engineer's possession or based upon any inadequacy or inaccuracy of the information furnished.

Certain subsurface conditions information may be shown on separate sheets or otherwise made available by the Owner/Engineer to Bidders, Contractors, and other interested parties. Such information shall not be considered a part of the Contract Documents, 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, or that it represents a true picture of the subsurface conditions to be encountered, or that all pertinent subsurface conditions information in the possession of the Owner/Engineer has been furnished.

Any Bidder will be permitted to make test borings, Test Pits, soundings, and any other investigation it deems necessary at the Site of the Work if it so desires, subject to its first obtaining written approval from the Owner. It is understood that the party or parties receiving such approval must assume all risks and liabilities contingent thereto.

It shall be the obligation of each Contractor to inquire of the Owner/Engineer whether pertinent subsurface conditions information has been obtained by the Owner with respect to the Work.

#### SC-20.0 LINES, GRADES, AND ELEVATIONS

From the information provided by the Engineer, the Contractor shall verify benchmarks and develop and make all detail surveys needed for construction.

The Contractor shall set and maintain all necessary intermediate points, lines, grades and elevations, and provide slope stakes, offset stakes, batter boards, stakes for pipe locations, and other such items at his own expense. Where the Contractor uses the laser for control, he shall periodically check the grade and alignment during each day's operation.

The Contractor will be responsible for performing all survey activities for each work site, using a New York State-licensed land surveyor, during the performance of response actions. The survey activities will include, at a minimum, the following:

- Reviewing the technical drawing for each work site prior to initiating site activities, evaluating the existing surface drainage pattern, and identifying areas within the proposed limits of excavation that may potentially pond water and not promote positive drainage.
- Staking out the limits of excavation for each work site and maintaining the stakes during the performance of excavation activities;
- Performing detailed horizontal and vertical control surveys during the performance of excavation activities (for verification of removal limits);
- Installing additional stakes upon the completion of excavation activities to establish final elevations and facilitate site restoration activities;
- Performing survey following backfill and before topsoil is placed to verify grades and quantities for work. Both the volume of material that was excavated and the volume of material that was backfilled (separate volumes for fill material and topsoil) shall be included on the Record Drawings. The Engineer will compare the volumes to verify that the appropriate volume of material was placed and that pre-existing conditions have been achieved (i.e., there are no overfills or underfills).
- Performing a detailed survey following site restoration activities to verify that each work site is restored in accordance with the provisions of the Contract and to prepare Record Drawings. In addition, the surveyor should determine the volume (using units of in-situ cubic yards) of material that was excavated from each work site and include that volume versus the volume backfilled on the Record Drawing for each work site. The surveyor should also determine the final area (using units of square feet) of excavation; and
- Providing all survey notes (e.g., control points, baseline data, etc.) to National Grid to allow survey replication by National Grid.

National Grid's Representative may periodically audit the Contractor's surveyor, both in the field and office, to review all accumulated data and evaluate the surveyor's performance.

Based on the contents of this section, the Contractor should anticipate and schedule site work to accommodate survey activities. No claims by the Contractor for additional payment due to work interruption caused by survey activities will be considered by the Owner.

The Contractor shall furnish copies to the Engineer in advance of construction of grade letters and cut sheets prepared by the Contractor. The accuracy of the Contractor's survey and other furnishing of data to the Engineer does not constitute a transferal of responsibility for checking.

#### SC-21.0 EQUIVALENT PRODUCTS

There shall be no acceptance given by the Engineer during the bidding period or prior to award of Contracts for any names or equal equipment systems.

Whenever a product is specified or described in the Contract Documents by reference of name, trade name, make or catalog number of a particular manufacturer, supplier, fabricator or distributor, the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of the manufacturers, fabricators, suppliers or distributors may be accepted by the Engineer if sufficient information is submitted by the Contractor to allow the Engineer to determine that the material or equipment proposed is equivalent to that named. The procedure for the review by Engineer shall be described below.

Requests for review of substitute items of material and equipment will not be accepted by Engineer from anyone other than the Contractor. If Contractor wishes to furnish or use a substitute item of material or equipment, Contractor shall make written application to Engineer for review thereof.

Unless directed otherwise, the Contractor may propose the use of substitute products and materials other than as specified in the Contract. The Contractor may also submit substitute procedures for performing operations other than as described in the Contract. All proposed substitute materials and procedures must be effectively equivalent to the materials and procedures specified in this Contract. In submitting "equivalent" products or procedures, the Contractor recognizes that it is responsible for all costs associated with furnishing, installing, or performing the "equivalent" product or procedure.

The submittal or use of an "equivalent" product or procedure will in no way impact the overall implementation schedule. Potential time delays associated with the Engineer to review the proposed substitute should be considered by the Contractor in submitting an "equivalent" product or procedure.

In order to aid the Engineer in determining the equality of a proposed substitution (when compared to the item actually specified), the Contractor shall arrange for the performance of any tests requested by the Engineer. The nature, extent, testing, and supervision of such tests including engineering costs, shall be borne by the Contractor. Certified test results shall be mailed directly to the Engineer for all tests requested. Engineer may require Contractor to furnish at Contractor's expense additional data about the proposed substitute.

Engineer will be the sole judge of acceptability, and no substitute will be ordered or installed without Engineer's written acceptance. The Owner may require the Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

Engineer will record time required by Engineer and Engineer's consultants in evaluating substitutions proposed by the Contractor and in making changes in the Contract Drawings or Specifications occasioned thereby. If Engineer determines the proposed substitute is not "equal," Contractor shall reimburse Owner for the charges of Engineer and Engineer's consultants for evaluating the proposed substitute.

#### SC-22.0 EMERGENCY CALLS

The Contractor shall maintain telephone service 24 hours a day, 7 days a week to responsible personnel who shall be in a position to dispatch men and machinery to the project area in the event of an emergency. The Contractor shall provide a list to the Owner and the Engineer of at least three contacts and corresponding telephone numbers. In addition, the Contractor shall have posted the following:

- National Grid **One-Call** number (315-460-1200).
- NYSDEC Spill Hotline number (1-800-457-7362).

#### SC-23.0 NOISE AND DUST CONTROL

It shall be the responsibility of the Contractor to take adequate measures for controlling dust and vapors produced by drilling, excavation, backfilling, loading, or other means. The use of calcium chloride or petroleum-based materials for dust control is prohibited.

The presence of visible dust during the performance of response actions is not acceptable and will require the suspension of work activities until appropriate dust control measures have been implemented. Appropriate dust control measures include the following:

- Spraying water on access roads;
- Spraying water on excavation faces, buckets during excavation, and excavated soil when loading transport vehicles;
- Spraying water on backfill stockpiles and on backfill materials that have been placed within excavated areas;
- Hauling excavated materials and clean backfill materials in properly tarped vehicles;
- Restricting vehicle speeds to 5 miles per hour; and
- Covering excavation faces with a layer of polyethylene sheeting (anchored appropriately to resist wind forces) after excavation activities cease for the day.

The Contractor should make a source of water (water tank truck, fire hydrant, water from property owner) available. The Contractor will be responsible for maintaining, in the immediate vicinity of the work, a supply of water and means of dispersion (e.g., a water tank and sprayer, fire hydrant using a fire hose) such that water may be applied for dust

control immediately as required. If the dust control measures being utilized by the Contractor do not lower particulates, based on visual observations and/or the results of airborne particulate monitoring, excavation activities must be suspended until the Contractor develops the appropriate corrective measure(s) to remedy the situation.

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), the Environmental Protection Agency (EPA), and the New York State Industrial Code Guidelines and Ordinances. All construction equipment presenting a potential noise nuisance shall be provided with noise muffling devices.

#### SC-24.0 SOIL, SEDIMENT, AND EROSION CONTROL

##### Erosion Control

Erosion control procedures shall be utilized on the Site as required elsewhere in the Contract Documents. Erosion control shall occur as required prior to commencement of any site work.

##### Sediment Control

Care should be taken not to damage or kill vegetation by excessive watering or by damaging silt accumulation in the discharge area. Temporary silt fence, erosion control mats, and/or hay bales shall be used where necessary to protect vegetation and to achieve environmental objectives to allow sediment to settle out of runoff waters that come in contact with construction, before such water leaves the site limits or enters any surface waters. Sediment control measures shall be performed in accordance with the requirements specified elsewhere in the Contract Documents.

#### SC-25.0 WORK WITHIN PUBLIC ROADWAYS

The use and protection of all public roadways involved in this Contract shall be in accordance with all applicable state, county, and local requirements. All transportation of equipment and materials along public roadways shall be preceded by the application and issuance of all necessary road and bridge crossing permits from the appropriate city/town/county if not already covered under permits as addressed in the site specific Special Conditions. The Contractor shall be responsible for all permits and associated fees not addressed in the site specific Special Conditions. Any damages to existing roadways or bridges shall be repaired (to its original or better condition) by the Contractor, at no expense to the Owner.

Additionally, the Contractor shall provide traffic plans and associated warnings and controls for all points of equipment access to the Site. Such warnings and controls shall include, but are not limited to, warning signs and the use of a flagman during all instances when heavy equipment enters and/or exits the Site. The use of such controls shall be maintained for the duration of the project.

## SC-26.0 DISPOSAL OF CLEARED MATERIAL

All materials that are cleared in order to facilitate excavation of a given area must be disposed of according to the following criteria:

- All materials cleared from at or below grade (i.e., tree stumps/roots, surface debris, building slabs, etc.) must be disposed based on the planned removal actions for the soil from which the material was removed. For example, if a tree stump is removed from an area of soil that is subject to excavation and disposal as a impacted material, the tree stump will also be disposed of as an impacted material;
- All cleared materials subject to off-site disposal with the associated soils shall be broken into sufficiently small pieces (a maximum of 2 foot sections) so as to be acceptable to the disposal facility;
- The Contractor should dispose of all vegetative materials cleared from above grade (i.e., trees/brush/branches, etc.) at a local permitted resource recovery facility. These materials must be removed and handled in a manner that will prevent contact between cleared materials and the soils subject to excavation and disposal;
- Foreign materials and other surface debris must be disposed of as regulated materials (i.e., hazardous, nonhazardous) unless otherwise instructed by National Grid; and
- On-site open burning of cleared materials is prohibited.

## SC-27.0 SUBMITTALS

Following award of the Contract, the Contractor will submit to the Engineer a list of equipment, materials, and other items for which shop drawings, layouts, samples, or shop drawings and samples will be required. This listing shall not be construed to be all-inclusive and may be added to, or deleted from, as may be required in the opinion of the Engineer.

The Contract requires that the Contractor submit various plans, documents, data, drawings, and other information related to the performance of remedial activities. Eight copies of each submittal (numbered in sequential order as submitted) shall be received by the Engineer at least 20 days prior to the Contractor's intended use of the item covered by the submittal. Copies of submittals should be submitted to the Engineer as identified by the Owner.

The Engineer will subsequently review the submittals in accordance with Article SC-13 to determine general compliance with the Contract conditions. The Engineer's review will not be a complete check of the detailed methods, materials, or procedures and shall in no way be construed as permitting any departure from the Contract, except where the Contractor has previously requested and received written approval of the Engineer for such departure. The Contractor will not be permitted to undertake any activity that is directly or indirectly related to the item covered by the submittal until such time that the Engineer provides notification to the Contractor.

The following provides a list of the required submittals subject to the provisions of this section:

- All applicable environmental and/or local permits to perform the work specified;
- Proposed substitutions for materials or modifications to procedures specified in the Contract Documents;
- Health and Safety Plan;
- Work Schedule;
- The name, location (as identified on a detailed map), and quantity of each source and type of backfill material and topsoil proposed by the Contractor;
- The name of subcontractor(s) to be utilized for the Work;
- Record Drawings;
- Remediation Plan;
- Waste Handling and Disposal Plan;
- Remedial Action Contingency Plan;
- All sample and analytical results, including all laboratory deliverables (e.g., wipe samples); and
- All other technical submittals.

The contractor will keep a Technical Submittal Register and will update the Register as necessary to reflect the receipt of new submittals and/or changes in submittal(s) status.

#### SC-28.0 RECORD KEEPING AND RECORD DRAWINGS

During construction, the Contractor for each Contract shall keep one set of the Contract Drawings at the project Site on which he shall show all changes in, or directly associated with, the work under this Contract. Such changes shall be neatly and clearly marked on the drawings using colored ink or pencil, and the entire set of drawings shall be kept current on a day-to-day basis in concert with the progress of the work. Where applicable, the change marked on a drawing is to carry the notation "per Change Order No. \_\_\_\_", or similar reference that cites the reason for the change. The day to day construction record drawings shall be made available to the Engineer and/or Owner for review upon request.

The following items are examples of some of the types of changes that could occur and are to be recorded by the Contractor:

1. Change in location of project components
2. Change in elevation of project components.
3. Change in excavation volumes.
4. Change in materials, such as backfill.
5. Change in topographic contours of finished earth surfaces.
6. Change in elevation of finished grades.
7. Additions to project.
8. Elimination of a project component.
- 9.

10. Relocation of existing underground utilities made necessary because of interference with project components.
11. 12. Soil excavation activities including areas that require additional excavation beyond the specified limits and areas where ORC is applied;
13. Unforeseen modifications made to existing structures made necessary by requirements of the work.
14. Relocation of equipment.
15. 16. Abandonment of encountered piping.

In addition, the record drawings shall show the precise as-built locations of all buried, imbedded, or concealed features installed by the Contractor.

The Contractor shall include on the Record Drawings, both the volume of material that was excavated and the volume of material that was backfilled (separate volumes for fill material and topsoil. National Grid will compare the volumes to verify that the appropriate volume of material was placed.

The Owner retains the right to withhold a portion of progress payments to the Contractor if record drawings are not kept current in accordance with this section. Copies of the record drawings at the end of each payment period shall be submitted with this application for payment.

Upon substantial completion of the Contract, and as a condition of reduction of retainage, the Contractor shall deliver one (1) complete, accurate, and legible set of record drawings to the Engineer for transmittal by the Engineer to the Owner.

#### SC-29.0 MATERIALS ACCEPTABILITY TESTING

Contractor shall be responsible for and shall pay all costs in connection with any inspection or testing required in connection with Owner's or Engineer's acceptance of a manufacturer, fabricator, supplier, or distributor of material or equipment submitted for acceptance prior to Contractor's purchase thereof for incorporation in the Work.

Tests and certifications which will be required, the cost thereof to be borne by the Contractor, are as follows:

1. Testing of materials where required in the Specifications.
2. Certification of concrete materials.
3. 4. Certification of paving materials.
5. Gradation and conformance of all granular materials.

Conformance tests may be required, the cost thereof for initial testing being borne by the Owner, and are as follows:

6. Compaction and density tests of backfill.
7. Concrete cylinder tests of concrete work.
8. Tests ordered by the Engineer.

The Contractor is advised that any follow-up testing required due to unacceptability of initial test results will be performed at no additional expense to the Owner.

#### SC-30.0 REPLACEMENT OF PROPERTY

The Contractor shall replace all culverts, pavements, driveways, shrubs, lawns, fences, and any other property either public or private which is damaged as a result of the work of this Contract. All such replacement shall be made according to the applicable specifications and no extra payment will be made for such work. If applicable specifications do not address a replacement item, at a minimum, the Contractor will replace in kind, any property or items damaged as a result of the work of this Contract.

#### SC-31.0 CONTRACT WORK LIMITS AND SECURITY

Working limits where applicable have been depicted on the Contract Drawings. The Contractor shall restrict all work activities, including, but not limited to, storage of materials and equipment to be incorporated in the project, as well as parking of vehicles, heavy equipment, project trailers, etc., to these designated on the Contract Drawings. However, where appropriate and in accordance with SC-01710 Storage of Equipment, the Contractor may provide off-site storage of construction materials or equipment as necessary.

All access roads within and outside of the working limits shall be kept open to allow for uninterrupted passage.

The Contractor shall provide all elements of Work area security necessary to prevent the unauthorized entry of persons onto the Contract Work area during both working and nonworking hours. The Contractor shall be responsible for providing and maintaining, at minimum, one security guard on site during nonworking hours from the date of initial mobilization throughout the construction activities until the date of final demobilization, or as otherwise directed by the Engineer. The Contractor's trailer shall be maintained at the site as the main operating station for the security guard(s). The Contractor shall be responsible for providing the security guard(s) with access to an operating telephone.

The Contractor's security guard(s) shall be responsible for performing periodic inspections (at a minimum, every twenty minutes) to check conditions at various areas throughout the site. The Contractor's site security guard shall be responsible for maintaining a log notebook. The security guard shall log, in the notebook, any unusual circumstances encountered during site inspections, any disturbances encountered, and any persons who enter the site (including arrival and departure times). In the event that

an on-site emergency occurs at any time during the construction activities, the security guard shall be responsible for notifying appropriate parties (including, but not limited to, the Engineer, project management personnel, law enforcement officials, the local fire department, the local ambulance squad, the local spill response team, etc.).

The Contractor shall inspect site perimeter fencing (including temporary fencing at the site perimeter) to verify that the fencing is in good condition. If perimeter fencing becomes disturbed and/or damaged at any time during the construction activities, the Contractor shall immediately repair and/or replace the disturbed/damaged section of fencing.

The Contractor shall be responsible for all costs associated with installation, maintaining, and removing Work area security measures instituted during the various phases of construction. This shall include, but is not limited to, the maintenance of existing fences, and providing additional temporary fencing along or near the perimeter of the work limits to completely enclose and secure the work area.

#### SC-32.0 DECONTAMINATION OF EQUIPMENT

As part of everyday Work activities, the Contractor shall provide a personnel decontamination area (as specified in each of the Contractor's Health and Safety Plans). The personnel decontamination area (within the contamination reduction zone) shall include those facilities necessary to decontaminate personnel upon exit of the Work area (exclusion zone), in accordance with the Contractor Health and Safety Plan, and in accordance with local, state, and federal laws and regulations.

The Contractor will establish procedures for decontamination of all vehicles and equipment used for construction activities. These procedures shall be reviewed by the Owner and Engineer prior to initiation of construction activities for equipment and materials that are being transferred from a remediation area to an Equipment Decontamination Area (discussed below) or moved within the Site from one remediation area to another, visual observation of the equipment shall be performed by the Contractor. This observation shall occur while the equipment is positioned in the Equipment Decontamination Area. Any visible soils or other debris shall be promptly removed and disposed in a manner consistent with materials excavated.

Unless otherwise directed by the Owner/Engineer, any equipment to be taken off site or moved within the Site from one remediation area to another, shall be subject to final visual observation and cleaning (if necessary) at a designated Equipment Decontamination Area. In general, this area will consist of an impermeable barrier which shall be sloped to a collection sump. The Equipment Decontamination Areas shall be placed as identified on the Contract Drawings and constructed in accordance with the Equipment Decontamination Area Detail as identified in the Contract Drawings. Precautions shall be taken to limit contact between the equipment, personnel performing the cleaning activities, and any cleaning liquids that may accumulate in the cleaning area. The Contractor shall be responsible for constructing and maintaining the cleaning area to accommodate all loads, equipment, and migration scenarios. The Contractor shall dismantle and properly dispose all materials associated with the cleaning area and shall restore the area to its original conditions.

The extent and method of cleaning shall be at the discretion of the Contractor; however, equipment and materials shall be observed by the Engineer's on-site representative prior to its departure from the Decontamination Area. In addition, the Owner/Engineer reserves the right to require additional decontamination if deemed necessary and perform sampling analysis as part of the pre-departure confirmation. Sampling would be performed by the Engineer's on-site representative at their discretion to demonstrate that equipment that contacted soils/sediments contain surface concentrations allowable to the regulatory agencies. Recleaning shall be at no additional expense to the Owner.

Wash water, solids, and other materials generated during equipment cleaning shall not contact native soils and existing facilities, and shall be collected by the Contractor and placed into designated containers. Disposal of collected wash water, solids, and other materials shall be in accordance with Special Condition 01739 – Waste Disposal.

Personnel engaged in vehicle decontamination shall use personal protective equipment including disposable clothing in accordance with the Contractor's Health and Safety Plan.

A special "clean area" within the remediation support area shall be established for performing equipment maintenance. This area shall be used when personnel are required by normal practices to expose themselves to contact with ground soil (e.g., crawling under a vehicle to change engine oil).

Should vehicles be required to transport materials over Site roadways or roadways traversed by local traffic, it is imperative that these roads be kept free of any potentially impacted as well as nonimpacted soils due to Contractor's operations. All Contractor vehicles shall be carefully loaded to avoid potential contamination of areas exterior to the remediation areas.

#### SC-33.0 WASTE DISPOSAL

The Contractor shall be responsible for proper stabilization, containerization, staging, preparation of waste material for treatment/disposal, loading, transportation, and disposal of waste material. Each waste medium (e.g., soil, decontamination water, groundwater, waste debris, PPE) shall be properly containerized via DOT-approved 55-gallon drums, temporary tanks, lined and covered roll-off containers, or lined and covered dump trailers and properly labeled and staged with like materials.

#### SC-34.0 HEALTH AND SAFETY PLAN

Due to the nature of the chemical constituents identified at the Site, the Owner, in compliance with regulations, requires that safety precautions be observed at all times by each Contractor and all persons, employees, and subcontractors that each Contractor directly or indirectly introduces to the Work while engaging in various aspects of the Work. It is understood that each Contractor shall be solely and totally responsible for safety compliance associated with the Work at the Site.

Prior to the start of construction, each Contractor shall submit a Health and Safety Plan that has been reviewed and certified by an Industrial Hygienist for review by the Owner. At a minimum, the Health and Safety Plan shall address the following topics:

1. Designation of Work-Specific Areas, including exclusion zone, contamination reduction zone, and health/safety/emergency facilities (such as equipment and personnel decontamination area[s]). Specific work areas (exclusion zone and contamination reduction zone) shall be designated through the use of a temporary barrier (e.g., temporary chain-link fence) with appropriate signage that identifies the specific area and details its restricted access and PPE requirements. Signage shall also be placed at the entrance/exit of the exclusion zone that details personnel and equipment decontamination procedures.
2. Description of Work Site Hazards, including hazardous materials present, physical hazards present, and evaluation of expected risks.
3. Protective Measures, including contact protection, respiratory protection, eye protection, and airborne dust prevention.
4. Health and Safety Program and Procedures, including on-site organization, training program, monitoring program, equipment and personnel decontamination procedures, entry and exit procedures, on-site health and safety concerns, and medical program.
5. Emergency Response Provisions, including a listing of equipment and personnel to be dispatched in the event of an emergency and to remove conditions creating any hazard to life, limb, or property.

Provisions must be made for work area monitoring during construction activities. Work area monitoring will be conducted by each Contractor to determine employee exposure to airborne constituents. The monitoring devices to be used, at a minimum, are a combustible gas/oxygen meter, a photoionization detector (PID), MIE MiniRAM portable dust monitor, and an LEL/Oxygen (O<sub>2</sub>)/Carbon Monoxide (CO)/Hydrogen Sulfide (H<sub>2</sub>S) monitor. Air monitoring will be conducted continuously with the LEL/O<sub>2</sub>/CO/H<sub>2</sub>S meter when flammable/explosive vapors, hydrogen sulfide, or carbon monoxide are suspected and during all intrusive (e.g., site grading, water-tight steel sheetpiling installation) activities. Monitoring for organic vapors for the purpose of estimating worker exposure level will be conducted in the breathing zone with the PID during field activities. During operations that may cause airborne particulate (e.g., site grading, water-tight steel sheetpiling installation), an MIE MiniRAM portable dust monitor will be used to measure concentrations of total particulate (dust) material. Additional air monitoring requirements may be detailed elsewhere in the Contract Documents.

Each Contractor shall provide a Health and Safety Officer to implement, monitor, and enforce its Health and Safety Plan. The Health and Safety Officer shall have working experience appropriate for the Work. The Health and Safety Officer shall have a sound working knowledge of any and all applicable federal and state occupational safety and health regulations and formal educational training in occupational safety and health.

Each Contractor shall provide documentation certifying that all on-site personnel have read and understood the provisions of the plan. Any personnel found to be disregarding provisions of the Health and Safety Plan shall, at the request of the Owner, be barred from the Site

## SC-35.0 REMEDIATION PLANS

Based on the information presented on the Contract Drawings and the requirements of these Contract Documents, the Contractor will be required to develop and submit remediation plans for certain aspects of the project. The plans shall be accompanied with a written text and figures or other supporting materials, as necessary. The information in the plans shall include, but not be limited to, the proposed methods, equipment, sequence, and/or materials to perform the work:

### 1. Remediation Plan

- Air Monitoring Program;
- Staging area(s) and temporary construction roads/stabilized construction surfaces;
- Soil Excavation Plan;
- Excavation of soil/debris from the locations specified on the Contract Drawings including ingress and egress routes to specified areas;
- Dewatering of soil excavation areas within the Site;
- Methods to break apart/segregate debris and preparation of materials (including soil mixing, dewatering, stabilization) for treatment;
- Erosion control to limit accelerated erosion of areas subject to remediation and to prevent excess sedimentation in Site drainage pathways. This shall include development of an erosion, sediment, and storm water control plan consistent with the requirements of this Contract Document;
- Methods for dust and vapor control in accordance with the HASP;
- Equipment decontamination procedures; and
- Restoration of the Site.

### 2. Waste Handling and Disposal Plan

A Waste Handling and Disposal Plan will be prepared to address wastes generated during implementation of the remedial design. The Waste Handling and Disposal Plan must identify each waste stream that has the potential to be generated as a result of construction activities. Using the list of National Grid pre-approved disposal facilities and waste haulers (as identified and included as "Not Part of the Contract Documents"), the Contractor must identify the name, address, and USEPA/NYSDEC number for each disposal facility and waste hauler to be utilized for each identified waste stream. For each of the Contractor's identified disposal facilities and waste haulers, the Contractor must present acceptance/waste characterization criteria and any restrictions for acceptance of waste streams. Wastes that will be covered by the plan may include, but are not limited to, the following:

- Soil and other materials excavated or encountered during implementation of the remedial design;
- Groundwater from excavation dewatering;
- Decontamination materials; and
- Other wastes and refuse from implementation of remedial design activities.

The plan will include a description of and requirements for the following waste-related activities:

- Staging/containerization of waste materials;
- Sampling and analysis activities for waste characterization (including characterization for treatment/recycling);
- Waste stream preparation prior to transporting;
- Proposed waste stream characterization and profiling procedures (including a copy of the waste profile form);
- Manifesting and packing/shipping requirements for waste streams; and
- Identifying NYSDEC-permitted and National Grid-approved transporters and treatment/recycling facilities for the wastes.

### 3. Remedial Action Contingency Plan

The Contractor will prepare the Remedial Action Contingency Plan (RACP). This plan will describe the provisions required for responding to Site-related emergencies that could potentially occur during remedy implementation. The RACP will, at a minimum, present the following components:

- A spill response plan (SRP) for addressing spills that occur on site during remedial construction activities. The SRP will describe the methods, means, and facilities required to prevent soil, water, structure, equipment, and material impacts caused by spills; provide information regarding spill containment and cleanup; and provide information related to decontamination measures;
- Procedures that Contractor's personnel will take in response to an emergency;
- Designations of an emergency coordinator;
- Include a current list of all emergency equipment and evacuation plans;
- Procedures and routes for emergency vehicular access/egress;
- Procedures for the evacuation of personnel from the Site;
- A listing of contact personnel with phone numbers that, at a minimum, includes fire officials, ambulance service, local, county, and state police, local hospitals, a spill response team, NYSDEC 24-hour Spill Hotline, and procedures for notifying each party; and
- Routes to local hospitals, including written directions and a map that depicts the location of the Site relative to the hospital(s).

The selected Contractor will be required to submit all the complete plans at least 20 days prior to mobilization to the Site.

#### SC-36.0 BACKFILL OF EXCAVATION AREAS

All excavations will be backfilled with material approved by the Engineer. The fill to be utilized for the backfill of excavations shall be obtained on-site in the form of the gravel materials utilized to construct the stabilized construction surfaces and access roadways (if deemed suitable) or an off-site location (as necessary), provided the selected source of fill meets the minimum requirements.

All on-site and off-site sources of fill materials utilized for the backfill of subsurface excavation areas shall be tested by the Contractor. This testing, at a minimum, shall include laboratory analytical data for two discrete soil samples representing a specific type and source of fill material. At a minimum, the laboratory analysis shall include all constituents necessary to provide data that indicates that the source of material meets NYSDEC TAGM 4046. The Engineer may request, at no additional cost to the Owner, that additional sampling and testing of proposed backfill be performed. The Engineer shall be present during all sampling activities.

All confirmation sampling associated with clean fill shall be reviewed by the Engineer prior to placement within excavation areas. Upon confirmation of the source of clean fill, this material must also be determined to be suitable in accordance with the requirements specified elsewhere in the Contract Documents. In addition, the clean fill shall be free from excessive moisture, frost, stumps, trees, roots, sod, muck, marl, vegetable matter, or other unsuitable materials as specified elsewhere in the Contract Documents.

Backfill and compaction of excavations with clean fill shall be performed in accordance with the backfilling requirements specified elsewhere in the Contract Documents. In addition, clean fill shall be placed and compacted within excavation areas in horizontal layers not exceeding twelve (12) inches in loose thickness and stones shall not exceed six (6) inches in greatest dimension and shall be distributed throughout the mass. Each layer of soil fill material shall be thoroughly tamped or rolled to the required degree of compaction. Clean fill placed within excavation areas, shall be compacted to a minimum of 95 percent of the maximum dry weight density in pounds per cubic foot in accordance with the testing requirements as specified in elsewhere in the Contract Documents.

#### SC-37.0 PRECEDENCE

In the case of identified discrepancies among any components of the final Contract Documents, the Contractor will provide notice to the Engineer. Unless otherwise directed, precedence among the components of the Contract Documents will be in the following order:

1. Change Orders;
2. National Grid, a National Grid Company's Purchase Order;
3. Addenda to the Contract Documents (later dates taking precedence over earlier dates);
4. Special Conditions (for specifically referenced project);
5. Supplemental Conditions to National Grid Remedial Construction Purchase Orders;
6. Technical Drawings;
7. Approved Submittals;

8. National Grid USA Terms and Conditions for Construction Purchase Orders; and
9. Material and Performance Specifications.



**SPECIAL CONDITIONS  
FOR  
PHASE I REMEDIAL ACTION**

**GLEN COVE FORMER  
MANUFACTURED GAS PLANT SITE**

**TO  
NATIONAL GRID  
PHASE I REMEDIAL ACTION  
PURCHASE ORDERS**

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## **SECTION 01 11 00 SUMMARY OF WORK**

### **PART 1 GENERAL**

#### **1.1. PROJECT DESCRIPTION**

- A. The Glen Cove Former MGP Phase I Remedial Action (RA) consists of the excavation, removal, and off-Site disposal of MGP-related impacted material that are located in shallow soils. This includes, but is not limited to excavation of MGP-related impacted material, design and installation of an excavation support system, installation of a demarcation barrier, and restoration. The site consists of a steeply graded wooded area and an active LIPA Substation. Additional information on the Site conditions and history are included in Attachment B.
- B. All tasks, requirements, deliverables, etc. contained in the Contract Documents are the sole responsibility of the Contractor unless specifically assigned to Others in the Contract Documents. Project Work performed by the Contractor includes:
  - 1. Install, operate, and maintain temporary facilities and controls, including:
    - a. Perimeter fence.
    - b. Storm water and erosion controls.
    - c. Worker health and safety measures.
    - d. Equipment and personnel decontamination facilities.
    - e. Site roadways and traffic controls.
    - f. Sanitary facilities.
    - g. Signs (including but not limited to exclusion zone, site control signs, safety, speed limit, no trespassing and NYSDEC site sign (refer to Site Management Plan))
    - h. Dust, odor, and vapor control.
    - i. Excavated material (soil and debris) management/loading areas.
  - 2. Perform a pre-construction survey of the substation property to 50 feet beyond the project limits under the supervision of the Engineer and/or National Grid.
    - a. Conduct the survey under the oversight of the Engineer and the findings reviewed and approved by the Engineer and National Grid prior to mobilization.
    - b. Include video/photographic documentation of the existing conditions of the substation and surrounding properties.
    - c. Claims determined to be resulting from pre-existing structural and/or cosmetic damage, not identified during the pre-construction survey, shall be the responsibility of the Contractor.

- d. Structural surveys of adjacent residences on Grove Street were conducted by a H2M Group of Melville, NY on behalf of National Grid. The Contractor may accept the results of this survey or perform their own survey under the supervision of National Grid.
3. Establish additional survey control points as necessary.
4. Obtaining all local permits required for completion of the Phase I RA.
5. Provide contact information for all subcontractors including transporters and disposal facilities for approval by National Grid.
6. Perform Site Work
  - a. Identify and protect existing utilities and Site features to remain after the project is complete.
  - b. Site preparation and site clearing.
  - c. Excavate and remove MGP impacted material, its overlying soil, and/or concrete and asphalt.
  - d. Transport and dispose off-Site of MGP impacted material and debris.
  - e. Abandon the monitoring wells shown in the Contract Drawings.
  - f. Restore disturbed sections of the Site and related access road.
7. Provide clear pathways for Emergency Vehicles entering and exiting the Site.
8. Provide and perform any other equipment, work, or submittals required to facilitate items 1 through 7 above and the work shown on the Contract Drawings.
9. Prepare and implement a Contractor Health and Safety Plan in accordance with Section SC-34.0 of the National Grid Supplemental Conditions.
10. Prepare and implement a Site Operations Plan.

## 1.2. CONTRACT DOCUMENTS:

- A. The Contract Documents include all specifications, Contract Drawings, figures, and conditions included or referenced in the Request for Proposal package and any subsequent contract/purchase order.
- B. It is not the intent of the Contract Documents to show every pipe, wire, conduit, utility connection, detail, and appurtenance necessary to complete the work for this project. However, such connections and details may be necessary to complete the work in accordance with Contract Documents, code requirements, and to the Engineer's satisfaction shall be included in the work.
- C. The organization and division of work contained within the Contract shall not make the Engineer or National Grid an arbitrator to establish contract limits between the Contractor and any subcontractor.

- D. Perform work in accordance with the concepts and intent of the Phase I RA Work Plan (RAWP). The Final RAWP is included in Attachment B.

## 1.3. CONTRACTOR REQUIREMENTS

- A. The Work will be performed on a known contaminated Site.
- B. Comply with the requirements of the Health and Safety Plan (HASP), along with any Site specific amendments, taking precautions as necessary to protect the public and work force personnel from potential hazards.
- C. Comply with the requirements of the Community Air Monitoring Plan (CAMP), taking precautions as necessary to protect the public and work force personnel from potential hazards
- D. For any Work performed in close proximity to commercial properties, utilities or any other third party property, utilize every precaution to protect the property, utility lines, trees, walls, and other structures and related appurtenances from damage. Any damage that the Contractor may cause directly or indirectly outside the project limits shall be repaired or replaced in kind in a prompt manner as directed by National Grid, the Construction Manager, and/or the Engineer at no additional cost to National Grid.
- E. Identify plan for storage, lay down, and material handling facilities and locations with this bid submittal.
- F. Representatives of regulatory agencies from New York State, Nassau County, and the City of Glen Cove and other local civic organizations may be on-Site to observe and inspect the work. Communications with regulatory agency personnel shall be directed to National Grid or their designee. The Contractor (including his employees) shall not communicate with third parties without a National Grid representative present.
- G. Do not conduct Work outside of the permitted working hours (Monday through Friday, 7:00 am to 6:00 pm, no work on Federal holidays) without advanced approval.

## 1.4. CONTRACT DRAWINGS AND SPECIFICATIONS:

- A. Maintain at the Site two (2) copies of all Contract Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders, and other modifications, schedules and instructions, in good order. One set shall be marked to record all changes made during construction. One set shall be kept clean of all markings. Both sets shall be available to National Grid, NYSDEC, the Construction Manager, and the Engineer at all times.
- B. The Contract Drawings include notes. Refer to the Contract Drawings in conjunction with the Specifications.

1.5. SUBMITTALS

- A. Submit Contractor Health and Safety Plan in accordance with Section SC-34.0 of the National Grid Supplemental Conditions.
- B. Submit Contractor Quality Control Plan. Contractor Quality Control Plan may be incorporated into the Site Operations Plan.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

(Not Applicable)

END OF SECTION 01 11 00

## **SECTION 01 20 00 PRICE AND PAYMENT PROCEDURES**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. The items listed in Price Schedule constitute all of the pay items for completion of the Work.
- B. The estimated quantities for the unit bid prices shall be verified by the Contractor in the field.
- C. National Grid reserves the right to increase or decrease any quantity or to eliminate any line item as a result of actual conditions encountered during the performance of the Work.

#### **1.2. PAYMENT TERMS**

- A. See National Grid Terms and Conditions, and Supplemental Conditions.
- B. Payment will not be made unless the proper support documentation has been submitted and approved by National Grid or National Grid's representative.
- C. Payment includes: Full compensation for all required labor, products, tools, equipment, plant, transportation, services, and incidentals; erection, application, or installation of an item of the Work, including overhead and profit.
- D. Payment will not be made for any of the following:
  - 1. Products wasted or disposed of in a manner that is not acceptable.
  - 2. Products determined as unacceptable before or after placement.
  - 3. Products not completely unloaded from the transporting vehicle.
  - 4. Products placed beyond the lines and levels of the required work.
  - 5. Loading, hauling, and disposing of rejected materials.
  - 6. Products remaining on hand after completion of work.
  - 7. Additional work undertaken to expedite Contractor's operations.
  - 8. Repair or replacement of monitoring wells, utilities, or any other facilities property located within or adjacent to the Work Area.
- E. Payment will be made by National Grid for all Work actually performed during a particular payment period. Payments for lump sum items will be made based on the percent completion of the pay item. Upon approval by the CM, judgments of percent completion of lump sum items will be made in reference to the Schedule of Quantities and Prices.

- F. Retainage (10 percent) shall be withheld from payments as specified in the Agreement.

## 1.3. SUBMITTALS

- A. Invoices: Submit invoices monthly in accordance with the provisions of the National Grid Terms and Conditions, and Supplemental Conditions. Include an update of Price Schedule with each invoice.
- B. Bid Form: The Contractor shall submit a Price Schedule and Bid Form signed and sealed with a Company Seal by a Company Officer.

## 1.4. QUANTITY ESTIMATES

- A. For all Unit Price Work, the Contract Price will include an amount equal to the sum of the unit price for each pay item times the estimated quantity of each item as indicated in the Bid Form. The estimated quantities shown on Bid Form Schedule A are not guaranteed and are solely for the purpose of comparison of bids and determining an initial Contract Price. Quantities and measurements supplied or placed in the Work in accordance with the Specifications and Contract Drawings and verified by the CM will determine payment.
- B. The CM will determine the actual quantities and classifications of Unit Price Work performed by the Contractor. The CM will review with the Contractor the CM's preliminary determinations before rendering a written decision on an Application for Payment.
- C. If the actual Work requires more or fewer units than the estimated units indicated on Bid Form Schedule A, Contractor shall provide the required units at the unit prices contracted. Under no circumstances may Contractor exceed stated quantities without prior written approval from the CM.

## 1.5 MEASUREMENT OF QUANTITIES

- A. Measurement by Weight:
  - 1. Weigh Scales: Scales shall be certified in accordance with applicable laws and regulations for the state in which the scales are located. Certification shall have been made within a period of not more than one year prior to date of use for weighing commodity.
  - 2. The term "ton" will mean the short ton consisting of 2,000 pounds.
  - 3. For shipments to off-Site disposal facilities, trucks will be weighed at the receiving facility for the purpose of measuring the quantity of Work for payment.
- B. Measurement by Volume:

1. Volumes measured as in-place volumes will be determined by survey approved by the CM. The Contractor shall retain the services of an independent land surveyor, licensed or registered in the State of New York, whose determination of in-place volumes shall be authoritative and final for the purpose of measurement for payment. To compute in-place volumes of excavation, the average end area method or other methods acceptable to the CM will be used.
  - C. Measurement by Area: Measured by square dimension using length and width or radius, and verified by the CM.
  - D. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord, and verified by the CM.
  - E. Measurement by Time: Measure by the actual time rounded to the nearest time unit and verified by the CM.
- 1.6 ASSESSMENT OF NON-CONFORMING WORK:
- A. Contractor shall replace Work, or portions of the Work, that do not conform to the requirements of the Specifications and Contract Drawings, as assessed by the CM or Engineer.
  - B. If, in the opinion of the CM and Engineer, it is not practical to remove and replace the non-conforming Work, the CM will direct one of the following remedies:
    1. The non-conforming Work may remain, but the unit price will be adjusted to a new price at the discretion of the CM.
    2. The non-conforming Work shall be partially repaired to the instructions of the Engineer, and the unit price will be adjusted to a new price at the discretion of the CM.
  - C. The individual Specification sections may modify these options or may identify a specific formula or percentage price reduction.
  - D. The authority of the Engineer to assess non-conforming Work and identify payment adjustment is final.
- 1.7 ELIMINATED ITEMS:
- A. Should any items contained in the Contract Drawings or Specifications be found unnecessary for the proper completion of the Work, the Engineer may, upon written order to the Contractor, eliminate such items from the Work, and such action shall in no way invalidate the Agreement.
  - B. Contractor will be paid for actual Work done and all documented costs incurred, including mobilization of materials prior to elimination of such items.

## 1.8 MEASUREMENT AND PAYMENT OF BID ITEMS:

- A. Bid Form Schedule A, Project Price Schedule, lists the Bid Items and Unit Price Items for the Work. Measurement and payment of the Work covered by the Contract Documents is specified below.
- B. At the direction of the CM, Contractor may be asked to perform change order work on a Time and Materials (T&M) basis. The unit rate schedule included in the Contractor's proposal shall be the basis for measurement and payment of equipment and labor for T&M. Hourly prices for equipment and labor listed on the Contractor's unit rate schedule shall include Contractor's overhead and profit for such Time and Materials Work.
- C. The following paragraphs specify measurement and payment of the Lump Sum Bid items listed on Bid Form Schedule A (attached to this Specification):

### **Item 1 Mobilization**

- 1. Work required to complete Mobilization includes, but is not limited to:
  - a. Movement of personnel, equipment, and materials to the Site, if such movement is not included in any other Bid Item.
  - b. Preconstruction coordination meetings.
  - c. Preparation, submittal, and revision of all required pre-mobilization submittals as described in Specification 01 33 00 - Submittal Procedures.
- 2. Mobilization will be measured for payment as one unit, complete as specified.
- 3. Payment for Mobilization Work will be made on a percent complete basis of the lump sum price for the Bid item listed on Bid Form Schedule A. Payment of the lump sum price for "Mobilization" shall constitute full compensation for all labor, supervision, materials, equipment, start up submittals, incidentals and all other costs necessary to complete Mobilization Work, including the transport of all equipment, labor and temporary facilities and materials to and from the Site.

### **Item 2 Site Preparation**

- 1. Work required to complete the Site Preparation includes, but is not limited to:
  - a. Implement requirements for environmental protection specified in Specifications Section 01 50 00 – Temporary Facilities and Controls unless specifically identified as being provided by others.
  - b. Provide and maintain temporary fencing and visual barrier fabric as shown on the Contract Drawings.

- c. Provide a Rusmar foam (or equivalent) unit of sufficient size to cover the impacted areas within 5 minutes on the Project Site for the duration of the excavation. Foam expendables will be paid under alternate bid item UP1.
  - d. Implement the health and safety requirements specified in the approved Contractor Site Operations Manual as detailed in Specification Section 01 50 00 - Temporary Facilities and Controls.
  - e. Install and maintain temporary facilities and controls specified in Specifications Section 01 50 00 - Temporary Facilities and Controls unless specifically identified as being provided by others.
  - f. Project management and oversight as specified in Section 01 30 00 - Administrative Requirements.
  - g. Install decontamination facilities as specified in Specifications Section 01 50 00 - Temporary Facilities and Controls and the disposal of any liquids or residues generated during decontamination.
  - h. Maintain and repair all temporary facilities and controls including those provided by others during the period when Work is taking place at the Site.
  - i. Remove existing pavement, trees, fences, and abandon wells as specified in the Contract Drawings.
  - j. Conduct any surveying needed to control and document the Work.
  - k. Clearing, grubbing, and leveling of Work Zones, including CAMP locations.
  - l. Removal and off-site disposal of existing site debris, including debris located along the retaining wall at the southern fence line of the substation.
  - m. All other one-time and recurring activities required by the Contractor to complete the Work unless included in another pay item or specifically identified as being the responsibility of others.
2. Site Preparation will be measured for payment as one unit, complete as specified.
  3. Payment for Site Preparation will be made on a percent complete basis of the lump sum price for the Bid item listed on Bid Form Schedule A. Payment of the lump sum price for "Site Preparation" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Site Preparation Work, as specified in Specifications Section 31 10 00.

**Item 3            Dewatering and Water Treatment System Mobilization and Installation**

1. Work required to complete the Dewatering and Water Treatment System Mobilization and Installation includes, but is not limited to:
  - a. Movement of personnel, equipment, and materials to the Site, required for setup of the dewatering and water treatment system.
  - b. Installation of the dewatering system, and setup of the water treatment system.
2. Dewatering and Water Treatment System Mobilization and Installation Work will be measured for payment as one unit, complete as specified.
3. Payment for Dewatering and Water Treatment System Mobilization and Installation Work will be made on a percent complete basis of the lump sum price for the Bid item listed on Bid Form Schedule A. Payment of the lump sum price for "Dewatering and Water Treatment System Mobilization and Installation" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Dewatering and Water Treatment System Mobilization and Installation Work, as specified in Specification Sections 31 23 19 and 44 01 40.

**Bid Item 4    Excavation Support System Design**

1. Work required to complete the Excavation Support System Design includes, but is not limited to:
  - a. Design and Certification of an excavation support system meeting the requirements of Section 31 50 00.
  - b. Preparation of a monitoring plan Monitoring plan to include the types and locations of geotechnical instruments required to monitor the performance of the excavation support system in accordance with Section 31 09 00.
2. Excavation Support System Design work will be measured for payment as one unit, complete as specified.
3. Payment for Dewatering Excavation Support System Design work will be made on a percent complete basis of the lump sum price for the Bid item listed on Bid Form Schedule A. Payment of the lump sum price for "Excavation Support System Design" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Excavation Support System Design Work, as specified in Specification Sections 31 50 00 and 31 09 00.

**Item 5            Installation/Removal of the Excavation Support System**

1. Work required to complete the Installation/Removal of the Excavation Support System includes, but is not limited to:
  - a. Movement of personnel, equipment, and materials to the Site, required for installation and removal of the excavation support system.
  - b. Installation of the excavation support system.
  - c. Installation of geotechnical monitoring points required for monitoring , performance of the excavation support system
  - d. Removal of the excavation support system after completion of the Phase I RA.
2. Installation/Removal of the Excavation Support System Work will be measured for payment as one unit, complete as specified.
3. Payment for Installation/Removal of the Excavation Support System Work will be made on a percent complete basis of the lump sum price for the Bid item listed on Bid Form Schedule A. Payment of the lump sum price for “Installation/Removal of the Excavation Support System” shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the Installation/Removal of the Excavation Support System Work, as specified in Specification Sections 31 50 00 and 31 09 00.0.

## **Item 6 Miscellaneous Site Restoration**

1. Miscellaneous Site Restoration will be measured for payment as one unit, complete as specified. Work required to complete the Site Restoration pay item includes restoration of the access road, the excavation area and any Site features disturbed during implementation of the Work. Specific activities include but are not limited to:
    - a. Restoring the excavated area that lies outside the access road as per Specification Section 31 23 00 and as shown on the Contract Drawings.
    - b. Restoring the Access Road as specified in Specification Section 31 12 00 and as shown on the Contract Drawings.
    - c. Restoring the Site fence as shown on the Contract Documents.
  2. Payment for Miscellaneous Site Restoration will be made in accordance with the unit price for the Bid item “Miscellaneous Site Restoration” listed on Bid Form Schedule A. Payment of the unit price for Site restoration shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to restore the site to its original condition.
- D. The following paragraphs specify measurement and payment of the unit price line items listed on Bid Form Schedule A

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**Line No. 1    Operation and Maintenance of Water Treatment Equipment**

1. Work required to complete Operation and Maintenance of Water Treatment Equipment includes but is not limited to:
  - a. Treating all dewatering, decontamination, and other liquids to a level compliant with the governing permits, prior to discharge to the approved outlet.
2. Operation and Maintenance of Water Treatment Equipment Work will be measured for payment on a per day basis. Contractor will be paid for each day of operation and treatment during the Phase I RA.
3. Payment for Operation and Maintenance of Water Treatment Equipment Work will be made in accordance with the unit price listed on Bid Form Schedule A. Payment of the unit price for "Operation and Maintenance of Water Treatment Equipment" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals, and all other costs necessary to complete Operation and Maintenance of Water Treatment Equipment Work, as specified in Specifications Section 44 01 40.

**Line No. 2    Wastewater Discharge Fees**

1. Wastewater Discharge Fees will be measured for payment on a per one thousand (1000) gallon basis, as documented by an appropriately calibrated and inspected flow meter.
2. Payment for Wastewater Discharge Fees will be made in accordance with the unit price listed on Bid Form Schedule A. Payment of the unit price for "Wastewater Discharge Fees" shall constitute full compensation for all approved discharge and/or disposal facility fees necessary to complete Operation and Maintenance of Water Treatment Equipment Work, as specified in Specifications Section 44 01 40.

**Line No. 3    Soil Excavation**

1. Work required to complete Soil Excavation includes, but is not limited to:
  - a. Excavation of impacted soils.
  - b. Loading of impacted material for off-Site disposal.
2. Soil Excavation Work will be measured for payment on an in place cubic yard basis, as verified by survey.
3. Payment for Excavation and Loading Work will be made in accordance with the unit price listed on Bid Form Schedule A. Payment of the unit price for "Soil Excavation" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Soil Excavation Work as specified in Section 31 23 00 - Excavation and Fill and as

indicated on the Contract Drawings. Payment will only be made for soil excavated within the horizontal and vertical limits of excavation shown on the Contract Drawings.

**Line No. 4    Transportation and Disposal: Soil**

1. Work required to complete the Transportation and Disposal: Soil pay item includes, but is not limited to:
  - a. Disposal of excavated soil and incidental concrete and debris from the Project Site at disposal facilities approved by the Owner in accordance with Specification 02 61 00 – Removal and Disposal of Contaminated Materials.
  - b. Identify the proposed disposal facilities and trucking companies in the list of subcontractors provided with the Contractor's bid. The Contractor shall select a disposal facility from the three listed below. The Contractor shall ensure that the selected disposal facility has capacity to accept excavated materials and spoils at a rate sufficient to meet the Construction Milestones listed in the Contractor's schedule. If multiple disposal facilities are required to achieve the construction milestones, the bidder shall provide unit costs and percent of the total excavated material and spoils shipped to each facility in their Site Operations Plan and in Schedule A.

Bay Shore Soil Management (formerly ESMI of New Jersey) located at 75 Crows Mill Road Keasbey, New Jersey, 08832

Clean Earth of Philadelphia, Inc., Thermal Desorption Services located at 3201 South 61<sup>st</sup> Street, Philadelphia, Pennsylvania, 19153

Clean Earth of Southeast Pennsylvania, Thermal Desorption Services located at 7 Steel Road East, Morrisville, Pennsylvania, 19067
2. Disposal will be measured for payment on a per ton basis, as documented by approved disposal facility scale weight tickets.
3. Payment for Disposal will be made in accordance with the unit price listed on Bid Form Schedule A. Payment of the unit price for "Transportation and Disposal: Soil" shall constitute full compensation for all labor, supervision, materials, equipment, approved disposal facility fees, incidentals, and all other costs necessary to complete transportation and disposal of excavated material and spoils as specified in Specifications Section 02 61 00.

**Line No. 5    Transportation and Disposal: Hazardous Waste Soil**

1. Work required to complete Transportation and Disposal: Hazardous Waste Soil includes but is not limited to:

- a. Disposal of hazardous waste soil, if encountered, the Project Site at disposal facilities approved by the Owner in accordance with Specification 02 61 00 – Removal and Disposal of Contaminated Materials.
- b. Identify the proposed disposal facilities and trucking companies in the list of subcontractors provided with the Contractor's bid. The Contractor shall use the facility noted below or select another National Grid-approved disposal facility. The Contractor shall ensure that the selected disposal facility has capacity to accept excavated materials and spoils at a rate sufficient to meet the Construction Milestones listed in the Contractor's schedule. If multiple disposal facilities are required to achieve the construction milestones, the bidder shall provide unit costs and percent of the total excavated material and spoils shipped to each facility in their Site Operations Plan and in Schedule A.

Waste Management Model City Facility located at 1550 Balmer Road,  
Youngstown, NY 14107

2. Based on the sampling conducted to date, it is not anticipated that hazardous waste will be generated during this Phase I RA.
3. Disposal will be measured for payment on a per ton basis, as documented by approved disposal facility scale weight tickets.
4. Payment for Disposal will be made in accordance with the unit price listed on Bid Form Schedule A. Payment of the unit price for "Transportation and Disposal: Hazardous Waste Soil" shall constitute full compensation for all labor, supervision, materials, equipment, approved disposal facility fees, incidentals, and all other costs necessary to complete transportation and disposal of excavated material and spoils as specified in Specifications Section 02 61 00.

## **Line No. 6    Transportation and Disposal: Construction Debris**

1. Work required to complete Transportation and Disposal: Construction Debris includes but is not limited to:
  - a. Transportation and disposal of debris at an approved disposal facility.
  - b. Identify the proposed disposal facilities and trucking companies in the list of subcontractors provided with the Contractor's bid.
2. Transportation and Disposal: Debris Work will be measured for payment on a per ton basis, as documented by scale weight tickets.

3. Payment for Transportation and Disposal: Construction Debris Work will be made in accordance with the unit price listed on Bid Form Schedule A. Payment of the unit price for "Transportation and Disposal: Construction Debris" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals, approved disposal facility fees and all other costs necessary to complete Transportation and Disposal: Construction Debris Work, as specified in Specifications Section 02 61 00.

**Line No. 7 Transportation and Disposal: Contaminated Debris**

1. Work required to complete Transportation and Disposal: Contaminated Debris includes but is not limited to:
  - a. Transportation and disposal of debris at an approved disposal facility.
  - b. The Contractor shall select a disposal facility for contaminated debris from the facilities listed below.  
  
 Waste Management of PA Geological Reclamation Operations and Waste Systems, Inc. (G.R.O.W.S., Inc.) North Landfill located at 1121 Bordentown Road, Morrisville, PA 19067,  
  
 Waste Management of PA Tullytown Resource Recovery Facility Landfill located at 1121 Bordentown Road, Morrisville, PA 19067
2. Transportation and Disposal: Contaminated Debris Work will be measured for payment on a per ton basis, as documented by scale weight tickets.
3. Payment for Transportation and Disposal: Contaminated Debris Work will be made in accordance with the unit price listed on Bid Form Schedule A. Payment of the unit price for "Transportation and Disposal: Contaminated Debris" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals, approved disposal facility fees and all other costs necessary to complete Transportation and Disposal: Contaminated Debris Work, as specified in Specifications Section 02 61 00.

**Line No. 8 Transportation and Disposal: Wastewater**

1. Work required to complete the Transportation and Disposal: Wastewater pay item includes, but is not limited to:
  - a. Disposal of wastewater and decontamination fluids from the Project Site at disposal facilities approved by the Owner in accordance with Specification 02 61 00 – Removal and Disposal of Contaminated Materials.
  - b. Identify the proposed disposal facilities and trucking companies in the list of subcontractors provided with the Contractor's bid. The Contractor

shall select a disposal facility from the two listed below. The Contractor shall ensure that the selected disposal facility has capacity to accept wastewater and decontamination fluids at a rate sufficient to meet the Construction Milestones listed in the Contractor's schedule.

Clean Water New York, Inc. located at 3249 Richmond Terrace, PO Box 030312, Staten Island, New York, 10303.

United Industrial Services, Inc. located at 136 Gracey Avenue, Meriden, Connecticut, 06451.

2. Disposal will be measured for payment on a per 100 gallon basis, as documented by an appropriately calibrated and inspected flow meter at the receiving facility.
3. Payment for Disposal will be made in accordance with the unit price listed on Bid Form Schedule A. Payment of the unit price for "Transportation and Disposal: Wastewater" shall constitute full compensation for all labor, supervision, materials, equipment, approved disposal facility fees, incidentals, and all other costs necessary to complete transportation and disposal of excavated material and spoils as specified in Specifications Section 02 61 00.

**Line No. 9    Approved Off-Site Backfill Material - Granular Fill**

1. Work required to complete Approved off-Site Backfill Material includes, but is not limited to:
  - a. Delivery of approved Granular Fill, as specified in Specification Section 31 23 00 - Excavation and Fill.
2. Approved off-Site Backfill Material will be measured for payment on a per ton basis as verified by delivery weight tickets.
3. Payment for Approved Off Site Backfill Material - Granular Fill as specified in Specifications Section 31 23 00, will be made in accordance with the unit price for the Bid item "Approved Off Site Backfill Material- Granular Fill" listed on Bid Form Schedule A. Payment of the unit price for "Approved Off Site Backfill Material- Granular Fill" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to furnish approved fill for the Site to the grades shown on the Contract Drawings.

**Line No. 10    Approved Off-Site Backfill Material - Select Granular Fill**

1. Work required to complete Approved off-Site Backfill Material includes, but is not limited to:

- a. Delivery of approved Select Granular Fill - Slope Protection, as specified in Specification Section 31 23 00 - Excavation and Fill.
- 2. Approved off-Site Backfill Material will be measured for payment on a per ton basis as verified by delivery weight tickets.
- 3. Payment for Approved Off Site Backfill Material - Select Granular Fill as specified in Specifications Section 31 23 00, will be made in accordance with the unit price for the Bid item "Approved Off Site Backfill Material- Select Granular Fill" listed on Bid Form Schedule A. Payment of the unit price for "Approved Off Site Backfill Material- Select Granular Fill" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to furnish approved fill for the Site to the grades shown on the Contract Drawings.

**Line No. 11 Backfill to Grade**

- 1. Work required to complete Backfill to Grade includes, but is not limited to:
  - a. Placement, compaction, and density testing of approved fill as specified in Specification Section 31 23 00- Excavation and Fill.
  - b. Placement of a demarcation barrier at the final depth of excavation as specified in Specification Section 31 20 00 - Excavation and Fill and as shown on the Contract Drawings.
- 2. Backfill to Grade will be measured for payment on an in place cubic yard basis as verified by survey.
- 3. Payment for Backfill to Grade as specified in Specifications Section 31 23 00, will be made in accordance with the unit price for the Bid item "Backfill to Grade" listed on Bid Form Schedule A. Payment of the unit price for "Backfill to Grade" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to place fill to the final grades shown on the Contract Drawings.

**Line No. 12 Odor Control Foam System – Expendables**

- 1. Odor Control Foam System – Operation will be measured for payment by the gallon of odor suppressant concentrate(s) used.
- 2. Payment for Odor Control Foam System – Expendables will be made on a per gallon unit price as listed on Bid Form Schedule A. Payment for odor control foam expendables shall constitute full compensation for all the costs of Odor Control Foam Concentrate actually used.

**Line No. 13 Excavation Standby Time - Day**

- 1. Payment for the Work shall be made on a daily basis.

2. Payment for Excavation Standby Time – Day will be made on a daily basis unit price as listed on Bid Form Schedule A. Payment for Excavation Standby Time – Day shall constitute full compensation for cease excavation Work at the direction of the CM for reasons not chargeable to the Contractor. The Excavation Standby Time – Day pay item assumes that labor will be reassigned and thus labor costs will not be included in this pay item.

**Line No. 14** Soil Amendment – Ton

1. Payment for the Work shall be made on a per ton basis of Cement Kiln Dust (CKD) or other approved amendment as directed by CM.
2. Payment for Soil Amendment shall be made on per ton basis of the unit price listed on Bid Form Schedule A. Payment for Soil Amendment shall constitute full compensation for amendment of soils for moisture reduction at the direction of the CM, including all labor, equipment, and incidentals to blend and mix CKD with excavated soils. Soil Amendment will be reimbursed if all dewatering and water treatment maximum flows and capacities are being performed to the CM's satisfaction and soils still require amendment prior to transportation and disposal.

**Line No. 15** Gravel Fill – Ton

1. Delivery of approved Gravel Fill, as specified in Specification Section 31 23 00 - Excavation and Fill.
2. Approved off-Site Backfill Material will be measured for payment on a per ton basis as verified by delivery weight tickets.
3. Payment for Gravel Fill shall be made on per ton basis of the unit price listed on Bid Form Schedule A. Payment of the unit price for "Gravel Fill" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to furnish approved fill for the Site to the grades shown on the Contract Drawings.

**Line No. 16** Cut and Cap Operations – Day

1. Cut and cap any encountered MGP-remnant piping at the excavation perimeter at the direction of National Grid or the CM.
2. All materials excavated or removed will be paid at the appropriate unit prices for excavation and disposal noted above.
3. Payment for Cut and Cap Operations shall be made on per day basis of the unit price listed on Bid Form Schedule A. Payment of the unit price for "Cut and Cap Operations" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the work as directed by National Grid and the CM.

PART 2 PRODUCTS

(Not Applicable)

PART 3 EXECUTION

3.1. PRICE AND PAYMENT PROCEDURES

- A. Refer to Section 01 33 00 – Submittal Procedures and National Grid Supplemental Conditions.

END OF SECTION 01 20 00

## **SECTION 01 30 00 ADMINISTRATIVE REQUIREMENTS**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. This Section describes the minimum level of coordination and meetings required to execute the Work in accordance with Sections 4.0 and 15.0 of the Terms and Conditions. Additional meetings and/or other coordination may be required.

#### **1.2. ON-SITE CONSTRUCTION PERSONNEL**

- A. National Grid may maintain a representative on-Site for the duration of the Work. This representative will be responsible for contractual oversight of the Work. The National Grid representative will also be responsible for observing the Work relative to conformance with the technical requirements of the Contract Drawings and Specifications.
- B. The Engineer will maintain a full-time on-Site representative for the duration of the Work. The Engineer will be responsible for construction quality assurance, ensuring that the work is completed in accordance with the Contract Documents, and final certification of the Work.
- C. The Construction Manager will maintain a full-time on-Site representative for the duration of the Work. In the event that the National Grid representative is off-Site, he/she may designate the Construction Manager to fulfill the contractual oversight role during his/her absence. All decisions relative to performance of the Work, pay items, and additional Work items will be made by National Grid and/or its representative.
- D. Maintain a full-time on-Site Superintendent, who will be responsible for QA/QC, Contractor health and safety, and Competent Person(s) for the duration of the Work. The Superintendent will be responsible for the supervision and/or coordination of all Contractor employees, Subcontractors, manufacturers, fabricators, suppliers, distributors, installers, and testing agencies whose services, materials or equipment are required to ensure the completion of the Work. The Superintendent shall have sufficient qualifications, experience, and authority to act as a single point of contact for the on-Site staff, and to make adjustments to the means and methods as needed and as requested by National Grid, its representative, and the Engineer.
- E. Maintain a dedicated full-time on-Site Health and Safety officer in accordance with Section SC-34 of the Supplemental Conditions. The Health and Safety officer will have no other on-site responsibilities or duties outside of health and safety.
- F. New York State Department of Environmental Conservation (NYSDEC) will maintain a part/full-time field representative for the duration of the Work. NYSDEC will be responsible for administration of the Phase I RA.

- G. Long Island Power Authority (LIPA) Representative – A representative of LIPA (Site Owner) will be on-site for all work. The LIPA representative will observe all work conducted and may stop work at any time if the LIPA representative deems the work may interfere with electrical service or damage the existing substation facilities or appurtenances. All communications with the LIPA representative will be coordinated through the CM and National Grid.

### 1.3. MEETINGS

- A. Attend Project meetings as often as deemed necessary by the owner during the term of the Agreement.
- B. A post-award meeting will be held at National Grid's Hicksville New York office, or the Site to discuss Project submittals, schedule, etc. Contractor's Officer-in-Charge, Project Manager, and Superintendent for the Project shall attend the meeting.
- C. A pre-construction meeting will be held, in accordance with Section SC-16.0 of the Supplemental Conditions, at the Site prior to start of Work. At a minimum, the Contractor's Project Manager and/or Superintendent for the Project shall attend the meeting. It is recommended that the Contractor assemble input from the primary Subcontractors.
  - 1. This meeting is intended to make certain that the Phase I RA is properly scheduled, responsibilities are coordinated among subcontractors and suppliers, and that those responsibilities are reflected on the Contractor's submittals. Questions concerning the administrative requirements outlined during the Pre-construction Conference or any other aspect of the Project may also be addressed.
- D. Beginning with the mobilization to the Site, the Construction Manager will facilitate weekly construction meetings for the duration of the Work. Prior to mobilization, if necessary, bi-weekly meetings may be held via teleconference. After mobilization, weekly meetings will be held at the Site. Present a progress update at weekly construction meetings to include tasks completed from the prior week, currently active tasks, and tasks/activities planned for the next two weeks along with an updated project schedule.
- E. The standard meeting day and time for the weekly construction meeting will be established based on mutual agreement with National Grid and the other participants. Prior to each weekly meeting the Engineer will prepare a meeting agenda.
- F. Special construction meetings will be held at the Site or other designated location to discuss urgent construction issues. The Contractor, National Grid, National Grid's representative, the Engineer or NYSDEC may call special construction meetings. Coordination (agenda, meeting minutes, location, time, and attendance) of special construction meetings is the responsibility of the organization calling the meeting. Special construction meetings shall be called judiciously.

- G. Ensure weekly construction meeting and special construction meeting attendance by all Contractor staff required to discuss and make decisions on behalf of the Contractor, relative to the meeting agenda.
- H. Prepare a Critical Path Method (CPM) project schedule in accordance with Section SC-15.0 of the Supplemental Conditions, make physical arrangements for meetings, and prepare for agency meetings.
- I. All expenses associated with attending the meetings, except those that are incurred by National Grid, their representatives or consultants, shall be borne by the Contractor.

#### 1.4. REQUESTS FOR INFORMATION, CLARIFICATIONS, AND CHANGES

- A. All Contractor communications regarding discrepancies, claims, and change conditions shall be in accordance with Sections 17.0 and 18.0 of the Terms and Conditions.
- B. All Contractor requests for project information and clarifications or changes in the requirements of the Contract Documents must be made in writing to National Grid, the Construction Manager, and the Engineer.
- C. Written requests must be provided regardless of any preceding conversations and preliminary decisions regarding the matter(s) subject to the requests.
- D. At National Grid's discretion, email communications may qualify as "requests made in writing" for the purposes of this provision.
- E. National Grid or the Engineer will provide written responses to the request.
- F. At their discretion, National Grid or the Engineer may provide verbal approvals of requests to expedite the Work. In such cases, the Contractor is still required to provide written documentation of the request and approval from National Grid or the Engineer.
- G. National Grid or the Engineer may also issue clarifications and/or amendments based on their own assessment of Project needs.
- H. Any potential increases or decreases in Contractor compensation due to amendments will be in accordance with the provisions of the Terms and Conditions.
- I. National Grid and/or their representative will issue the Contractor supplemental instructions authorizing minor changes in the Work that may or may not involve adjustments to the Contract Price or the schedule.
- J. If latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes in the Work by submitting a detailed request to include labor rates, equipment rates, material costs, etc. for a change to National Grid and/or their representative.

- K. Change Order requests shall be documented in accordance with the requirements of the Terms and Condition, Supplemental Conditions, and with the procedures set forth by National Grid during procurement.
- L. The Engineer or the Construction Manager may issue an Authorization for Contract Change (ACC) on behalf of National Grid, which instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Any ACC must be authorized by National Grid in advance and signed by the Engineer and National Grid.

## 1.5. COMMUNITY RELATIONS

- A. National Grid will provide all external communication with the media/press, project stakeholders, elected officials, public, etc. Contractor shall not communicate with the media/press, project stakeholders, elected officials, public, etc. regarding the Work. Refer all external questions and comments to National Grid.

## 1.6. RECORDS

- A. Maintain on-Site copies of all project correspondence and project documents generated during the Work.

## 1.7. DAILY REPORT

- A. Prepare a daily report summarizing the staff and equipment used and the Work performed each Day and anticipated Work for the next Day. The daily report should also list all daily quantities applicable to pay items listed on the price schedule. The Contractor's internal documentation used for this purpose may be used to fulfill this requirement, subject to approval by National Grid, the Construction Manager, and/or the Engineer.

## 1.8. SUBMITTALS

- A. Prepare a Critical Path Method (CPM) project schedule. Update and disseminate the schedule on a weekly basis before the weekly construction meetings.
- B. Submit daily report for each working Day by 10 AM of the next Day worked.

## PART 2 PRODUCTS

(Not Applicable)

## PART 3 EXECUTION

### 3.1. PRICE AND PAYMENT PROCEDURES

- A. REFER TO SECTION 01 20 00 – Price and Payment Procedures.

END OF SECTION 01 30 00

## **SECTION 01 33 00 SUBMITTAL PROCEDURES**

### **PART 1 GENERAL**

#### **1.1. PROJECT DESCRIPTION**

- A. Provide all submittals in hardcopy format directly to the Engineer in accordance with the schedule and procedures contained in this Section and in Section 27.0 of the Supplemental Conditions.
- B. Include calculations, Contract Drawings, shop drawings, plans, reports, records, photographs, diagrams, and details with submittals where applicable to facilitate the review and/or approval.
- C. For all submittals, provide eight (8) copies to the Engineer unless otherwise directed.
- D. If directed by National Grid or the Engineer, provide submittals electronically in the format requested (i.e. document file, drawing file, image file, etc.). For electronic drawings, submit AutoCAD 2004 (or more recent version) file using e-transmit feature (i.e. include external references, image files, color table file, font file, line file, etc.). Convert all AutoCAD add on data to AutoCAD format. Use descriptive layer titles (i.e. not numbers or internal use acronyms). Use extensive layer control and use line color by layer and line type by layer management. AutoCAD files of Contract Drawings will be available to the Contractor upon request.
- E. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer, or other individual, authorized to sign documents on behalf of that entity. Submittals requiring preparation by an engineer shall be signed and sealed by a Professional Engineer licensed to practice engineering in the State of New York.
- F. Test and Inspection Reports: Comply with requirements in Section 01 40 00, Quality Requirements.
- G. Schedule submittals to expedite Work. Provide the Engineer a minimum of 5 working Days, excluding transmittal time, for review.

#### **1.2. SUBMITTAL SCHEDULE**

- A. See Table 013300-1 *Project Submittal Summary* attached at the end of this Section. Submittals are required on the items as described individually in each Section of the Specifications. The description of the submittal data is defined in the Specifications.

## 1.3. SUBMITTAL PROCEDURES

- A. Use the submittal numbers assigned in Table 013300-1. For submittals not included in Table 013300-1, use the next sequential number as the submittal number. For revised submittals, use original number and a sequential alphabetic suffix. For multiple submittals with the same submittal number, use the original number with a sequential numerical suffix.
- B. Use a cover form for submittal. The cover form shall include Project identification, Project number, date, submittal number, submittal description/title, submittal exclusions, special issues, Contractor, Subcontractor, etc.
- C. Include drawings and details as appropriate.
- D. Use the same units of weights and measures used on all submittals as are used in the Contract Documents.
- E. Submit all supplier and Subcontractor submittals.
- F. Apply a signed/initialed Contractor's stamp certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information, are in accordance with the requirements of the Contract Documents.
- G. Sign the following certification as part of the submittal form.
  - 1. I hereby certify that I have carefully examined the enclosed submittal(s) and have determined and verified all field measurements, construction criteria, materials, catalog numbers and similar data, coordinated the submittal(s) with other submissions and the work of other trades and contractors, and to the best of my knowledge and belief, the enclosed submittal(s) is/are in full compliance with the Contract Documents, except as follows (enter "NONE" if there are no exceptions).
- H. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed Work.
- I. Prepare submittals that are complete and in sufficient detail for ready determination of compliance with the contract requirements.
- J. Resubmit based on Engineer review: revise, update, and resubmit, identifying all changes made since previous submission. For each re-submittal allow the same number of workdays required for review as the original submittal.
- K. Submittals not requested will not be recognized or processed.

## 1.4. SUBMITTAL REGISTER

- A. Maintain a technical submittal register at the Site including the submittal number, description, date submitted, status, date of approval/rejection in accordance with Section SC-27 of the Supplemental Conditions.

## 1.5. SUBMITTAL REVIEW

- A. The Engineer will review all submittals solely for the purpose of determining whether the information contained in the submittal conforms to the design concept of the contract documents. The Engineer will return the submittals with the following classifications:
  - 1. Approved as Submitted, Work May Proceed, no exceptions taken.
  - 2. Approved as Noted, Work May Proceed subject to comments. Resubmittal not required.
  - 3. Revise and Resubmit, Work May Not Proceed. Resubmittal required for indicated items. Proceed with work on other items subject to comments.
  - 4. Rejected, Work May Not Proceed. Resubmittal Required. Submittal unresponsive and/or not in conformance with Contract Documents.
  - 5. For Information Only. Items not reviewed or items for which no submittal is required.
- B. Engineer's review of submittals for conformance with Contract Documents does not relieve the Contractor from responsibility with regard to fulfillment of the terms of the Contract and proper and complete performance of the Work in accordance with the requirements of the applicable permits, and the general requirements of the Contract Documents.
- C. Engineer's review of submittals does not relieve the Contractor from responsibility for errors or omissions in its designs, details, calculations, analyses, test methods, materials, and it's sole responsibility for means and methods of construction, and safe and successful construction of the Work.

## 1.6. CERTIFICATES OF COMPLIANCE

- A. Execute any certificates required for demonstrating proof of compliance of materials with the requirements of the Contract Drawings and Specifications in three (3) copies.
- B. Sign each certificate by an official authorized to certify on behalf of the manufacturing or testing company and provide the name and address of the Contractor, the Project name and location, and the quantity and data or dates of shipment or delivery to which the certificates apply.
- C. Provide the name and address of the testing laboratory and the date or dates of the tests to which the report applies with copies of laboratory test reports that are submitted with certificates.
- D. Certifications shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specified requirements.

1.7. INVOICES

- A. Submit monthly invoices in accordance with the provisions of the Terms and Conditions and Supplemental Conditions.
  - 1. Include update of price schedule with each invoice.
  - 2. Payment shall not be made unless all the proper supporting documentation has been submitted and approved by National Grid or National Grid's representative.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

SUBMITTAL SUMMARY TABLE 01 33 00-1

Submittal Number	Description of Submittal	Submission Deadline	Referenced Specification Section
<b>PRE-CONSTRUCTION</b>			
1	Critical Path Method Project Schedule	Submitted with Bid, Updated weekly during construction	01 30 00
2	Site Operations Plan	1 week after award	01 50 00 (31 23 00)
3	Disposal Facility Contracts	Prior to Excavation	02 61 00, 01 50 00,
4	Contractor Health and Safety Plan	1 week after award	00 20 00, 01 11 00, 01 50 00
5	Contractor Quality Control Plan	1 week after award	01 11 00, 01 50 00
6	Remedial Action Contingency Plan	1 week after award	National Grid Terms and Conditions
7	Burrow Source Evaluation	Prior to importing fill to the site	31 23 00
8	Schedule of Permits	1 week after award	01 41 00, 01 50 00
9	Permits and Data Submittals	Prior to submittal to agency	01 41 00
10	Final Executed Permits	Upon Receipt	01 41 00
<b>REMEDIATION</b>			
11	Backfill Geotechnical Analytical Reports	1 Week Prior to Placement	31 23 00
12	Analytical Sampling Reports	Upon Receipt	National Grid Terms and Conditions
13	Monitoring well and Piezometer Decommissioning Records	Upon Completion	02 41 00
14	Waste Manifests, Bills of Lading, Weight Slips for off-site disposal	As received with daily report	02 61 00
15	Daily Progress Report	End of each working day or prior to the start of next working day	01 30 00, 31 23 00,
<b>PROJECT CLOSEOUT</b>			
18	Written Notice of Completion	Work is Substantially Complete	01 77 00
19	Project Closeout	Final Completion of Work	01 77 00
20	Permit Closeout Documentation	Upon Receipt	01 77 00
21	Insurance Certification for Continuing Coverage	Prior to Closeout	01 77 00
23	Utility Repair Confirmation	Prior to Closeout	01 77 00
24	Record Documents	Prior to closeout	01 77 00
25	Invoices	Monthly	01 12 00, 01 33 00

END OF SECTION 01 33 00

## **SECTION 01 41 00 REGULATORY REQUIREMENTS - PERMITS**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. This section establishes responsibility for obtaining major project permits between National Grid, the Engineer, and the Contractor.
- B. This section does not describe all permits required for performance of the Work. Any permits not identified in this section, or elsewhere in the Contract Documents, are the responsibility of Contractor. The Contractor will also be responsible for providing any technical and equipment related data required for National Grid or the Engineer to obtain the necessary permits.
- C. Regardless of who is responsible for obtaining a permit, the Contractor is responsible for performing in accordance with the terms and conditions of all permits.

#### **1.2. NATIONAL GRID /ENGINEER PERMITS**

- A. National Grid and/or the Engineer will obtain the following project permits:
  - 1. Approvals from NYSDEC and/or NYSDOH, excluding approvals of Contractor submittals required by NYSDEC and/or NYSDOH.

#### **1.3. CONTRACTOR PERMITS**

- A. Obtain the following project permits in accordance Section 33.0 of the Terms and Conditions:
  - 1. Local construction and demolition permits.
  - 2. Permits required for temporary road closures, if necessary, but not anticipated.
  - 3. Permits required for temporary access entrances off of public roads, if necessary.
  - 4. Permits required for any off-Site parking that is negotiated between the Contractor and the City of Glen Cove, and/or private parking facilities.
  - 5. Permits required for any off-site staging/lining of trucks that is negotiated between the Contractor and the City of Glen Cove, and/or private parking facilities.
  - 6. Local variances for temporary fence installation.
  - 7. Discharge permit from the Nassau County Department of Public Works, or a New York State Pollutant Discharge Elimination System (SPDES) permit for treated groundwater.
  - 8. Any other permits required for the Work.

## 1.4. COORDINATION/ASSISTANCE

- A. National Grid and/or the Engineer will coordinate delivery of Contractor submittals to NYSDEC and/or NYSDOH.
- B. Provide all data requested by National Grid or the Engineer required to support permit applications. When necessary, National Grid and/or the Engineer may provide data summaries or other project information to the Contractor in support of Contractor data submittals.
- C. Any coordination and/or assistance between the Contractor and National Grid or the Engineer is provided in the interest of expediting the project. Provision of coordination and/or assistance does not relieve the Contractor of any obligations regarding the timeliness and completeness relative to the permit submittals.

## 1.5. SUBMITTALS

- A. Submit a schedule of applicable permits including approximate lead time. Indicate any action items or information required from National Grid or the Engineer.
- B. Data required by permit: submit copies of all supplemental data required by permits with documentation that the supplemental data was provided to the entity that issued the permit according to the schedule required by the permit.
- C. Submit copies of complete permit applications to National Grid and the Engineer prior to submittal to the regulatory entity.
- D. Submit copies of fully executed permit applications and final permits to National Grid and the Engineer.

## PART 2 PRODUCTS (not used)

## PART 3 EXECUTION

### 3.1. Noise Limitations

- A. Comply with local noise limitations for the City of Glen Cove at all times while performing the Work, which include:
  - 1. § 196-14. Sound created by certain equipment and vehicles impacting residential occupancy - Do not create sound exceeding 75dBA as measured at the property line of the residential receiving property.
  - 2. § 196-13. Maximum permissible impulse sound levels
  - 3. § 196-12. Maximum permissible continuous sound levels
- B. Do not conduct Work outside of the permitted working hours (Monday through Friday, 7:00 am to 6:00 pm, no work on Federal holidays) without advanced approval.

3.2. PRICE AND PAYMENT PROCEDURES

- A. Refer to Section 01 20 00 – Price and Payment Procedures.

END OF SECTION 01 41 00

**SECTION 01 50 00**  
**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 GENERAL**

**1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, equipment, supplies, laboratory testing, materials, and performing all operations required for providing temporary facilities and controls during the performance of the Work.
- B. For the purposes of this specification, environmental protection is defined as the retention of the environment in its natural state to the greatest extent possible during the project construction and to enhance the natural appearance in its final condition. Environmental protection requires consideration of air, water, and land resources and involves noise, solid waste management, and management of other pollutants. Comply with all applicable or relevant and appropriate Federal, State, and local laws to provide for abatement and control of any environmental pollution arising from the construction activities in performance of the Work.
- C. National Grid, National Grid's representative, or the Engineer may notify the Contractor in writing of any non compliance with Federal, State, and/or local laws. Such notice, when delivered to the Contractor or Contractor's representative at the Site, shall be deemed sufficient for the purpose. After receipt of the notice, immediately inform National Grid, National Grid's representative, or the Engineer of the proposed corrective action and take such actions if they are approved. If the Contractor fails or refuses to comply promptly, National Grid and/or National Grid's representative, or the Engineer may issue an order suspending or halting all or parts of the Work until satisfactory corrective action has been taken. Claims for extensions of time or for excess costs or damages by the Contractor due to the stop orders described above, will be denied.
- D. Ensure that all subcontractors comply with the provisions of the specifications.
- E. Operate and maintain all equipment and systems to ensure that that the temporary facilities, controls, utilities, other services, etc. are provided without disruption.

**1.2. ENVIRONMENTAL PROTECTION**

- A. Do not pollute any stream, river, waterway, roadway, or soil with fuel, oil, grease, lubricant, hydraulic fluid, bitumen, calcium chloride, acid, base, or other harmful materials. Comply with appropriate Federal, State, and local regulations and guidelines for the handling and disposal of all materials.
- B. Properly dispose any debris resulting from the performance of the Work. Disposing any debris, soil, water, effluent, by product, waste, trash, chemical, fuel, oil, grease, lubricant, bitumen, calcium chloride, acid, base, or other harmful material etc., in or adjacent to the work area is not acceptable. Remove any unauthorized dumped materials and restore the area as directed by the Engineer.

If necessary, contaminated areas as a result of unauthorized activity or dumping by the Contractor shall be remediated or excavated at no additional cost to National Grid. Manage excavated soil in accordance with Part 1.2 (A).

- C. All contaminated materials (debris, soil, water, effluent, by-product, waste, trash, chemical, fuel, oil, grease, lubricant, bitumen, calcium chloride, acid, base or other harmful material etc.) resulting from the Work shall be disposed in accordance with all applicable or relevant and appropriate Federal and State laws prior to completion of construction.

## 1.3. UTILITY PROTECTION

- A. Maintain all utility markouts for the duration of the project. Provide copies of all one call numbers/tickets/utilities plates/private utility location information/test pit logs to the Engineer prior to beginning intrusive activities. The Engineer will maintain copies on site in a clearance package.
- B. Conduct a utility search and identification prior to commencement of intrusive field activities and resolve all potential conflicts.
- C. All existing underground electrical will be marked out by the Long Island Power Authority.
- D. Conduct a utility survey of the excavation area using a private utility locating service and markout all suspected utility locations. Confirm all suspected utility locations with LIPA prior to beginning intrusive activities.
- E. Markout the safe off-set distance, as determined by LIPA, for electrical facilities, substation equipment, and utility poles prior to beginning intrusive activities.
- F. Hand clear locations of underground 13 kV electrical cables prior to performing any intrusive activities within 5 feet of the markout location. Cables and conduits must be visually located to confirm the markout. Locations must be permanently marked at the surface following hand clearing. No mechanical intrusive activities will be performed within 3 feet of the 13 kV underground cables.
- G. Hand clear all monitoring well or soil boring locations to a depth of 5 feet below ground surface.
- H. All Hand clearing will be performed using fiberglass non-conductive tools or vacuum extraction methods and/or air knife.

## 1.4. VEHICLE AND EQUIPMENT GROUNDING REQUIREMENTS

- A. Ground all equipment involved in invasive activities using a LIPA approved grounding wire. Grounding wire must be a minimum of 100 feet long and have an ampacity equal to or greater than 4 AWG copper wire and be constructed in accordance with LIPA specifications (CS-3575).

- B. Whenever possible, the grounding wire will be connected to a known ground point at the substation. If the activities are located too far from a known ground point, a (temporary) ground rod should be installed in the area of the work and the equipment or vehicle should be attached to the rod with the same 4 AWG ground.
- C. All equipment requiring grounding shall be equipped with a LIPA-approved ground connection welded to the frame of the vehicle.

## 1.5. WORKING RESTRICTIONS – OVERHEAD ELECTRICAL UTILITIES

- A. There are overhead distribution and transmission lines that run over the excavation area. Use extreme care during the implementation of the remedial construction activities so as not to damage or interfere with these utilities.
- B. Maintain the minimum setbacks for all booms and trucks operating in the vicinity of energized lines as follows:
  - 1. 10 feet for the 13 kV overhead electrical lines; and,
  - 2. 10 feet for the 69 kV transmission cables.
- C. Maintain the minimum physical clearance of 5 feet for personnel working within close proximity of energized conductors without any mechanical means.
- D. Coordinate all excavation activity with National Grid and LIPA to ensure that overhead electrical lines are de-energized prior to excavating beneath the electrical lines.
- E. Sequence excavation activities so that no remedial work that can potentially interrupt, damage or interfere with the overhead electrical utilities shall be performed during peak summer months (i.e., June 15th to September 1st) unless otherwise approved in writing by National Grid.
- F. Do not load or empty/dump trucks under the overhead electrical utilities, unless approved by National Grid and LIPA. Do not open truck covers under the overhead electrical utilities. Provide warning signs of overhead lines and clearances for truck drivers at the site entrance and at the base of the access road.

## 1.6. SITE OPERATIONS PLAN

- A. Prepare a narrative discussion and drawings describing the means and methods that will be used to execute the Work. The final design shall be based on the requirements, intent, and concepts contained in the Contract Documents. All drawings included in the Site Operations Plan shall be at a scale no less than 20 feet per inch. At a minimum, the Site Operations Plan must include final submittals with means and methods for the following project elements:
  - 1. Schedule of permits required for work. Refer to Section 01 41 00 – Regulatory Requirements - Permits.

2. Traffic control plan for equipment delivery.
  3. Site specific Contractor Health and Safety Plan for all proposed and likely Site activities, prepared by a certified industrial hygienist.
  4. Site specific Contractor Quality Control Plan for ensuring the Work objectives are met. This will include a summary of equipment maintenance procedures and contract personnel training requirements.
  5. Security fence alignment, gate locations, construction details, and signage.
  6. Security procedures and equipment specifications.
  7. Sanitary facility locations.
  8. On-Site parking and traffic layout.
  9. Off-Site parking locations including routes to and from the Site.
  10. Off-Site trucking contractors.
  11. Dewatering system design, overview, phasing, and maintenance.
  12. Water Treatment system design, overview, phasing, and maintenance.
  13. Primary and alternate disposal facility sites for the following:
    - a. Bulk solid waste and construction debris
    - b. Non-Hazardous Soils (Thermal Desorption)
    - c. Non-Hazardous Liquid Wastes
  14. Acceptance criteria for disposal.
  15. Debris management.
  16. Staff roles and responsibility summary, including explicit identification of Contractor or Subcontractor staff and qualifications, and who will personally perform and be responsible for the following tasks:
    - a. Site health and safety
    - b. Quality control
    - c. Construction documentation
    - d. For each company performing one of the above roles, include company contact information (address, telephone number, facsimile number, website, etc.). For each person identified in the Site Operations Plan include resume with license number for surveyors and engineers.
- B. Site Operations Plan may be submitted in parts, so long as all parts are submitted by the submittal deadline. Organize for use in the field and for review. Site Operations Plan will be reviewed for both technical content and organization.

Include table of contents, technical sections and subsections, appendices (tables, drawings, data, etc.), etc.

## 1.7. SUBMITTALS

- A. Site Operations Plan: Submit a detailed Site Operations Plan for performing the Work.

## PART 2 PRODUCTS

### 2.1. MATERIALS AND FACILITIES

- A. All materials shall be suitable for their intended use and shall conform to applicable codes and standards.
- B. First Aid Supplies: Provide appropriate first aid supplies in accordance with all applicable and relevant Federal, State, and local regulations.
- C. Fire Extinguishers: Provide hand carried, portable, UL rated, Class ABC, dry chemical extinguishers or a combination of extinguishers of NFPA recommended classes for the exposures. Provided fire extinguishers at all temporary facilities, workstations, trailers, and offices. Keep detailed records of maintenance and expiration dates.
- D. Temporary Sanitary Facilities: Provide sufficient number of self contained, single occupancy toilets with chemical flush, aerated re-circulation, which are properly vented and fully enclosed with fiberglass or other nonabsorbent material. At a minimum provide two single occupancy toilets outside of exclusion zone. One toilet will be designated as "Women Only."
- E. Construction Offices: Provide office space for National Grid, the CM, the Engineer, CAMP technician, and the NYSDEC representative. At a minimum provide a furnished construction trailer with five work stations, including electricity, air conditioning, and heat. Each work station will include a desk, chair, separate telephone for each work station, facsimile, and internet services.
- F. On-Site Parking: On-Site parking is limited. Parking on Grove Street will be limited to residents. Contractor shall coordinate parking with a local parking facility for contractor's vehicles, or negotiate for off-Site parking space with the City of Glen Cove. Parking must be sufficient to include all contractor vehicles, a one vehicle each for the CM, Engineer, NYSDEC, CAMP technician, and National Grid representative.
- G. Equipment Decontamination: Provide plan to conduct gross level decontamination of delivery vehicle tires and chassis to remove surface soils prior to departing the Site.
  - 1. Decontamination Equipment: Provide and maintain a sufficient supply of materials/equipment required to implement decontamination procedures, including, but not limited to, the following items:

- a. Plastic trash barrels
  - b. Liners for trash barrels
  - c. Wash basins
  - d. Alconox<sup>TM</sup> or approved equivalent detergent concentrate
  - e. Hand pump sprayers
  - f. Long handled soft bristle brushes
  - g. Large sponges
  - h. Cleaning wipes for respirators
  - i. Bench or stool(s)
  - j. Stepladder(s)
  - k. Steam generator
  - l. Liquid detergent and paper towels
  - m. Plastic trash bags
  - n. Supplies and equipment to construct the decontamination pad
  - o. All necessary hosing, connection, etc. to collect and transport decontamination fluids to the wastewater treatment system
- H. Site Perimeter Fence, Gates, and Signage: Refer to Contract Drawings for locations.
1. Modify the Site perimeter fence as shown on the Contract Drawings to accommodate the placement of the support zone.
  2. Additional fence construction must be a minimum of 8 feet in height.

## PART 3 EXECUTION

### 3.1. GENERAL

- A. Design, furnish, install, and maintain all temporary Site facilities and controls required for the performance of the Work.
- B. Provide and maintain all temporary environmental controls as necessary for protection of the environment throughout the performance of the Work.
- C. Provide and maintain proper barricades and warning signs at all closures, holes, hazards, and equipment areas.

### 3.2. SANITARY FACILITIES

- A. Empty the sanitary facilities before the capacity is exceeded, or on a weekly basis, whichever occurs first. Clean sanitation facilities concurrently with emptying.

### 3.3. TEMPORARY UTILITIES

- A. Electrical service will be installed in the construction offices prior to the start of excavation work.
- B. Provide water suitable for decontamination for the duration of the Project.
- C. Supply potable drinking water for on Site personnel.
- D. Provide all temporary utility services in accordance with the specification for the duration of the project. This includes, but is not limited to installation, operation, maintenance and removal of all equipment and/or systems required to assure uninterrupted service and all charges associated with installation, connection, service, and shut-off.

### 3.4. TEMPORARY CONSTRUCTION FACILITIES

- A. Consult with National Grid, Engineer and/or the CM in regard to requirements, locations, access, and related facilities prior to installation of construction trailers, the Obtain necessary permits and/or approvals for use and occupancy of these facilities. All trailers other than storage sheds shall be provided with the following minimum requirements:
  - 1. Grounded Lighting - Lighting shall be electric, non-glare type producing a minimum illumination level of 50 foot-candles measured at desk height.
  - 2. Heating and Cooling - Heating and cooling shall be capable of maintaining ambient temperatures within the trailer of approximately 70°F.
  - 3. Office Trailer(s) - Coordinate with National Grid, the Engineer, and the CM as to the extent of office space, furniture (desks, chairs), conference table and chairs for National Grid, the Engineer, the CAMP technician, the CM and NYSDEC representative. At a minimum, each work station to be used by National Grid, the Engineer, the CM, and the NYSDEC shall include the following:
    - a. Built-in desks or free standing;
    - b. Built-in overhead shelves;
    - c. Built-in plan table;
    - d. High speed wireless or DSL internet access with jack;
    - e. Adjustable office chairs with swivels;
    - f. Fireproof file cabinets.
  - 4. Engineer/CM Office Trailer will include:
    - a. Coffee machine;
    - b. Microwave oven;

- c. Medium size compact refrigerator;
- d. Plain paper fax machines;
- e. Folding chairs;
- f. Folding conference tables;

5. CAMP Technician work station will include 2 dedicated phone lines.

### 3.5. PERSONNEL DECONTAMINATION

- A. Comply with all requirements of Site Specific Contractor Health and Safety Plan.
- B. Provide the means for National Grid and the Engineer, to comply with Site Specific Contractor Health and Safety Plan.
- C. Provide personnel decontamination station within the work zone where personnel can drop equipment and remove personal protective equipment (PPE).
  - 1. The Contractor will equip decontamination station with basins for water and detergent and trash bags or cans for containing disposable PPE and other discarded materials.
  - 2. The Contractor will supply a sink as a secondary means of personal hygiene for personnel.

### 3.6. EQUIPMENT DECONTAMINATION

- A. Install decontamination in accordance with the Contract Drawings.
  - 1. Decontamination pad will be located and operated at any point that equipment leaves the Site
  - 2. Decontamination pad will be sufficiently sized to ensure the largest piece of equipment can be adequately decontaminated
- B. Remove heavy contamination using a broom and/or brushes within the excavation area prior to movement to the decontamination pad.
- C. Perform heavy equipment decontamination within the limits of the decontamination pad.
- D. Pressure wash heavy equipment before leaving the Site, if necessary.
- E. Decontaminate any equipment utilized to excavate impacted materials prior to backfilling.
- F. Collect and pump wastewater from equipment decontamination into frac tanks.
- G. Collect and remove soils from decontamination pad and bulk with excavated materials.

3.7. NOISE CONTROL

- A. Limit noise to 80 dBA at project limit. Measure the noise level at project limit as needed. Provide noise barrier or apply for ordinance to exceed noise limit.
- B. Equip vehicles and motorized equipment with appropriate noise control devices to maintain noise levels that conform to current OSHA standards and current State and local regulations. Immediately take steps to correct any deficiencies noticed or as directed by National Grid and/or the Engineer.
- C. Properly maintain all mufflers and noise control devices and replace when necessary. Operate all construction equipment in the manner that it was intended. Excessive amount of noise and vibration due to improper use of vehicles and equipment is prohibited.
- D. All equipment that is required to operate beyond standard Site work hours shall, to the maximum extent possible, be electrically driven.

3.8. EQUIPMENT LEFT ON SITE

- A. Secure all vehicles and/or equipment left on the Site outside of the standard Site work hours.
- B. Ensure that all equipment, where feasible, is de energized when left on Site and not in use to prevent electrical/fire/explosive hazards. Contractor will be responsible for security and operation and maintenance of any systems that require such services outside standard Site work hours. If systems are operational outside the standard Site work hours, provide oversight at all times when equipment is in operation, or provide an electronic monitoring system with remote communication of system failure. Repair system failures in a timely manner such that the Project schedule is not affected.

3.9. SITE SECURITY

- A. Provide security during non-working hours and weekends.
- B. Establish written site security procedures as part of the Site Operations Plan. At a minimum the procedures will include:
  - 1. Roles and responsibilities of site personnel involved with Site Security;
  - 2. Description of proposed daily security operations;
  - 3. Method and frequency for conducting security checks;
  - 4. Sign in/sign out procedures;
  - 5. Location of security station;

6. Description of how a breach of security will be handled. A breach of security shall include, but not be limited to, unauthorized personnel located on the site working area, unauthorized personnel attempting to gain access to the site working area, broken fences and unlocked gates, and unauthorized personnel on the hazardous work zones;
  7. Communications; and
  8. List of personnel to be contacted in case of emergency
- 3.10. PRICE AND PAYMENT PROCEDURES
- A. Refer to Section 01 20 00 – Price and Payment Procedures.

END OF SECTION 01 50 00

## **SECTION 01 77 00 CLOSEOUT PROCEDURES**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. Final Acceptance covers the administrative and technical requirements for final cleaning, inspection, project as-built documents, system demonstrations and adjustments, warranties, bonds, final payment, and other procedures for Project close out in accordance with Section 13.0 of the Terms and Conditions.
- B. Prepare the Site for Substantial Completion and Final Acceptance. Work includes record documents, cleaning the project Site and administrative provisions.

#### **1.2. CLOSEOUT PROCEDURES**

- A. Restore Site: Refer to the Contract Drawings
- B. Substantial Completion
  - 1. When the Contractor considers the Work or designated portion thereof to be at Substantial Completion, provide written notice, with a list of items to be completed or corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. The Engineer will inspect to determine the status of completion.
  - 3. Should the Engineer determine that Work is not Substantially Complete, Engineer will notify Contractor in writing.
  - 4. The Contractor will within two (2) days of the notice provide a schedule for when all defects will be corrected and/or the Work completed for the Engineers review.
  - 5. Upon the Engineer's approval, remedy any deficient and/or incomplete work and upon completion notify the Engineer. The Engineer will re-inspect the Work for the purpose of final acceptance.
- C. Final Acceptance
  - 1. Submit written certification that confirms the following: Contract Documents have been reviewed, Work has been inspected, Work is complete in accordance with the Contract Documents including satisfactory compliance with performance guarantees, any previously noted deficiencies have been corrected or remediated, equipment has been tested in presence of the Engineer, and Work is complete and ready for final inspection.
  - 2. The Engineer will inspect Work to verify status of completion.
  - 3. Should the Engineer consider the Work to be incomplete or defective, the Contractor will be notified in writing identifying incomplete or defective Work.

4. Take immediate action to remedy incomplete and deficient Work and send written notice when Work is complete. The Engineer will re-inspect Work to verify status of completion.
5. Provide all submittals that are required by governing authorities in the Contract Documents.
6. Submit final application for payment identifying total Contract amount, previous payments and the amount due.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

## 1.3. SUBMITTALS

- A. Record Documents: Submit all project record documents, drawings, specifications including system operations and maintenance manual, as built, waste disposal records, analytical data, miscellaneous records, warranties, etc. Submit record surveys in electronic and hard copy format. Record surveys include:
  1. Encountered structures left in place
  2. Encountered pipes not removed and cut/capped pipes
  3. Utility locations, elevations, and inverts
  4. Bottom of remedial excavation
  5. Backfill grade
  6. Demarcation Barrier grade
  7. Final Grade
  8. Benchmark coordinates and elevation
- B. Utility Repair Confirmation: Submit written confirmation from the operating companies that all temporary relocated utilities have been restored to pre-remediation condition and that all temporary utility connection points have been restored to a suitable condition.
- C. Project Closeout: Submit final completion submittals for Final Acceptance.

## PART 2 MATERIALS (not used)

## PART 3 EXECUTION

### 3.1. POST CONSTRUCTION INSPECTION

- A. After final cleaning and upon written notice from the Contractor that Work is complete, the Engineer will make a preliminary inspection. The Engineer will notify the Contractor in writing of defective and/or incomplete Work by generating a "punch list."

- B. Upon receiving written notice from the Engineer, Contractor shall remedy defects and/or incomplete Work to the satisfaction of the Engineer at no additional cost to National Grid in a time frame suitable to support the project schedule.
- C. Inform the Engineer in writing after the items listed in the “punch list” are corrected or completed. Upon receipt of notice, Engineer will make final inspection of the project in the presence of the Contractor.
- D. Should the Engineer find Work to be satisfactory, Contractor will be allowed to make application for final payment in accordance with provisions of the Contract. Should the Engineer still find deficiencies and incomplete Work, the Contractor will be notified in writing of deficient and/or incomplete Work and will not approve Contractor’s request for final payment until such time that the Contractor has satisfactorily completed the required Work.

3.2. PRICE AND PAYMENT PROCEDURES

- A. Refer to Section 01 20 00 – Price and Payment Procedures.

END OF SECTION 01 77 00

## **SECTION 02 41 00 DEMOLITION**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials and equipment, and performing all operations required for the partial or complete removal, storage, and/or disposal of structures, at grade, above grade, and below grade during performance of the Work.
- B. Demolition must be carried out in accordance with State of New York Department of Transportation- Standard Specifications May 4, 2006, Section 200.
- C. Remove existing pavement, concrete, and other structures and appurtenances from the Site as required to perform the Work.
- D. Abandon monitoring wells in accordance with the NYSDEC Groundwater Monitoring Well Decommissioning Procedures, dated April 2003.

#### **1.2. SUBMITTALS**

- A. Submit monitoring well decommissioning records to National Grid and the Engineer.

### **PART 2 MATERIALS (not used)**

### **PART 3 EXECUTION**

#### **3.1. DEBRIS HANDLING**

- A. Any demolition materials stockpiled shall be stored on a debris pad or in a container designed for the purpose.
- B. Dispose of any demolition materials in accordance with Section 02 61 00 – Removal and Disposal of Contaminated Materials.

#### **3.2. DEMOLITION OF PAVEMENT AND CONCRETE**

- A. Sawcut all pavement and concrete using complete depth sawcuts.

#### **3.3. ON-SITE CRUSHING**

- A. On site crushing will not be allowed.

#### **3.4. MONITORING WELL ABANDONMENT**

- A. Notify Engineer a minimum of two days prior to abandoning monitoring wells.

#### **3.5. GROUDING WIRE REMOVAL**

- A. Remove the grounding wire that extends into the excavation limits from the northeast corner of the substation. Coordinate with and obtain authorization from the Long Island Power Authority, National Grid, and Engineer prior to removal.

3.6. PRICE AND PAYMENT PROCEDURES

- A. Refer to Section 01 20 00 – Price and Payment Procedures.

END OF SECTION 02 41 00

## **SECTION 02 61 00**

### **REMOVAL AND DISPOSAL OF CONTAMINATED MATERIALS**

#### **PART 1 GENERAL**

##### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials and equipment, and performing all operations required for the proper management, off-Site transportation, and disposal of waste materials and waste liquids generated during performance of the Phase I RA.

##### **1.2. SUBMITTALS**

- A. National Grid will provide the Contractor with an approved list of receiving facilities.
- B. Designate and submit primary and alternate thermal desorption receiving facilities, liquid waste treatment facilities, and landfill receiving facilities for materials (soils, liquid waste, and bulk waste). Upon final approval from National Grid, the Contractor shall contract all facilities prior to any excavation. Copies of contracts or letters from each facility indicating acceptance of the total estimated volume of material from this Project shall be given to the Engineer.
- C. Submit copies of all waste manifests, bills of lading, and certified weight slips from a scale approved for use by the Engineer and/or National Grid for all materials removed from the Site for disposal.
- D. Submit copies of Part 364 Permits for all waste transporters.

#### **PART 2 PRODUCTS**

- 2.1. Vehicles utilized for the transport of impacted materials shall be structurally sound and tight to prevent leakage or spillage of materials.
- 2.2. Vehicles utilized for the transport of impacted materials shall be specially equipped with solid covers that extend over the sides and back of the truck to minimize the release of odors during transport. Standard mesh canvas covers are not acceptable.
- 2.3. Odor and dust suppressing foam shall be provided to supplement covers if required.
- 2.4. Impermeable liners shall be provided for the interior of the excavated impacted material transportation vehicles to prevent leakage of entrained liquid. The liner material shall be strong enough to withstand the placement of excavated material into the container without tearing, and chemically resistant to the contaminants within the material.

## PART 3 EXECUTION

### 3.1. LOADING AND TRANSPORTATION OF MATERIAL

- A. Use pre-characterization sample results provided by Engineer to allow direct load, transport, and disposal of all MGP-related impacted material whenever possible.
- B. All trucks entering the site will be free of contamination and/or visual dirt. The CM, Engineer and/or National Grid reserves the right to reject any trucks can send away trucks that arrive to the site dirty.
- C. All trucks transporting material should be outfitted with the impermeable liner. Based on site constraints, the impermeable liner may be installed at the off-Site Contractor staging area, prior to the trucks arrival on-Site. The contractor is responsible for securing an off site staging area.
- D. Do not idle trucks for a period longer than three minutes at any point while operating within the limits of the City of Glen Cove.
- E. Provide traffic control at the site entry to ensure a smooth flow of traffic and to minimize congestion at the site entrance.
- F. Appropriately cover trucks filled with excavated material prior to exiting the Site to prevent vapor and fugitive dust emissions during transport. Supplement with odor suppressant foam as needed. Gross vehicle truck weights shall conform with the most current local, City, state, federal DOT and bridge and tunnel requirements from the point of origin to the final disposal facility.
- G. All Work in and around trucks shall be performed in appropriate personal protective equipment. These activities must be specifically addressed in the Site specific Contractor HASP.
- H. Prior to leaving the Site, all material transport vehicles and containers shall be visually inspected for evidence of contamination (including inside of wheels and undercarriage). All trucks leaving the Site shall proceed to a decontamination station for cleaning prior to exiting onto public roads.
  - 1. Brush off equipment using a broom and/or brushes within the excavation area prior to movement to the decontamination pads to decrease the amount of respirable particulates leaving the remediation area.
  - 2. If necessary, at the decontamination pad, all heavy equipment will be pressure washed before leaving the Site.
  - 3. All equipment leaving the Site will be decontaminated per these guidelines. In addition, any equipment previously utilized to excavate impacted material will be decontaminated prior to use in backfilling (e.g. excavator bucket).

4. Size decontamination pads to ensure that the largest piece of Contractor equipment can be adequately decontaminated. Provisions will be made to control overspray at the decontamination pads.
  5. Collect and pump wastewater from equipment decontamination into frac tank(s).
  6. Wastewater, which is not treated and discharged under an appropriate permit, will be transported from the Site by a properly licensed liquid waste hauler.
  7. Soils collected from the decontamination pads will be bulked with the MGP-related impacted material and sent to the properly licensed National Grid-approved disposal facility, as necessary.
- I. Trucks shall proceed directly to the designated treatment, storage, and disposal facility.
  - J. The Contractor is responsible for any and all actions necessary to remedy situations involving material spilled or leaked in transit, or mud or dirt tracked off-Site. This includes trucks carrying imported fill or other materials to the site (i.e. dust generated from trucks entering the site on adjacent roads). Clean up shall be performed in accordance with all applicable Federal, State, and local regulations at no additional costs to National Grid.
  - K. All transporters used shall be properly licensed, permitted, and certified for the service provided.
  - L. All drivers will be required to review and sign a driver orientation policy provided by National Grid prior to transporting materials from the site.
  - M. Material from the site will not be combined with any other material, without the Engineer's approval.
  - N. National Grid or a National Grid designated representative will sign transport bill of lading or manifests. National Grid will provide a hazardous waste generator number if required. Maintain on Site copies of all documents involving transportation of materials from the Site. Copies of these records shall be submitted to the CM and the Engineer at a frequency agreed to by the Contractor and National Grid. All records shall be turned over to National Grid at the completion of the Phase I RA.
  - O. Ensure that transport vehicles are properly secured, labeled, and placarded prior to exiting the Site.

### 3.2. DISPOSAL OF MATERIALS

- A. Dispose of soils that contain MGP-related impacted material at an off-Site licensed thermal desorption facility approved by National Grid, unless otherwise specified.

- B. In the event that pre-characterization sampling indicates that the material cannot be thermally desorbed, notify National Grid in writing that the material must be disposed of as non-hazardous waste at a Subtitle D landfill or as hazardous waste at a Subtitle C landfill.
- C. After notification that soils cannot be thermally desorbed, National Grid will provide a list of approved landfill facilities.
- D. Dispose of debris to an off-Site licensed landfill receiving Construction & Debris facility approved by National Grid, unless otherwise specified.
- E. The Contractor is responsible for the acceptance of materials at the facilities. In the event that the identified and approved facilities cease to accept the materials, the Contractor shall be responsible for identifying alternate facilities, and making arrangements with such facilities to accept material from the Site with no change in the unit price submitted in the Contractor's Bid for this project. Alternate facilities are subject to review and approval by National Grid.
- F. In the event that an alternate facility is needed to accept the material, the Contractor will supply a written submission to National Grid on the material type, amount, location, and reason the approved facility ceased to accept the material. Alternate facilities not previously audited by National Grid will require an audit prior to allowing transport of materials to the facility. Any charges or fees incurred by the Contractor associated with delays to the project schedule during this audit process are the Contractor's responsibility.
- G. Pre-Phase I RA waste disposal characterization of the MGP-related impacted material did not identify hazardous waste. If any materials are encountered during excavation that appear to exhibit hazardous characteristics these materials should be segregated, stored on Site, sampled, and disposed of appropriately.
- H. Decontaminate construction debris and/or bulky material within the excavation, if encountered, if possible.
- I. Segregate non-contaminated construction debris and bulky wastes for transport to a landfill facility.
- J. Groundwater and decontamination wastewater, which is not treated and discharged under an appropriate permit, shall be disposed of at an off-Site liquid waste treatment facility approved by National Grid.
- K. Solid material collected in the dewatering frac tank(s), as a result of settling in the tank, shall be bulked with the suspected MGP-related impacted material and sent to the thermal desorption facility and/or landfill as necessary.

### 3.3. METHOD OF MEASUREMENT

- A. Measurement for payment for disposal of soils shall be made by the actual number of tons of material removed and transported to the thermal desorption facility, landfill or other authorized method of disposal, and shall be based on certified weight slips from a scale approved for use by the Engineer and National Grid.
- B. Measurement for payment for trucking and offsite disposal of liquids shall be made per one thousand (1,000) gallons of contaminated liquids removed and transported to the treatment facility, and shall be based on the volume certified by the receiving facility.
- C. Measurement for payment for disposal of bulky waste and construction debris shall be made by the actual number of tons of material removed and transported to the appropriate receiving facility or other authorized method of disposal, and shall be based on certified weight slips from a scale approved for use by the Engineer and/or National Grid.
- D. Measurement for payment for disposal of hazardous soil or media, if required, shall be made by the actual number of tons of material removed and transported to the appropriate receiving facility or other authorized method of disposal, and shall be based on certified weight slips from a scale approved for use by the Engineer and/or National Grid.

### 3.4. SAMPLING AND CHEMICAL ANALYSIS

- A. Additional sampling and laboratory analyses as required by disposal facilities will be performed by the Contractor.
- B. All laboratory analyses will be conducted by a laboratory certified by the New York State Environmental Laboratory Approval Program for the analyses conducted.
- C. Results of the laboratory analysis will be forwarded to the CM and Engineer upon receipt.

### 3.5. PRICE AND PAYMENT PROCEDURES

- A. Refer to Section 01 20 00 – Price and Payment Procedures.

END OF SECTION 02 61 00

## **SECTION 31 09 00 GEOTECHNICAL INSTRUMENTATION**

### **PART 1 GENERAL**

#### **1.1 SUMMARY**

- A. Provide all labor, equipment, supplies, and materials to install and protect the geotechnical instrumentation as indicated in the excavation support system design.

#### **1.2 SUBMITTALS**

- A. Include the following information, at a minimum, in the geotechnical instrumentation plan:
  - 1. Plan of the proposed locations for each type of instrument.
  - 2. Details for each type of instrument.
  - 3. Manufacturer's product data or catalogue cuts for instruments to be installed.
  - 4. Installation procedures and details for casing and surface protection.
  - 5. Name and qualifications of Subcontractor to install instruments.

### **PART 2 PRODUCTS**

#### **2.1 MATERIALS**

- A. Provide all ancillary products as per the requirements and/or recommendations of the manufacturer of the geotechnical instruments.

### **PART 3 EXECUTION**

#### **3.1 GENERAL**

- A. Install all geotechnical instruments as per the manufacturer's requirements and in the locations specified in the excavation support system design.
- B. Install all geotechnical instrumentation in accordance with all applicable state and local laws and regulations.
- C. Install all geotechnical instruments under the observation of the Engineer.

#### **3.2 DATA ACQUISITION**

- A. Engineer will obtain and analyze data from all geotechnical instruments in use on the Site.
- B. Provide safe access to each instrument location to allow for data collection by the Engineer.

- C. Data obtained by the Engineer will be made available, upon request, to the Contractor. The Contractor may observe the Engineer during data acquisition, and may obtain independent or supplemental data at no additional cost to National Grid.

END OF SECTION 31 09 00

## **SECTION 31 10 00 SITE PREPARATION**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials and equipment and performing all operations required for the Site preparation prior to performance of the Phase I RA.
- B. Locate all underground utilities prior to the initiation of intrusive Work. The Contract Drawings indicate the location of known utilities on the site, and may not represent all utilities on site. The Contractor is responsible for locating and protecting all underground utilities in and adjacent to the excavation area in accordance with Section 01 50 00.
- C. Install the construction entrances, Site perimeter fence, and gates in accordance with Contract Drawings.
- D. Clear all debris, rubble, and vegetation from the work areas and in any other areas which will be used by the Contractor for construction support as approved by the Engineer, CM and National Grid.
- E. Clear all debris, rubble, and vegetation from the CAMP air monitoring station locations as directed by the Engineer, CM and National Grid.
- F. Provide protection for existing monuments, structures, and appurtenances during the extent of the construction.
- G. Provide settlement and stability monitoring on the retaining wall located immediately east of the access road, south of the substation, and other nearby structures.
- H. Provide temporary relocation of appurtenances from off-Site properties near the Work.

#### **1.2. SUBMITTALS**

- A. Provide the DigNet of New York City & Long Island ticket number and the findings of the utility mark out to National Grid and the Engineer prior to beginning excavation.
- B. Provide a plan of monitoring points for settlement and stability to the Engineer prior to excavation.
- C. Provide reports of survey elevations and coordinates along with all previous readings of the monitoring reports for settlement and stability to the Engineer within 24 hours of the survey.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS

3.1. UNDERGROUND UTILITIES

- A. Contact DigNet of New York City & Long Island to request that all utilities on the Site are located and marked. Ensure that the utility mark out is refreshed as necessary or as directed by DigNet or at the direction of National Grid or the Engineer.
- B. Retain the services of a private underground utility location company to mark out the locations of underground utilities in the areas of planned excavation on private property.
- C. Any underground utility protection will be the responsibility of the Contractor prior to and during any excavation activities.
- D. Repair any utilities damaged as a result of the Work.

3.2. TEMPORARY CONSTRUCTION ENTRANCE

- A. Obtain the appropriate permits required for temporary construction entrances; refer to Section 01 41 00.
- B. Install temporary construction entrance, if necessary, in accordance with the City of Glen Cove requirements.

3.3. SITE CLEARING AND DEBRIS REMOVAL

- A. Contractor shall remove debris within the limits of work area; handle, screen and characterize the debris as necessary.
- B. Contractor shall remove all debris (i.e. trash, metal, etc.) within site boundaries. The Contractor shall also conduct all handling, segregating and screening activities that are necessary to facilitate off-site disposal.
- C. Contaminated materials must be segregated from non-contaminated materials and prepared, as necessary, for disposal at an off-site facility approved by National Grid, the Engineer.
- D. The Contractor shall be responsible for transportation and disposal of all generated wastes at an off-site properly licensed and permitted disposal facility approved by National Grid.

3.4. TREE REMOVAL

- A. Removal all undermined trees located along the southern slope adjacent to the active substation and the eastern slope adjacent to the access road. Cut trees at 6-inches above grade and leave the root system in place.
- B. National Grid will negotiate access to tree located on the adjacent private properties.

- C. Remove all potentially unstable debris and former non-functional slope control from the slopes prior to construction. The Engineer will photo-document the condition of soil slope/wall prior to construction activities and upon completion of the construction program.
- D. Repair any incidental slope issues upon completion of construction.

### 3.5. SETTLEMENT AND STABILITY MONITORING

- A. Establish a system of settlement and stability monitoring for existing structures within 50 feet of the excavation or as directed by the Engineer. Settlement and stability monitoring shall be performed using a combination of Surface Monitoring Points (SMPs) and Crack Monitoring Points (CMPs). The Contractor shall submit a plan of proposed monitoring points for approval by the Engineer.
- B. Established SMPs at 10 foot intervals along the top of the CMU retaining wall and along the top timber wall of the terraced slope.
- C. Install cast in place concrete monuments in the soil at the top of the slope at 15 foot intervals for the section of slope with no remaining timber wall. The monuments should be located 4 feet back from the crest of the slope and be embedded at least 4 feet below the ground surface.
- D. Monitor both horizontal and vertical movement of the SMPs.
- E. SMP
  - 1. SMP will consist of inscribed markings or approved surveyor nails driven flush with the surface and installed into existing concrete, masonry or asphalt.
- F. CMP
  - 1. CMP will consist of fixed markers placed on either side of cracks in existing structures to record horizontal and vertical movement.
  - 2. Attached and protect from vandalism.
- G. Readings
  - 1. Immediately following monitoring point installation, the Contractor shall take two sets of initial readings 1 week apart to provide baseline data points and to demonstrate the adequacy of the completed installation. Perform baseline readings at least 2 weeks prior to the start of any demolition, excavation, or excavation support system installation.

2. At a minimum, daily monitoring will be required for all SMP and CMP during pile driving activities and weekly measurements during other construction activities unless otherwise specified by the Engineer. Within 24 hours of each survey submit to the Engineer the latest survey elevations and coordinates at each monitoring point along with all previous survey information. The Engineer and Construction Manager must be notified with in 30 minutes of survey measurement greater or equal to 0.5 inches.

H. Tolerances

1. Survey measurements for initial location of each monitoring point shall consist of determining the elevation and horizontal position with respect to benchmark(s) approved by the Engineer.
  2. Elevations of monitoring points should be determined to an accuracy of plus/minus 0.01 feet. Horizontal position of monitoring points should be determined to an accuracy of plus/minus 0.01 feet.
- I. The Contractor shall be prepared to alter the excavation methods if movement exceeding 0.5 inch is measured at any structure, unless otherwise approved by the Engineer. The maximum allowable cumulative vertical or horizontal movement measured at any SMP or CMP shall be no more than 1 inch. If the movements exceed this criterion the Contractor shall stop all related construction activities to prevent additional movement. These criteria may be adjusted by the Engineer based on actual conditions.

3.6. SUBSTATION ACCESS

- A. Access to the active substation facility is restricted. All requests to access the facility will be made to the CM and National Grid and forwarded to the LIPA representative.
- B. Sequence work such that one gate of the substation facility is accessible to LIPA personnel for emergency service of the facility at all times.

3.7. PRICE AND PAYMENT PROCEDURES

- A. Refer to Section 01 20 00 – Price and Payment Procedures

END OF SECTION 31 10 00

## **SECTION 31 23 00** **EXCAVATION AND FILL**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials, equipment, and performing all operations required for the excavation, handling, backfilling, and dewatering of material during performance of the Phase I RA.
- B. Limits of the excavation are as indicated on the Contract Drawings.
- C. The anticipated extent of the excavation was established based on the existing Site data and limitations due to the infrastructure of the operational substation. The Contractor should be prepared to accommodate potential field adjustments as necessary.
- D. Strip, excavate, and load the material into trucks for disposal at an appropriate National Grid approved disposal facility, based on the results of the pre-characterization. Excavated material handling includes:
  - 1. Stripping and the removal of existing pavement.
  - 2. Excavate subsurface soil (MGP-related impacted material and overlying material) and any debris encountered.
  - 3. Load subsurface soil for off-Site transport and disposal at a regulated, licensed, National Grid-approved thermal desorption facility.
  - 4. Segregate bulk solid waste and construction debris encountered during excavation.
    - a. Separate the construction debris and solid waste within the limits of the excavation. Due to limited space, no stockpiling will be allowed on-Site, with the exception of gravity dewatering within the excavation limits on an as needed basis. Soil should be gravity dewatered such that the water is allowed to drain back into the excavation.
- E. Implement airborne dust and vapor suppression measures required to comply with the CAMP and as directed by National Grid or the Engineer. These actions may include any of the following or other measures to minimize air emissions:
  - 1. Applying water on exposed soil surfaces and/or roadways to suppress dust.
  - 2. Covering working areas of exposed soils with tarpaulins, vapor suppressing foam, or other vapor controls.
  - 3. Modifying the means and methods of the work (i.e. using different or additional equipment, etc.).
  - 4. Modifying the production rate (i.e. excavation rate, etc.).

- 5. Changing the sequence of activities.
- F. Handle materials in a manner that will protect Site personnel, the public, and the environment in accordance with all applicable Federal, State, and local laws and regulations and to prevent cross contamination.
- G. For weight submittals, provide documentation from the disposal facility and borrow source location.

## 1.2. SUBMITTALS

- A. Excavation and Backfilling Plan: Submit Excavation and backfilling plan showing sequencing, staging, and phasing of the excavation and backfill activities. Incorporate into Site Operations Plan submittal described in Section 01 50 00 – Temporary Facilities and Controls.
- B. Daily Report - Anticipated Excavation, Transportation, and Disposal Needs: Submit an estimate of the excavation rate, number of trucks needed for transportation to the disposal facility, and the disposal facility production rate for each day. Notify the transportation and/or disposal contractors of anticipated needs.
- C. Borrow Source Evaluation: Submit the results of the borrow source evaluation for each source to be used as imported clean backfill indicating the material is in compliance with the geotechnical and environmental criteria. Perform borrow source evaluation prior to the import of fill from the borrow source. Include the following:
  - 1. Name, address, telephone number, facsimile number, and web site address of borrow source.
  - 2. Certificate of clean fill from the borrow location stating that the soil is native in origin and free of contamination.
  - 3. Analytical results from the borrow source, specific to the actual fill being imported to the Site, as confirmation that the material is free of contamination and in compliance with the clean fill environmental criteria.
  - 4. Geotechnical test results from the borrow source, specific to the actual fill being imported to the Site, as confirmation that the material is in compliance with the clean fill geotechnical criteria.
- D. Daily Report - Compaction Test Results: Submit compaction test results for each working day.
- E. Geotechnical Laboratory Test Results: Submit geotechnical laboratory test results for backfill as the test results become available. Incorporate into a Daily Report one week prior to placing the tested materials.

- F. Daily Report - Excavation Rate and Weight Tickets: Submit excavation rate for each working day. Submit certified weight tickets for material exported for off-site disposal and for each load of imported backfill material each working Day.
- G. Provide National Grid and the Engineer the manufacturers' MSDS's and product information for all stabilization agents prior to their use on Site.

## PART 2 PRODUCTS

### 2.1. GENERAL

- A. Equipment, storage containers, and tanks brought on Site for the purpose of handling and/or storage of materials shall be clean and certified decontaminated prior to entry to the Site. Construction equipment and materials to be incorporated into the work shall be placed in a location so as not to damage any part of the work or existing facilities, and will be stored at a sufficiently safe distance from any contaminated location or material, covered against the weather, and elevated.
- B. A stabilization agent, such as cement kiln dust (CKD), or equivalent to amend soils too wet to transport in trucks must be provided, as necessary. The stabilization agent used must be acceptable to the disposal facility and in accordance with NYSDEC requirements for amendments as described in Attachment C. Provide National Grid and the Engineer the manufacturers' MSDS's and product information for all amendments prior to their use on Site.

### 2.2. BACKFILL

#### A. Granular Fill

- 1. Granular fill shall conform to material designation 304-1 Type 4 in the May 1, 2008; Standard Specification prepared by the New York State Department of Transportation and shall have a pH greater than 5 and less than 10. Fill generated from tunnel cuttings commonly referred to as "mole rock" shall not be used on this site. Clean fill shall be free of organic matter and meet the following gradation requirements:

U.S. Standard Sieve	Percent Finer by Dry Weight
2 inch	100
0.25 inch	30 to 65
No. 40	5 to 40
No. 200	0 to 10

#### B. Gravel Fill

- 1. Gravel fill shall be free of organic matter and meet the following gradation requirements:

U.S. Standard Sieve	Percent Finer by Dry Weight
1.5 inch	100
1.0 inch	95 to 100
0.5 inch	25 to 60
No. 4	0 to 10
No. 8	0 to 5

**C. Select Granular Fill - Slope Protection**

1. Gravel Fill shall conform to material designation 203-2 Select Granular Fill Slope Protection in the May 1, 2008, Standard Specification prepared by the, New York State Department of Transportation, and meet the following gradation requirements:

U.S. Standard Sieve	Percent Finer by Dry Weight
24 inch maximum dimension	100
6 inch maximum dimension	90 to 100
2 inch square sieve	0 to 30
0.25 inch sieve	0 to 10

2. Material shall be from a virgin source. Recycled concrete aggregate will not be used at this site.

**D. Collect a sample of the backfill at the beginning, the middle and the end of backfill operations for environmental and geotechnical criteria. A minimum of three samples of backfill will be collected.**

1. Analyze backfill samples for RCRA 8 Metals, PCBs by EPA Method 8082, VOCs by EPA Method 8260 or NYSASP Method 95.1, and SVOCs by EPA Method 8270C or NYSASP Method 95-2.
2. At least one sample must be collected from each borrow source.

**2.3. DEMARCATION BARRIER**

- A. Provide a high visibility orange, polypropylene snow fence or a woven or non-woven geotextile fabric with an ultraviolet inhibitor. Other high visibility or florescent colors may be used upon approval from the Engineer. Suggested manufacturers include:

Belton Industries, Inc.  
5600 Oak Brook Parkway  
Norcross, GA, 30093  
1-800-225-4099  
Product Name: Woven Fabric Style 922

Tenax Corporation  
4800 East Mountain Street  
Baltimore, MD, 21205  
1-800-522-7000

Product Name: Ultra-Vera™ Highly UV 506 Stabel Geotextile

- B. Underground warning tape shall be non-detectable, high visible polyethylene tape of a different color than the demarcation barrier. Print warning text in Spanish and English “Danger - Do Not Dig - Peligro no Excavar”

## PART 3 EXECUTION

### 3.1. EXCAVATION

- A. Perform excavations in accordance with OSHA regulations.
- B. The remedial excavation will generally extend to a target depth of 15 feet below grade surface (bgs).
  - 1. Manage excavated materials in accordance with the Section 02 61 00 – Removal and Disposal of Contaminated Materials.
- C. Perform all excavations using proper shoring and bracing and/or excavation sloping/benching to ensure slope stability.
- D. The excavation portion of the Work will be above and below the water table. Perform the excavation below the water table using techniques to minimize the water content of the excavated soil such that they can be transported in trucks without stabilization or other special measures. If needed, use short term stockpiling within the excavation to allow excavated soil to drain as space and equipment allow. Use stabilization only for soils that are inherently too wet and cannot be dried sufficiently using other techniques. Stabilization may only be used with the approval of National Grid and/or the Engineer and must comply with the NYSDEC restrictions provided in Attachment C.

### 3.2. BORROW SOURCE EVALUATION

- A. Perform borrow source evaluation for geotechnical and environmental criteria to ensure that the imported material meets the Project criteria.

### 3.3. BACKFILL

- A. Backfill shall consist of imported clean backfill material.
  - 1. Backfill the area above the water table with the granular fill.
  - 2. Backfill the area below the water table with the granular fill or gravel fill, if the excavations are competed in the wet.
  - 3. During restoration place a 6 inch layer of select granular fill - slope protection to bring the excavation to final grade in the area shown on the Contract Drawings.

- B. Do not place backfill without the approval of the Engineer. Placement of backfill prior to Engineer approval is at the Contractor's risk and may require removal at the Contractor's cost. Commence backfill placement and compaction upon confirmation of the horizontal and vertical limits of the excavation; whichever is applicable, and as directed by the Engineer.
- C. General
  - 1. Install visual demarcation barrier at the vertical limits of the excavation.
  - 2. Backfill excavations in accordance with the Contract Drawings.
  - 3. Place backfill using a method that does not cross contaminate backfill, disturb, or damage adjacent structures or property.
  - 4. Place and compact backfill in maximum twelve-inch lifts.
  - 5. Maintain moisture content within +3 to -3 percent of the backfill optimum moisture content to attain required compaction density.
  - 6. Perform laboratory and field geotechnical testing.
  - 7. Compact backfill to 95 percent of the Modified Proctor Maximum Density (ASTM D1557). Perform compaction testing for all backfill to assess the degree of compaction. Overlying lifts of backfill shall not be placed until in place compaction tests indicate that the current grade layer has been compacted in accordance with this criterion.
  - 8. In place density testing shall be performed by an appropriately licensed testing Subcontractor that is certified to test soil by ASTM D6928-08a Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods-Shallow Depth (ASTM D6928).
- D. Field Control Quality
  - 1. If compaction testing indicates that the work does not meet the specified requirements, provide additional compaction or remove the soil and replace with acceptable backfill.
  - 2. The Engineer reserves the right to reject backfill that differs visually from the identified source material and to randomly test backfill materials for conformance with the specifications. Remove backfill that fails to meet the specifications.

### 3.4. CONSTRUCTION METHODS

- A. Establish, in consultation with the Engineer, manageable and appropriate excavation stages to permit continuous work to ensure effective coordination between soil excavation; documentation sampling, if required; and material load out, while accommodating the receiving capacity of the selected treatment/disposal facilities.

- B. Due to limited space, materials will be excavated as a direct load operation with the exception of gravity dewatering which may take place within the excavation limits. Soil should be gravity dewatered such that the water is allowed to drain back into the excavation.
  - 1. No stockpiling will be allowed on Site.
  - 2. One truck may be on Site at once unless approved by the Engineer and CM. Other trucks will stage in parking areas that have been negotiated for use by the Contractor through the City of Glen Cove or other parking facility. Use designated truck route in accordance with Contract Drawings.
- C. Divert or otherwise prevent surface water from entering excavations to the greatest extent practicable without causing damage or flooding to adjacent properties.
  - 1. Pump groundwater effluent, if encountered above final excavation limits, from the dewatering system to a covered frac tank.

### 3.5. PRICE AND PAYMENT PROCEDURES

- A. Refer to Section 01 20 00 – Price and Payment Procedures.

END OF SECTION 31 23 00

**SECTION 31 23 19****DEWATERING****PART 1 GENERAL****1.1 SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials, equipment, and performing all operations required for the dewatering of the excavation area during performance of the Phase I RA.
- B. Field tests to determine the groundwater level were conducted and the results are noted in the Contract Drawings.
- C. Design, furnish, install, operate, and remove a dewatering system to allow excavation to the depths shown on the Contract Drawings plus an additional 2 feet without requiring redesign. The system should be designed to keep groundwater levels at least 2 feet below active excavation activities while minimizing the amount of water discharged. Working drawings and supporting computations for the dewatering system shall be prepared and stamped by a Professional Engineer registered in the State of New York.
- D. The water from the active excavation area or water in contact with exposed impacted soils may contain MGP residuals. This water will be segregated and pumped to a water treatment system (WTS) prior to discharge in accordance with the governing discharge permit (SPDES, sewer discharge permit, etc.). The design of the system shall be provided in the Contractor's Site Operations Plan.
- E. The average daily discharge of treated water to the targeted receiving location shall be in conformance with the discharge permit at all times.

**1.2 SUBMITTALS**

- A. Submit information in the dewatering section of the Site Operations Plan that details the principle components of the system and contains narratives on the installation, operation, maintenance, and removal of the dewatering system. The Site Operations Plan should detail the excavation, backfill, and dewatering sequence that achieves the required draw downs, without exceeding the volumetric discharge limits imposed by the governing permit. The design shall contain drawings of the proposed dewatering system, calculations showing the basis for the design, and include a monitoring program so as to demonstrate compliance with these specifications.
- B. Submit a detailed dewatering design to the Engineer at least 2 weeks prior to the start of excavation. Working drawings and supporting computations for the dewatering systems shall be prepared and stamped by a Professional Engineer registered in the State of New York.

- C. Provide, as part of the Daily Reports, pumping quantities, vacuum gauge readings, and a narrative detailing any problems which may have developed and the proposed remedy.
- D. Provide weekly Dewatering Logs summarizing the following information at a minimum:
  - 1. Quantity of groundwater and surface water pumped to the wastewater treatments system during the week, in gallons with totalizing flow meters.
  - 2. Condition of the dewatering system.
  - 3. Weekly rainfall measured at the Site.
  - 4. Weekly record of water levels within the excavation area.
- E. Submit all reports required by the regulatory agency that has issued the discharge permit, and comply with any other requests for reports that may be required to maintain all permits necessary for dewatering in force during the duration of the Work.

### 1.3 SEQUENCING AND SCHEDULING

- A. Continuously dewater the excavation until the target excavation elevations have been achieved and the area has been backfilled as specified in Specification 31 23 00 - Excavation and Fill.
- B. Coordinate and schedule the dewatering work in a manner that minimizes the quantity of water pumped while not affecting the excavation and backfill schedule.

### 1.4 QUALITY CONTROL

- A. Establish, maintain, and document quality control of the dewatering system in a manner acceptable to the Engineer, and the regulatory agency that has issued the discharge permit. Quality control documentation by the Contractor is required to assure compliance with regulatory requirements.

## PART 2 – PRODUCTS

### 2.1 DEWATERING EQUIPMENT

- A. Furnish, install, and operate pumping equipment of sufficient capacities to meet the requirements for the removal of groundwater, stormwater, and surface runoff water from the excavation area as necessary to complete the excavation and backfilling Work.
- B. Keep on-Site or have immediate access to, additional pumps of sufficient capacity to maintain dewatering activities during any pump breakdown, maintenance, or in case of flooding.

- C. The excavation dewatering system design should have redundant features such as adequate standby pumping capacity, valves, and piping so that damage to or failure of a principle component of the system will not result in the failure of the entire system.
- D. Provide sufficient suction and discharge hose or piping for transferring pumped liquids without causing erosion, sedimentation, or other adverse consequences.
- E. Provide freeze protection for all dewatering hoses, piping, and pumping equipment necessary to execute the Work throughout the winter months, including but not limited to: insulation, heat wraps, heaters, and/or enclosures. Freeze protection chemicals or solutions shall not be used on Site without prior approval of the Engineer.
- F. Equipment for dewatering may be new or used, but shall be suitable for the Work and maintained in good condition.
- G. All dewatering equipment shall remain the property of the Contractor or Subcontractor.
- H. Decontaminate dewatering equipment in accordance with Specification 01 50 00 - Temporary Facilities and Controls, and remove the equipment from the Site at the completion of the Work.

## **PART 3 - EXECUTION**

### **3.1 DEWATERING-GENERAL**

- A. Visit the Site, be aware of its restrictions, and review the sub-surface and geotechnical information.
- B. Furnish, at a minimum, all labor, materials, and equipment, required to perform all operations required to design, install, test, pump, measure, and maintain the excavation dewatering equipment and water storage systems, including the storage tank, ditches, dikes, sandbags, wells, wellpoints, sumps, electric power supply and distribution as required to dewater the excavations so that the Work can be conducted under controlled conditions. Demobilize and decontaminate all dewatering equipment and materials after completing the excavation and backfill Work.
- C. Coordinate dewatering, excavation, and backfill so that the volumes of water generated during dewatering can be treated and discharged without exceeding the treatment system discharge limits.
- D. Test components of the excavation dewatering system, such as the individual wells and wellpoints, immediately after their installation, so as to verify design assumptions and demonstrate yields without suspended solids.

- E. Conduct localized dewatering, as necessary, to perform excavation and restoration Work.
- F. Repair or replace damaged pumps, piping, hoses, tanks, and all other dewatering equipment and materials within four working hours, if damaged. Damage includes any pump and power failures, leaks, breaks, clogs, or other conditions that adversely affect the dewatering system or release contaminated water.
- G. Grade the excavation area using run-on/runoff controls including but not limited to slopes, berms and sumps in conjunction with the dewatering systems to channel water away from the immediate work areas to minimize dewatering and prevent undue impediments to the soil inspection and excavation progress. Prevent the stormwater runoff sources noted in the Contract Drawings from entering the excavation.
- H. Prevent any impacted water from contacting soils, or water outside of the active excavation area. If environmental contamination results from the Contractor's failure to control impacted water, remove the contamination, to the satisfaction of the Engineer, at no additional cost to National Grid.
- I. After the excavation is completed and inspected by the Engineer, backfilling may proceed with the water levels maintained at least 2 ft. below the backfill level until final grades are achieved.
- J. Install, operate, and remove the dewatering systems in accordance with applicable Federal, State, and local Laws and Regulations, permits and generally accepted industry practices.
- K. Safety of personnel, and protection of off-Site facilities and designated on-Site facilities during dewatering Work, shall be solely the responsibility of the Contractor.

### 3.2 SAMPLING AND ANALYSES

- A. Water sampling and analysis will be performed by the Engineer in accordance with Specification 44 01 40 - Operation and Maintenance of Water Treatment Equipment.

### 3.3 PRICE AND PAYMENT PROCEDURES

- A. Refer to Section 01 20 00 - Price and Payment Procedures.

END OF SECTION 31 23 19

## **SECTION 31 50 00 EXCAVATION SUPPORT AND PROTECTION**

### **PART 1 GENERAL**

#### **1.1 SUMMARY**

- A. Provide all labor, equipment, supplies, and materials to install, operate, maintain, and remove a temporary excavation support system.
- B. Install the temporary excavation support system in order to excavate and backfill the excavation area shown in the Contract Drawings.
- C. The Contractor is responsible for the design, materials, methods, and phasing of construction, subject to the design criteria.
- D. Limit movement to protect near-by structures, utilities, roadways, and other features.

#### **1.2 EXCAVATION SUPPORT SYSTEM DESIGN CRITERIA**

- A. Design the excavation support system in accordance with industry standards, soil and groundwater conditions at the Site, and the concepts and criteria on the Contract Drawings. Criteria are intended as guidelines for design and are to be regarded as a minimum.
- B. Design the excavation support system to support earth pressures, hydrostatic pressures, construction equipment loads, substation loads and other surcharge loads as appropriate. Design the excavation support system to allow safe and expeditious excavation and backfill.
- C. Design the excavation support system based on allowable movements that will not damage nearby structures, utilities, roadways and other features.
- D. Design the excavation support system to allow excavation to a depth of two feet deeper than the target elevations indicated on the Contract Drawings without any change in the support system as installed.

#### **1.3 SUBMITTALS**

- A. Excavation support design submittals shall be stamped by a Professional Engineer registered in the state of New York.
- B. Submit a complete excavation support system design which shall include the following:
  - 1. Soil properties and design assumptions.
  - 2. Pre-cut depths and limits.
  - 3. Requirements for the setback of surcharge loads.

4. Load diagrams with force combinations acting on the system at each excavation stage.
  5. Phasing diagrams.
  6. Complete drawings showing all materials, locations, layouts, sizes of members, details, connections and methods, and sequence of installation and removal of the excavation support systems.
  7. Complete engineering computations and design assumptions for all parts and stages of the excavation support system.
  8. Movement estimates, including an explanation of why the estimated movements are protective of nearby structures, utilities, roadways and other features.
  9. Monitoring plan to include the types and locations of geotechnical instruments required to monitor the performance of the excavation support system, refer to Specification 31 09 00 for further details.
- C. After installation submit a detailed as-built plan of the excavation support system. Include steel member identification, size, location, length, top elevation, excavation level/stage, and any other pertinent data. Include joint details. Indicate modifications, if any, to the design.
  - D. Submit an action plan for arresting any unforeseen movements which could damage nearby structures, utilities, roadways and other features. Include methods and time for implementation.
  - E. Provide a plan for the backfilling of the void space created by the removal of the excavation support system. Include details for the materials and methods that will be utilized during this process.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Use materials suitable for their intended use and that conform to applicable codes and standards.
- B. All structural steel members used shall conform to AISC standards.
- C. Welding and welding electrodes shall be in accordance with AWS D1.1, Structural Welding Code, latest edition.
- D. Use steel shims or wedges, wooden shims or wedges are not permitted.

### 2.2 INSTALLATION EQUIPMENT

- A. Size installation equipment to provide sufficient energy to install the excavation support system.

- B. Size removal equipment to provide sufficient energy to remove the excavation support system.

## PART 3 EXECUTION

### 2.1 GENERAL

- A. Install, maintain, and remove the excavation support system in a manner that prevents the following:
  - 1. Excessive movement and settlement.
  - 2. Removal of soil fines from the adjacent ground.
  - 3. Damage to or excessive movement of nearby structures, utilities, roadways and other features.
- B. Implement the setback of surcharge loads outside of the excavation as required by the design.

### 2.2 INSTALLATION

- A. Install steel support members in a plumb position in the locations shown on the excavation support system design.
- B. If the excavation support system is unable to be installed as designed due to unforeseen field conditions, cease installation and notify the Engineer.
- C. Maintain accurate records of the excavation support system installation. Include type of steel member, detailed installation record, final elevation, deviations from design location and alignment, lateral deflection and settlement measurements, and all other data pertaining to the installation and performance. Permanently mark/stamp/tag each steel member with a reference number above the ground surface.

### 2.3 MOVEMENT

- A. Monitor the performance of components of the excavation support system for vertical and horizontal movements and for the overstressing of structural members.

### 2.4 REMOVAL

- A. Design excavation support system to be removed. Remove all components of the system, after the excavation and backfill has been completed as specified in the Contract Documents.
- B. Remove the excavation support system, and abandon the void space in accordance with all applicable state and local regulations.

END OF SECTION 31 50 00

## **SECTION 32 12 00 PAVEMENT**

### **PART 1 GENERAL**

#### **1.1. SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials and equipment, and performing all operations required for the installation of bases, sub-grades, and pavement surfaces during performance of the Work.
- B. Installation of pavement and/or any related structures must be carried out in accordance with City of Glen Cove Specifications and the State of New York Department of Transportation- Standard Specifications May 1, 2008, section 400.

### **PART 2 MATERIALS**

#### **2.1. BASE**

- A. 6" Gravel Course – Type 2 Aggregate meeting the requirements of Table 304-1 Percent Passing by Weight, State of New York Department of Transportation – Standard Specifications May 1, 2008.

#### **2.2. PAVEMENT**

- A. Pavement shall consist of a 3 inch binder course, under a 1.5 inch top course, placed over the appropriately prepared base material.
- B. Binder Coarse - Type 3 Hot Mix Asphalt meeting the requirements of Table 403-1 Composition of Hot Mix Asphalt Mixtures, State of New York Department of Transportation- Standard Specifications May 1, 2008.
- C. Top Course - Type 6 Hot Mix Asphalt meeting the requirements of Table 403-1 Composition of Hot Mix Asphalt Mixtures, State of New York Department of Transportation- Standard Specifications May 1, 2008.
- D. Aggregates for hot mix asphalt mixtures specified in Table 403-1 shall meet the requirements of Coarse Aggregate in Section 703-02 State of New York Department of Transportation- Standard Specifications May 1, 2008.

### **PART 3 EXECUTION**

#### **3.1. RESTORATION OF PAVEMENT**

- A. Surface the portions of the access road and entire parking lot that were removed to accommodate the excavation and any areas that were damaged during the execution of the Phase I RA.
- B. Field compaction of asphalt will be 95% of design density.
- C. Complete all restorations in accordance with the City of Glen Cove Specifications, where applicable.

3.2. PRICE AND PAYMENT PROCEDURES

- A. Refer to Section 01 20 00 – Price and Payment Procedures.

END OF SECTION 32 12 00

**SECTION 44 01 40**  
**OPERATION AND MAINTENANCE OF WATER TREATMENT EQUIPMENT**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. The Work required under this section includes furnishing all labor, materials, equipment, and performing all operations required for the treatment and discharge of impacted water collected during dewatering, decontamination, and other operations.
- B. Provide a water treatment system (WTS) capable of treating water generated during construction dewatering, as described in Specification 31 23 19 - Dewatering, to the treatment standards required by the appropriate discharge permit (i.e., SPDES, sewer discharge permit, etc.).
- C. The Contractor is responsible for the design, materials, and methods of construction subject to the design criteria. Working drawings and supporting computations for the water treatment system shall be prepared and stamped by a Professional Engineer registered in the State of New York.
- D. Maintain a log which contains, discharge volume that is measured daily from a continuously totalizing water meter, hours of treatment system operation, and other pertinent data for the Engineer's verification and approval in accordance with the discharge permit. Contractor's Daily Report of water treatment activities shall be in a format acceptable to the Engineer and include the results of daily system inspections.
- E. Contractor is responsible for all fines and penalties associated with non-conformance of the system in meeting the discharge permit.
- F. Minimum excavation depths and the elevation of the groundwater table have been provided in the Contract Drawings. The Contractor is responsible for the final design and performance of the WTS.
- G. The Contractor may elect to pursue a permit to discharge treated water to the Nassau County Department of Public Works sewer system, or obtain a State Pollutant Discharge Elimination System (SPDES) permit to discharge treated water to Glen Cove Creek.
- H. The criteria to discharge treated water to the Nassau County sewer system are as follows:

Parameter	Limit
Total VOCs	1 part per million (ppm)
pH	between 6 and 8
Chlorine demand (30 minutes)	15 mg/L
Total dissolved solids	1,000 mg/L
Total Kjeldahl Nitrogen	20 mg/L
Phosphorus (Total)	50 mg/L
Sulfide	500 mg/L
Chloride	500 mg/L
Cyanide (Total)	0.3 mg/L
Flouride	18.0 mg/L
Aluminum (Total)	1.2 mg/L
Arsenic	0.1 mg/L
Barium	2.0 mg/L
PCB	1.0 mg/L
Cadmium (Total)	1.0 mg/L
Chromium (Hexavalent)	0.25 mg/L
Chromium (Total)	1.0 mg/L
Copper (Total)	2.0 mg/L
Iron (Total)	1.5 mg/L
Lead (Total)	0.4 mg/L
Magnesium	50 mg/L
Manganese (Total)	5.0 mg/L
Mercury (Total)	0.10 mg/L
Nickel (Total)	2.0 mg/L
Selenium (Total)	0.10 mg/L
Silver (Total)	1.0 mg/L
Sodium (Total)	500 mg/L
Sulfate	500 mg/L
Zinc (Total)	2.0 mg/L
Total Metals	10 mg/L
Phenols	5.0 mg/L

1. Additionally toxic chemicals defined in the regulations promulgated pursuant to Title 40 of the Federal Regulations Part 403 shall not be discharged in the county owned wastewater facilities in concentrations in excess of those permitted in said regulations.
2. These disposal requirements for the Nassau County sewer system were obtained from the Nassau County Department of Public Works on January 13, 2010. Verify the disposal requirements and make any required adjustments prior to, and during the Work. Notify National Grid, the Engineer, and CM of any changes prior to discharging.

## 1.2 SUBMITTALS

- A. In the WTS section of the Site Operations Plan submit the following information:
  1. Description of water treatment system, equipment (including size and capacity), processes, and monitoring.
  2. Operation & Maintenance plan with their design of the WTS to include regular maintenance, routine inspection requirements, daily operating procedures and recording of performance parameters, logs, and record keeping.
  3. Calculations and supporting documentation for the WTS design, component selection, and sizing.
  4. Description of the phasing and coordination between the WTS, excavation, and dewatering portions of the Work.
  5. A backup liquid disposal contingency plan.

## PART 2 PRODUCTS

### 2.1 PRIMARY WATER TREATMENT EQUIPMENT

- A. Provide a system capable of performing the following unit process functions:
  1. Separation and recovery of LNAPL and DNAPL products recovered with the water.
  2. Removal of suspended solids by gravity separation and filtration.
  3. Removal of volatile and semi-volatile organic compounds.
  4. Effluent water storage and discharge flow metering.
- B. Choose the type and size of equipment and components needed to accomplish the functions designated.

- C. Furnish a discharge pump with sufficient flows and pressures to achieve a discharge rate capable of maintaining the groundwater levels a minimum of 2 feet below the bottom of the excavation. Provide a standby generator with sufficient capacity to provide power to the water treatment system and dewatering operations in the case of hard line electrical outage. Equipment wiring shall be such that dewatering and treatment may continue without interruption or with only minor interruption in the event of a power outage.
- D. Provide freeze protection for all water treatment system equipment, piping, and pipe connections to allow for operation through the winter months, including but not limited to: insulation, enclosures, heaters, heat tapes, and circulation pumps.
- E. The materials and equipment used for the water treatment system may be new or used but must be suitable for the work and be maintained in good condition.
- F. Keep on hand, or have immediate access to, spare components to provide reasonably for any breakdown.
- G. All water treatment and storage equipment shall remain the property of the Contractor or Subcontractor and shall be properly decontaminated prior to removal from the Site at the completion of the Work as specified in Specification 01 50 00 - Temporary Facilities and Controls.
- H. Provide and maintain at all times a flow meter to record water discharged from the WTS. The flow meter shall record instantaneous and totalized flow. Provide calibration records of the meter.
- I. Provide sampling ports for collecting samples in accordance with the discharge permit.
- J. Provide adequate freeze protection for the operations and protection of all water treatment equipment.
- K. Provide all necessary safety equipment and personnel protective equipment for safe handling of contaminated water and water treatment chemicals.

## 2.2 WATER TREATMENT SYSTEM CONTROLS

- A. Provide adequate system controls to permit unattended operation with occasional operator checks for monitoring and adjustments.
- B. Provide a notification system, such as pressure gages, to alert an operator if the system experiences conditions that will potentially cause the treatment system to shutdown.
- C. Provide high-level alarms on tanks to prevent overflow conditions. Alarms may cause automatic actions to relieve the condition or may warn the operator.

- D. If an upset condition occurs, which may result in a release or nonconformance with the discharge permit, immediately suspend operation and notify the Engineer.
- E. Do not operate the water treatment system without on-Site supervision.

### **PART 3 – EXECUTION**

#### **3.1 WATER TREATMENT - GENERAL**

- A. Furnish all labor, materials and equipment, and perform all operations required to design, furnish, install, test, operate, and maintain the water treatment equipment, including: storage tanks, pumps, process equipment, water treatment chemicals, water meters, process controls, operator alarms, dikes, sandbags, electric power supply and distribution, and domestic water supply and distribution, as required to treat the collected water.
- B. Perform a pre-production test of the entire water treatment system in accordance with the requirements of the discharge permit and any other applicable required permits. At a minimum, the pre-production test must consist of the collection and treatment of one settling tank of representative groundwater. Prior to discharge, analytical test results for treated samples collected under the supervision of the Engineer must demonstrate that the treated water is in compliance with the discharge permit requirements.
- C. The discharge from the Contractor's water treatment system shall enter a discharge system at a location approved by the Engineer.
- D. Place equipment at a location approved by the Engineer. Equipment, in as much as possible, should be located in a permanent location for the entire duration of the project.
- E. Arrange components and provide means to contain any spills or overflows from the treatment process within the Site.
- F. Provide spill containment for any water treatment chemicals used on the Site.
- G. Provide additional erosion and sediment control measures, as necessary, to ensure that all components of the WTS are enclosed.
- H. Establish, maintain, and document quality control, as required in Specifications 01 33 00 - Submittal Procedures.
- I. The Engineer may specify and require additional records from the Contractor as needed to satisfy permit and project requirements.

### 3.2 SEQUENCING AND SCHEDULING

- A. Conduct water treatment activities in conjunction and coordination with decontamination, excavation, dewatering, and backfilling Work. Coordinate water treatment with all other Site activities.
- B. Provide a water treatment system with the treatment and storage capacity to manage water from dewatering operations without causing construction delays.

### 3.3 DISPOSAL OF OTHER RESIDUALS

- A. Manage settled solids, collected NAPL, and spent filtration and granular activated carbon adsorption media in accordance with all transportation laws, regulations, and the receiving facility requirements.
- B. Groundwater and decontamination wastewater, which is not treated and discharged under an appropriate permit, shall be disposed of at an off-Site liquid waste treatment facility approved by National Grid as described in Section 02 61 00.

### 3.4 SAMPLING AND CHEMICAL ANALYSIS

- A. Sampling and laboratory analyses as required by the discharge permit will be performed by the Engineer.
- B. Sampling and laboratory analyses conducted for off-site disposal of wastewater will be performed by the Contractor.
- C. All laboratory analyses will be conducted by a laboratory certified by the New York State Environmental Laboratory Approval Program for the analyses conducted.
- D. Results of the laboratory analysis will be forwarded to the Contractor by the Engineer upon receipt.

### 3.5 PRICE AND PAYMENT PROCEDURES

- A. Refer to Section 01 20 00 – Price and Payment Procedures.

END OF SECTION 44 01 40

# Glen Cove Former MGP Phase I Remedial Action PROJECT PRICE SCHEDULE

Bid Item #	Description	Approximate Quantity Unit of Measurement	Unit of Measurement	Unit or Lump Sum Price Dollars & Cents	Extended Total Dollars & Cents
1	Mobilization	1	Lump Sum		
2	Site Preparation	1	Lump Sum		
3	Dewatering and Water Treatment System Mobilization/Removal	1	Lump Sum		
4a	Operation and Maintenance of Water Treatment Equipment	30	Day		
4b	Wastewater Discharge Fees	1,600	1000 gallons		
5	Excavation Support System Design	1	Lump Sum		
6	Installation/Removal of the Excavation Support System	1	Lump Sum		
7	Soil Excavation	1,900	CY		
8	Transportation and Disposal: Soil	3,000	Ton		
8a	Transportation and Disposal: Hazardous Waste Soil	0	Ton		
9a	Transportation and Disposal: Construction Debris	100	Ton		
9b	Transportation and Disposal: Contaminated Debris	20	Ton		
10	Transportation and Disposal: Wastewater	20	1,000 Gallons		
11a	Approved Off-Site Backfill Material – Granular Fill	2,900	Ton		
11b	Approved Off-Site Backfill Material – Select Granular Fill – Slope Protection	100	Ton		
12	Backfill to Grade	1,900	CY		
13	Miscellaneous Site Restoration	1	Lump Sum		
UP1	Odor Control	20	55-Gallon Drum		
UP2	Excavation Standby Time	1	Day		
UP3	Soil Amendment	100	Ton		
UP4	Gravel Fill	0	Ton		
UP5	Cut and Cap Operations	0	Day		
				<b>TOTAL:</b>	

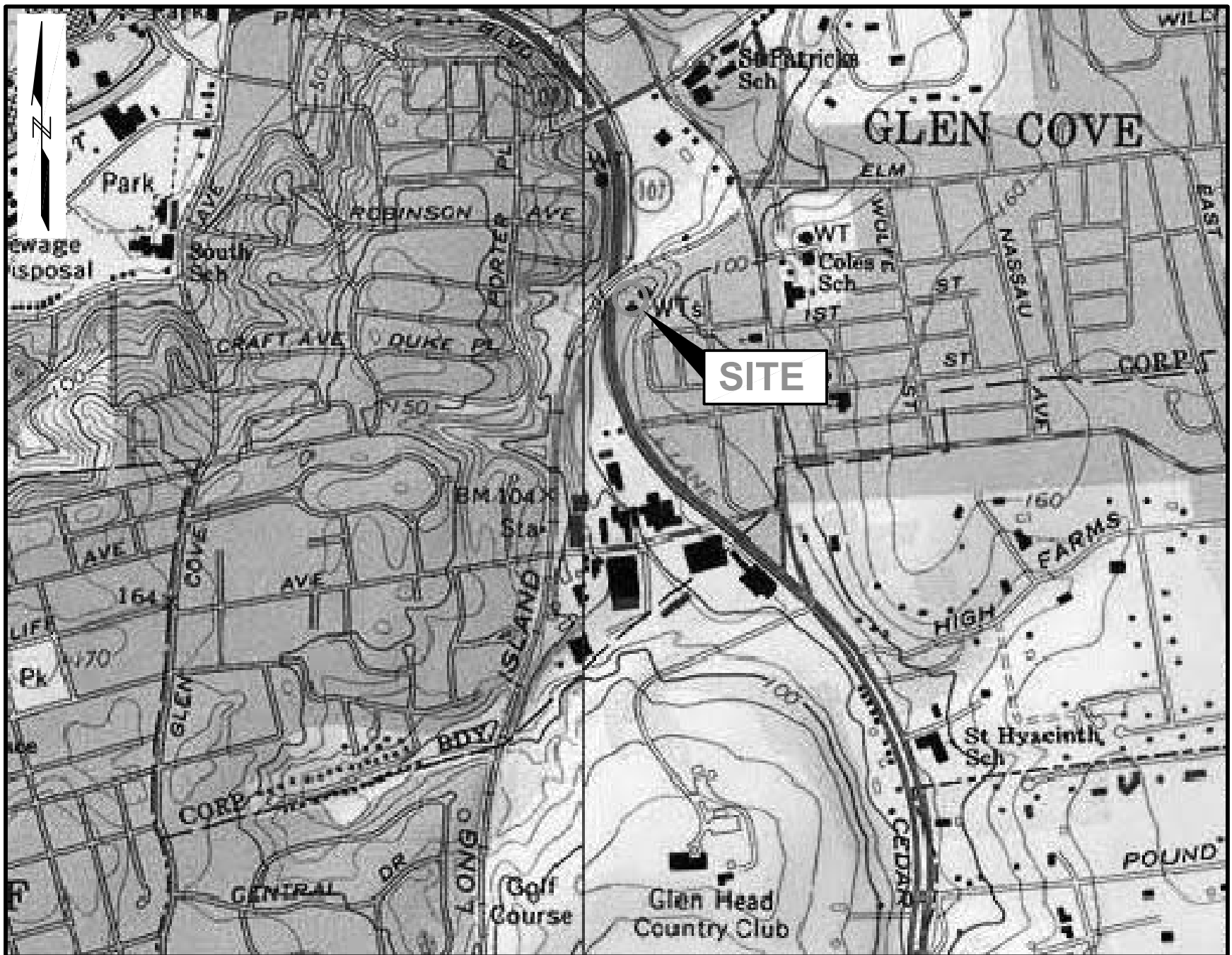
**Measurement & Payment Notes:**

- 8a - Hazardous waste soil is not expected to be encountered during the Phase I RA.
- 9 - This bid item is expected to primarily consist of the demolished portion of the access road.
- 10 - This bid item is intended to account for any incidental liquid waste requiring disposal after the water treatment system has been removed.
- UP3 - Assuming 30% of the soil to be removed will require amendment to be applied approximately at a ratio of 10 to 1 for soil to amendment.
- UP4 - The Engineer may direct the Contractor to use Gravel Fill to backfill the excavation in place of the Granular Fill.

# PHASE I REMEDIAL ACTION

## GLEN COVE FORMER MANUFACTURED GAS PLANT SITE CITY OF GLEN COVE, NASSAU COUNTY, NEW YORK

REV. NO.	DATE	DESCRIPTION	DES	DR	CH	APP	



**SITE LOCATION**  
SCALE: 1" = 1000'

### SCHEDULE OF DRAWINGS

TITLE SHEET AND INDEX TO SHEETS	
1	EXISTING CONDITIONS AND SUBSURFACE EXPLORATION PLAN
2	EXISTING UTILITIES PLAN
3	TRANSPORTATION PLAN
4	SITE MANAGEMENT PLAN
5	DEMOLITION AND PROTECTION PLAN
6	EXCAVATION PLAN
7	EXCAVATION SUPPORT AND INSTRUMENTATION DETAILS
8	RESTORATION PLAN
9	DETAILS



PREPARED FOR:

**nationalgrid**  
**175 EAST OLD COUNTRY ROAD**  
**HICKSVILLE, NEW YORK 11801**



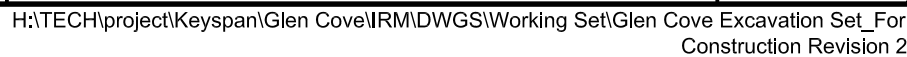
**PROJECT NUMBER: 093270-3**  
**APRIL 2010**

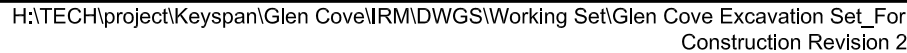
LEGEND:	
---	SITE PROPERTY BOUNDARY
---	PROPERTY BOUNDARY
□	EXISTING STRUCTURE
□	HISTORIC STRUCTURE
50	SURFACE ELEVATION CONTOUR (10' INTERVAL)
---	SURFACE ELEVATION CONTOUR (2' INTERVAL)
---	EASEMENT BOUNDARY
---	CREEK
x	FENCE
∅	UTILITY POLE
⊞	FLOODLIGHT

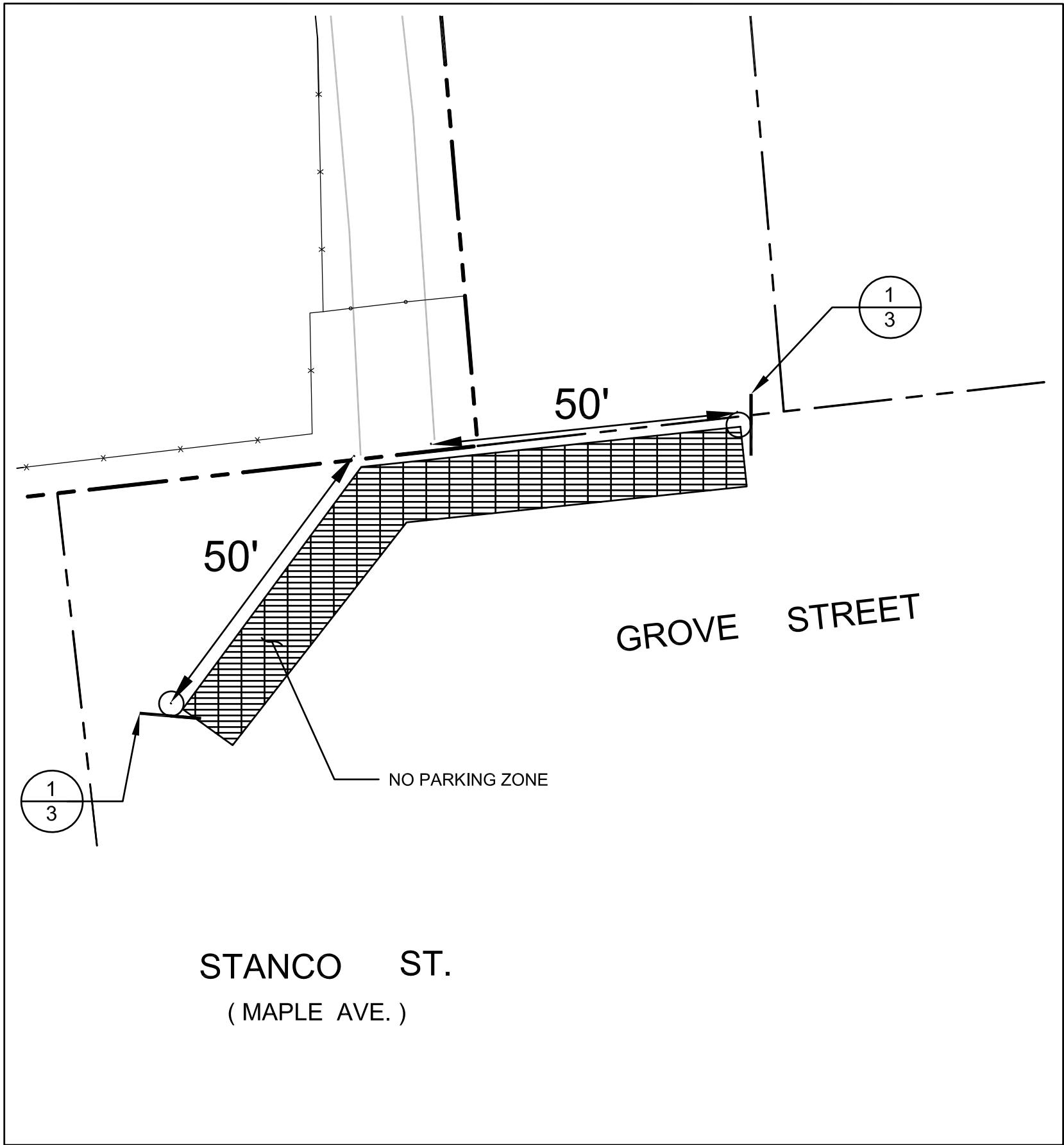
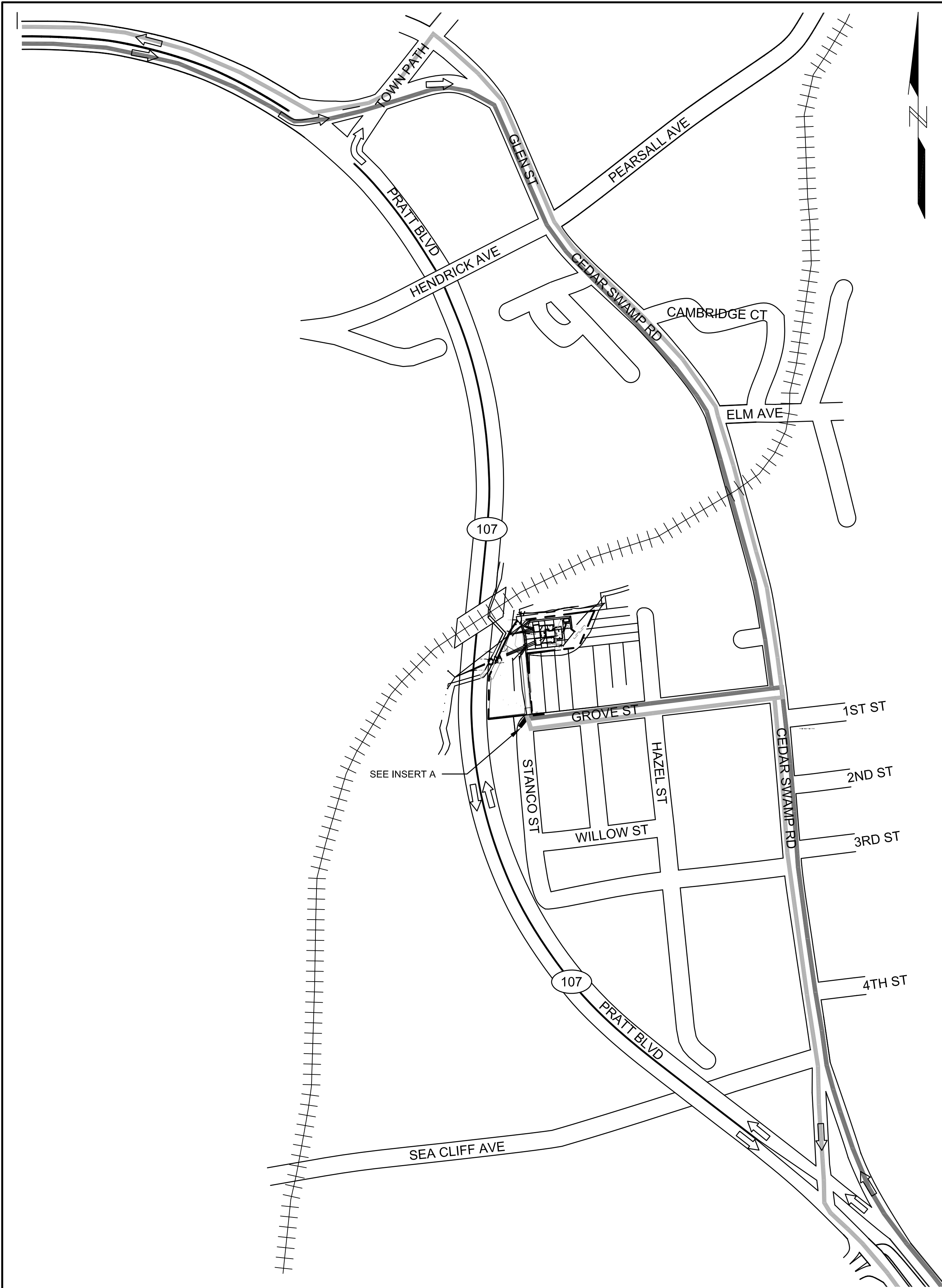
SOURCE:	
1.	PLAN BASED ON DRAWING 1: INTERPRETED LATERAL EXTENT OF SOIL AND GROUNDWATER IMPACTS, PREPARED BY PS&S, SCALE: 1" = 25', DATE: 9/4/07.
2.	SITE FENCE LOCATION BASED ON DRAWING TOPOGRAPHICAL SURVEY ORCHARD SUBSTATION PREPARED BY NATINOAL GRID ENGINEERING AND SURVEY, INC., SCALE: 1" = 20', DATE: 8/19/09.

DATUM NOTES:	
HORIZONTAL:	NEW YORK STATE PLANE COORDINATE SYSTEM LONG ISLAND 3104
VERTICAL :	NORTH AMERICAN VERTICAL DATUM 1988

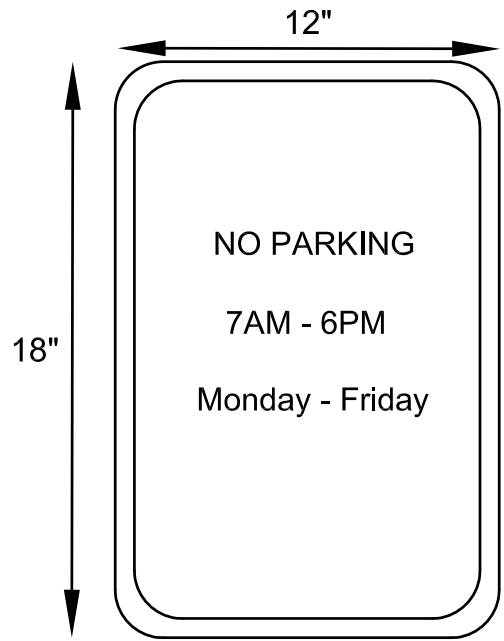
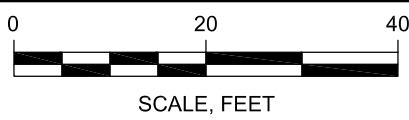
**FOR CONSTRUCTION**







INSERT A: SITE ENTRANCE TRAFFIC CONTROL



NO PARKING SIGN DETAIL  
NOT TO SCALE

NO PARKING SIGN NOTES:

- 1. REFLECTIVE ALUMINUM SIGN
- 2. FONT COLOR = RED
- 3. BACKGROUND COLOR = WHITE
- 4. MINIMUM HEIGHT = 7 FEET (TO BOTTOM OF SIGN)

TRUCK ROUTE LEGEND:

- PROJECT LIMITS
- ➡ DIRECTION OF TRAFFIC
- ▬ EXITING SITE TRUCK ROUTE
- ▬ ENTERING SITE TRUCK ROUTE
- ++++ RAILROAD TRACKS

C. TRUCK ROUTE NOTES:

- 1. ROADWAY BASE MAP SOURCE: NEW YORK STATE OFFICE OF CYBER SECURITY & CRITICAL INFRASTRUCTURE COORDINATION
- 2. ALL STREETS CONTAIN TWO WAY TRAFFIC UNLESS NOTED OTHERWISE.
- 3. TRUCKS TRANSPORTING CONSTRUCTION EQUIPMENT OR MATERIALS (SOIL, WATER, PIPE, CEMENT, ETC.) TO OR FROM THE SITE MUST USE SPECIFIED ROUTES.
- 4. DO NOT QUEUE TRUCKS AND EQUIPMENT IN LOCAL STREETS.
- 5. TRUCK ROUTE MUST BE INSPECTED DAILY FOR SPILLAGE, DUST, OR OTHER SITE RELATED IMPACTS. ANY IMPACTS MUST BE APPROPRIATELY REMEDIATED AS DIRECTED BY THE ENGINEER.
- 6. MAINTAIN CONTINUOUS TRAFFIC FLOW ON GROVE STREET OUTSIDE THE PROJECT AREA.
- 7. PERMANENT ROAD CLOSURES ARE NOT AUTHORIZED DURING THE DURATION OF THE REMEDIATION.
- 8. NEGOTIATE TEMPORARY ROAD CLOSURES WITH THE CITY OF GLEN COVE, IF NECESSARY.
- 9. PERFORM MAINTENANCE AND PROTECTION OF TRAFFIC IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITION, AND TO THE SATISFACTION OF THE ENGINEER.

D. DIRECTIONS ENTERING THE SITE:

FROM THE NORTH OFF ROUTE 107:

- 1. LEFT ON TOWN PATH 0.1 MI
- 2. TURN RIGHT ON GLEN ST 0.3 MI
- 3. CONTINUE ONTO CEDAR SWAMP RD 0.2 MI
- 4. TURN RIGHT ON GROVE ST 0.2 MI
- 5. TURN RIGHT INTO SITE

FROM THE SOUTH OFF ROUTE 107:

- 1. SLIGHT RIGHT ON CEDAR SWAMP RD 0.4 MI
- 2. LEFT ON GROVE ST 0.2 MI
- 3. TURN RIGHT INTO SITE

E. DIRECTIONS LEAVING THE SITE:

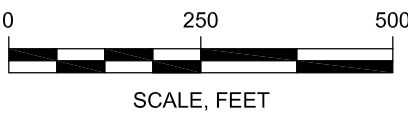
TO POINTS NORTH:

- 1. LEFT OUT OF SITE
- 2. HEAD EAST ON GROVE ST 0.2 MI
- 3. TURN LEFT ON CEDAR SWAMP RD 0.2 MI
- 4. CONTINUE ON GLEN ST 0.3 MI
- 5. TURN LEFT ON TOWN PATH 0.01 MI
- 6. MERGE ONTO ROUTE 107

TO POINTS SOUTH:

- 1. LEFT OUT OF SITE
- 2. HEAD EAST ON GROVE ST 0.2 MI
- 3. TURN RIGHT AT CEDAR SWAMP RD 0.4 MI
- 4. MERGE ONTO ROUTE 107

FOR CONSTRUCTION



NO.	DATE	ISSUE/REVISION	DES	DRN	CH	APP	



**GEI** Consultants  
1 Greenwood Avenue  
Montclair, NJ 07042  
(973) 873-7110

**nationalgrid**

GEI Project 093270-3

Glen Cove Former MGP  
Phase I Remedial Action  
Glen Cove, New York

TRANSPORTATION PLAN

ISSUE  
0

SHEET NO.  
3 of 9



2	05/26/10	UPDATED LIMITS OF THE EZ AND CRZ	CP	CP	MO	MZ	
1	05/18/10	UPDATED LIMITS OF THE EZ AND CRZ	CP	CP	MO	MZ	
NO.	DATE	ISSUE/REVISION	DES	DRN	CH	APP	

	 1 Greenwood Avenue Montclair, NJ 07042 (973) 873-7110	 GEI Project 093270-3	Glen Cove Former MGP Phase I Remedial Action Glen Cove, New York	ISSUE <b>2</b>
			SITE MANAGEMENT PLAN	SHEET NO. 4 of 9



NO.	DATE	ISSUE/REVISION	DES	DRN	CH	APP
2	05/26/10	UPDATED GW DEMOLITION AREA	CP	CP	MO	MZ
1	05/18/10	UPDATED NOTES AND GW DEMOLITION AREA	CP	CP	MO	MZ

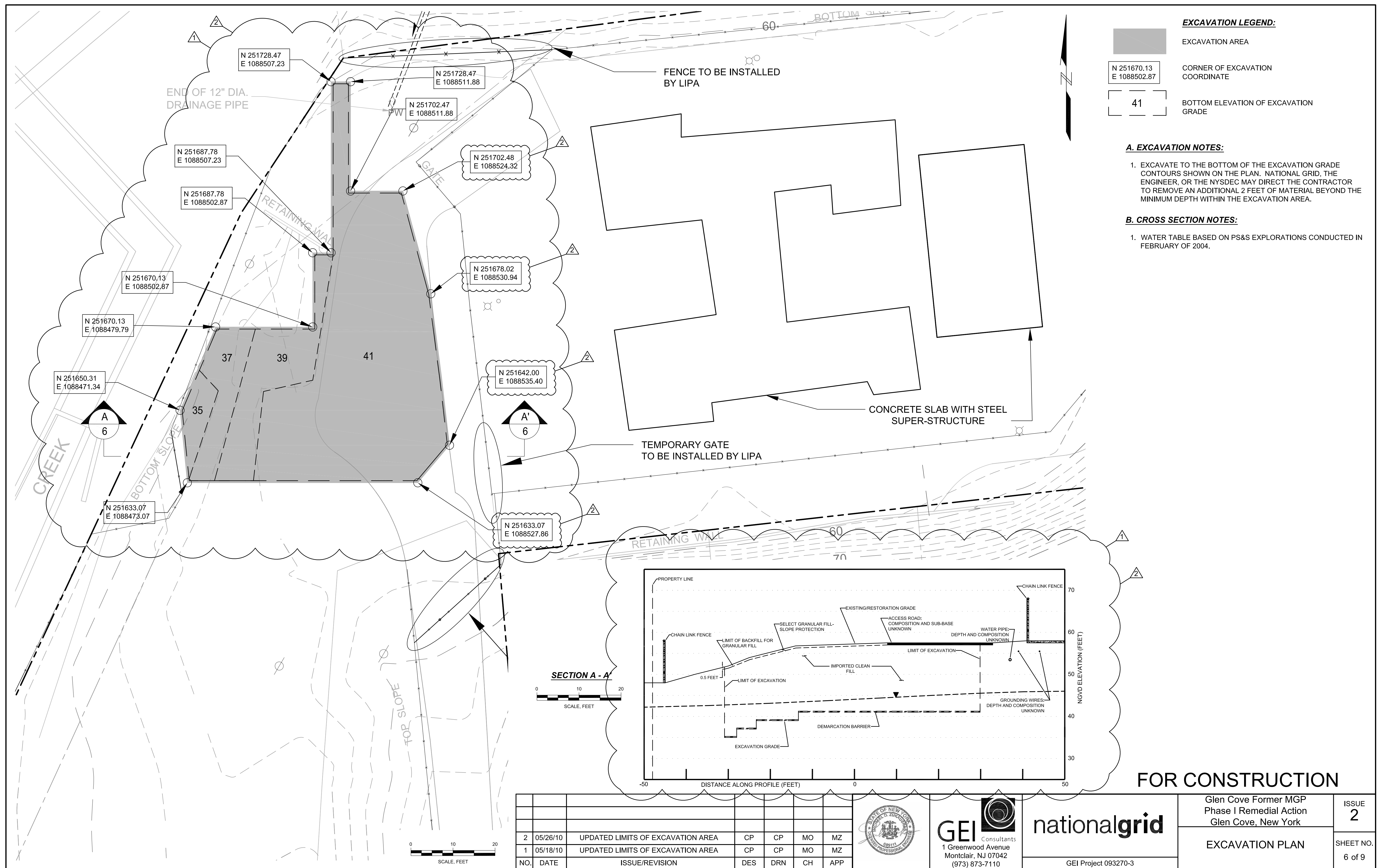


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**nationalgrid**  
GEI Project 093270-3

Glen Cove Former MGP  
Phase I Remedial Action  
Glen Cove, New York  
**DEMOLITION AND  
PROTECTION PLAN**

ISSUE  
**2**  
SHEET NO.  
5 of 9



A. GENERAL NOTES:

1. PREPARE AN EXCAVATION SUPPORT AND DEWATERING SYSTEM DESIGN PREPARED AND STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW YORK.
2. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY EXCAVATION SUPPORT SYSTEMS. THE DESIGN SHALL UTILIZE APPROPRIATE DESIGN LOADINGS AND CRITERIA AS NECESSARY TO ENSURE SATISFACTORY PERFORMANCE, BUT NOT LESS THAN THE MINIMUM DESIGN CRITERIA SHOWN HERE. DESIGN CALCULATIONS AND DRAWINGS WILL BE PROVIDED TO THE ENGINEER.
3. RECOMMENDED SOIL PROPERTIES FOR DESIGN ARE SHOWN HERE. THE CONTRACTOR SHALL MAKE HIS OWN EVALUATION OF THE AVAILABLE GEOTECHNICAL DATA TO SELECT APPROPRIATE DESIGN VALUES FOR HIS DESIGN OF THE EXCAVATION SUPPORT SYSTEMS. THE DESIGN VALUES SELECTED BY THE CONTRACTOR SHALL NOT BE LESS CONSERVATIVE THAN THE VALUES SHOWN ON THE DRAWINGS. IF THE DESIGN VALUES SELECTED BY THE CONTRACTOR ARE LESS CONSERVATIVE THAN THE VALUES SHOWN ON THE DRAWINGS, THE CONTRACTOR'S DESIGN SUBMITTAL MUST INCLUDE TECHNICAL BACKUP TO JUSTIFY THE USE OF THE LESS CONSERVATIVE DESIGN VALUES.
4. THE DESIGN CALCULATIONS SHALL ACCOUNT FOR ALL STAGES OF CONSTRUCTION, INCLUDING INTERMEDIATE EXCAVATION STAGES AND REMOVAL OF BRACING. THE CONSTRUCTION SEQUENCE SHALL BE SHOWN ON THE DESIGN DRAWINGS.
5. REMOVAL OF TEMPORARY BRACING ELEMENTS SHALL BE PLANNED SO AS TO AVOID ADDING LOAD TO PERMANENT STRUCTURES OR OTHER MEMBERS OF THE TEMPORARY SUPPORT SYSTEM IN EXCESS OF THEIR DESIGN LOADS.
6. WHERE THE LOADING CONDITIONS ON OPPOSITE SIDES OF AN EXCAVATION ARE NOT EQUAL, THE OVERALL STABILITY OF THE EXCAVATION SUPPORT SYSTEM SHALL BE ANALYZED AND THE STRUCTURAL MEMBERS SHALL BE DESIGNED TO TAKE THIS CONDITION INTO ACCOUNT.
7. UNLESS NOTED OTHERWISE, TEMPORARY EXCAVATION SUPPORT SYSTEMS SHALL BE DESIGNED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING REFERENCE STANDARDS:  
"SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS - ALLOWABLE STRESS DESIGN" OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC).  
  
"STRUCTURAL WELDING CODE - STEEL, AWS D1.1" OF THE AMERICAN WELDING SOCIETY (AWS).  
  
"BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, ACI-318" OF THE AMERICAN CONCRETE INSTITUTE (ACI).
8. PERFORM A PRE-CONSTRUCTION SURVEY IN ACCORDANCE WITH THE SPECIFICATIONS PRIOR TO INSTALLATION OF THE EXCAVATION SUPPORT SYSTEM. COORDINATE SCHEDULE WITH THE ENGINEER.

B. EXCAVATION SUPPORT SYSTEM NOTES:

1. PROVIDE AN EXCAVATION SUPPORT AND DEWATERING SYSTEM CAPABLE OF EXCAVATING IN THE DRY TO THE ELEVATIONS SHOWN ON THE CONTRACT DRAWINGS, PLUS, AN ADDITIONAL 2 FEET OF EXCAVATION PAST THE TARGET DEPTHS SHOWN ON THE CONTRACT DRAWINGS WITHOUT REQUIRING REDESIGN.
2. DESIGN FOR A MINIMUM FACTORY OF SAFETY OF 1.5 AGAINST HEAVY LATERAL SLIDING AND OVERTURNING.

C. MINIMUM DESIGN LATERAL PRESSURE NOTES:

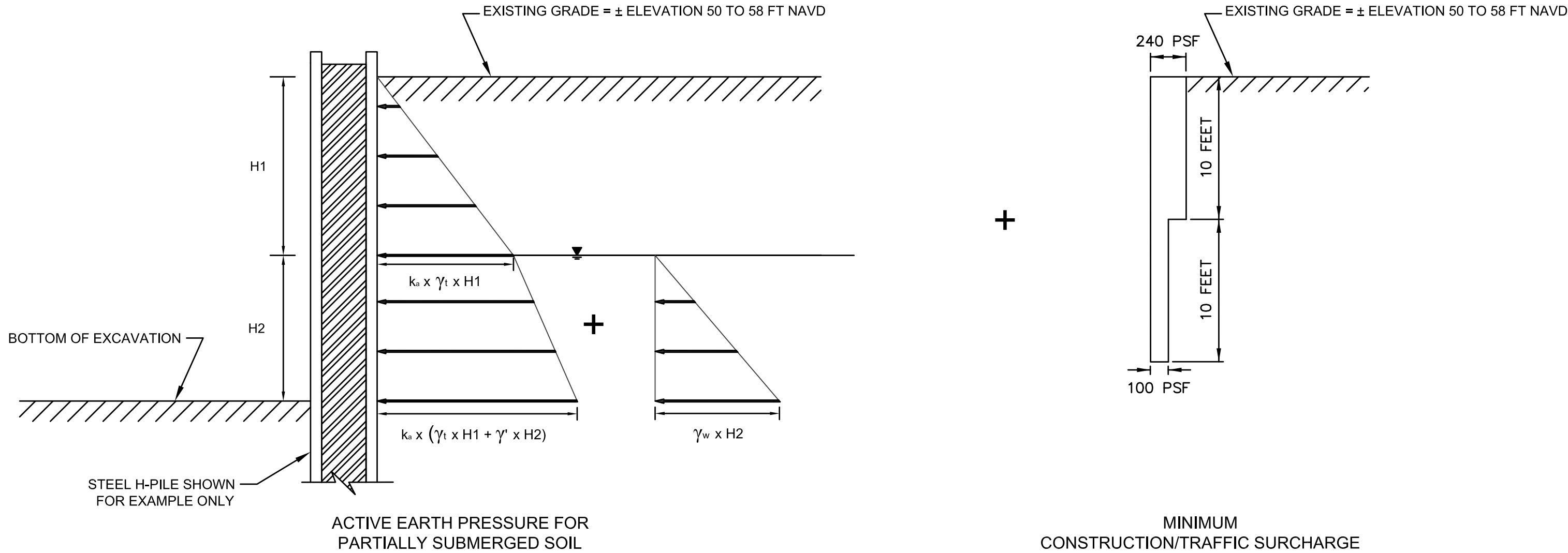
1. MINIMUM DESIGN PRESSURE FOR CANTILEVER WALLS IS THE ACTIVE PRESSURE COMPUTED USING THE SOIL PROPERTIES IN TABLE 3, AND THE APPARENT PRESSURE ENVELOPES SHOWN IN DETAIL:
2. IF PROPOSING A BRACED EXCAVATION SUPPORT SYSTEM, USE DESIGN PROCEDURES CONFORMING TO CONVENTIONAL ENGINEERING THEORY.
3. INCORPORATE FULL HYDROSTATIC WATER PRESSURE ON THE DESIGN WHEN CALCULATING THE FACTOR OF SAFETY.
4. THE MINIMUM DESIGN CONSTRUCTION/TRAFFIC SURCHARGE IS BASED ON A 600 PSF VERTICAL SURFACE PRESSURE ACTING OVER A 20-FOOT-WIDE AREA ADJACENT TO THE EXCAVATION, BEYOND WHICH A 200 PSF VERTICAL SURFACE PRESSURE IS ASSUMED. DESIGN FOR HIGHER SURCHARGE PRESSURES IF LARGER SURFACE PRESSURES ARE ANTICIPATED. DESIGN FOR LESS THAN THIS MINIMUM SURCHARGE PRESSURE IS PERMITTED WHERE CONSTRUCTION SURCHARGE RESTRICTIONS ARE IMPOSED IN THE FIELD.
5. THE LOWEST DESIGN WATER LEVEL OUTSIDE THE EXCAVATION SUPPORT SYSTEM IS 10 FEET BELOW GROUND SURFACE.

D. INSTRUMENTATION NOTES:

1. DESIGN A GEOTECHNICAL INSTRUMENTATION PLAN THAT SHALL MONITOR THE PERFORMANCE OF THE EXCAVATION SUPPORT AND DEWATERING SYSTEM, AND SUBMIT TO THE ENGINEER FOR REVIEW.
2. CONTRACTOR TO PERFORM VIBRATION MONITORING DURING THE EXCAVATION SUPPORT SYSTEM INSTALLATION AND REMOVAL.
3. IF PROPOSING NEW OBSERVATION WELLS AS PART OF THE GEOTECHNICAL INSTRUMENTATION PLAN, INSTALL A MINIMUM OF 2 WEEKS PRIOR TO EXCAVATING. INSTALL OBSERVATION WELLS IN ACCORDANCE WITH NYSDEC REQUIREMENTS, USING A WELL DRILLER LICENSED IN THE STATE OF NEW YORK. SUBMIT COPIES OF WELL INSTALLATION RECORDS TO THE ENGINEER.
4. ENGINEER WILL MONITOR ALL GEOTECHNICAL INSTRUMENTATION INSTALLED BY THE CONTRACTOR TO MONITOR THE PERFORMANCE OF THE EXCAVATION SUPPORT SYSTEM. ENGINEER TO BE PROVIDED ALL BASELINE AND ROUTINE DATA, AND WILL BE PROVIDED SAFE ACCESS TO ALL GEOTECHNICAL INSTRUMENTS. CONTRACTOR MAY OBTAIN ADDITIONAL OR SUPPLEMENTAL DATA AT NO ADDITIONAL COST TO NATIONAL GRID.

E. PERMEABILITY NOTES:

1. PERMEABILITY VALUES OBTAINED FROM GLEN COVE FORMER MANUFACTURED GAS PLANT SITE FINAL REMEDIAL INVESTIGATION REPORT, PS&S, 2008.



LATERAL EARTH PRESSURE DIAGRAM - MINIMUM DESIGN PRESSURE ABOVE BOTTOM OF EXCAVATION

1  
7

TABLE 2: LIST OF SYMBOLS

HEIGHT OF CUT IN FEET FROM GROUND H1 = SURFACE TO THE TOP OF THE GROUNDWATER TABLE
HEIGHT OF CUT IN FEET FROM THE TOP H2 = OF THE GROUNDWATER TABLE TO THE BOTTOM OF EXCAVATION
$\gamma_t$ = TOTAL SOIL UNIT WEIGHT
$\gamma'$ = EFFECTIVE SOIL UNIT WEIGHT ( $\gamma_t - \gamma_w$ )
$\gamma_w$ = UNIT WEIGHT OF WATER
$\phi$ = FRICTION ANGLE
$k_o$ = AT REST LATERAL PRESSURE COEFFICIENT
$k_a$ = ACTIVE LATERAL PRESSURE COEFFICIENT
$k_p$ = PASSIVE LATERAL PRESSURE COEFFICIENT
K = PERMEABILITY
= WATER SURFACE

TABLE 3: RECOMMENDED SOIL PROPERTIES

STRATUM	$\gamma_t$ (PCF)	SOIL PARAMETERS				
		$\phi$ (DEGREES)	EARTH PRESSURE COEFFICIENTS			K (FT/DAY)
			$k_o$	$k_a$	$k_p$	
FILL	110	30	0.50	0.33	3.00	0.22
WIDELY GRADED SAND WITH SILT AND GRAVEL	125	34	0.50	0.28	3.54	0.22

REFER TO EXPLORATION LOGS FOR SUBSURFACE CONDITION AT SPECIFIC LOCATIONS

FOR CONSTRUCTION

NO.	DATE	ISSUE/REVISION	DES	DRN	CH	APP	



**GEI** Consultants  
1 Greenwood Avenue  
Montclair, NJ 07042  
(973) 873-7110

**nationalgrid**

GEI Project 093270-3

Glen Cove Former MGP  
Phase I Remedial Action  
Glen Cove, New York

EXCAVATION SUPPORT  
AND INSTRUMENTATION  
DETAILS

ISSUE  
0

SHEET NO.  
7 of 9



**UTILITY LEGEND:**

REPLACE ASPHALT

SPREAD AND COMPACT SELECT GRANULAR FILL-SLOPE PROTECTION

RESTORE FENCE

- A. RESTORATION NOTES:**
1. MINIMUM RESTORATION LIMITS SHOWN. ACTUAL RESTORATION LIMITS TO BE BASED ON CONTRACTOR'S MEANS AND METHODS. FEATURES NOT REMOVED, DEMOLISHED OR DAMAGED DO NOT NEED TO BE RESTORED.
  2. RESTORE THE AREA INSIDE THE PROJECT LIMITS TO THE CONDITIONS SHOWN ON THE PLAN.
  3. RESTORE ANY EXISTING FEATURE THAT IS REMOVED, DEMOLISHED, OR DAMAGED TO THE SATISFACTION OF THE ENGINEER.
  4. CONSTRUCT NEW FENCE TO MATCH EXISTING PERIMETER FENCE IN HEIGHT, COLOR, AND DESIGN.
  5. RESTORE ALL AREAS OUTSIDE PROJECT LIMITS THAT HAVE BEEN DISTURBED BY CONSTRUCTION TO PRE-EXISTING CONDITIONS.
  6. INSTALL PAVEMENT IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
  7. SPREAD AND COMPACT 6 INCHES OF SELECT GRANULAR FILL - SLOPE PROTECTION OVER ALL UNPAVED AREAS ON THE SITE THAT HAVE BEEN DISTURBED BY CONSTRUCTION ACTIVITIES, REFER TO CROSS SECTION A-A' ON SHEET 6.
  8. REMOVE TEMPORARY CONSTRUCTION FEATURES (EROSION CONTROLS, SECURITY CONTROLS, AIR MONITORING EQUIPMENT, ODOR CONTROL EQUIPMENT, DECONTAMINATION EQUIPMENT, ETC.) WHEN NO LONGER NEEDED.
  9. REMOVE FIELD OFFICE AND DISCONNECT UTILITIES (ELECTRIC POWER, TELEPHONE, INTERNET SERVICE, ETC.).
  10. CLEAR SITE OF CONSTRUCTION DEBRIS AND LEAVE SITE IN A NEAT, ORDERLY CONDITION.
- B. RESTORATION SURVEY NOTES:**
1. SURVEY THE FOLLOWING:
    - A. FINAL GRADE
    - B. NEW FEATURES
    - C. REPLACED FEATURES
    - D. DEMARCATION BARRIER

FOR CONSTRUCTION

1	05/18/10	UPDATED RESTORATION LIMITS	CP	CP	MO	MZ	
NO.	DATE	ISSUE/REVISION	DES	DRN	CH	APP	



**GEI** Consultants  
1 Greenwood Avenue  
Montclair, NJ 07042  
(973) 873-7110



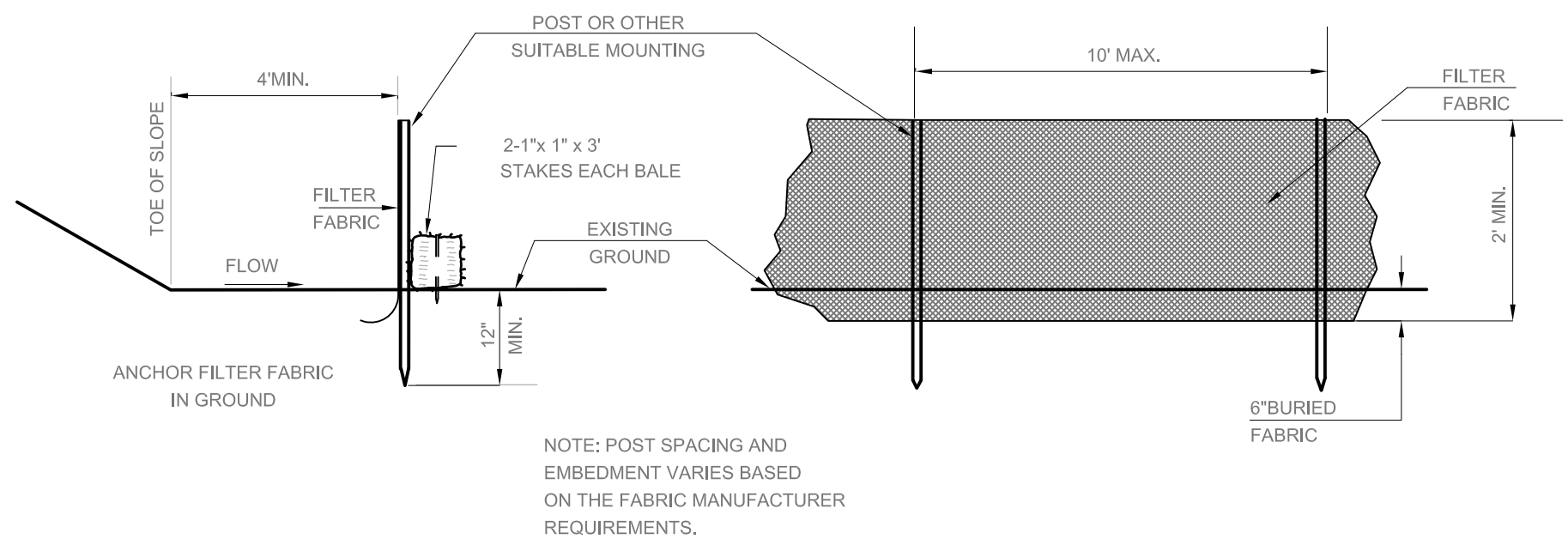
GEI Project 093270-3

Glen Cove Former MGP  
Phase I Remedial Action  
Glen Cove, New York

RESTORATION PLAN

ISSUE  
1

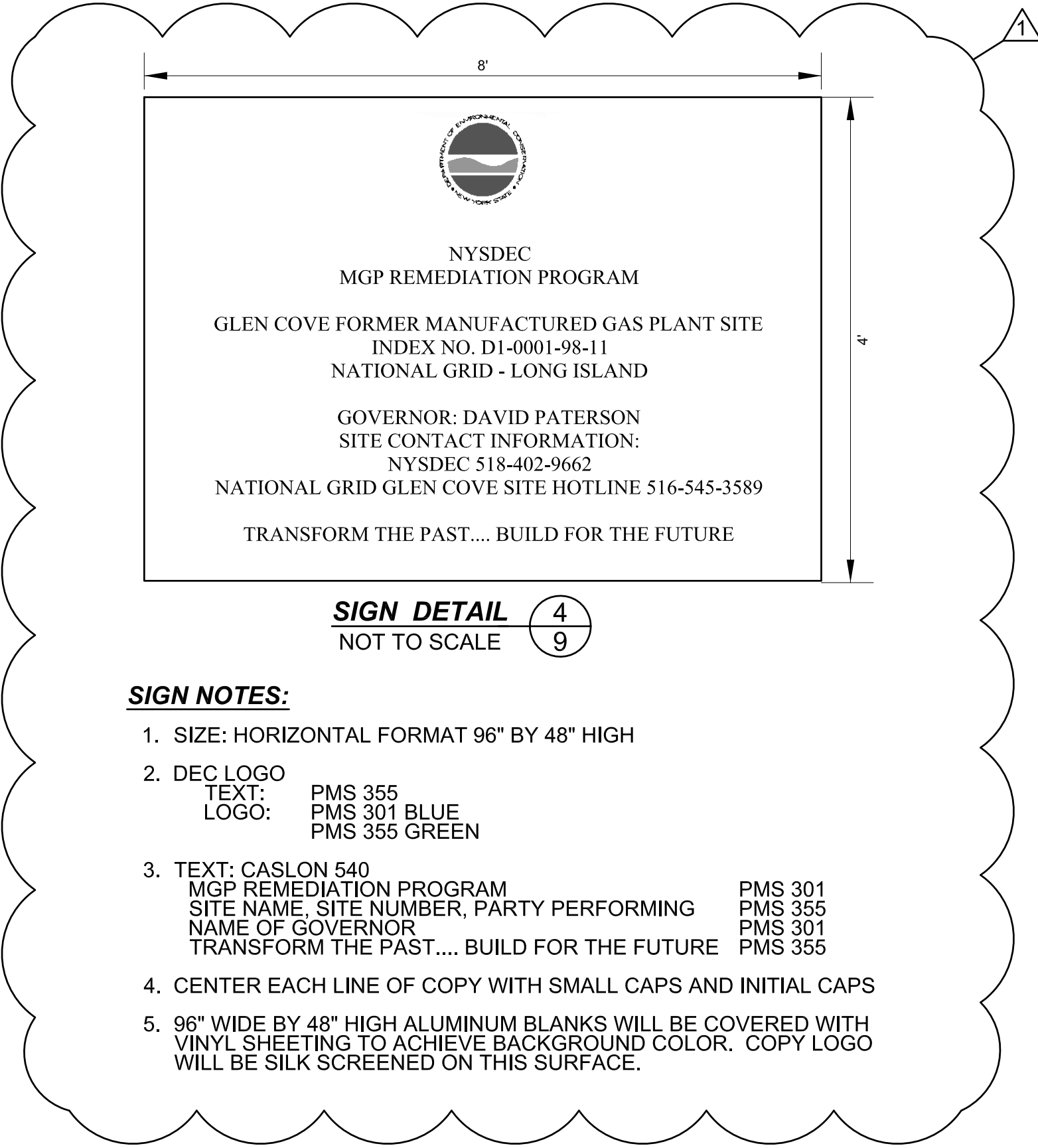
SHEET NO.  
8 of 9



**HAY SILT FENCE DETAIL** 1/9  
SOURCE: NYSDEC

**A. HAY SILT FENCE NOTES:**

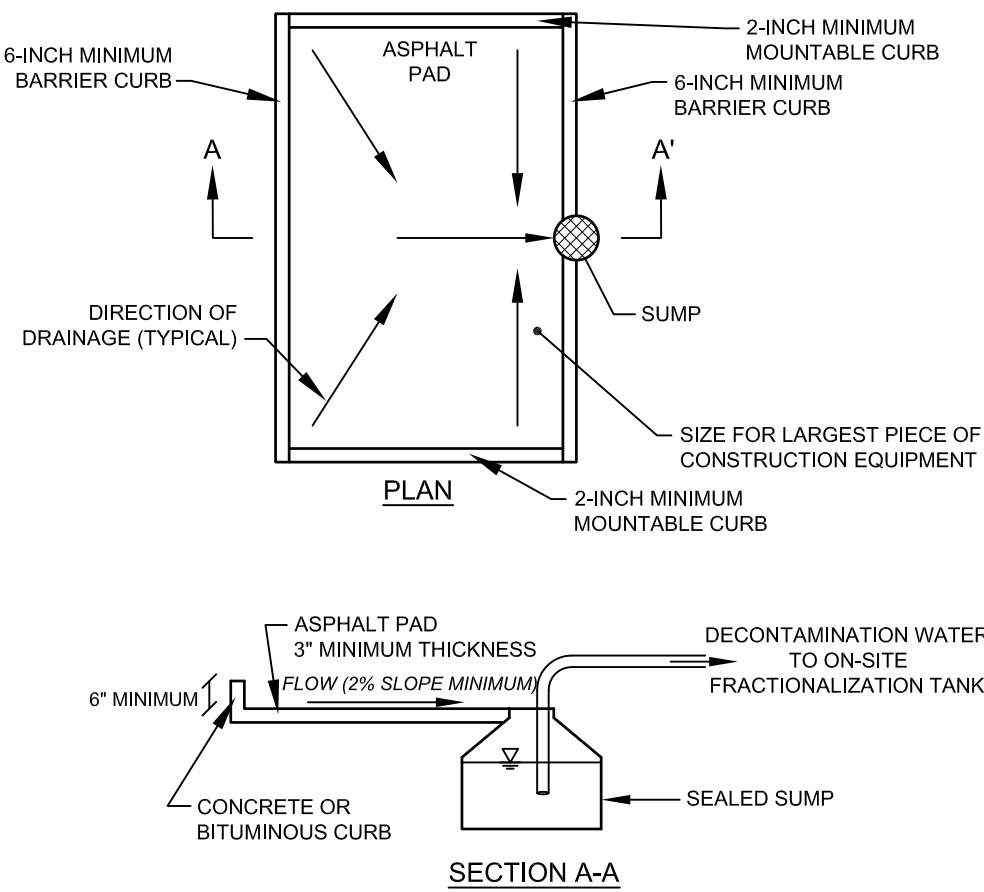
1. PLACE BALES AT TOE OF SLOPE OR ON CONTOUR.
2. BALES SHALL BE EMBEDDED IN SOIL 4" MINIMUM.
3. ANCHOR SECURELY BY TWO STAKES OR REBARS ANGLING FIRST TO FORCE BALES TOGETHER IN A ROW.
4. INSPECT BALES AFTER RAINFALL EVENTS AND REMOVE BUILT UP SEDIMENT TO MAINTAIN CAPACITY. DESIGN LIFE 3 MONTHS.



**SIGN DETAIL** 4/9  
NOT TO SCALE

**SIGN NOTES:**

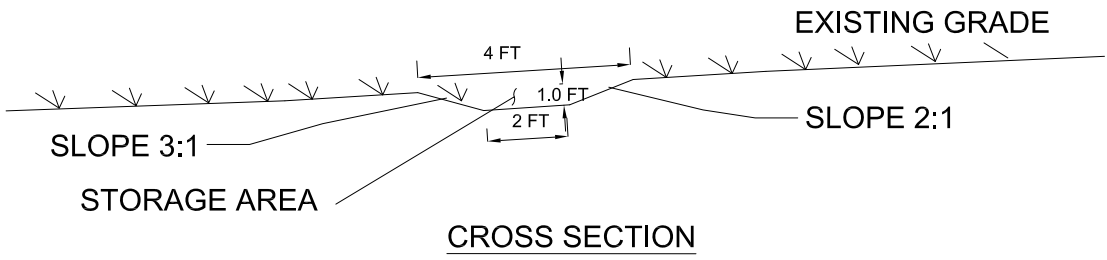
1. SIZE: HORIZONTAL FORMAT 96" BY 48" HIGH
2. DEC LOGO  
TEXT: PMS 355  
LOGO: PMS 301 BLUE  
PMS 355 GREEN
3. TEXT: CASLON 540  
MGP REMEDIATION PROGRAM PMS 301  
SITE NAME, SITE NUMBER, PARTY PERFORMING PMS 355  
NAME OF GOVERNOR PMS 301  
TRANSFORM THE PAST.... BUILD FOR THE FUTURE PMS 355
4. CENTER EACH LINE OF COPY WITH SMALL CAPS AND INITIAL CAPS
5. 96" WIDE BY 48" HIGH ALUMINUM BLANKS WILL BE COVERED WITH VINYL SHEETING TO ACHIEVE BACKGROUND COLOR. COPY LOGO WILL BE SILK SCREENED ON THIS SURFACE.



**EQUIPMENT DECONTAMINATION PAD** 2/9  
NOT TO SCALE

**B. DECONTAMINATION NOTES:**

1. ALL VEHICLES EXITING EXCLUSION ZONE MUST PASS THROUGH THE CONTAMINANT REDUCTION ZONE. USE EQUIPMENT DECONTAMINATION PAD AS REQUIRED BY ENGINEER AND NYSDEC. CONTROL OVER SPRAY.



**SWALE (TYPICAL)** 3/9  
NOT TO SCALE

POSITIVE DRAINAGE: 0.5% OR STEEPER DEPENDENT ON TOPOGRAPHY

FOR CONSTRUCTION

1	05/18/10	UPDATED SIGN DETAIL	CP	CP	MO	MZ
NO.	DATE	ISSUE/REVISION	DES	DRN	CH	APP

	 1 Greenwood Avenue Montclair, NJ 07042 (973) 873-7110	 GEI Project 093270-3	Glen Cove Former MGP Phase I Remedial Action Glen Cove, New York	ISSUE 1
			DETAILS	SHEET NO. 9 of 9

# New York State Department of Environmental Conservation

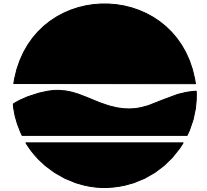
## Division of Environmental Remediation

Remedial Bureau C, 11th Floor

625 Broadway, Albany, New York 12233-7014

Phone: (518) 402-9662 • FAX: (518) 402-9679

Website: [www.dec.state.ny.us](http://www.dec.state.ny.us)



Alexander B. Grannis  
Commissioner

May 20, 2008

Eddy Louie, P.E.  
Consolidated Edison Co  
31-12 20<sup>th</sup> Ave, Bldg 136  
Long Island City, New  
York 11105-2048

Maribeth McCormick  
Orange & Rockland  
Utilities  
390 West Route 59  
Spring Valley, New York  
10977

Joseph Simone  
New York State Electric  
and Gas Corporation  
Corporate Drive-Kirkwood  
Industrial Park  
PO Box 5224  
Binghamton, New York  
13902-5224

Jeffrey Clock  
Central Hudson Gas and  
Electric  
284 South Ave  
Poughkeepsie, New York  
12601

Charles Willard, Director  
National Grid  
300 Erie Blvd West  
Syracuse, New York  
13202

Dear Messrs.:

Re: Use of Quick Lime and Similar Materials

Based on both past and recent experience during the remediation of Manufactured Gas Plant (MGP) sites in New York State the use of quick lime and similar products, including some lime kiln dusts, to control the moisture content of excavated MGP coal tar and coal tar-contaminated soils will no longer be permitted by the New York State Department of Environmental Conservation (Department).

The use of materials which contain high percentages of calcium and/or magnesium oxide (Ca/MgO) in this manner has resulted in uncontrolled airborne releases of coal tar-related volatile organic compounds (VOCs), and high airborne particulate levels from the lime material itself at several MGP sites subject to Department oversight. The Department attributes these releases to the high heat of hydration and fine particle size of these materials (e.g., quick lime and some lime kiln dusts), which have lead to uncontrolled reactions with water during material offloading, handling and mixing processes. These uncontrolled reactions have resulted in MGP vapor and lime dust exposures to both on-site workers, DEC personnel and the neighboring communities.

Therefore, effective immediately, the use of quick lime and/or lime kiln dust containing greater than 50% Ca/MgO as an amendment to MGP-contaminated soils is to be discontinued at all active MGP remediation sites. Further, the use of these materials are to be specifically prohibited by all future design documents.

The utilities are encouraged to use alternative materials, such as cement kiln dust, to amend excavated materials. However, the use of lime kiln dust containing lower percentages of free oxide in this manner may be proposed on a site-specific basis subject to Department approval. In such cases the design documents will indicate that the Department shall be provided the manufacturer's analysis of the proposed material and will evaluate its suitability based on site-specific factors, such as prevailing winds, the proximity of receptors and the nature of the excavated material. Additional requirements may be imposed on the offloading, storage and mixing procedures to prevent uncontrolled releases

If you have any questions about this issue, please contact me or the appropriate Department project manager at (518) 402-9662.

Sincerely,

*Robert W. Schick*

Robert W. Schick, P.E.  
Director, Remedial Bureau C  
Division of Environmental Remediation

cc: C. Geraci  
W. Jones  
J. Morgan  
E. Neuhauser  
B. Stearns  
S. Stucker  
  
B. Finch  
T. Blazicek  
J. Ruspantini  
  
R. Rienzo  
Y. Skorobogatov  
C. Hughes  
C. Leary  
N. O'Halloran

T. Lessing  
T. Bell  
A. Prophete  
T. Campbell  
B. Ryan  
R. Van Rossem  
  
S. Mullen

# National Grid Corporate Services LLC

175 East Old Country Road, Hicksville, New York 11801

March 10, 2010

Subject: Addendum "1" to  
Glen Cove MGP Site  
Interim Remedial Measure Project  
Q 200902

Bid Due: 4:00 pm – 3/18/210

The following clarifications and changes are provided to subject solicitation:

1. Add the following to Section 01 30 00, Administrative Requirements:
  - 1.8 INCIDENT REPORTING
    - A. The Contractor shall notify the National Grid Project Manager within 4 hours of a reportable incident.
    - B. Complete an incident report in the format provided for all National Grid reportable incidents.
    - C. National Grid reportable incidents include the following:
      1. Injury/Illness to Employee (including temp)
      2. Injury/Illness to Contractor
      3. Near-miss
      4. Motor Vehicle
      5. Public Incident
      6. Hazardous Condition
      7. Company property Damage/Equipment Damage/Equipment Failure
      8. Switching/Relay Incident
      9. Environmental
2. Add the following to Section 01 50 00, Temporary Facilities and Controls, 1.3 Utility Protection:
  - I. Work in proximity to underground and overhead utilities near a LIPA substation should be performed in accordance with National Grids safety operations procedures.

3. Add the following to Section 01 50 00, Temporary Facilities and Controls, 1.5 Work Restrictions:
  - G. Utilize equipment and or vehicles, where possible, which avoid or minimize proximity to energized lines.
  - H. Coordinate activities so that proximity to energized lines avoided or at least minimized.
  - I. Where electrical clearance is required, organize and sequence such work to minimize the duration and frequency of de-energizing lines or equipment.
  - J. Where electrical clearance is required, organize and sequence such work to minimize de-energizing lines or equipment in the high load season (i.e., June 1st to September 15th)
4. All site work will be completed by either July 9, 2010 or July 30, 2010 (Ngrid will advise at award).
5. Value added engineering approaches are acceptable. The Contractor must provide both the base bid and the value added bid identifying the specific cost and/or time savings for the value added engineering approach (Section 12.5 Ariba bid site).
6. The Competent Person identified in Section 01 30 00 Administrative Requirements, Paragraph 1.2 (D) should have at least 5 years cumulative experience of work within energized electrical substations, and/or in close proximity to energized underground and overhead high voltage electrical lines. Include the resume of the Competent Person in the Contractor bid and indicate the related work experience.
7. The maximum height of the transmission cables at the mid-span portion of the lines is listed below:

Pole Number	Pole Location	Maximum Height at Mid-Span (feet)
69-530	Center of Excavation Area	24
69-489	West of Site – West Side of Rt 107	39
69-531	North Side of Excavation Area	43

It is understood that the contractor's methodology shall ensure the Work is performed at a safe working distance so that the grounding of the transmission lines will not be required for the contractor's Work.

It is further understood that the contractor's methodology shall include a statement that the tree clearance and tree removal work will be performed by competent workers. If such work is within the ten feet of the primary conductors the contractor will employ qualified line clearance trimmers.

Capital Improvement – Taxes: All work performed at the former MGP property (including but not limited to, sub-base preparation, bollard installation, and asphalt pavement installation) constitutes a Capital Improvement for New York State Sales Tax purposes. The Owner National Grid Gas East Corporation will issue a Capital Improvement form, Form ST-124, to the successful bidder for this portion of the work. The Contractor shall pay all necessary sales, consumer, use, gross receipts and other similar taxes as required to be paid by the Contractor in accordance with the Laws and Regulations of the place of the project which are applicable during the performance of construction for the Capital Improvement portion of the project. All required taxes for the Capital Improvement portion of the project shall be computed and included in the Contractor bid prices. For additional guidance, refer to NYS Dept of Tax and Finance Publication 862 [http://www.tax.state.ny.us/pdf/publications/sales/pub862\\_401.pdf](http://www.tax.state.ny.us/pdf/publications/sales/pub862_401.pdf).

A revised proposal form Q-200902a has been posted to the bid site and replaces proposal form Q-200902.

The Proposal Form provides for pricing for two schedule options with completion of work either July 9, 2010 or July 30, 2010. Completion shall be considered the completion of all site work and site available for others to perform their work.

The Health and Safety Coordinator must be on site when Work is being performed. The individual shall be a competent person relative to working in and around an energized substation.

**Time is of the Essence for this Work.** The Contractor shall commence and complete the Work in accordance with the schedule contained in the Purchase Order. The Work will not be deemed complete until the Contractor has complied with all requirements of the Agreement.

"Excusable Delay" means any delay in the performance of the Work which (a) exceeds 8 consecutive hours and is caused by (i) an act or omission of the Company, (ii) interference by a public or quasi-public authority, (iii) strikes or injunctions, none of which are caused, instituted or provoked by the Contractor or its subcontractors, agents or representatives, (iv) delays in delivery to Contractor of, or resulting from defects in, materials directly purchased, or to be purchased, by the Company for use by the Contractor in the performance of the Work, unless such delay is caused by the Contractor, or (b) is caused by unusual severe weather conditions such as floods, hurricane, storm surge, ice, or blizzard that will endanger equipment, personnel and delays performance of the Work for more than 8 consecutive hours ("Weather Delay").

In no event shall normal, seasonal weather conditions, including precipitation, give rise to an Excusable Delay.

Company may direct the Contractor to perform such additional effort(s) as may be required to promptly realign the Work progress with the Project schedule. Such additional effort(s) shall be defined by after the Company upon site evaluation and review with the Contractor of the economics of the additional effort(s) and Site conditions. The additional effort(s) as defined by the Company shall be performed by the Contractor without additional cost or obligation to the Company unless. However, if upon completion of the Work, it is subsequently determined by the Engineer that the additional effort(s) as directed by the Company were not necessary to conform with the Project schedule. In such event, the Contractor shall be entitled to be reimbursed for the premium portion of overtime incurred by the Contractor in performing such additional effort(s), which will be calculated pursuant to Labor – Overtime.

Extension of Time: If the Contractor is delayed by any Excusable Delay causes lost time that, and if the Contractor cannot with reasonable diligence, due to such Excusable Delay, make up then an extension of for such delay or delays, then the specified date(s) or dates for completion of the Work or the portion(s) or portions thereof so delayed shall be granted will be extended by the Company by the amount of time for such delay as determined solely by the Engineer. Notwithstanding the foregoing, no periods of such Excusable Delay will be deemed to begin until written notice thereof has been given by the Contractor to the Company.

If the Contractor is delayed by any Company act or omission or, an Excusable Delay other than a Weather Delay and the Contractor cannot engage its personnel otherwise and make up for such delay by applying reasonable diligence and speed, then the Company shall consider Contractor may receive compensation to the Contractor for such delay, if appropriate. The Engineer shall determine the time period covered by the delay and the amount of compensation payable to the Contractor shall be in accordance with the Purchase Order.

Contractor will be reimbursed for the premium portion of the overtime as follows: The premium billing rate will be in accordance with the respective contractual hourly labor wage rate including the contractual benefits then in effect for the classifications involved up to and including trade foreman, plus \_\_\_\_\_ percent.

The above factor includes statutory costs, and all overheads that will be applied to the contractual hourly wage rate, and benefits.

Example (Premium Portion)

Hourly Wage	Contractual	Total Wage	Total
----------------	-------------	---------------	-------

<u>Rate</u>		<u>Benefits</u>		<u>Rate</u>		<u>Factor</u>		<u>Billing</u>
\$10.00	+	\$4.00	=	\$14.00	x	1.20	=	\$16.80

**Payment and Performance Bond:** The cost to be included in the lump sum is equal to the lump sum work plus the extended total dollars of approximate quantity of the unit pricing shown herein.

The date for receiving bids remains 4:00 pm, 3/18/2010. Please acknowledge receipt of this addendum in your proposal.

Sincerely,

Ronald Filosa  
Purchasing Department  
Phone (516) 545 4061

## Incident Report Overview

Report incident (s) to Sarah Aldridge within 4 hours of occurrence

1. Incident Date and time
2. Employee type (regular, temp, contractor). Name, DOB, sex.
3. Incident Type
  - a. Injury/Illness to Employee (including temp)
  - b. Injury/Illness to Contractor
  - c. Near-miss
  - d. Motor Vehicle
  - e. Public Incident
  - f. Hazardous Condition
  - g. Company property Damage/Equipment Damage/Equipment Failure
  - h. Switching/Relay Incident
  - i. Environmental
4. Notifications (who, date, time, comment)
  - a. Manager
  - b. agencies
5. Address of site where incident happened
6. Description of what happened, number people injured, fatalities
7. Lost time, medical attention
8. Spills (if applicable) - material, source, quantity, weather conditions, cause, responsible for cleanup PCB level, Land, water, and/or air impacted. Clean up and Corrective actions.
9. Equipment details (if applicable) - type, number, size, unit, manufacturer
10. Witness Detail (name, address, statement).
11. OSHA severity, Hazard level.
12. Name and address of off site medical care facility/doctor (if treated by a doctor or hospital). Was employee treated overnight? In the emergency room?
13. Nature of injury - part injured. Be specific.
14. Object that caused injury. Be specific.

15. What was employee doing just prior to injury?
16. How could this incident been prevented?
17. List any unsafe acts / unsafe conditions
18. Were safety rules, work methods, procedures violated?
19. Was proper protective equipment worn?
20. List any prior accidents and dates that this employee has experienced?

# **National Grid Corporate Services LLC**

175 East Old Country Road, Hicksville, New York 11801

March 10, 2010

Subject: Addendum "2" to  
Glen Cove MGP Site  
Interim Remedial Measure Project  
Q 200902

Bid Due: 4:00 pm – 3/18/210

The following clarifications and changes are provided to subject solicitation:

The contractor acknowledges receipt and has taken into consideration the following Questions and Answers that were posted to the Ariba bid site for subject project.

MSG2365729, MSG2364170, MSG2362277, MSG2342967, MSG2337501,  
MSG2336374, MSG2334772, MSG2317865, MSG2301941, MSG2291669,  
MSG2283034, MSG2277367, and MSG2276887

The date for receiving bids remains 4:00 pm, 3/18/2010. Please acknowledge receipt of this addendum in your proposal.

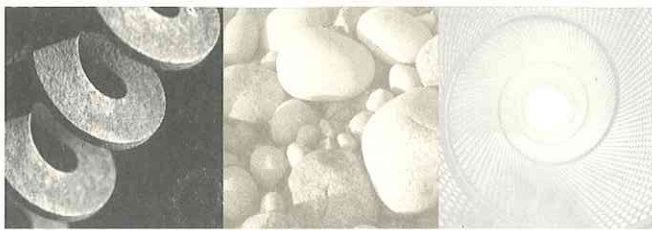
Sincerely,

Ronald Filosa  
Purchasing Department  
Phone (516) 545 4061

## **Appendix D**

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### **Community Air Monitoring Plan (electronic only)**



Geotechnical  
Environmental  
Water Resources  
Ecological

## **Community Air Monitoring Program**

### **Glen Cove Former Manufactured Gas Plant**

Glen Cove, Town of Oyster Bay,  
Nassau County, New York

Order on Consent Index No. D1-001-98-11

Site No. 1-30-089P

**Submitted to:**

National Grid  
175 East Old Country Road  
Hicksville, New York 11801

**Submitted by:**

GEI Consultants, Inc.  
1 Greenwood Avenue, Suite 210  
Montclair, New Jersey,  
973-509-9650

April 22, 2010

093270-2-1201

---

Michael Zukauskas, P.E.  
GEI Project Manager



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## Executive Summary

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This Community Air Monitoring Program (CAMP) Work Plan has been developed to provide procedures for measuring, documenting, and responding to potential airborne contaminants during excavation activities associated with the Glen Cove Former Manufactured Gas Plant (MGP) Site. The procedures in this CAMP focus on air monitoring techniques and contingency measures designed to mitigate potential airborne contaminants. This CAMP Work Plan is based on the CAMP guidelines established by the New York State Department of Health (NYSDOH) in the New York State Department of Environmental Conservation (NYSDEC) *Draft DER-10 Technical Guidance for Site Investigation and Remediation* (DER-10) (December 2002).

The CAMP provides Air Monitoring Procedures, Alert Levels, Response Levels, Action Levels, and Contingency Measures if Action Levels are approached. Alert Levels are internally established concentration levels for volatile organic compounds and are not established by the NYSDOH or NYSDEC. Alert Levels are set below the levels established by the NYSDOH so that actions can be taken prior to exceeding a NYSDOH threshold. An Alert Level serves as a screening tool to trigger contingent measures if necessary, to assist in minimizing off-site transport of contaminants during remedial activities. A Response Level is a contaminant concentration level that triggers a temporary work stoppage, continued monitoring, and potential contingent measures. An Action Level is a contaminant concentration that triggers work stoppage and implementation of contingent measures to mitigate potential airborne contaminants prior to resuming work activities. Response Levels and Action Levels are NYSDOH thresholds levels established in the November 2009 NYSDOH Generic CAMP presented in Appendix 1A of DER-10. Exceedances of either Response Levels or Actions Levels will be reported to NYSDEC and NYSDOH.

During times of excavation activity and potential related ground intrusive activities, perimeter air monitoring will be conducted using a combination of fixed-station, moveable tripod-mounted, and “walk-around” air monitoring equipment (as appropriate). Monitoring will be performed for total volatile organic compounds (VOC), dust, and odors along the Site perimeter 24 hours a day when fixed stations are used or during working hours if the movable tripod-mounted units are used. The Contingency Plan defines Alert Levels, Response Levels, Action Levels, and specific contingency measures to be implemented. The response actions, potentially including work stoppage and work area controls by various methods, are intended to prevent or significantly reduce the migration of airborne contaminants from the Site.

GEI will implement the CAMP and will report any exceedance of Response Levels and Action Levels to the Contractor, the Construction Manager, National Grid, NYSDOH, and NYSDEC. As specified in the DER-10, all 15-minute readings will be recorded and be available for State (DEC and DOH) personnel to review. The excavation contractor will be responsible for enacting contingency measures to respond to Alert Levels, if necessary, and to the exceedances of Alert and Action Levels as they may occur. GEI will provide data summary reports to the Contractor, the Construction Manager, National Grid, and NYSDEC each week during excavation and/or ground intrusive activity.

# 1. Introduction

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The New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (CAMP), as presented in New York State Department of Environmental Conservation's (NYSDEC) document *Draft DER-10 Technical Guidance for Site Investigation and Remediation*, recommends that real-time monitoring for total volatile organic compounds (TVOC) and particulates (i.e. dust) be conducted at the downwind perimeter of each designated work area during ground intrusive activities at contaminated sites. As such, this work plan describes the proposed air monitoring means and methods that will be implemented during excavation activities associated with Glen Cove Former MGP Site. A site location map is shown in Figure 1.

The purpose of the Air Monitoring Plan is to provide early detection in the field of potential short-term emissions. The Plan will be conducted in accordance with the generic NYSDOH CAMP.

The objectives of the CAMP are as follows:

- Provide an early warning system to alert the Contractor, the Construction Manager (CM), National Grid, and NYSDEC that concentrations of TVOCs or dust in ambient air are approaching Action Levels due to Site activities.
- Provide potential contingency measures to be enacted by the excavation contractor and related contractors that are designed to reduce the off-site migration of contaminants if established Action Levels are approached or exceeded.
- Determine whether construction controls are effective in reducing ambient air concentrations to below Action Levels and make appropriate and necessary adjustments.
- Develop a permanent record that includes a database of perimeter air monitoring results, equipment maintenance, calibration records, and other pertinent information.

## 1.1. Roles and Responsibilities

GEI will implement the monitoring and reporting components of this CAMP under contract with National Grid. The excavation contractor is responsible for the selection and implementation of appropriate contingency measures that will mitigate the off-site migration of contaminants in response to Action Levels being approached or exceeded. The remainder of this section specifies the roles and responsibilities of each entity relative to the CAMP. A communication flowchart is shown in Figure 6 with each entity and lines of communication for the CAMP.

### 1.1.1 *GEI Consultants, Inc.*

The scope of GEI's activities will be limited to CAMP monitoring and reporting used for the CAMP. GEI is responsible for the Health and Safety of their employees. GEI's CAMP roles and responsibilities are as follows:

- GEI will monitor and record total volatile organic compound (TVOC) and dust at various locations around the site as described in the following sections of this CAMP Work Plan.
- On a daily basis, GEI will communicate to the following entities whether TVOCs or dust exceeded Response Levels or Action Levels specified in Section 2.1, and suggest corrective actions required to address the situation. GEI will convey the CAMP results to the entities listed below and inform them if the Alert or Response Levels have been exceeded. GEI will direct contractors at the site to take action if warranted.
  - **Contractor – Posillico Environmental, Inc.**  
Lee Kaplan - Site Supervisor  
(516) 779-1990  
Michael Percibelli – Project Manager  
(516) 523-3945  
1750 New Highway  
Farmingdale, New York 11735  
(631) 752-2145
  - **New York State Department of Environmental Conservation**  
Mr. Amen Omorogbe – Project Manager  
(518) 402-9662  
MGP Remedial Section, Division of Environmental Remediation  
Bureau of Western Remedial Action, 11<sup>th</sup> Floor  
625 Broadway  
Albany, New York 12233-7017

- **National Grid**  
Ms. Sarah Aldridge – Project Manager  
Office: (516) 545-2551  
175 East Old Country Road  
Hicksville, NY 11801
  - **Construction Manager - AECOM**  
Mike Hewitt – Construction Manager  
(678) 427-4377  
Mark Hayden - Project Manager  
(978) 888-3168  
2 Technology Park Drive  
Westford, MA 01886
- GEI will provide, maintain, and operate the equipment utilized to implement the CAMP.
  - GEI will provide data summary reports to the Contractor, CM, National Grid, and NYSDEC each week during excavation activity. The reports will identify Response Level and Action Level exceedances and will include data summary reports for all TVOC and dust data collected.

### **1.1.2 Excavation Contractor**

The excavation contractor is the lead contractor responsible for site activities pertaining to the excavation activity. The excavation contractor will be responsible for taking contingent actions in conjunction with National Grid in response to Response Level and Action Level exceedances. The General Contractor will be responsible for taking contingent actions for Alert Levels, if required by GEI, CM, and /or National Grid. The excavation contractor is responsible for the Health and Safety of their employees.

### **1.1.3 National Grid**

National Grid has the responsibility to provide mitigation services related to the release of MGP-related vapors in excess of CAMP Response Level and Action Levels. National Grid is also ultimately responsible for the remediation of the Site under an approved work plan with NYSDEC.

#### **1.1.4 New York State Department of Environmental Protection**

NYSDEC is responsible for the environmental regulatory enforcement for all activities conducted at the site including compliance with this CAMP, stormwater runoff mitigation (erosion and sediment control), and all environmental and remediation regulations, policies, and guidance applicable to the site. NYSDEC may provide on-site oversight personnel for the work being conducted.

#### **1.1.5 Construction Manager**

AECOM is National Grid's representative on site and is responsible for day to day operations on the site. The CM will be responsible for directing the contractor to take contingent actions in conjunction with National Grid in response to Alert Level (VOCs only), Response Level, and/or Action Level exceedances. The CM is responsible for the Health and Safety of AECOM employees and subcontractors.

## **2. Sampling and Analytical Procedures**

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This section of the CAMP presents a detailed description of the air monitoring sampling and analytical procedures, including data management that will be used during ground intrusive site activities. The intent of the real-time monitoring program is to provide early detection in the field of short-term emissions and off-site migration of site-related TVOCs and dust.

Real-time sampling methods will be utilized to determine ambient air concentrations during the project. Monitoring for TVOC and respirable particulate matter (PM-10) will occur at up to six locations. Wind direction will be monitored under all monitoring approaches. A meteorological station will be established if a centralized data logger system is implemented. Supplemental walk-around perimeter monitoring for TVOC and PM-10, will occur along the perimeter of the project site on an as-needed basis. In the event of a possible exceedance of a Response Level or Action Level for TVOC or PM-10, GEI will compare upwind to downwind concentrations within 60 minutes of the possible exceedance to determine if site activity is causing the Response Level or Action Level exceedance. The air monitoring procedures and equipment are detailed below.

### **2.1 Alert Level, Response Level, and Action Levels**

Alert Levels are not established by the NYSDOH or NYSDEC and are internally established concentration levels for volatile organic compounds. Alert Levels are set below the levels established by the NYSDOH so that actions can be taken prior to exceeding a NYSDOH threshold. An Alert Level serves as a screening tool to trigger contingent measures if necessary, to assist in minimizing off-site transport of contaminants during remedial activities.

A Response Level is a contaminant concentration level that triggers a temporary work stoppage, continued monitoring, reporting, and potential contingent measures. A Response Level serves as a screening tool for both TVOC and PM10 to trigger contingent measures to assist in minimizing off-site transport of contaminants during remedial ground intrusive activities. Response Levels are NYSDOH thresholds levels established in the November 2009 NYSDOH Generic CAMP presented in Appendix 1A of DER-10.

An Action Level is a contaminant concentration that triggers work stoppage and implementation of contingent measures to mitigate potential airborne contaminants prior to resuming work activities. Action Levels are NYSDOH thresholds levels established in the November 2009 NYSDOH Generic CAMP presented in Appendix 1A of DER-10.

For example, if high concentrations of dust are detected on the Site, contingent measures such as the use of spraying water may be required to reduce the concentrations and keep them below Response Levels. An Action Level is a contaminant concentration that when exceeded requires a work stoppage and implementation of contingent measures to mitigate that condition prior to resuming work activities.

The following target compounds and corresponding Alert Levels, Response Levels, and Action Levels were developed in accordance with the NYSDOH Generic CAMP.

<b>Target Compounds</b>	<b>Alert Level</b>
TVOCs (15-minute average concentration)	3.7 ppm greater than background*
<b>Target Compounds</b>	<b>Response Level</b>
TVOCs (15-minute average concentration)	5.0 ppm greater than background*
Respirable Particulate Matter (PM-10)	100 µg/m <sup>3</sup> greater than background*
<b>Target Compounds</b>	<b>Action Level (**)</b>
TVOCs (15-minute average concentration)	25 ppm greater than background*
Respirable Particulate Matter (PM-10)	150 µg/m <sup>3</sup> greater than background*

ppm - parts per million

µg/m<sup>3</sup> - micrograms per meter cubed

TVOCs – total Volatile Organic Compounds

\* Background is defined as the current upwind fifteen-minute average concentration.

\*\* Action Level Exceedance Requires Work Stoppage and Mitigation of the condition causing the Exceedance

## 2.2 Air Monitoring Procedures

During times of excavation activity and potential related ground intrusive activities, perimeter air monitoring will be conducted using a combination of fixed-station, moveable tripod-mounted, and/or “walk-around” air monitoring equipment (as appropriate). Monitoring will be performed for total volatile organic compounds (VOC), dust, and odors along the Site perimeter 24 hours a day when fixed stations are used or during working hours if the movable tripod-mounted units are used.

Monitoring for TVOC and respirable particulate matter (PM-10) will occur at up to six locations using real-time sampling equipment. Readings will be checked manually on a predetermined periodic basis if tripod mounted units are used or transmitted to a centralized data logger system station once per minute. Depending on the units used, monitoring will be conducted during working hours or 24 hours a day 7 days a week during construction activity along the Site perimeter. Supplemental “walk-around” perimeter monitoring for TVOC and PM-10, and odor will occur along the perimeter of the project site on an as-needed basis. Each approach is detailed below.

It is anticipated that fixed stations will be used during the excavation portion of the IRM. It is anticipated that tripod mounted stations will be used for minimally intrusive work such as installation of monitoring wells, installation of recovery wells, installation of the groundwater treatment system, and during shallow invasive work during facility upgrades.

### **2.2.1 Fixed-Station Monitoring Procedures**

Real-time air monitoring for TVOCs and suspended particulates will be conducted upwind and downwind of the work area along the Site perimeter during excavation portions of the IRM. Instruments will be positioned to monitor around the active excavation work zone based on a particular day activities at up to six locations adjacent to the work area. Real-time monitors will continuously gather data 24 hours a day 7 days a week. The air monitoring system consists of up to six air monitoring stations, one meteorological tower, and one central computer system. The central computer system will be located in the project trailer or similar work area.

Real-time monitoring will be conducted at six fixed air-monitoring stations (AMS-1 through AMS-6, Figure 2). The real-time fixed air monitoring stations will be positioned between the work zone and the largest number of potential off-site receptors. Therefore, the placement of the fixed air monitoring stations is based on the need to document all potential off-site migration on the perimeter, but also recognizes the potential off-site receptors and the location of the proposed construction activities. The following are the approximate location of the fixed air monitoring stations:

- **AMS-1** will be located along the northern boundary of the Site in the adjacent parking lot.
- **AMS-2 and AMS-3** will be located along the eastern boundary of the Site.
- **AMS-4** will be located on private property along the eastern boundary of the Site. The station will be located southeast of the proposed excavation between the excavation and the adjacent residences.
- **AMS-5** will be located within the support zone south of the proposed excavation.
- **AMS-6** will be located on the western boundary of the Site.

Each real-time air monitoring station contains the following:

1. Station enclosure
2. An organic vapor analyzer
3. A particulate monitor
4. A radio telemetry device

Each monitoring station is housed in a weather-tight NEMA-4 type enclosure. Each monitoring station will continuously measure and record TVOCs and PM-10 at a rate of one sample per minute and record 15 minute time-weighted running averages. Figure 3A shows an example of a typical fixed air monitoring station.

In addition to the air monitoring stations, a Campbell Scientific, Inc. Met Data1 meteorological monitoring system, or equivalent, will be established on-site. The meteorological system will continuously monitor temperature, relative humidity, wind speed, and wind direction. Fifteen-minute average values for each meteorological parameter will be stored in the meteorological system and downloaded once per week. Wind direction and wind speed will be displayed on the central computer in real-time to determine upwind and downwind stations for assessing Alert, Response, and Action Levels. Upwind and downwind stations will be reduced real-time. Wind socks and/or flags will be placed at locations around the site, as necessary, to obtain real-time site-specific wind direction.

All TVOC, PM-10, and meteorological data will be stored in dataloggers located within each monitoring/meteorological station. Stored analytical data along with system performance data from each station will be sent in real-time, via radio telemetry, to the Site central computer system for monitoring and analysis. The meteorological station will be downloaded at a minimum of once per week. In the event of severe weather or power loss at the site, data recording and/or recovery may be affected.

### ***2.2.2 Tripod Mounted Monitoring Procedures***

It is anticipated that tripod mounted stations will be used for minimally intrusive work such as installation of monitoring wells, installation of recovery wells, installation of the groundwater treatment system, and during shallow invasive work during facility upgrades. Instruments will be positioned along the Site perimeter to monitor the air based on a particular day ground intrusive activities at up to three locations. Real-time monitors will continuously gather data during periods of intrusive activity during working hours. The equipment will be manually read on a predetermined periodic cycle during the work activity.

The readings will be collected at a minimum of 15-minute intervals during periods of intrusive activities. Wind direction will be determined by using a wind sock or flagging placed on a pole at the Site.

Each air monitoring station would include the following:

1. Station Tripod and enclosure
2. An organic vapor analyzer
3. A particulate monitor

Figure 3B shows an example of a typical tripod mounted air monitoring station.

Each monitoring station will continuously measure and record TVOCs and PM-10. All TVOC and PM-10 will be stored in dataloggers located within each monitoring station. Data from each piece of equipment will be downloaded daily at the completion of intrusive activities and stored on a central computer system. The location of each station, the work zone, and the wind direction will be noted daily. At each monitoring station location, the 15-minute average value of TVOC and PM-10 will be recorded. The 15-minute average value of TVOC and PM-10 data from the upwind and downwind station will be compared and resultant downwind concentration will be calculated and recorded.

### ***2.2.3 Supplemental and Perimeter Walk-around Monitoring***

Supplemental walk-around perimeter monitoring for TVOC and PM-10 will occur along the perimeter of the project site on an as-needed basis. Specific site conditions that may trigger walk-around perimeter monitoring include:

- Visible dust
- Detection of TVOCs and/or PM-10 at an air monitoring station at concentrations exceeding an Alert Level, Response Level, and Action Levels
- Direction by the construction manager, National Grid, or NYSDEC

Fifteen-minute average TVOC and PM-10 readings will be collected continuously at a downwind location between the work area and the nearest receptors.

When a triggering condition is observed during ground intrusive activity, the supplemental downwind perimeter monitoring will occur continuously until the conditions that triggered the monitoring have subsided. TVOC concentrations will be monitored and recorded using an organic vapor analyzer. PM-10 will be measured and recorded using a portable aerosol monitor equipped with a PM-10 impactor.

At each monitoring point, the 15-minute average value of TVOC and PM-10, sample time, and sample location will be collected and recorded. Additional temporary monitoring points may be established due to changing site or meteorological conditions.

#### **2.2.4 Equipment Calibration**

Equipment calibration will be performed according to manufacturer's instructions. Each organic vapor analyzer will be calibrated once daily using a certified standard isobutylene gas. Particulate monitors for PM-10 will be zeroed daily. Other hand-held portable equipment will be calibrated before each use, or a minimum of once per week when not in use.

### **2.3 VOC Analytical Sampling**

Verification VOC samples will be collected once per week at two air-monitoring stations. The verification samples are collected to demonstrate that the real-time monitoring stations are effective in measuring the concentration of the VOC target compounds. VOC samples will be collected using 6-liter Summa<sup>®</sup> canisters (or equivalent vacuum canisters) and analyzed using United States Environmental Protection Agency (EPA) Method TO-15 modified to include naphthalene. An accredited laboratory will perform the analytical testing on the canisters and will provide Category B deliverables as required by the New York Analytical Services Protocol. The data will be validated according to EPA and New York State Requirements.

### **2.4 Pre-Construction Baseline Sampling**

Pre-construction sampling will be completed to establish baseline ambient air concentrations prior to the start of construction activities. Baseline conditions will be developed for TVOCs and PM<sub>10</sub> in ambient air using real-time fixed station sampling methods. Sample collection and analysis methods will follow those described in subsection 2.2.1. Pre-construction real-time sampling will take place at the six fixed air monitoring station locations to determine TVOC and PM<sub>10</sub> baseline conditions. TVOC and PM<sub>10</sub> data will be recorded 24 hours per day for a minimum of three days.

### **2.5 Data Management Procedures**

This section of the Plan discusses the data management procedures that will be used during the remedy. Data may be generated from a variety of sources, including real-time fixed station analytical monitoring, supplemental walk-around monitoring, tripod-mounted monitoring stations, and meteorological monitoring.

These data must be reduced, evaluated, verified, and presented to related parties in a timely manner to facilitate decision-making. The data management process for each source of data is discussed below.

Analytical data generated at each fixed-station are sent to the central computer system via radio telemetry or will be manually downloaded daily. The monitoring data will also be downloaded to the project database for data evaluation. The following daily charts or tables will be prepared:

- Instantaneous and averaged TVOC concentrations compared to the TVOC Action Level
- Instantaneous and averaged PM-10 concentrations compared to the PM-10 Action Level
- Supplemental Perimeter Walk-Around PM-10 concentrations compared to the Action Level (if any)
- Supplemental Perimeter Walk-Around TVOC concentrations compared to the TVOC Action Level (if any)
- Air monitoring station locations

The following weekly charts or tables will be prepared:

- Meteorological conditions
- Maximum 15-minute average concentrations of TVOC and PM-10
- Upwind and downwind comparison of Response Level and Action Levels reached during the week
- Summary of site activities
- Air monitoring station locations

GEI will review all real-time data in a timely manner following collection and transmit the final summary report to National Grid.

### 3. Alert Response

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The purpose of this section is to identify the procedures to be followed in response to elevated levels of target compounds measured during ground intrusive activities. Response actions will be enacted by the Contractor, CM, and National Grid. GEI will report any occurrences where a Response Level or Action Level is exceeded, which would require response measures to be enacted. The NYSDEC will be notified of any occurrence where a Response Level and/or Action Level (NYSDOH threshold) is exceeded. If there is a verified exceedance, GEI will inform the CM, National Grid, and NYSDEC within 60 minutes of the exceedance via e-mail at a minimum. In general, a tiered approach to site conditions with corresponding response actions will be implemented during the air monitoring program. The four tiers of site conditions are defined as follows.

- **Site Condition 1.** Normal or ambient air-conditions where all target concentrations are less than the Response Levels for respirable particulate matter or TVOC.
- **Preliminary Site Condition 2.** Concentration of TVOC only is equal to or greater than the Alert Level, but less than the Response Level.
- **Site Condition 2.** Concentration of at least one target is equal to or greater than Response Level, but less than the Action Level.
- **Site Condition 3.** Concentration of at least one target is equal to or greater than the Action Level.

The response plan will rely on real-time data generated from the fixed-station monitoring, portable equipment monitoring, and meteorological monitoring. These data sources will be evaluated together in order to make appropriate decisions concerning site conditions and potential control measures.

An explanation of the notification system, specific conditions, and response actions for TVOCs and PM-10 are presented below.

#### 3.1 Total Volatile Organic Compounds

TVOC concentrations in air will be measured and recorded by station monitors. Figure 4 presents the TVOC decision diagram that will be used to determine the appropriate site condition based on contaminant concentrations.

### **3.1.1 Site Condition 1**

Site Condition 1 will be in effect when the TVOC concentration is less than the Alert Level (3.7 ppm). Under a Site Condition 1, each organic vapor analyzer located at the monitoring stations will collect and analyze a TVOC sample at a frequency of one sample per minute.

### **3.1.2 Preliminary Site Condition 2**

Preliminary Site Condition 2 will be in effect if the TVOC concentration measured at a station is greater than or equal to the Alert Level (3.7 ppm) but less than the Response Level (5.0 ppm). The Contractor, CM, and National Grid will be notified by GEI of elevated measurements and a Preliminary Site Condition 2.

At this time, the upwind and downwind concentrations will be compared to determine if the Preliminary Site Condition 2 is due to site activities. If downwind TVOC concentrations are greater than upwind concentrations, then it will be assumed that the Preliminary Site Condition 2 is due to site activities.

If the above condition is true, then a Preliminary Site Condition 2 will be verified. Under a verified Preliminary Site Condition 2, a contingency meeting attended by GEI, the Contractor, CM, and National Grid will be held. The Contractor, CM, and National Grid will determine appropriate response actions. This meeting will be held within 60 minutes of the Preliminary Site Condition 2 verification. Possible Preliminary Site Condition 2 response actions are listed in Table 1. The site will remain in Preliminary Site Condition 2 as long as the TVOC concentration is between 3.7 ppm (Alert Level) and 5.0 ppm (Response Level), based on 15-minute averages.

The site will return to Site Condition 1 if the following condition is true.

- The 15-minute average concentrations for TVOCs at each of the monitoring stations are less than 3.7 ppm (Alert Level).

### **3.1.3 Site Condition 2**

Site Condition 2 will be in effect if average TVOC concentrations increase to greater than the Response Level of 5.0 ppm. Site Condition 2 will remain in effect if one of the following conditions is true.

- The average TVOC concentration, measured over a 15-minute period, is greater than or equal to 5.0 ppm (Response Level)

Under Site Condition 2, construction activities will be temporarily halted. A meeting attended by GEI, the Contractor, CM, National Grid, and NYSDEC, will be held within 60 minutes of the Site Condition 2. The Contractor, CM, National Grid, and NYSDEC will determine appropriate response actions. Possible Site Condition 2 corrective measures/actions are listed in Table 1. After appropriate corrective measures/actions are taken, work activities may resume provided that the TVOC concentration at the Site perimeter is no more than 5.0 ppm above background for the 15-minute average.

If average TVOC concentrations fall below the Response Level, then the site will be returned to Preliminary Site Condition 2, at which time work activities may resume. The Preliminary Site Condition 2 site condition will remain in effect as long as the following condition is true.

- The 15-minute average concentration for TVOCs is greater than 3.7 ppm (Alert Level) and less than 5.0 ppm (Response Level).

The site will return to Site Condition 1 if the following condition is true.

- The 15-minute average concentrations for TVOCs at each of the monitoring stations are less than 3.7 ppm (Alert Level).

### **3.1.4 Site Condition 3**

Site Condition 3 will be in effect if average TVOC concentrations increase to greater than the Action Level of 25.0 ppm. Site Condition 3 will remain in effect if one of the following conditions is true.

- The average TVOC concentration, measured over a 15-minute period, is greater than 25 ppm (Action Level).

Under Site Condition 3, all construction activities will be halted. A meeting attended by GEI, the Contractor, CM, National Grid, and NYSDEC, will be held within 60 minutes of the Response Level notification. The Contractor, CM, National Grid, and NYSDEC will determine appropriate response actions. Possible Site Condition 3 corrective measures/actions are listed in Table 1. After appropriate corrective measures/actions are taken, work activities may resume provided that the TVOC concentration at the Site perimeter is no more than 5.0 ppm above background for the 15-minute average.

If average TVOC concentrations fall below the Action Level, then the site will be returned to a Site Condition 2. If average TVOC concentrations fall below the Response Level, then the site will be returned to Preliminary Site Condition 2, at which time work activities may resume. The Preliminary Site Condition 2 site condition will remain in effect as long as the following condition is true.

- The 15-minute average concentration for TVOCs is greater than 3.7 ppm (Alert Level) and less than 5.0 ppm (Response Level).

The site will return to Site Condition 1 if the following condition is true.

- The 15-minute average concentrations for TVOCs at each of the monitoring stations are less than 3.7 ppm (Alert Level).

Specific TVOC target concentrations for Site Condition 1, Preliminary Site Condition 2, Site Condition 2, and Site Condition 3 are summarized in Table 2.

## **3.2 Respirable Particulate Matter**

PM-10 concentration in air will be measured and recorded by the station monitors and may be temporarily suspended during periods of rain. Figure 5 presents the PM-10 decision diagram.

### **3.2.1 Site Condition 1**

Site Condition 1 will be in effect when the downwind 15-minute average PM-10 concentration is greater than  $100 \mu\text{g}/\text{m}^3$  above the current average upwind conditions (Alert Level).

### **3.2.2 Site Condition 2**

Site Condition 2 will be in effect if the average 15-minute PM-10 concentration at a station is greater than  $100 \mu\text{g}/\text{m}^3$  and related to site activities. The Contractor, CM, National Grid, and NYSDEC will be notified by GEI of elevated measurements and a possible Site Condition 2. The upwind and downwind PM-10 concentrations will be compared to determine if the elevated PM-10 concentrations are due to site activities. If downwind PM-10 concentrations are  $100 \mu\text{g}/\text{m}^3$  greater than upwind concentrations (Response Level), then it will be assumed that the Site Condition 2 is due to site activities.

The Site Condition 2 will remain in effect as long as the average PM-10 concentration is greater than or equal to  $100 \mu\text{g}/\text{m}^3$  above upwind conditions (Response Level), and less than or equal to  $150 \mu\text{g}/\text{m}^3$  (Action Level). Under a verified Site Condition 2, dust suppression techniques must be implemented by the Contractor and/or National Grid contractors. At this point, routine monitoring continues and 15-minute averages continue to be evaluated. Work may continue with dust suppression techniques provided that downwind PM-10 levels do not exceed  $150 \mu\text{g}/\text{m}^3$  above the upwind level (Action Level) and provided that no visible dust is migrating offsite from the work area.

A contingency meeting attended by GEI, the Contractor, CM, National Grid, and NYSDEC will be held within 60 minutes of the verified Site Condition 2 if the condition is not mitigated by dust suppression techniques. Possible response actions for dust control are listed in Table 1.

### **3.2.3 Site Condition 3**

Site Condition 3 will be in effect if the average 15-minute PM-10 concentration exceeds  $150 \mu\text{g}/\text{m}^3$  above the current average upwind concentration (Action Level). Under Site Condition 3, work must be stopped and a meeting attended by GEI, the Contractor, CM, National Grid, and NYSDEC will be held within 60 minutes of the Response Level notification. The Contractor, CM, National Grid, and NYSDEC will determine appropriate response actions. Possible Site Condition 3 response actions for PM-10 are listed in Table 1. Work may resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 concentration to within  $150 \mu\text{g}/\text{m}^3$  of the upwind level and in preventing visible dust migration.

Specific PM-10 target concentrations for Site Condition 1, Preliminary Site Condition 2, Site Condition 2, and Site Condition 3 are summarized in Table 2.

## **3.3 Visible Dust**

In addition to measured PM-10 levels, the CAMP requires monitoring of visible dust conditions. If visible airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 levels do not exceed the Action Level concentration of  $150 \mu\text{g}/\text{m}^3$  above the upwind level and provided that no visible dust is migrating from the work area.

## 4. Reporting

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GEI will prepare and submit weekly reports to the the Contractor, CM, National Grid, and NYSDEC summarizing the CAMP monitoring data. Each report will consist of a letter-style report and charts/tables summarizing the following:

- Maximum 15-minute average concentrations of TVOC, and PM-10
- Upwind and downwind comparison of Response Levels and Action Level reached during the weekly period
- Summary of site activities
- Air monitoring station locations
- Meteorological conditions

Following the completion of all remedial measures a Final Engineering Report (FER) will be developed and stamped by an engineer licensed to practice in the State of New York. As part of the report, the CAMP activities will be documented. The FER will provide a summary of air monitoring data collected during the remedial activities, any exceedances noted, and responses taken during the remedial activities.

## Tables

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**Table 1**  
**Levels and Response Actions**  
**Community Air Monitoring Program Work Plan**  
**Glen Cove Former MGP Site**  
**Interim Remedial Measure**

Site Condition	Response Action
Site Condition 1	<ul style="list-style-type: none"> <li>▪ Normal Site Operations – No Response Action Required</li> </ul>
Preliminary Site Condition 2 and Site Condition 2	<ul style="list-style-type: none"> <li>▪ Establish trend of data and determine if evaluation/wait period is warranted</li> <li>▪ Temporarily stop work</li> <li>▪ Temporarily relocate work to an area with potentially lower emission levels</li> <li>▪ Apply water to area of activity or haul roads to minimize dust levels</li> <li>▪ Reschedule work activities</li> <li>▪ Cover all or part of the excavation area</li> <li>▪ Apply VOC emission suppressant foam over open excavation areas</li> <li>▪ Slow the pace of construction activities</li> <li>▪ Change construction process or equipment that minimize air emissions</li> <li>▪ Install a perimeter barrier fence</li> </ul>
Site Condition 3	<ul style="list-style-type: none"> <li>▪ Halt Work</li> <li>▪ Encapsulate construction area and treat air exhaust</li> <li>▪ Perform work during cold weather</li> <li>▪ Cease construction activities</li> <li>▪ Re-evaluate air monitoring work plan</li> </ul>
<b>Notes:</b> The bulleted response actions specified under each site condition can be implemented in any order that is most appropriate under the existing site conditions.	

**Table 2**  
**Target Concentrations for Site Conditions**  
**Community Air Monitoring Program Work Plan**  
**Glen Cove Former MGP Site**  
**Interim Remedial Measure**

Target	Alert Level	Response Level	Action Level	Site Condition			
				Site Condition 1	Preliminary Site Condition 2	Site Condition 2	Site Condition 3
Total VOC by GC (ppmv)	3.7	5.0	25.0	[C]<3.7	[C]>=3.7	NM	NM
Total VOC by PID (ppmv)	3.7	5.0	25.0	[C]<3.7	3.7<=[C]<=5.0	[C <sub>avg</sub> ]>5.0	[C <sub>avg</sub> ]>25.0
PM-10 (ug/m <sup>3</sup> )	NA	100 greater than upwind	150 greater than upwind	[C]<100	NA	100<=[C <sub>avg</sub> ]<=150	[C <sub>avg</sub> ]>150

Notes:

VOC = Volatile Organic Compound

PID = Photoionization Detector

GC = Gas Chromatograph

PM-10 = Respirable Particulate Matter

ppmv = parts per million volume

ug/m<sup>3</sup> = micrograms per cubic meter

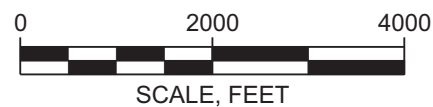
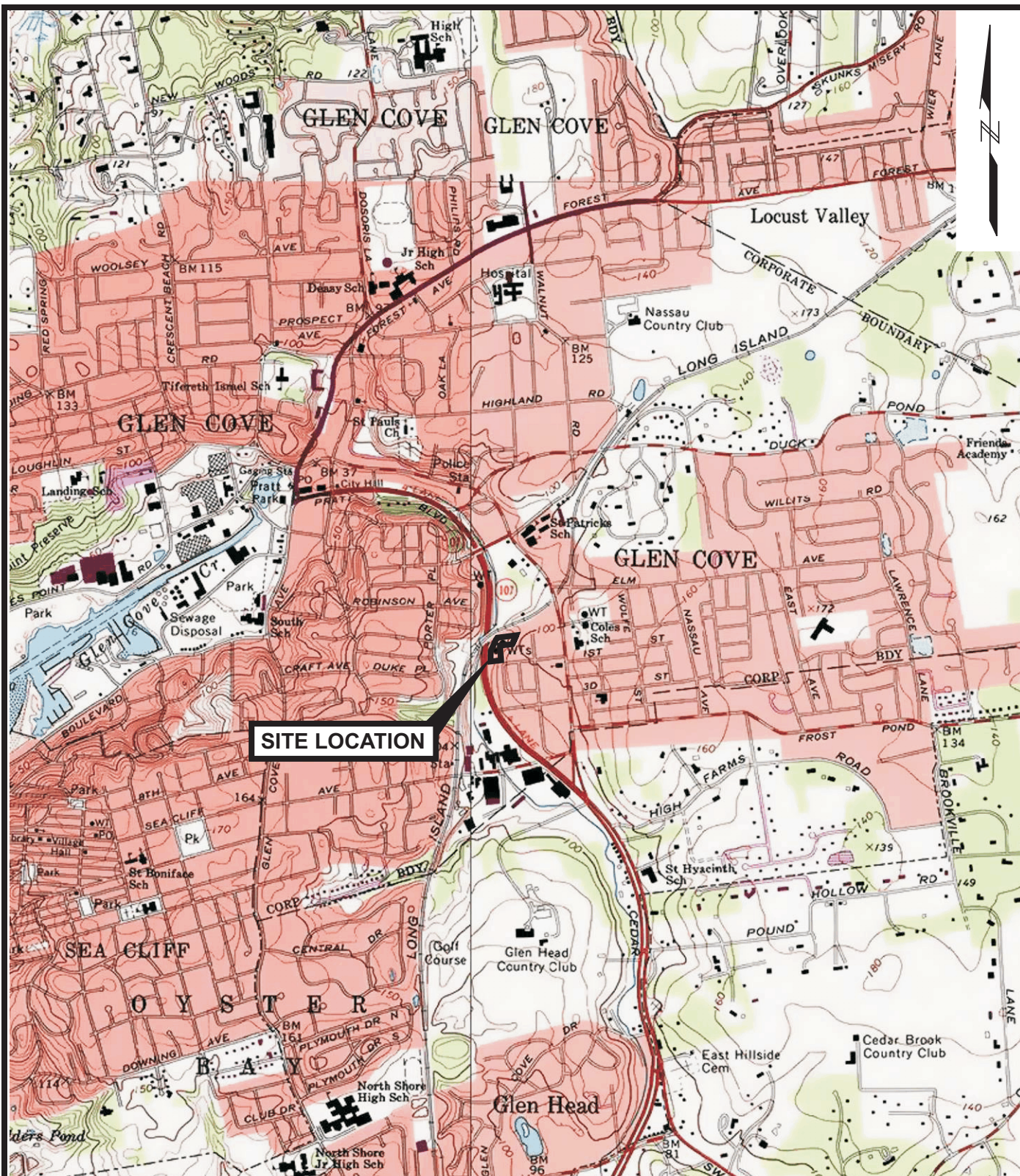
[C] = Concentration of target collected from a discrete sample.

[C<sub>avg</sub>] = 15-minute average concentration of target

NM = Target is not measured during this site condition

## Figures

---



SOURCE: MAP CREATED WITH TOPO!™ ©2000 WILDFLOWER PRODUCTIONS (www.topo.com)

COMMUNITY AIR MONITORING PLAN  
GLEN COVE FORMER MGP SITE  
GLEN COVE, NEW YORK

**nationalgrid**

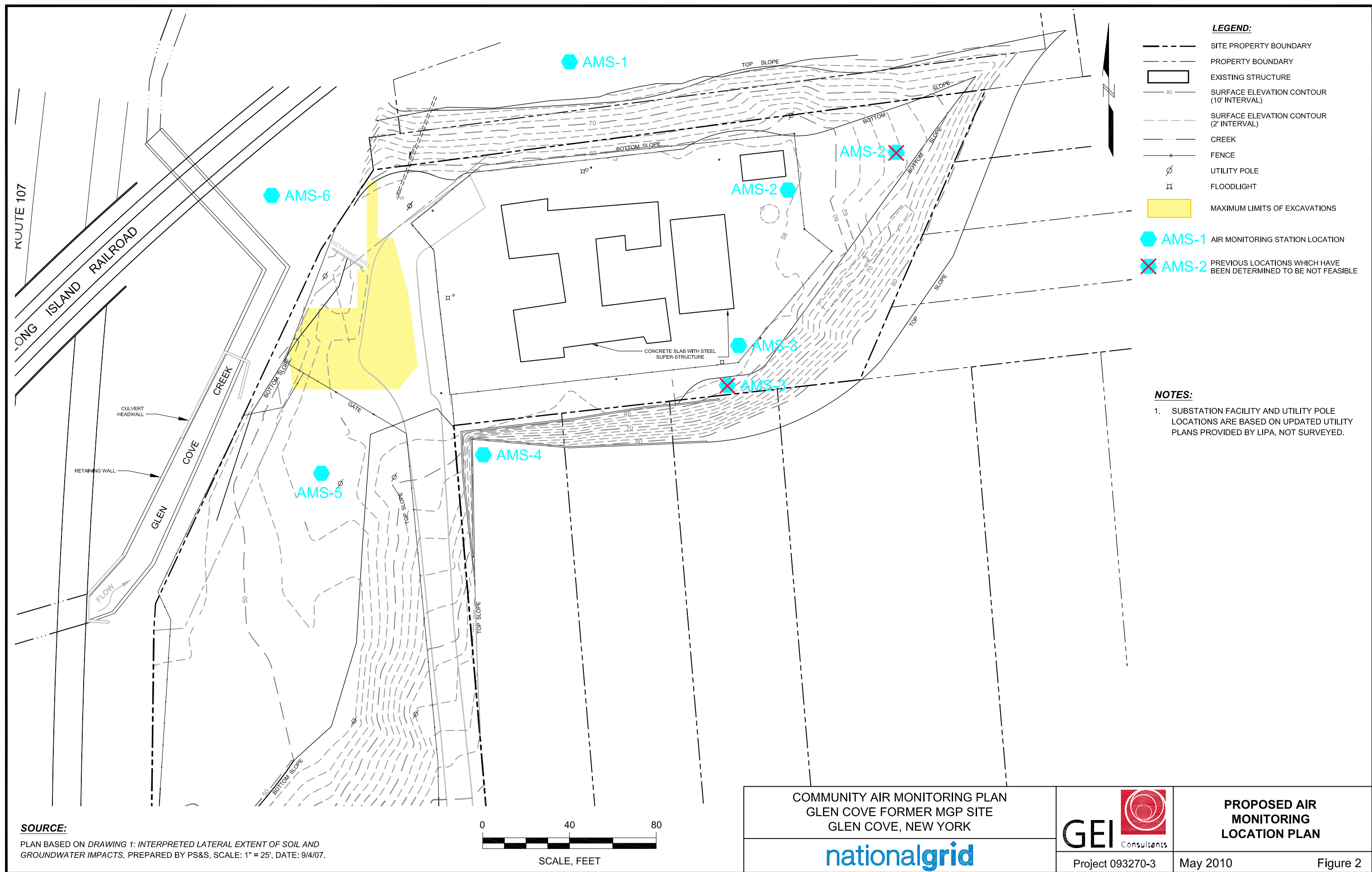


Project 093270-3

**SITE LOCATION MAP**

April 2010

Figure 1





(10)

(6)

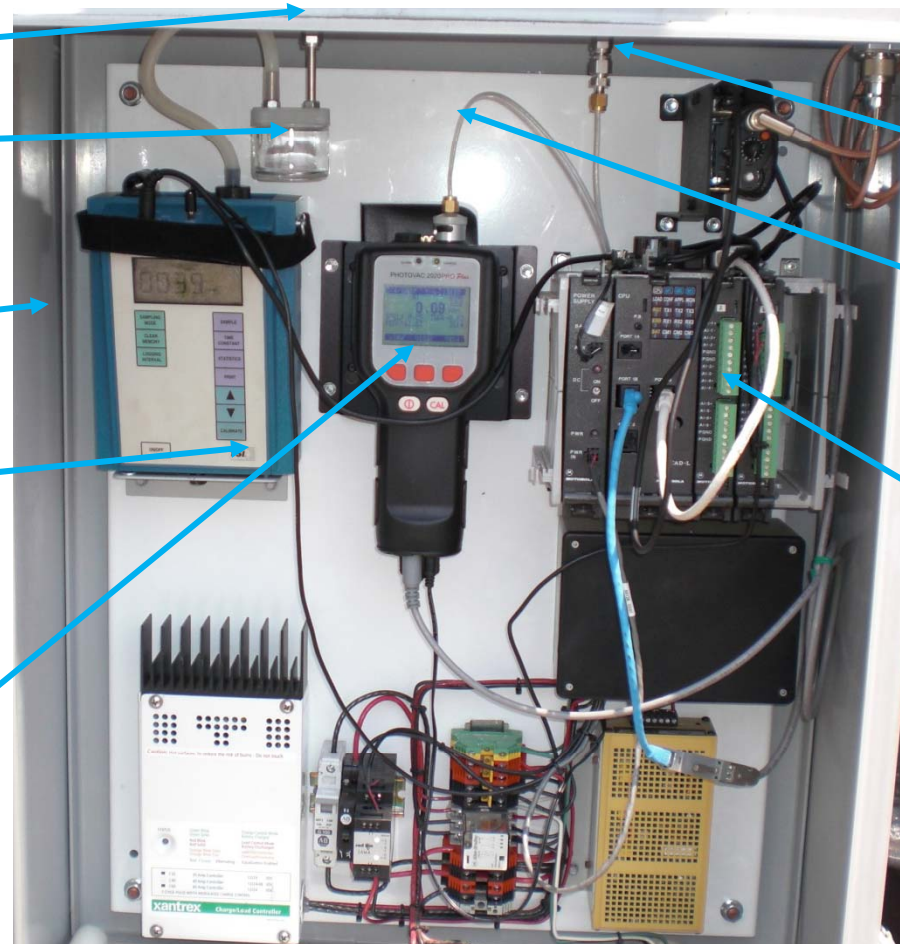
(7)

(1)

1. Station enclosure
2. Organic Vapor Monitor (OVM)
3. OVM sample inlet
4. OVM sample inlet tubing
5. Dusttrak™ Aerosol Monitor portable real-time aerosol monitor
6. Dusttrak™ sample inlet with PM-10 impactor
7. DataRAM sample tubing with in-line condensor
9. Data communications device
10. Solar Panel

(5)

(2)



(3)

(4)

(9)

Note: Figure depicts an Air Monitoring System from Pine Environmental as an example and may not be representative of the actual system or components that will be employed at the Site

COMMUNITY AIR MONITORING PLAN  
GLEN COVE FORMER MGP SITE  
GLEN COVE, NEW YORK

**nationalgrid**

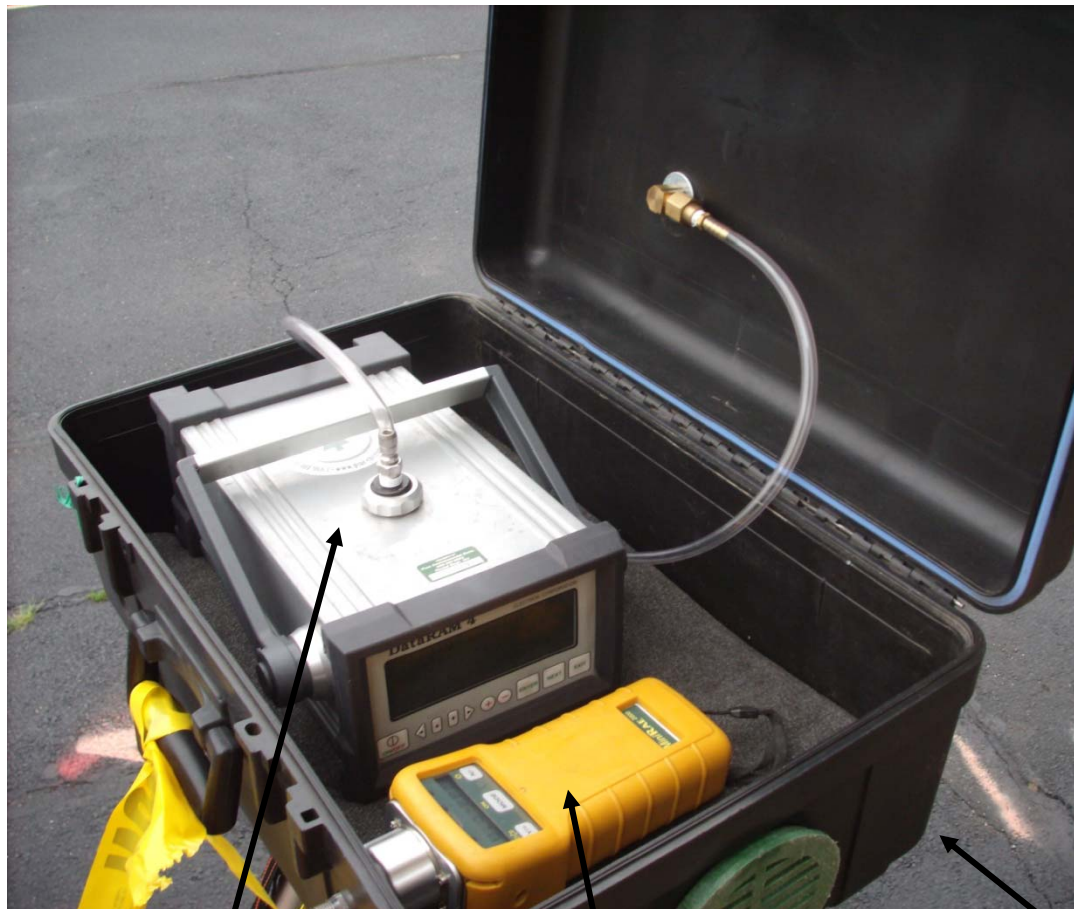


PROJECT 093270-3

**EXAMPLE  
FIXED STATION  
INTERNAL COMPONENTS**

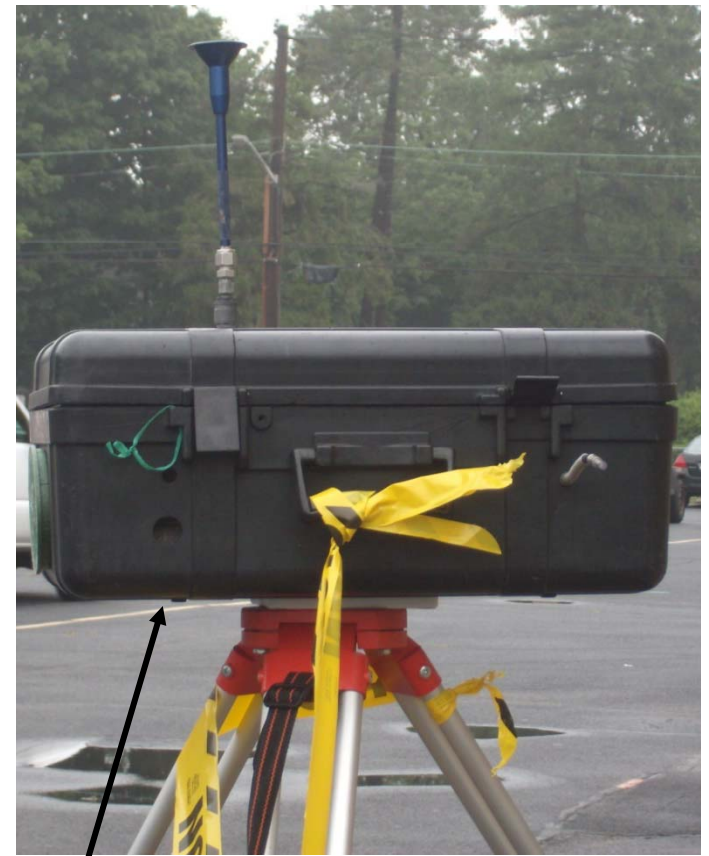
April 2010

Figure 3A



**Particulate  
Meter**

**Organic Vapor  
Analyzer**



**Station Enclosure**

Note: Figure depicts an Air Monitoring System from Pine Environmental as an example and may not be representative of the actual system or components that will be employed at the Site

COMMUNITY AIR MONITORING PLAN  
GLEN COVE FORMER MGP SITE  
GLEN COVE, NEW YORK

**nationalgrid**

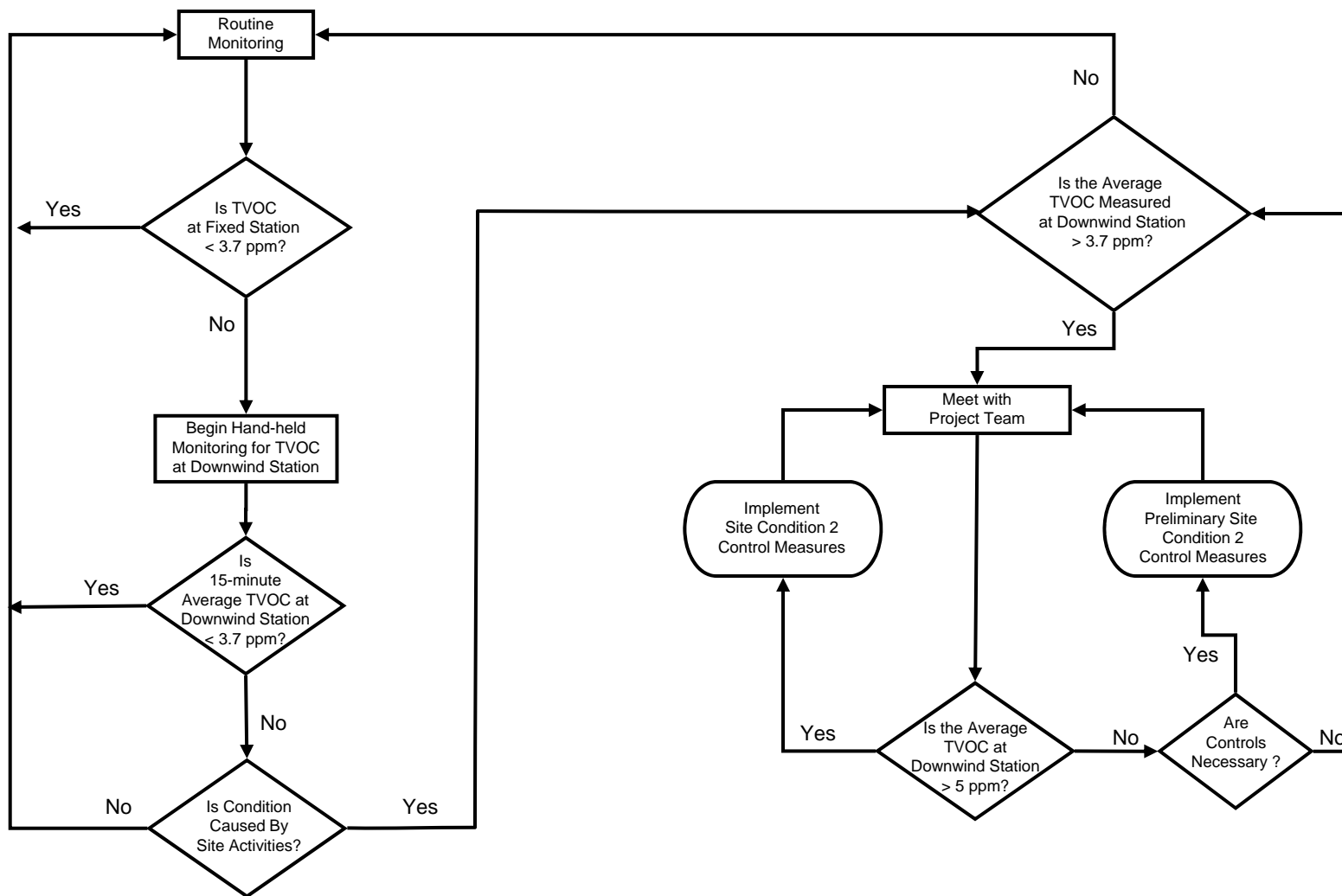


PROJECT 093270-3

**EXAMPLE  
TRIPOD MOUNTED STATION  
INTERNAL COMPONENTS**

April 2010

Figure 3B



TVOC – Total Volatile Organic Compound  
ppm – parts per million

COMMUNITY AIR MONITORING PLAN  
GLEN COVE FORMER MGP SITE  
GLEN COVE, NEW YORK



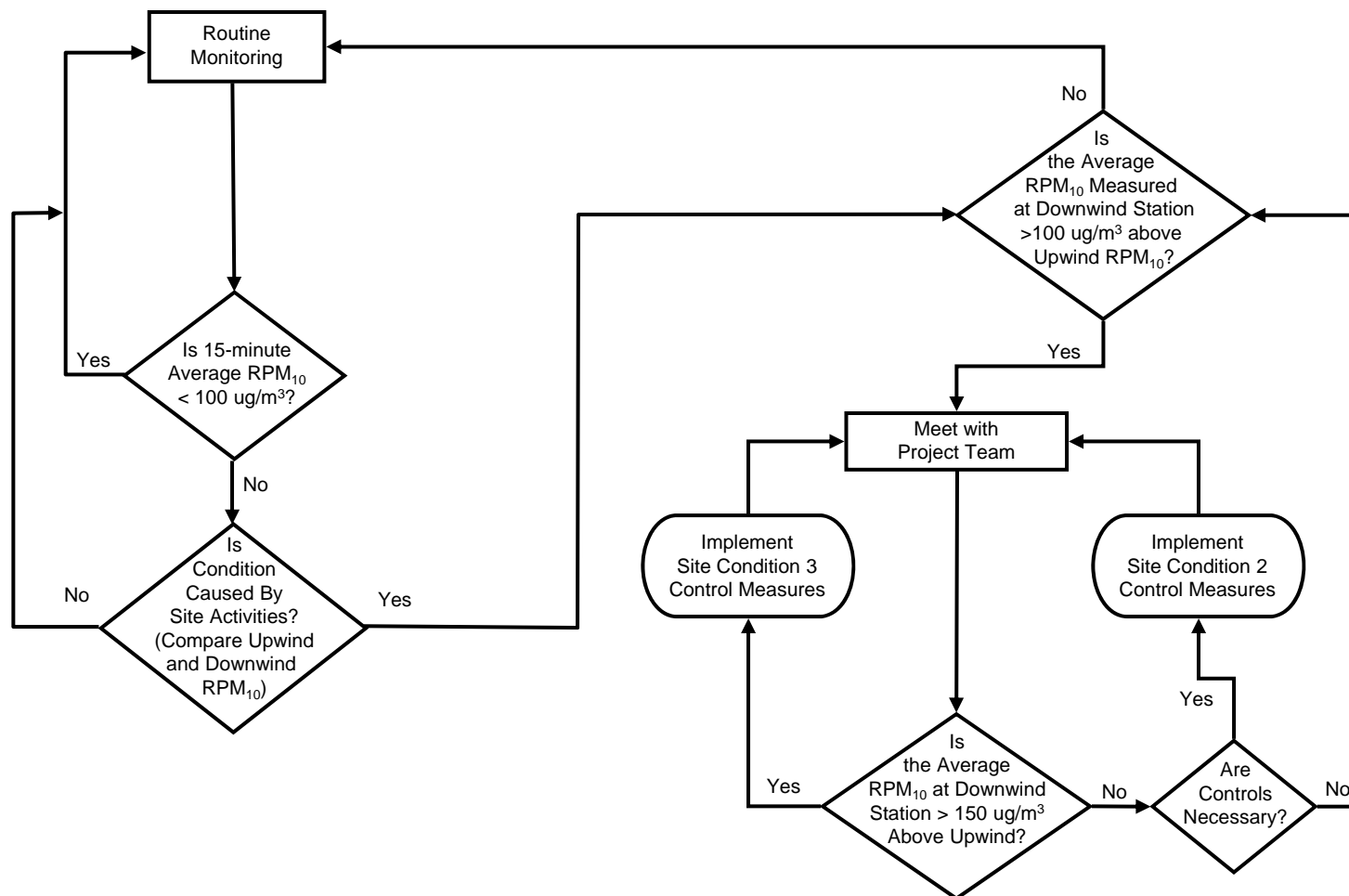
**TVOC  
DECISION DIAGRAM**

**nationalgrid**

PROJECT 093270-3

April 2010

Figure 4



RPM<sub>10</sub> – Respirable Particulate Matter

ug/m<sup>3</sup> – micrograms per cubic meter

COMMUNITY AIR MONITORING PLAN  
GLEN COVE FORMER MGP SITE  
GLEN COVE, NEW YORK

**nationalgrid**

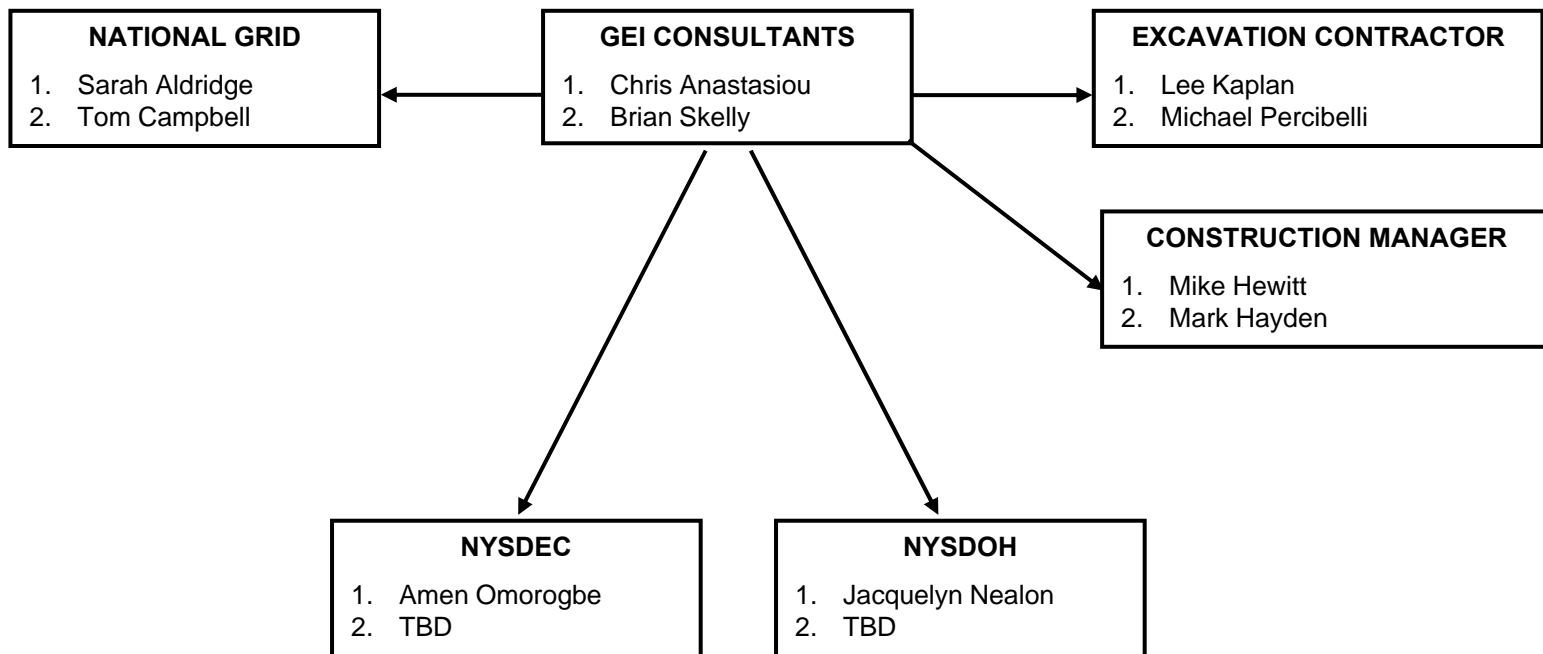


PROJECT 093270-3

**RESPIRABLE  
PARTICULATE MATTER  
DECISION DIAGRAM**

April 2010

Figure 5



National Grid, GEI, excavation contractor,  
and NYS Representatives  
**Meet at the Field Office and/or Confer  
by Phone Within 60 Minutes of the Alert**

**If the primary contact is unavailable,  
contact alternatives in the order noted,  
or as shown on the contact list.**

TBD – To Be Determined

## **Appendix E**

---

### **Health and Safety Plan (electronic only)**

## **SITE SPECIFIC HEALTH AND SAFETY PLAN (HASP)**

<b><i>Site:</i></b>	<b>GLEN COVE FORMER MANUFACTURED GAS PLANT (MGP) SITE NATIONAL GRID CORPORATION</b>
<b><i>Location:</i></b>	<b>GLEN COVE, NEW YORK</b>
<b><i>Date Prepared:</i></b>	<b>JANUARY 2010</b>
<b><i>Revision:</i></b>	<b>JUNE 2010</b>
<b><i>Project Description:</i></b>	<b>Pre-Characterization Sampling, Remedial Action Oversight and CAMP Oxygen Injection System Installation and OM&amp;M Groundwater Sampling, DNAPL Removal and Recovery Monitoring</b>
Waste types:	Impacted Soils
Characteristics:	Volatile, Toxic
Unusual Site Features:	Work near substation
Status:	Industrial (Off-site areas are residential)
Background Review:	Site Investigations have been performed
Overall Hazard:	Low

NATIONAL GRID, GEI AND GEI'S SUBCONTRACTORS CONTRACTOR DO NOT GUARANTEE THE HEALTH OR SAFETY OF ANY PERSON ENTERING THIS SITE. DUE TO THE NATURE OF THIS SITE AND THE ACTIVITY OCCURRING THEREON, IT IS NOT POSSIBLE TO DISCOVER, EVALUATE, AND PROVIDE PROTECTION FOR ALL POSSIBLE HAZARDS THAT MAY BE ENCOUNTERED. STRICT ADHERENCE TO THE HEALTH AND SAFETY GUIDELINES SET FORTH HEREIN WILL REDUCE, BUT NOT ELIMINATE, THE POTENTIAL FOR INJURY AT THIS SITE. THE HEALTH AND SAFETY GUIDANCE IN THIS PLAN WAS PREPARED TO SERVE AS AN EXAMPLE TO POTENTIAL GEI EMPLOYEES AND GEI'S SUBCONTRACTORS THAT MAY WORK AT THIS SITE AND SHOULD NOT BE USED ON ANY SPECIFIC PROJECT WITHOUT PRIOR RESEARCH AND EVALUATION BY TRAINED HEALTH AND SAFETY SPECIALISTS.

## GEI APPROVALS

By their signature, the undersigned hereby certify that this HASP has been reviewed and approved for use at the National Grid Corporation (National Grid) Glen Cove, New York site.

---

MICHAEL D. ZUKAUSKAS, P.E.  
PROJECT MANAGER  
GEI CONSULTANTS, INC.

---

DATE

---

ROBIN B. DEHATE, PhD, CMMM  
CORPORATE HEALTH AND SAFETY OFFICER  
GEI CONSULTANTS, INC.

---

DATE

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## 1. INTRODUCTION

---

### 1.1 PURPOSE

This Health and Safety Plan (HASP) addresses the health and safety practices that will be employed by workers participating in investigation and remediation activities at the site that are under the direction of the **CONSULTANT, GEI Consultants, Inc (GEI)**. This work will be performed at the National Grid Corporation (National Grid) Former Manufactured Gas Plant (MGP) Glen Cove, New York site (Site). The HASP takes into account the specific hazards inherent to the Site, and presents procedures to be followed by GEI, its SUBCONTRACTOR, and all site visitors in order to avoid and if necessary, protect against health and/or safety hazards. Activities performed under this HASP will comply with applicable parts of OSHA Regulations, primarily 29 CFR Parts 1910 and 1926 and attached National Grid policies and procedures. A copy this HASP will be maintained on-site for the duration of work.

All workers who may participate in activities at the Site that are under the direction of **GEI** are required to comply with the provisions specified in this HASP. All site visitors who enter designated work zones must also comply with this HASP. Refusal or failure to comply with the HASP or violation of any safety procedures by field personnel and/or subcontractors performing work covered by this HASP may result in immediate removal from the site following consultation with **GEI**.

### 1.2 SCOPE

This HASP has been developed to address the health and safety concerns during site investigation and remedial actions at the Site that are under the direction of **GEI**. Although the HASP addresses all activities listed below, work at the individual locations may include all, or only some of these tasks.

The HASP addresses the following activities:

#### Mobilization/Demobilization

- Mobilization/Demobilization of Equipment and Supplies
- Establishment of Site Security, Work Zones and Staging Areas

#### Pre-Construction Activities

- Locate All Utilities to and from the Site
- Locate All Active Utility Lines on Site

#### Investigation Activities

- Installation of Soil Borings, Groundwater Probes, and Monitoring Wells
- Sampling of Groundwater and Soil
- Pilot testing groundwater treatment equipment
- DNAPL Recovery Testing

#### Construction Activities

- Installation of Excavation Support System
- Excavation of Impacted Soils
- Construction Dewatering
- Community Air Monitoring
- Utility Connections (Electrical)
- Excavation and Trenching
- Injection System Installation

### **1.3 APPLICATION**

The HASP applies to all personnel involved in the above tasks that are under the direction of **GEI**, who wish to gain access to active work areas, including but not limited to:

- National Grid representatives, GEI, and GEI's subcontractors performing tasks under the direction of GEI;
- Federal, State or local representatives;

## **2. PROJECT ORGANIZATION AND RESPONSIBILITIES**

---

This section specifies the GEI Project Organization.

### **2.1 PROJECT MANAGER (PM)**

The Project Manager is Michael Zukauskas. The PM responsibilities include the following:

- Ensures implementation of this program;
- Conducts periodic inspections;
- Participates in incident investigations;
- Ensures the HASP has all of the required approvals before any site work is conducted;
- Ensures that the Site Manager is informed of project changes which require modifications of the site safety plan; and
- Has overall project responsibility for Project Health and Safety.

### **2.2 SITE MANAGER (SM)**

The Site Manager is TBD. The SM responsibilities include the following:

- Ensures that the HASP is implemented and that all health and safety activities identified in site safety plans are conducted and/or implemented;
- Ensures that field work is scheduled with adequate personnel and equipment resources to complete the job safely and enforce site health and safety rules;
- Ensures that adequate communication between field crews and emergency response personnel is maintained;
- Ensures that field site personnel are adequately trained and qualified to work at the site and that proper personal protective equipment is utilized by field teams;
- Investigate and report all accidents/incidents to the PM;
- Conducts and documents daily safety briefings;
- Stop work if necessary;
- Acts as the primary point of contact with National Grid for site related activities and coordination with non-project related site operations;
- Identifies operational changes which require modifications to health and safety procedures and site safety plans, and ensures that the procedure modifications are implemented and documented through changes to the HASP, with CHSO approval;
- Direct and coordinate health and safety monitoring activities;
- Determines upgrades or downgrades of personal protective equipment (PPE) based on site conditions and/or real-time monitoring results;
- Ensures that monitoring instruments are calibrated; and
- Reports to the CHSO to provide summaries of field operations and progress.

## **2.3 CORPORATE HEALTH AND SAFETY OFFICER (CHSO)**

The CHSO is a qualified health and safety professional with experience in hazardous waste site remediation activities. The CHSO is Robin Dehate. The CHSO responsibilities include the following:

- Provides for the development and approval of the HASP;
- Serves as the primary contact to review health and safety matters that may arise;
- Approves revised or new safety protocols for field operations;
- Coordinates revisions of this HASP with field personnel;
- Coordinates upgrading or downgrading of personal protective equipment with the SM; and
- Assists in the investigation of all accidents/incidents;

## **2.4 SITE SUPERVISOR**

The Site Supervisor is TBD. The Site Supervisor responsibilities include the following:

- Provide for the necessary training of field crews in accordance with OSHA regulations and provides proof of training to the SM prior to entering the site;
- Conduct routine safety inspections of their work areas;
- Conduct incident investigations and together with the SM, prepares appropriate reports;
- Enforce requirements about working around utilities including electrical;
- Will serve as the Competent Person and delegate other qualified employees as necessary to serve as a Competent Person with regards to above ground and underground utilities;
- Enforces health and safety rules and compliance with the HASP; and
- Plans field work using appropriate safe procedures and equipment.

## **2.5 SITE PERSONNEL**

The Site Personnel responsibilities include the following:

- Report any unsafe or potentially hazardous conditions to the SM;
- Maintain knowledge of the information, instructions and emergency response actions contained in the HASP;
- Comply with rules, regulations and procedures as set forth in this HASP and any revisions;
- Prevent admittance to work sites by unauthorized personnel; and
- Inspect all tools and equipment, including PPE, prior to use.

### 3. SITE HISTORY AND PROJECT DESCRIPTION

---

#### 3.1 LOCATION

The National Grid Glen Cove Site is located in the village of Glen Cove, Town of Oyster Bay, Nassau County, New York. See the Site-Specific Information provided in Appendix A for the Site Location Map.

#### 3.2 BACKGROUND AND SITE DESCRIPTION

MGP operations at the site began in 1905 under the ownership of the Sea Cliff and Glen Cove Gas Company. The facility's footprint was relatively small and remained unchanged through its operational period, which ended in 1929. Facility structures were located on the northern section of the property, and consisted of a 60,000 cubic foot gas holder; boilers, purifiers, retorts, coal shed, engine room, tar and oil tank; and approximately eight gas tanks. A 40,000 cubic foot high pressure Hortonsphere gas holder was added to the facility in the southwestern portion of the site in 1925 for gas distribution purposes. In 1923, Sea Cliff and Glen Cove Gas Company was purchased or merged with the Long Island Lighting Company (LILCO).

In 1929, LILCO terminated MGP operations and demolished the facility's surface structures sometime thereafter. Site activities following 1929 consisted solely of natural gas storage in the Hortonsphere gas holder through the 1950s. The Hortonsphere was decommissioned and demolished between 1959 and 1966.. In 1998, Brooklyn Union Gas (BUG) and LILCO merged to form the KeySpan Corporation, at which time the ownership of the substation was transferred to Long Island Power Authority (LIPA). Currently, the site is owned by LIPA and operated by KeySpan under contract to LIPA as a major electrical substation, which was constructed in the mid-1960s.

In 2007, National Grid acquired responsibility for the former MGP property through the acquisition of KeySpan. Currently, the site is owned by LIPA and operated by National Grid under contract to LIPA. The substation footprint is coincidental with the majority of the main operations area of the former MGP. High voltage transmission lines transverse the fenced substation area and the west and northwest sections of the site both aerially and below grade (Figure 3).

Through the 2007 acquisition of KeySpan, National Grid has accepted responsibility for addressing the environmental issues at the site. As such, National Grid will be referenced in the performance of all past and future work throughout the remainder of the document.

The Glen Cove Former MGP site is an inverted L-shaped parcel of approximately 1.9 acres presently occupied by an active electrical substation (**Figure 2**) which services Glen Cove and the surrounding area. Topographically, the Site is a flat depression bounded by approximately 20-foot high slopes to the north, south and east.

To the west, the property slopes downward about 17 feet to Glen Cove Creek, a channelized stream, which eventually discharges to Hempstead Bay. The Site is bordered by a health club parking area to the north, with the Long Island Railroad (LIRR) tracks to the northwest, mixed commercial/residential properties to the south and east, and Glen Cove Arterial Highway (Route 107) right-of-way (ROW) to the west. Glen Cove Creek flows in a general south to north direction along the western property line. It approaches the property via a culvert which passes beneath Route 107 and flows along the property line in an open channelized section. The creek leaves the property boundary at the northwest corner of Construction Manager the Site through a box culvert that directs flow beneath the LIRR tracks. The creek eventually discharges to Mosquito Cove (Hempstead Bay).

The Site is located in a flat depression bounded by approximately 20-foot high slopes to the north, south and east. Vehicle access to the Site is limited to a one-lane steeply-graded access road from Grove Street from a residential neighborhood terminating at the flat area in the center of the Site. The active LIPA substation, located on the flat portion of the Site, is an important component of the utility's infrastructure. The substation is fenced, as is access to the wooded western portion of the Site, and access from Grove Street. An easement runs along the north boundary of the property parallel to the health club property terminating to the east at Cedar Swamp Road.

## 4. POTENTIAL HAZARDS AT THE SITE

---

This section presents an assessment of the chemical, biological, and physical (including electrical) hazards that may be encountered during the tasks specified under HASP Section 1.2. A Hazard Communication Program is included in Appendix B. The Hazard Communication Program describes procedures for: 1) determining chemical hazards, 2) providing training on chemical hazards, 3) and transmitting chemical hazard information.

### 4.1 PROPERTIES OF CHEMICAL CONTAMINATION

The characteristics of compounds at the Site are discussed below for information purposes. Adherence to the safety and health guidelines in this HASP should reduce the potential for exposure to the compounds discussed below.

Polyaromatic hydrocarbons (PAHs) are present at the Site in impacted soil and groundwater and as a dense nonaqueous phase liquid (DNAPL) by-product of gas production. At high concentrations, these compounds generally have a depressant effect on the central nervous system (CNS), may cause chronic liver and kidney damage, and some are suspected human carcinogens. Acute exposure may include headache, dizziness, nausea, and skin and eye irritation.

Volatile organic chemicals (VOCs), such as benzene, toluene, ethyl benzene, and xylene (BTEX) may be present as soil and groundwater contaminants and in some cases as free product in abandoned pipelines. At high concentrations, these compounds generally have a depressant effect on the CNS, may cause chronic liver and kidney damage, and some are suspected human carcinogens. Benzene is a known human carcinogen. Acute exposure may include headache, dizziness, nausea, and skin and eye irritation.

Elevated concentrations of arsenic and lead may be encountered within subsurface soils. Exposure to arsenic can cause dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, and hyperpigmentation of skin. Chronic exposure to arsenic has resulted in lung cancer in humans. Exposure to lead may cause acute symptoms such as eye irritation, weakness, weight loss, abdominal pain, and anemia. Chronic exposure to lead may result in kidney disease, effects to the reproductive system, blood forming organs, and CNS. The primary route of exposure is through inhalation of dust particles when subsurface soils are disturbed and become airborne. Air monitoring will be completed as specified in Section 7 to minimize airborne exposures during subsurface soil investigations.

Cyanide compounds are common by-products of manufactured gas production. Hydrogen cyanide is toxic because it is a chemical asphyxiant.

It replaces the oxygen in the blood and thereby suffocates the cells. Ferrocyanides are not considered toxic because the hydrogen cyanide ion is bound too tightly to the iron and cannot therefore replace the oxygen.

It takes a great amount of heat and/or acid to release cyanide gas from the ferrocyanide molecule, therefore hydrogen cyanide is not a concern at this site.

Hydrogen sulfide is another common by-product of manufactured gas production. Exposure to lower concentrations can result in eye irritation, a sore throat and cough, shortness of breath, and fluid in the lungs. These symptoms usually go away in a few weeks. Long-term, low-level exposure may result in fatigue, loss of appetite, headaches, irritability, poor memory, and dizziness. Breathing very high levels (>800 ppm) of hydrogen sulfide can cause death within just a few breaths. The primary route of exposure is through inhalation and therefore respiratory protection is the primary control against exposure to hydrogen sulfide.

There is no record indicating that asbestos or asbestos containing materials (ACM) have been disposed of, detected, or observed on-site. ACM can be present in the form of demolition debris, ACM pipe insulation, and asbestos cement pipe. Chronic exposure to asbestos may cause asbestosis and mesothelioma. The primary route of exposure for asbestos is inhalation during the disturbance and/or removal of asbestos from the pipe insulation and cement pipes.

Asbestos is strictly regulated under OSHA 29 CFR 1910.1001/1926.1101. Employees that may be potentially exposed to ACM must participate in a medical surveillance program, have specific training in the hazards and controls of exposure to asbestos and wear respirators with high-efficiency particulate air (HEPA) filters. All work must be conducted in demarcated regulated areas to minimize the amount of people within the exposure area. Employers must conduct air sampling and provide signs and labels regarding the presence of asbestos.

There is no record indicating that polychlorinated biphenyls (PCBs) have been disposed of, detected, or observed onsite. The potential exists for PCBs to be encountered in subsurface soil because of the industrial and commercial operations in the area. PCBs have historically been used from a number of sources including, but not limited to: electrical systems, hydraulic oils, lubricants, cutting oils, printer's ink, and asphalt. Exposure to PCBs can occur through unbroken skin without immediate pain or irritation. Acute affects of PCB exposure can include eye, skin, nose, and throat irritation. Chronic effects of PCB exposure can include skin swelling and redness, gastro-intestinal disturbances, and neurological effects such as headache, dizziness, nervousness, and numbness of extremities. PCBs are suspected human carcinogens that can cause liver cancer. PCBs can accumulate in fatty tissues and result in health effects after the initial exposure has occurred. The primary route of exposure for PCBs is inhalation, dermal contact, and ingestion.

#### *4.1.1 Other Chemical Hazards*

Chemicals not identified in this HASP may be used during investigation and remediation activities. Prior to the initiation of these tasks, Material Safety Data Sheets will be obtained for each of the chemicals to be used, and all site workers and visitors who may potentially be exposed will be made aware of these hazards.

If the CHSO determines that monitoring will be required to determine if these chemicals are potentially migrating off-site, a monitoring program will be established that is consistent with the provisions stated in Section 7.

## **4.2 BIOLOGICAL HAZARDS**

During the course of the project, there is a potential for workers to come into contact with biological hazards such as animals, insects and plants. Workers will be instructed in hazard recognition, health hazards, and control measures during site-specific training.

#### *4.2.1 Animals*

During the conduct of site operations, wild animals such as stray dogs or cats, raccoons, and mice may be encountered. Workers shall use discretion and avoid all contact with wild animals. If these animals present a problem, efforts will be made to remove these animals from the site by contacting a licensed animal control technician.

#### *4.2.2 Insects*

Insects, including bees, wasps, hornets, and spiders, may be present at the Site making the chance of a bite possible. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition, any individuals who have been bitten or stung by an insect should notify the SM. The following is a list of preventive measures:

- Apply insect repellent prior to performing any field work and as often as needed throughout the work shift.
- Wear proper protective clothing (work boots, socks and light colored pants).
- When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible.
- Field personnel who may have insect allergies shall have bee sting allergy medication on site and should provide this information to the SM prior to commencing work.

**Table 4-1  
Chemical Data**

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Benzene	71-43-2	0.5 ppm (skin)	1 ppm TWA 5 ppm STEL	Inhalation Skin Absorption Ingestion Skin Contact	Irritant eyes, skin, nose, respiratory system, nausea; potential carcinogen	Eyes, skin, CNS, bone marrow, blood	FP: 12° F IP: 9.24 eV LEL: 1.2% UEL: 7.8% VP: 75 mm
Ethylbenzene	100-41-4	100 ppm	100 ppm	Inhalation Ingestion Skin Contact	Eye, skin, mucous membrane irritation; headache; dermatitis, narcosis; coma	Eyes, skin, respiratory system, CNS	FP: 55° F IP: 8.76 eV LEL: 0.8% UEL: 6.7% VP: 7 mm
Toluene	108-88-3	50 ppm	200 ppm	Inhalation Skin Absorption Ingestion Skin Contact	Eye, nose irritation; fatigue, weakness, confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscle fatigue, insomnia, tingling in limbs; dermatitis	Eyes, skin, resp system, CNS, liver, kidneys	FP: 40° F IP: 8.82 eV LEL: 1.1% UEL: 7.1% VP: 21 mm
Xylene	1330-20-7	100 ppm	100 ppm	Inhalation Skin Absorption Ingestion Skin Contact	Eye, skin, nose, throat irritation; dizziness, excitement, drowsiness; un-coordination, staggering gait; corneal damage; appetite loss, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, resp system	FP: 90° F IP: 8.56 eV LEL: 0.9% UEL: 6.7% VP: 9 mm
Arsenic	7440-38-2	0.01 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	Inhalation Skin Absorption Ingestion Skin Contact	Ulceration of nasal septum, derm, GI disturbances, peripheral neuropathy, resp irr, hyperpig of skin, potential carcinogen	Liver, kidneys, skin, lungs, lymphatic system	Metal: Silver-gray or tin-white, brittle, odorless solid FP: NA IP: NA LEL: NA UEL: NA VP: 0 mm
Asbestos	1332-21-4	0.1 f/cc	0.1 f/cc	Inhalation Ingestion Skin Contact	Asbestosis (chronic exposure); mesothelioma, breathing difficulty, interstitial fibrosis' restricted pulmonary function, finger clubbing; irritate eyes	Respiratory system, eyes	White, greenish, blue, or gray-green fibrous solids FP: NA IP: NA LEL: NA UEL: NA VP: 0 mm

**Table 4-1  
 Chemical Data**

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Lead	7439-92-1	0.050 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>	Inhalation Ingestion Skin Contact	Weak, lass, insom; facial pallor; pal eye, anor, low-weight, malnut; constipation, abdomen inal pain, colic; anemia; gingival lead line; tremor; paralyzed wrist, ankles; irritant eyes	Eyes, GI tract, CNS, kidneys, blood, gingival tissue	A heavy, ductile, soft, gray solid. FP: NA IP: NA LEL: NA UEL: NA VP: 0 mm
Naphthalene	91-20-3		10 ppm (50 mg/m <sup>3</sup> ) TWA	inhalation, skin absorption, skin ingestion, skin and/or eye contact	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage	Eyes, skin, blood, liver, kidneys, central nervous system	FP: 174 F IP: 8.12 eV, LEL: 0.8% UEL:6.7%, VP: 0.08 mm
PAH's as Coal tar pitch Volatiles (CTPV)	65996-93-2	0.2 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>	Inhalation Skin contact Ingestion	Irritant to eyes, swelling, acne contact dermatitis, chronic bronchitis	Respiratory system, CNS, liver, kidneys, skin, bladder, carc	Black or dark brown amorphous residue.
PCBs	11097-69-1	0.5 mg/m <sup>3</sup> (Skin)	0.5 mg/m <sup>3</sup> (Skin)	Inhalation Skin Absorption Ingestion Skin Contact	Irritate eyes; chloracne; liver damage;	Skin, eyes, liver, reproductive system	Colorless liquid or solid with a mild, hydro-carbon odor VP = 0.00006 mm
Hydrogen cyanide	74-90-8	4.7 ppm (5 mg/m <sup>3</sup> ) STEL [skin]	10 ppm (11 mg/m <sup>3</sup> ) [skin]	Inhalation Ingestion Absorption Skin/Eye Contact	Asphyxia; weakness, headache, confusion; nausea, vomiting; increased rate and depth of respiration or respiration slow and gasping; thyroid, blood changes	CNS, CVS, thyroid, blood	Colorless or pale-blue liquid or gas (above 78°F) with a bitter, almond-like odor.  VP: 630 mmHg IP: 13.60 eV

**Table 4-1  
Chemical Data**

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Hydrogen sulfide	7783-06-4	10 ppm TWA,  15 ppm STEL	20 ppm C,  50 ppm [10-min. Maximum peak]	Inhalation Skin/Eye Contact	Irritation eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (discharge of tears), photophobia (abnormal visual intolerance to light), corneal vesiculation; dizziness, headache, fatigue, irritability, insomnia; gastrointestinal disturbance; liquid: frostbite	Eyes, respiratory system, CNS	Colorless gas with a strong odor of rotten eggs. VP: 17.6 atm IP: 10.46 eV
<b><u>Abbreviations</u></b>							
C = ceiling limit, not to be exceeded				LEL = Lower explosive limit			
CNS = Central Nervous System				mm = millimeter			
CVS = Cardiovascular System				ppm = parts per million			
eV = electron volt				Skin = significant route of exposure			
FP = Flash point				STEL = Short-term exposure limit (15 minutes)			
IP = Ionization Potential				TWA = Time-weighted average (8 hours)			
GI = Gastro-intestinal				UEL = Upper explosive limit			
				VP = vapor pressure approximately 68° F in mm Hg (mercury)			

#### 4.2.3 *Lyme Disease*

Lyme disease is caused by infection from a deer tick that carries a spirochete. During the painless tick bite, the spirochete may be transmitted into the bloodstream that could lead to the worker contracting Lyme disease.

Lyme disease may cause a variety of medical conditions including arthritis, which can be treated successfully if the symptoms are recognized early and medical attention is received. Treatment with antibiotics has been successful in preventing more serious symptoms from developing. Early signs may include a flu-like illness, an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems as well as a disabling type of arthritis.

Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. This flu-like illness is out of season, commonly happening between May and October when ticks are most active. A large expanding skin rash usually develops around the area of the bite. More than one rash may occur. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. It's easy to miss the rash and the connection between the rash and a tick bite. The rash develops from three days to as long as a month after the tick bite. Almost one third of those with Lyme disease never get the rash.

Joint or muscle pain may be an early sign of Lyme disease. These aches and pains may be easy to confuse with the pain that comes with other types of arthritis. However, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

Lyme disease can affect the nervous system. Symptoms include stiff neck, severe headache, and fatigue usually linked to meningitis. Symptoms may also include pain and drooping of the muscles on the face, called Bell's Palsy. Lyme disease may also mimic symptoms of multiple sclerosis or other types of paralysis.

The disease can also cause serious but reversible heart problems, such as irregular heartbeat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Often, the effects of Lyme disease may be confused with other medical problems.

It is recommended that personnel check themselves when in areas that could harbor deer ticks, wear light color clothing and visually check themselves and their buddy when coming from wooded or vegetated areas. If a tick is found biting an individual, the SM should be contacted immediately. The tick can be removed by pulling gently at the head with tweezers. The affected area should then be disinfected with an antiseptic wipe. The employee will be offered the option for medical treatment by a physician, which typically involves prophylactic antibiotics. If

personnel feel sick or have signs similar to those above, they should notify the SM immediately. Workers' pants should be tucked into their socks to prevent ticks from crawling up their legs.

#### *4.2.4 Plants*

The potential for contact with poisonous plants exists when performing field work in undeveloped and wooded areas. Poison ivy, sumac, and oak may be present on site. Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison sumac can be present in the form of a flat-topped shrub or tree. It has fern-like leaves, which are velvety dark green on top and pale underneath. The branches of immature trees have a velvety "down." Poison sumac has white, "hairy" berry clusters. Poison oak can be present as a sparingly branched shrub. Poison oak is similar to poison ivy in that it has the same leaflet configuration, however, the leaves have slightly deeper notches. Prophylactic application of Tecnu may prevent the occurrence of exposure symptoms. Post exposure over the counter products are available and should be identified at the local pharmacist. Susceptible individuals should be identified by the SM.

Contact with poison ivy, sumac, or oak may lead to a skin rash, characterized by reddened, itchy, blistering skin which needs first aid treatment. If you believe you have contacted one of these plants, immediately wash skin thoroughly with soap and water, taking care not to touch your face or other body parts.

### **4.3 PHYSICAL HAZARDS**

Physical hazards will be addressed as necessary. More detailed safety procedures are provided as appendices where applicable.

#### *4.3.1 Cold Stress*

At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia as well as slippery surfaces, brittle equipment, poor judgment and unauthorized procedural changes. The procedures to be followed are found in Appendix C, the Cold Stress Program.

#### *4.3.2 Heat Stress*

Heat stress is a significant potential hazard, which is greatly exacerbated with the use of PPE in hot environments. The potential hazards of working in hot environments include dehydration, cramps, heat rash, heat exhaustion, and heat stroke. A heat stress prevention program will be implemented when ambient temperatures exceed 70°F for personnel wearing impermeable clothing. The procedures to be followed are found in Appendix D, the Heat Stress Program.

#### *4.3.3 Noise*

Noise is a potential hazard associated with the operation of heavy equipment, power tools, pumps and generators. Site workers who will perform suspected high noise tasks and operations for short durations (less than 1-hour) will be provided with earplugs. If deemed necessary by the SM, the CHSO will be consulted on the need for additional hearing protection and the need to monitor sound levels for site activities.

#### *4.3.4 Hand and Power Tools*

In order to complete the various tasks for the project, personnel will utilize hand and power tools. The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. Work gloves, safety glasses, and hard hats will be worn by the operating personnel at all times when utilizing hand and power tools and GFI-equipped circuits will be used for all power tools.

#### *4.3.5 Slips, Trips, and Falls*

Working in and around the site will pose slip, trip and fall hazards due to slippery surfaces that may be oil covered, or from surfaces that are wet from rain or ice. Excavation at the sites will cause uneven footing in the trenches and around the spoil piles.

#### *4.3.6 Fire and Explosion*

When conducting excavating activities, the opportunity of encountering fire and explosion hazards exists from contamination in the soil and the possibility of free product in the underground pipelines. This will be especially hazardous when pipelines are sawed or broken to grout the ends. Additionally, the use of a diesel engine on excavating equipment could present the possibility of encountering fire and explosion hazards.

#### *4.3.7 Manual Lifting*

Manual lifting of heavy objects such as sections of pipe may be required. Failure to follow proper lifting technique can result in back injuries and strains. Site workers will be instructed to use power equipment to lift heavy loads when possible and to evaluate loads before trying to lift them (i.e. they should be able to easily tip the load and then return it to its original position). Carrying heavy loads with a buddy and proper lifting techniques, 1) make sure footing is solid, 2) make back straight with no curving or slouching, 3) center body over feet, 4) grasp the object firmly and as close to your body as possible, 5) lift with legs, and 6) turn with your feet, don't twist, will be stressed. Back injuries are a serious concern as they are the most common workplace injury, often resulting in lost or restricted work time, and long treatment and recovery periods. In addition, hand digging for pipes may present lifting/ergonomic hazards.

#### 4.3.8 *Steam, Heat, Splashing*

Exposure to steam/heat/splashing hazards can occur during steam cleaning activities. Exposure to steam/heat/splashing can result in scalding/burns, eye injury, and puncture wounds. Proper PPE will be worn during all steam cleaning activities including rain gear or tyvek, hardhat equipped with splashguard, and water resistant gloves and boots.

#### 4.3.9 *Utilities (Electrocution and Fire Hazards)*

The Competent Person as defined in 2.4 will oversee utility procedures as described below. This competent Person can delegate other qualified employees as necessary to serve as a Competent Person.

- Underground utilities at the site pose fire, explosion, and electrocution hazards. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death. Underground utilities, facilities, equipment, and structures will be located prior to start of remedial excavation activities. The Underground Utilities Call Center will be notified a minimum of three (3) days before any subsurface disturbance. In the area of known underground utilities, such as the Lowland Area, all utilities will be located using a vacuum truck. If utilities are detected, no mechanical excavation will take place within three (3) feet of such utilities. All underground utilities are initially going to be considered active. However, if two open ends of an underground utility are found, this conduit will be considered inactive and removed from the ground. All underground utilities will be surveyed and a site wide utility drawing will be made. During portions of the excavation, alternate access will be provided into the substation.
- Overhead transmission lines pose fire, explosion, and electrocution hazards. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death. The overhead lines will be covered using eels to ensure high visibility. A competent Person/spotter as defined in 2.4 will oversee equipment operation to ensure that safe working distances (at least ten (10) feet) are maintained with respect to work near energized overhead conductors.

## **5. PROCESS SAFETY MANAGEMENT**

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Process Safety Management is a systematic way of identifying the potential health and safety hazards associated with major phases of work on the project and the methods to avoid, control, and mitigate those hazards. Process Safety Management Program guidance can be found in Appendix E. Process Safety Management guidelines will be developed for all activities as necessary, prior to start-up. Process Safety Management will be used to train work crews in proper safety procedures during phase preparatory meetings.

## 6. PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment (PPE) specified in Table 6-1 represents the hazard analysis and PPE selection required by 29 CFR 1910.132. Specific information on the selection rationale for each activity can be found under Section 4 and Appendix F - Personal Protective Equipment (PPE): Selection and Use. For the purposes of PPE selection, the CHSO and SM (if they have completed the 8-hour OSHA Site Supervisor Training) are considered competent persons. The signatures on the front of the HASP constitute certification of the hazard assessment. For activities not covered by Table 6-1, the SM will conduct the hazard assessment and select the PPE using the information provided in Appendix F. PPE selection will be made in consultation with the CHSO.

Modifications for initial PPE selection may also be made by the SM in consultation with the CHSO using the same form. A written justification for major downgrades will be provided to the CHSO for approval on a field change request form.

Table 6-1 describes the anticipated task-specific PPE.

### 6.1 PPE ABBREVIATIONS

<u>HEAD PROTECTION</u> HH = Hard Hat meeting ANSI Z89.1  <u>HEARING PROTECTION</u> EP = ear plugs EM = ear muffs	<u>EYE/FACE PROTECTION</u> APR = Full Face Air Purifying Respirator MFS = Mesh Face shield PFS = Plastic Face shield SG = ANSI Z87.1 approved safety glasses with side shields	<u>FOOT PROTECTION</u> Neo = Neoprene OB = Overboot Poly = polyethylene coated boot Rub = rubber slush boots STB = Leather work boots with steel toe meeting ANSI Z41.1. STB-EHR = Electric hazard Resistant leather work boots with steel toe
<u>HAND PROTECTION</u> Cot = cotton But = Butyl LWG = Leather Work Gloves Neo = Neoprene Nit = Nitrile Sur = Surgical Nit Sur - Nitrile Surgical	<u>BODY PROTECTION</u> Cot Cov = Cotton Coveralls Poly = Polyethylene coated tyvek coveralls Saran = Saranex coated tyvek coveralls Tyvek = Uncoated paper tyvek coveralls WC = Work clothes FR = Fire Resistant	<u>RESPIRATORY PROTECTION</u> Level D = No respiratory protection required Level C = Full face air purifying respirator with approved cartridges Level B = Full face air supplied respirator with escape bottle

**TABLE 6-1**  
**PERSONAL PROTECTIVE EQUIPMENT SELECTION**

TASK	HEAD	EYE/FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR
<b><u>Mobilization/Demobilization</u></b>							
Mobilization/ demobilization of equipment and supplies	HH	SG	STB	LWG as needed	WC + FR as required	EP as needed	Level D
Establishment of site security, work zones and staging area	HH	SG	STB	LWG as needed	WC + FR as required	EP as needed	Level D
<b><u>Pre Soil Boring Installation Activities</u></b>							
Locate all utilities to and from the site	HH	SG	STB	LWG as needed	WC + FR as required	EP as needed	Level D
Locate all active utility lines on site	HH	SG	STB	LWG as needed	WC + FR as required	EP as needed	Level D
<b><u>Construction Activities</u></b>							
Excavation and Trenching	HH	SG	STB	LWG as needed	WC + FR as required	EP as needed	Level D
Excavation Support Installation	HH	SG	STB	LWG as needed	WC + FR as required	EP as needed	Level D
Groundwater Treatment System Installation	HH	SG	STB	LWG as needed	WC + FR as required	EP as needed	Level D
<b><u>Soil/Groundwater Sampling Activities</u></b>							
Soil Borings and Soil Sampling, Groundwater probes/Monitoring Well Install and Groundwater Sampling	HH	SG	STB	Nit Sur, LWG	WC + FR as required	EP as needed	Level D
DNAPL Well Installation and DNAPL Monitoring Program	HH	SG	STB-EHR	Nit Sur, LWG	WC + FR as required	EP as needed	Level D

## 6.2 OSHA REQUIREMENTS FOR PERSONAL PROTECTIVE EQUIPMENT

All personal protective equipment used during the course of this field investigation must meet the following OSHA standards:

<u>Type of Protection</u>	<u>Regulation</u>	<u>Source</u>
Eye and Face	29 CFR 1910.133	ANSI Z87.1-1968
Respiratory	29 CFR 1910.134	ANSI Z88.1-1980
Head	29 CFR 1910.135	ANSI Z89.1-1969
Foot	29 CFR 1910.136	ANSI Z41.1-1967

ANSI = American National Standards Institute

Any on-site personnel who have the potential to don a respirator must have a valid fit test certification and documentation of medical clearance. The CHSO will maintain such information on file for **GEI** personnel. The SM will obtain such information from the subcontractor's site supervisor prior to the initiation of any such work. Both the respirator and cartridges specified for use in Level C protection must be fit-tested prior to use in accordance with OSHA regulations (29 CFR 1910.1025; 29 CFR 1910.134). Air purifying respirators cannot be worn under the following conditions:

- Oxygen deficiency;
- IDLH concentrations; and
- If contaminant levels exceed designated use concentrations.

## 7. MONITORING

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### 7.1 MONITORING REQUIREMENTS

Environmental Health and Safety Monitoring will be performed by GEI in accordance with this section.

#### 7.1.1 *Work Zone Monitoring*

The following monitoring instruments will be available for use during field operation as necessary:

- Photoionization Detector (PID), Photovac Microtip with 10.6 eV lamp or equivalent; or
- Flame Ionization Detector (FID), Foxboro OVA model 128 or equivalent; and
- Dust Meter, MIE Miniram model PDM-3 or equivalent; and
- Combustible Gas Indicator (CGI)/Oxygen (O<sub>2</sub>) / H<sub>2</sub>S / HCN meter, MSA model 361 or equivalent; and
- Sound Level Meter if deemed necessary by the SM and CHSO, type to be appropriate to the activities performed.

All air monitoring equipment will be calibrated and maintained in accordance with manufacturer's requirements and the Monitoring Instruments: Use, Care, and Calibration program included in Appendix G.

Organic vapor concentrations shall be measured using the PID and/or FID during excavating and other intrusive activities. During intrusive operations, organic vapor concentrations shall be measured continuously; during other activities, readings shall be taken at least once every hour. Organic vapor concentrations shall be measured upwind of the work site(s) to determine background concentrations at least twice a day, (once in the morning and once in the afternoon). The SM will interpret monitoring results using professional judgment.

A dust meter shall be used to measure airborne particulate matter during intrusive activities. Monitoring will be continuous and readings will be averaged over a 15-minute period for comparison with the action levels. Monitoring personnel will make a best effort to collect dust monitoring data from downwind of the intrusive activity. If off-site sources are considered to be the source of the measured dust, upwind readings will also be collected.

A CGI/O<sub>2</sub> meter shall be used to monitor for combustible gases and oxygen content in the trenches and surrounding areas and elsewhere as necessary. The CGI will also be equipped with a hydrogen sulfide sensor and hydrogen cyanide sensor. H<sub>2</sub>S monitoring will be completed every fifteen minutes, or if a sulfur odor is present, monitoring will be continuous.

HCN monitoring will be completed every fifteen minutes, or if an almond odor is detected, monitoring will be continuous.

All trenches will be monitored before entry at the beginning of each shift.

Guidelines have been established by the National Institute for Occupational Safety and Health (NIOSH) concerning the action levels for work in a potentially explosive environment. These guidelines are as follows: 10% LEL- Limit all activities to those which do not generate sparks, 20% LEL- Cease all activities in order to allow time for the combustible gases to vent.

**TABLE 7-1**  
**REAL TIME AIR MONITORING ACTION LEVELS**

<b>Air Monitoring Instrument</b>	<b>Monitoring Location</b>	<b>Action Level</b>	<b>Site Action</b>
PID/FID - Benzene	Breathing Zone	.5 ppm	Use detector tube for benzene or z-nose to verify. Work stoppage until benzene presence is determined. Level C, stop work, and withdraw from work area if benzene levels are present.
		1ppm	Stop work, withdraw from work area; notify CHSO
PID/FID	Breathing Zone	0 - 10 ppm	No respiratory protection is required if benzene is not detected
		10 - 250 ppm	Level C, stop work, withdraw from work
		> 250 ppm	Stop work, withdraw from work area; notify CHSO
Oxygen meter	Breathing Zone	< 20.7%	Stop work; withdraw from work area; notify CHSO.
		> 21.2%	Stop work; withdraw from work area; notify CHSO.
H2S meter	Breathing Zone	<5 ppm	No respiratory protection is required
		>5 ppm	Stop work, cover excavation, notify CHSO
HCN meter	Breathing Zone	<2.5 ppm	No respiratory protection is required
		>2.5 ppm	Stop work, cover excavation, notify CHSO
CGI	Excavation	< 10 % LEL	Investigate possible causes, allow excavation to ventilate; use caution during procedures.
		> 10% LEL	Stop work; allow excavation, borehole to ventilate to < 10% LEL; if ventilation does not result in a decrease to < 10% LEL, withdraw from work area; notify CHSO.
Dust Meter	Excavation	> 1.5 mg/m <sup>3</sup>	Implement work practices to reduce/minimize airborne dust generation, e.g., spray/misting of soil with water
		> 2.5 mg/m <sup>3</sup>	Upgrade to Level C PPE

## 7.2 COMMUNITY AIR MONITORING PLAN

This community air monitoring plan has been designed to conform with the guidelines presented by the New York State Department of Health in Appendix 1A of the Draft New York State Department of Conservation DER-10 Technical Guidance for Site Investigation and Remediation. Real-time air monitoring for volatile compounds at the perimeter of the exclusion zone will be conducted. If particulates become a concern at the site, possibly as a result of excavating activities or wind erosion of soils, this community plan will be modified accordingly. Contaminants on-site are not anticipated to pose a problem as particulates because of the anticipated high moisture content of the soil during field activities. The following procedures will be implemented during field activities as appropriate:

- Volatile organic compounds will be monitored at the downwind perimeter of the exclusion zone on a continuous basis. If 15-minute average total organic vapor levels exceed 5 ppm (or 5 ppm above background as determined at an upwind location), excavating activities will be temporarily halted and monitoring continued until total organic vapor levels drop below the action level. If the organic vapor level is above 25 ppm at the perimeter of the exclusion area, activities must be shut down. Monitoring will continue and the CHSO will be consulted regarding a proper course of action. All 15-minute average readings must be recorded and be available for regulatory personnel to review.
- Particulates will become a concern if visible dust emissions occur from site investigation activities or wind erosion or if intrusive activities are performed. When particulates become a concern, the following protocol will be followed. PM10 particulate levels will be continuously monitored downwind at the perimeter of the exclusion zone with a portable real-time PM10 particulate monitor that will have an alarm set at 100 ug/m<sup>3</sup>. If downwind particulate levels integrated over a period of 15 minutes exceed 100 ug/m<sup>3</sup>, then particulate levels upwind of the exclusion zone will be measured. If the downwind particulate level is more than 100 ug/m<sup>3</sup> greater than the upwind particulate level, dust suppression techniques (e.g. spraying water, covering exposed soils with poly sheeting) will be employed. If after implementation of dust suppression techniques, the downwind PM10 particulate level exceeds the upwind PM10 particulate level by greater than 150 ug/m<sup>3</sup>, activities will be halted and the CHSO will be consulted. All readings will be recorded and be available for regulatory personnel to review. These action levels can be modified if particulates are better characterized and identified.

### 7.2.1 Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background levels at the perimeter of the exclusion zone, excavating activities will cease and monitoring continued. If the organic vapor level decreases below 5 ppm (above background), excavating activities may resume. If the organic vapor levels are greater than 5 ppm, but less than 5 ppm over background at the perimeter of the work area, activities may resume provided:

- The organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest residence or commercial structure, whichever is less, is below 5 ppm over background, and
- More frequent intervals of monitoring, as directed by the SM in consultation with the CHSO, are conducted.

If the organic vapor level is above 5 ppm over background at the perimeter of the exclusion zone, work activities will halt and odor control contingencies will be implemented. Exposed soils will be covered with poly sheeting or a biodegradable, surfactant-based foam concentrate, will then be sprayed onto the excavated soils to control the fugitive vapors. When work shutdown occurs, downwind air monitoring will be implemented to ensure that vapor emissions do not impact the nearest residential or commercial structure.

If organic vapor levels greater than 5 ppm over background are identified 200 feet downwind from the exclusion zone, or half the distance to the nearest residential or commercial property line, whichever is less, all work must cease. Following cessation of work activities and implementation of odor control contingencies, if organic vapor levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the exclusion zone, then air quality must be monitored within 20 feet of the perimeter of the nearest residential/commercial structure (the “20 foot zone”).

If organic vapor levels approach 5 ppm above background within the “20 foot zone” for a period of more than 30 minutes, or organic vapor levels greater than 10 ppm above background for any time period occur within the “20 foot zone”, then the following steps will be taken:

- Frequent air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two successive readings below action levels are measured, air monitoring within the 20 foot zone may be halted and the perimeter reduced back to the exclusion zone perimeter, or as determined by the SM.

## **7.3 DATA QUALITY ASSURANCE**

### *7.3.1 Calibration*

Instrument calibration shall be documented and included in a dedicated safety and health logbook or on separate calibration pages. All instruments shall be calibrated before and after each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

### *7.3.2 Operations*

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the SM for reference.

## **7.4 NOISE MONITORING**

Work areas or tasks that pose an exposure risk greater than 85 dBA will require hearing protection. If there is a reasonable possibility that workers may be exposed to an 8-hour time-weighted average exceeding 85 dBA, noise monitoring will be conducted.

## 8. ZONES, PROTECTION, AND COMMUNICATION

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### 8.1 SITE CONTROL

Site zones are intended to control the potential spread of contamination and to assure that only authorized individuals are permitted into potentially hazardous areas. A three-zone approach will be utilized. It shall include an Exclusion Zone (EZ), Contamination Reduction Zone (CRZ) and a Support Zone (SZ). Specific zones shall be established on the work site when operations begin for each task requiring such delineation (i.e. construction, excavation, trenching in impacted areas of the site). Maps will be available at the Site and used during initial site-specific training.

This project is being conducted under the requirements of 29 CFR 1910.120, and any personnel working in an area where the potential for exposure to site contaminants exists, will only be allowed access after proper training and medical documentation as required by National Grid. These records are maintained by the CHSO, and copies are provided to the SM prior to mobilization for project activities.

The following shall be used for guidance in revising these preliminary zone designations, if necessary.

**Support Zone** - The SZ is an uncontaminated area that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

**Contamination Reduction Zone** - The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides an area for decontamination of personnel and portable hand-held equipment, tools and heavy equipment. A personnel decontamination area will be prepared at each exclusion zone. The CRZ will be used for Exclusion Zone entry and egress in addition to access for heavy equipment and emergency support services.

**Exclusion Zone** - All activities which may involve exposure to site contaminants, hazardous materials and/or conditions should be considered an exclusion zone. This zone will be clearly delineated by cones, tapes or other means. The SM may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the site SM allowing adequate space for the activity to be completed, field members and emergency equipment.

## 8.2 CONTAMINATION CONTROL

### 8.2.1 *Personnel Decontamination Station*

Personnel hygiene, coupled with diligent decontamination, will significantly reduce the potential for exposure.

### 8.2.2 *Minimization of Contact with Contaminants*

During completion of all site activities, personnel should attempt to minimize the degree of contact with contaminated materials. This involves a conscientious effort to keep "clean" during site activities. All personnel should minimize kneeling, splash generation, and other physical contact with contamination. This may ultimately minimize the degree of decontamination required and the generation of waste materials from site operations.

Field procedures will be developed to control over spray and runoff and to ensure that unprotected personnel working nearby are not affected.

### 8.2.3 *Personnel Decontamination Sequence*

Consideration will be given to prevailing wind directions so that the decontamination line, the support zone, and contamination reduction zone exit is upwind from the exclusion zone and the first station of the decontamination line. Decontamination will be performed by removing all PPE used in EZ and placing in drums/trash cans at CRZ. Baby wipes shall be available for wiping hands and face.

### 8.2.4 *Emergency Decontamination*

If circumstances dictate that contaminated clothing cannot be readily removed, then remove gross contamination, wrap injured personnel with clean garments/blankets to avoid contaminating other personnel or transporting equipment.

If the injured person can be moved, he/she will be moved to the exclusion zone boundary and decontaminated by site personnel as described above before emergency responders handle the victim. If the person cannot be moved because of the extent of the injury (a back or neck injury) provisions shall be made to ensure that emergency response personnel will be able to respond to victim without being exposed to potentially hazardous atmospheric conditions. If the potential for inhalation hazards exist, such as with open excavation, this area will be covered with poly to eliminate any potential inhalation hazards. All emergency personnel are to be immediately informed of the injured person's condition, potential contaminants, and provided with all pertinent chemical data.

### 8.2.5 *Hand Held Equipment Decontamination*

Hand held equipment includes all monitoring instruments, samples, hand tools, and notebooks. The hand held equipment is dropped at the first decontamination station to be decontaminated by one of the decontamination team members. These items must be decontaminated or discarded as waste prior to removal from the exclusion zone.

To aid in decontamination, monitoring instruments can be sealed in plastic bags or wrapped in polyethylene. This will also protect the instruments against contaminants. The instruments will be wiped clean using wipes or paper towels if contamination is visually evident.

Decontamination procedures for sampling equipment, hand tools, etc., shall include the use of steam cleaning or a detergent wash, as appropriate for the site conditions.

### 8.2.6 *Heavy Equipment Decontamination*

Decontamination of chemically contaminated heavy equipment will be accomplished using high-pressure steam or dry decon with brushes and shovels. Decontamination shall take place on a decontamination pad and all liquids used in the decontamination procedure will be collected. Vehicles or equipment brought into an exclusion zone will be treated as contaminated, and will be decontaminated prior to removal. All liquids used in the decontamination procedure will be collected, stored and disposed of in accordance with federal, state and local regulations. Personnel performing this task will wear the proper PPE as prescribed in Table 6-1.

## 8.3 COMMUNICATIONS

The following communications equipment shall be specified as appropriate:

- Telephones - A cellular telephone will be located in the SZ for communication with emergency support services/facilities and the home office. Personnel in the EZ can carry cellular telephones for communication as well if Level D PPE has been determined to be appropriate.
- Hand Signals - Hand signals shall be used by field teams along with the buddy system. They shall be known by the entire field team before operations commence and their use covered during site-specific training. Typical hand signals are the following:

Signal	Meaning
Hand gripping throat	Out of air, can't breathe
Grip on a partner's wrist or placement of both hands around a partner's waist	Leave area immediately, no debate
Hands on top of head	Need assistance
Thumbs up	Okay, I'm all right, I understand.

## **9. MEDICAL SURVEILLANCE PROCEDURES**

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All personnel performing field work where potential exposure to contaminants exists at the site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f) and, where applicable, expanded health standards.

### **9.1 MEDICAL SURVEILLANCE REQUIREMENTS**

A physician's medical release for work will be confirmed by the SM before a worker can enter the exclusion zone. The examination will be taken annually at a minimum and upon termination of hazardous waste site work if the last examination was not taken within the previous six months. Additional medical testing may be required by the CHSO in consultation with the SM if an over-exposure or accident occurs, if an employee exhibits symptoms of exposure, or if other site conditions warrant further medical surveillance.

## 10. SAFETY CONSIDERATIONS

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### 10.1 HIGH LOSS POTENTIAL HAZARDS

Activities to be conducted at the site may involve operations that have the potential for a serious injury to occur, include the following:

- Lockout/Tagout
- Heavy Equipment Operation
- Excavation and Trenching
- Confined Space Entry
- Line Breaking

#### *10.1.1 Lockout-Tagout*

Site personnel will assume that all electrical equipment at surface, subsurface, and overhead locations is energized, until the equipment has been designated as de-energized by a qualified National Grid representative. If the equipment cannot be de-energized, work will stop and the SM will consult with the PM and CHSO. GEI, the SM, or the PM will notify National Grid prior to working adjacent to such equipment, and will verify that the equipment is energized or de-energized in the vicinity of the excavation location. All applications of lockout devices shall be accomplished by qualified National Grid representatives using procedures equivalent to those shown in The Control of Hazardous Energy Program "Lock Out/Tag Out" included in Appendix I.

All power lines which have been indicated by National Grid to be de-energized must be locked out, such that the lines cannot be energized when personnel are working near them. The lines shall not be unlocked and re-energized until GEI, the SM, and/or the PM notifies National Grid that they have completed work in the area and that all personnel are clear of the area. National Grid representatives will thoroughly familiarize GEI, the SM, and the PM personnel with site-specific lockout/tagout procedures during the site orientation. The lockout procedures must be equivalent in effectiveness to those found in Appendix I.

If power lines cannot be de-energized, the SM will consult with LIPA safety personnel to determine the safe working distance from the energized line. Work tasks will only commence after determination that a safe working distance can be maintained and all personnel working in the area have been informed of the limitation. Caution tape, other warning devices or physical barriers will be placed at the perimeter to the safe zone.

### *10.1.2 Heavy Equipment Operation*

Working with large motor vehicles and heavy equipment (e.g., drill rig, excavator) could be a major hazard at this site. Injuries can result from equipment hitting or running over personnel, impacts from flying objects, or overturning of vehicles. Vehicle and heavy equipment design and operation will be in accordance with 29 CFR, Subpart O, 1926.600 through 1926.602. In particular, the following precautions will be utilized to help prevent injuries/accidents:

- Brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horn, and other safety devices will be checked at the beginning of each shift
- The operation of heavy equipment will be limited to authorized personnel specifically trained in its operation. GEI must provide this information to the SM.
- The operator will use the safety devices provided with the equipment, including seat belts. Backup warning indicators and horns will be operable at all times.
- While in operation, all personnel not directly required in the area will keep a safe distance from the equipment.
- A large construction motor vehicle will not be backed up unless it has a reverse signal alarm audible above the surrounding noise level; or it is backed up only when an observer signals that it is safe to do so.
- Personnel directly involved in activity will avoid moving in the path of operating equipment or any portion thereof. Areas blinded from the operator's vision will be avoided. Spotters will be used when personnel may be in areas where the operator's view is obstructed.
- Spotters will be used when in close proximity to overhead and underground utilities to provide an additional non-obstructed view.
- Heavy equipment cabs or motor vehicles will be kept free of all nonessential items, and all loose items will be secured.
- Large construction motor vehicles and heavy equipment will be provided with necessary safety equipment (such as seat belts, roll-over protection, emergency shut-off in case of roll-over, backup warning lights and audible alarms).
- Additional riders will not be allowed on equipment unless it is specifically designed for that purpose.

### *10.1.3 Excavation and Trenching*

The safety requirements for each excavation must be determined by a competent person who is capable of identifying existing and predictable hazards and work conditions that are unsanitary, hazardous, or dangerous to employees. The competent person must also have the authorization to take prompt corrective measures to eliminate unsatisfactory conditions.

The following are general requirements for work activities in and around excavations:

- Prior to initiation of any excavation activity, the location of underground installations will be determined. The New York State one-call center will be contacted by the excavation subcontractor a minimum of 72 hours prior to excavation activities.
- All excavations will be inspected daily and after each period of rain by the competent person prior to commencement of work activities.

Evidence of cave-ins, slides, sloughing, or surface cracks or excavations will be cause for work to cease until necessary precautions are taken to safeguard employees.

- Excavated and other materials or equipment that could fall or roll into the excavation shall be placed at least 5 feet from the edge of the excavation.
- Spoils and heavy equipment will be kept at least 5 feet from the edge to prevent cave-in.
- Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with CFR 1926.652 (b) or (c) except when excavations are less than 5 feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in or excavation is made entirely in stable rock.
- Ladders will be positioned no further than 25 ft from the furthest individual working in the trench.

#### *10.1.4 Confined Space Entry*

All trenches and excavations deeper than five feet will be considered potential Permit Required Confined Spaces. All trenches deeper than 5 feet will be monitored for oxygen content, combustible gases, and toxic gases and vapors if entry is required. All trenches which contain hazardous atmospheres at concentrations above the action levels found in Section 7.1.1 will be classified as Permit Required Confined Spaces. All entry into these trenches will be performed in accordance with the Confined Space/Hot Work Permitting Procedure which is found in Appendix J.

#### *10.1.5 Line Breaking*

During line breaking activities, the potential exists for exposure to suspect asbestos containing materials (ACM). If suspect ACM is encountered, work will stop and the suspect ACM will be isolated. If the material is determined to be ACM, it will be properly removed by a New York State Department of Labor (NYSDOL)-licensed asbestos contractor in accordance with applicable regulations. Protocols for appropriate work practices, health and safety measures, and monitoring will be developed and implemented by NYSDOL-licensed personnel.

## 11. DISPOSAL PROCEDURES

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All discarded materials, waste materials or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard or causing litter to be left on site. All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary, labeled and segregated for disposal. All non-contaminated materials shall be collected and bagged for appropriate disposal as non-hazardous solid waste. The waste management procedures as specified in the Field Sampling Plan and the applicable work plan for activities being performed, shall be complied with.

## **12. EMERGENCY RESPONSE / CONTINGENCY PLAN**

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This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly, and require an immediate response; therefore, contingency planning and advanced training of staff are essential. Specific elements of emergency support procedures which are addressed in the following subsections include communications, local emergency support units, preparation for medical emergencies, first aid for injuries incurred on-site, record keeping, and emergency site evacuation procedures.

### **12.1 RESPONSIBILITIES**

#### *12.1.1 Corporate Health and Safety Officer (CHSO)*

The CHSO oversees and approves the Emergency Response/Contingency Plan and performs audits to determine that the plan is in effect and that all pre-emergency requirements are met. The CHSO acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

#### *12.1.2 Site Manager (SM)*

The SM is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The SM is required to immediately notify the PM and CHSO of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the CHSO can notify OSHA within the required time frame. The CHSO will be notified of all OSHA recordable injuries, fires, spills, releases or equipment damage in excess of \$500 within 24 hours. The SM also serves as the Alternate Emergency Coordinator.

#### *12.1.3 Emergency Coordinator*

In the event of an emergency, the Emergency Coordinator, with National Grid representatives, shall make contact with Local Emergency Response personnel. In these contacts, the Emergency Coordinator will inform response personnel about the nature of work on the Site, the type of contaminants and associated health or safety effects, and the nature of the emergency, particularly if it is related to exposure to contaminants.

The Emergency Coordinator shall review this plan and verify emergency phone numbers and identify hospital routes prior to beginning work on Site. The Emergency Coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator shall implement the Emergency Response/Contingency Plan whenever conditions at the Site warrant such action.

#### *12.1.4 Site Personnel*

Site personnel are responsible for knowing the Emergency Response/Contingency Plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a Site emergency.

## **12.2 COMMUNICATIONS**

A variety of communication systems may be utilized during emergency situations. These are discussed in the following sections.

The primary form of communication during an emergency between field groups in the exclusion zone and the Emergency Coordinator will be verbal communications. During an emergency situation, the lines will be kept clear so that instructions can be received by all field teams.

#### *12.2.1 Telephone Communications*

A cellular telephone will be available on-site.

#### *12.2.2 Hand Signals*

Hand signals will be employed by downrange field teams where necessary for communication during emergency situations. Hand signals are found in Section 8.3.

## **12.3 PRE-EMERGENCY PLANNING**

Before the field activities begin, the local emergency response personnel may be notified by National Grid of the schedule for field activities and about the materials that are thought to exist on the site so that they will be able to respond quickly and effectively in the event of a fire, explosion, or other emergency.

In order to be able to deal with any emergency that might occur during remedial activities at the Site, emergency telephone numbers will be readily available in the SM vehicle or Construction Office. These telephone numbers are presented in the Site Specific Appendix A to this Health and Safety Plan. Hospital route maps will also be readily available in the SM vehicle and/or Construction Office. The Emergency phone numbers listed are preliminary. Immediately prior to mobilization the SM shall verify all numbers, and document any changes in the Site Logbook.

## **12.4 EMERGENCY MEDICAL TREATMENT**

The procedures and rules in this HASP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it will be reported to the SM immediately. First-aid equipment will be available on-site.

During the site safety briefing, project personnel will be informed of the location of the first aid station(s) that have been set up. Unless they are in immediate danger, severely injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics, before an emergency-response squad arrives at the site or before the injured person can be transported to the hospital, will be followed closely.

## **12.5 EMERGENCY SITE EVACUATION ROUTES AND PROCEDURES**

In the event of a Site Emergency that would require the evacuation of personnel, the Emergency Coordinator will immediately contact the project-specific dedicated National Grid Corporation contact (this person may or may not be on-site).

All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs at the work area, including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, immediate evacuation of all personnel is necessary due to an immediate or impending danger. All heavy equipment will be shut down and all personnel will evacuate the work areas and assemble at a pre-determined location.

If any task covered under this HASP has the potential for significant hazards, evacuation drills will be performed as deemed necessary by the SM and CHSO.

## **12.6 FIRE PREVENTION AND PROTECTION**

In the event of a fire or explosion, procedures will include immediately evacuating the work area, the Emergency Coordinator will immediately notify the local fire and police departments. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

Fires will be prevented by adhering to the following precautions:

- Good housekeeping and storage of materials
- Storage of flammable liquids and gases away from oxidizers
- No smoking in the exclusion zone or any work area
- No hot work without a properly executed hot work permit
- Shutting off engines to refuel
- Grounding and bonding metal containers during transfer of flammable liquids
- Use of UL approved flammable storage cans
- Fire extinguishers rated at least 10 pounds ABC located on all heavy equipment, in all trailers and near all hot work activities
- Monthly inspections of all fire extinguishers

The person responsible for the maintenance of fire prevention and/or control equipment is the Site Supervisor. The person responsible for the control of fuel source hazards is the Site Manager.

## 12.7 OVERT CHEMICAL EXPOSURE

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the Material Safety Data Sheet will be followed as necessary. If first aid or emergency medical treatment is necessary the Emergency Coordinator will contact the appropriate emergency facilities.

SKIN AND EYE CONTACT:	Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination. Skin should also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs.
INHALATION:	Move to fresh air. Decontaminate and transport to hospital or local medical provider.
INGESTION:	Decontaminate and transport to emergency medical facility.
PUNCTURE WOUND OR LACERATION:	Decontaminate and transport to emergency medical facility.

## 12.8 DECONTAMINATION DURING MEDICAL EMERGENCIES

If emergency life-saving first aid and/or medical treatment is required, normal decontamination procedures may need to be abbreviated or postponed. The SM or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed on site, a plastic barrier between the injured individual and clean surfaces should be used to help prevent contamination of the inside of ambulances and/or medical personnel. Outer garments may then be removed at the medical facility. No attempt will be made to wash or rinse the victim if his/her injuries are life threatening, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the normal decontamination procedures will be followed.

## 12.9 ACCIDENT/INCIDENT REPORTING

Incident reporting will be done following the guidelines established in the Incident Reporting Program presented in Appendix J.

Written confirmation of verbal reports are to be submitted within 24 hours. The accident/incident report is found in Appendix J.

In addition to the incident reporting procedures and actions described in the HASP, the SM will coordinate with National Grid relative to reporting and notification for all environmental, safety, and other incidents. Also, the SM and PM will notify the CHSO and HR within 2 hour of the incident and submit the GEI Accident report form within 24 hours of the incident.

If necessary, a site safety briefing will be held to discuss accidents/incidents and any findings from the investigation of the incident. The HASP will be modified if deemed necessary by the CHSO.

## **12.10 ADVERSE WEATHER CONDITIONS**

In the event of adverse weather conditions, the SM will determine if work can continue without potentially risking the safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries
- Potential for cold stress and cold-related injuries
- Treacherous weather-related working conditions (hail, rain, snow, ice, high winds)
- Limited visibility (fog)
- Potential for electrical storms
- Earthquakes
- Other major incidents

Site activities will be limited to daylight hours, or when suitable artificial light is provided, and acceptable weather conditions prevail. The SM will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

## **12.11 SPILL CONTROL AND RESPONSE**

All small hazardous spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the MSDS will be consulted to assist in determining the best means of containment and cleanup. For small spills, absorbent materials such as sand, sawdust or commercial sorbents should be placed directly on the substance to contain the spill and aid recovery. Any acid spills should be diluted or neutralized carefully prior to attempting recovery. Berms of earthen or sorbent materials can be used to contain the leading edge of the spills. Drains or drainage areas should be blocked. All spill containment materials will be properly disposed. An exclusion zone of 50-100 feet around the spill area should be established depending on the size and type of the spill.

The following steps should be taken by the Emergency Coordinator:

1. Determine the nature, identity and amounts of major spill components;
2. Make sure all unnecessary persons are removed from the spill area;
3. Notify appropriate response teams and authorities;
4. Use proper PPE in consultation with the SM;
5. If a flammable liquid, gas or vapor is involved, remove all ignition sources and use nonsparking and/or explosive proof equipment to contain or clean up the spill (diesel only vehicles, air operated pumps, etc.);
6. If possible, try to stop the leak with appropriate material; and,
7. Remove all surrounding materials that can react or compound with the spill.
8. Notify the Project-Specific National Grid Corporation Dedicated Contact.

## **12.12 EMERGENCY EQUIPMENT**

The following minimum emergency equipment shall be kept and maintained on-site.

- Industrial first aid kit
- Portable eye washes
- Fire extinguishers (one per vehicle and heavy equipment)
- Absorbent material

## **12.13 POSTINGS**

The following information shall be posted or be readily visible and available at conspicuous locations throughout the site:

- Emergency telephone numbers
- Hospital Route Map

## **12.14 RESTORATION AND SALVAGE**

After an emergency, prompt restoration of utilities, fire protection equipment, medical supplies and other equipment will reduce the possibility of further losses. Some of the items that may need to be addressed are:

- Refilling fire extinguishers;
- Refilling medical supplies;
- Recharging eyewashes and/or showers
- Replenishing spill control supplies
- Replacing used air horns

## **13. TRAINING**

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### **13.1 GENERAL HEALTH AND SAFETY TRAINING**

In accordance with 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations unless otherwise noted in the above reference. At a minimum, the training shall have consisted of instruction in the topics outlined in the standard. Personnel who have not met the requirements for initial training shall not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical). Proof of training shall be submitted to the SM prior to the start of field activities.

### **13.2 ANNUAL EIGHT-HOUR REFRESHER TRAINING**

Annual eight-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The training will cover a review of 29 CFR 1910.120 requirements and related company programs and procedures.

### **13.3 SUPERVISOR TRAINING**

Personnel acting in a supervisory capacity shall have received 8 hours of instruction in addition to the initial 40 hours training.

### **13.4 SITE-SPECIFIC TRAINING**

Prior to commencement of field activities, all field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the site operations. It will include site and facility layout, hazards and emergency services at the site and will highlight all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity. Personnel that have not received site-specific training will not be allowed on-site.

### **13.5 ON-SITE SAFETY BRIEFINGS**

Project personnel and visitors will be given health and safety briefings daily by the SM to assist site personnel in safely conducting their work activities. The briefings will include information on new operations to be conducted, changes in work practices or changes in the site's environmental conditions, as well as periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to

identify performance deficiencies related to safety during daily activities or as a result of safety inspections. The meetings will also be an opportunity to periodically update the crews on monitoring results. All on-site briefings will be documented.

### **13.6 FIRST AID AND CPR**

Per the OSHA requirement for working around voltages above 50 volts (as specified in 29 CFR 1910.269), there shall be at least two employees trained in CPR and First-Aid on the Site during working hours where two or more workers are on the Site, and trained personnel shall be available so as to provide assistance to any person exposed to electrical shock on the Site within 4 minutes of exposure.

The SM will identify those individuals requiring first aid and CPR training in order to ensure that emergency medical treatment is available during field activities. The training will be consistent with the requirements of the American Red Cross Association and will include training on bloodborne pathogens.

### **13.7 HAZARD COMMUNICATION**

Hazard communication training will be provided in accordance with the requirements contained in the Health and Safety Hazard Communication Program in Appendix B.

## **14. LOGS, REPORTS, AND RECORD KEEPING**

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The following is a summary of required health and safety logs, reports, and record keeping.

### **14.1 MEDICAL AND TRAINING RECORDS**

Copies or verification of training (40 hour, 8 hour, supervisor, and site-specific training) and medical clearance for hazardous waste site work and respirator use will be maintained by the CHSO and copies provided to the SM prior to the initiation of work on-site.

### **14.2 ON-SITE LOG**

A log of personnel on-site each day will be kept by the SM in a field logbook.

### **14.3 EXPOSURE RECORDS**

All personal monitoring results, laboratory reports, calculations and air sampling data sheets will be maintained by the SM during site work. At the end of the project they may be maintained in employee files if deemed necessary by the CHSO.

### **14.4 ACCIDENT/INCIDENT REPORTS**

The incident reporting and investigation during site work will follow the Incident Reporting Program in Appendix J.

### **14.5 HAZARD COMMUNICATION PROGRAM/MSDS**

Material Safety Data Sheets (MSDSs) will be obtained for applicable substances and included in the site hazard communication file. The hazard communication program will be maintained onsite in accordance with 29 CFR 1910.1200 and the Hazard Communication Program in Appendix B.

### **14.6 WORK PERMITS**

All work permits, including confined space entry, hot work, lockout/tagout, and line breaking permits will be maintained in the project files. Copies of the work permits shall also be provided to the SM, and the Project-Specific National Grid Corporation Dedicated Contact.

### **14.7 SAFETY OBSERVATION TOUR**

GEI and its subcontractors shall participate in Safety Observations Tours as required by National Grid.

## 15. FIELD PERSONNEL REVIEW

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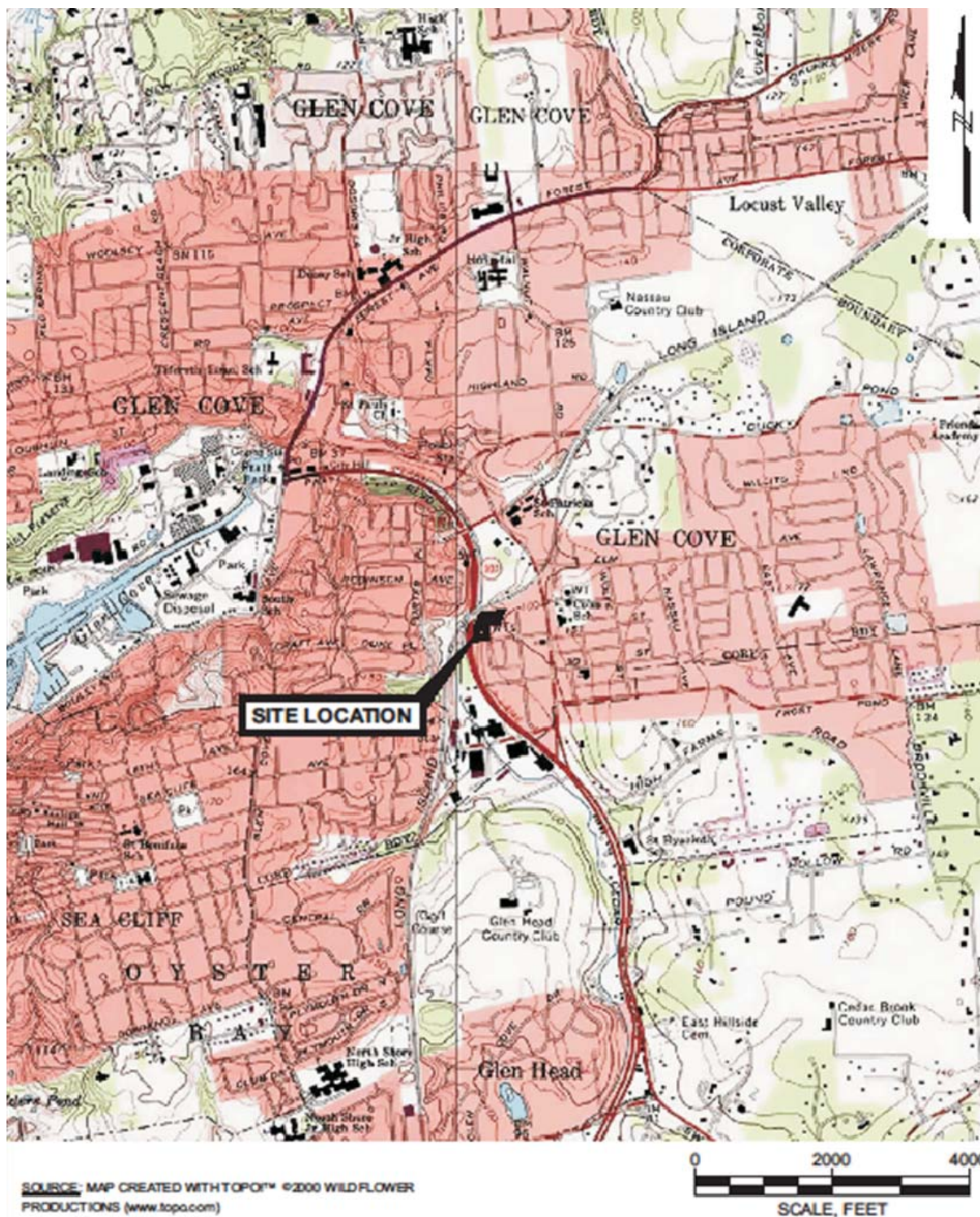
This form serves as documentation that field personnel have read, or have been informed of, and understand the provisions of this HASP for the Glen Cove Site. It is maintained on-site by the SM as a project record. Each field team member shall sign this section after training in the contents of this HASP has been completed. Site workers must sign this form after site-specific training is completed and before being permitted to work on-site.

I have read, or have been informed of, the Health and Safety Plan and understand the information presented. I have also completed site-specific training for the work detailed in the project Work Plan. I will comply with the provisions contained therein.

NAME (PRINT AND SIGN)	DATE

**APPENDIX A**

**SITE SPECIFIC INFORMATION**



HEALTH AND SAFETY PLAN  
GLEN COVE FORMER MGP  
GLEN COVE, NEW YORK

**nationalgrid**

GEI

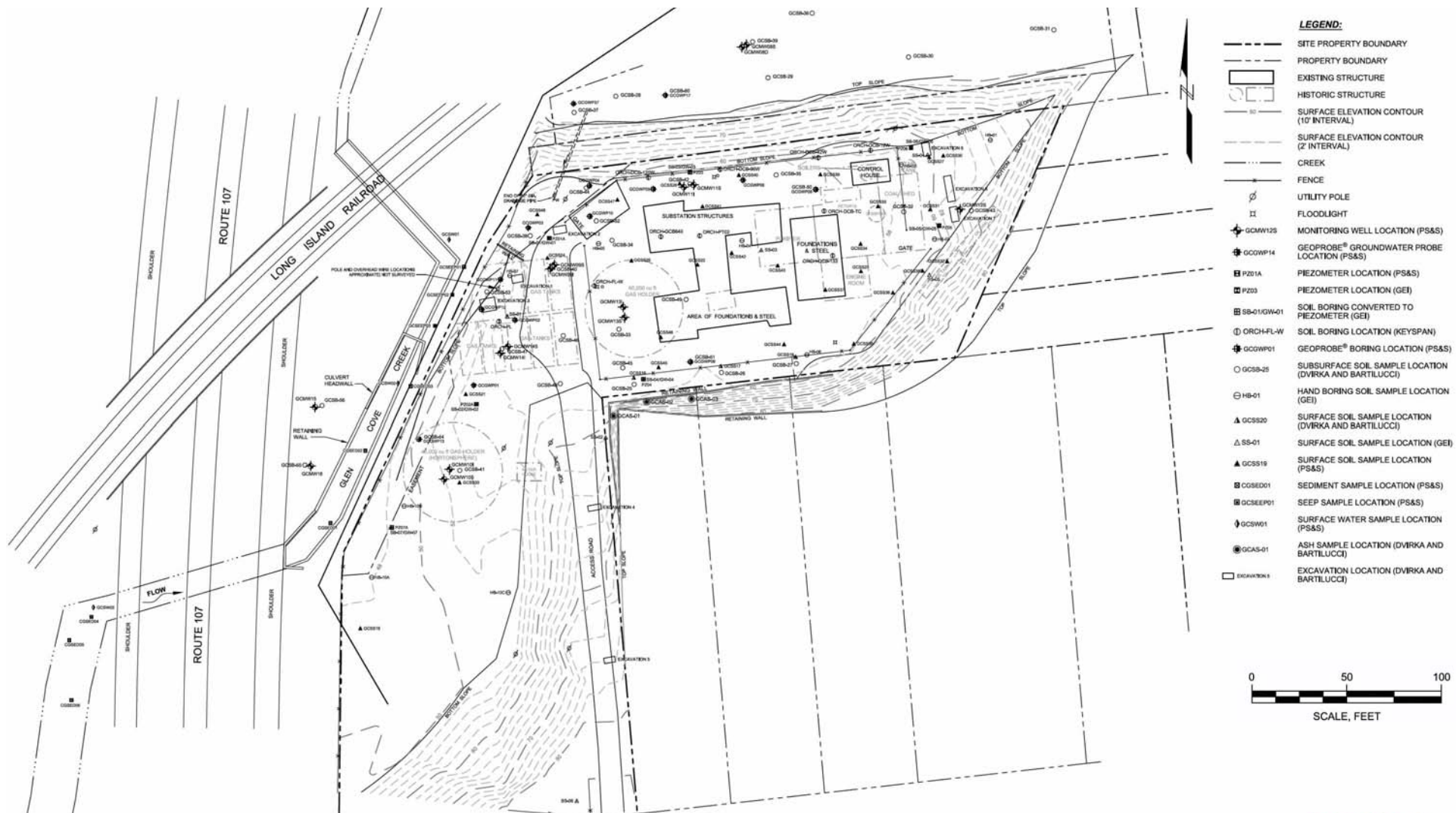


SITE LOCATION PLAN

Proj. 093270

June 2010

FIGURE 1



PLAN BASED ON DRAWING 1: INTERPETED LATERAL EXTENT OF SOIL AND GROUNDWATER IMPACT, PREPARED BY PS&S, SCALE 1"= 25", DATE 9/4/07

HEALTH AND SAFETY PLAN  
GLEN COVE FORMER MGP  
GLEN COVE, NEW YORK

**nationalgrid**

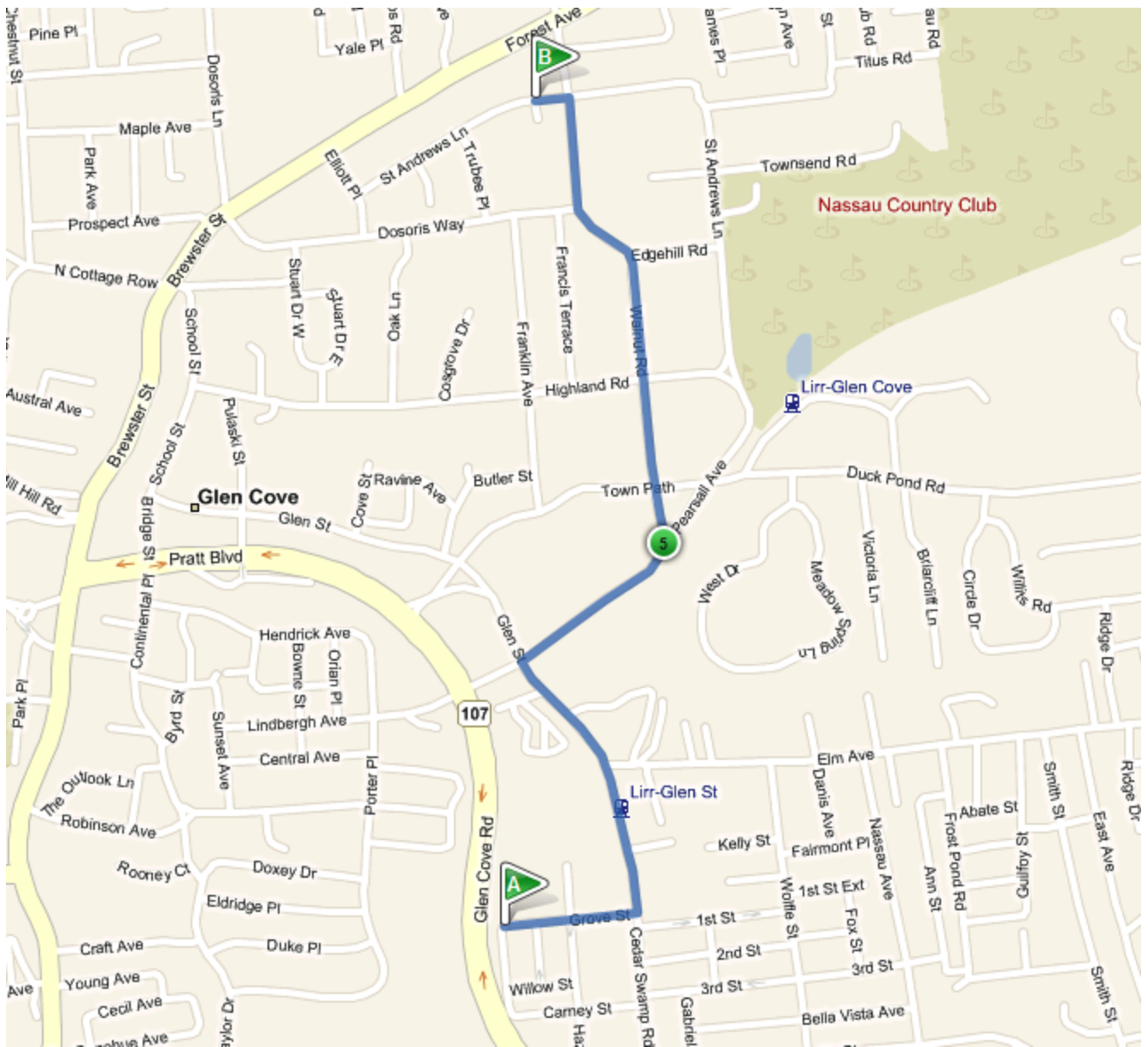
**GEI** Consultants

Project 093270

SITE PLAN

June 2010

FIGURE 2



**DIRECTIONS TO EMERGENCY ROOM AT NORTH SHORE UNIVERSITY HOSPITAL FROM SITE:**

- |                                      |           |
|--------------------------------------|-----------|
| 1. TURN LEFT ONTO GROVE STREET.      | 0.2 MILES |
| 2. TURN LEFT ONTO CEDAR SWAMP ROAD.  | 0.2 MILES |
| 3. CONTINUE ON GLEN STREET.          | 0.2 MILES |
| 4. TURN RIGHT ONTO PEARNSALL AVENUE. | 0.2 MILES |
| 5. BEAR LEFT ONTO WALNUT ROAD        | 0.6 MILES |
| 6. TURN LEFT ONTO ST ANDREW LANE     | 0.0 MILES |
| 7. ARRIVE AT 101 SAINT ANDREWS LANE  | 0.0 MILES |

SOURCE:  
BING MAPS  
(www.bing.com)

HEALTH AND SAFETY PLAN  
GLEN COVE FORMER MGP  
GLEN COVE, NEW YORK

**nationalgrid**

**GEI**



Consultants

**HOSPITAL ROUTE**

Proj. 093270

June 2010

FIGURE 3

**APPENDIX B**

**HAZARD COMMUNICATION PROGRAM**

## **1.0 INTRODUCTION**

The intent of the Hazard Communication Program is to provide employees with information about the potential health hazards from exposure to workplace chemicals in accordance with the OSHA Hazard Communication Standard promulgated on August 24, 1987. In order to accomplish its goal of transmitting this information to its employees, a written hazard communication program specifying how this goal will be achieved has been formulated. This document represents **GEI's** Hazard Communication Program (HCP).

Employee participation is the key ingredient to the HCP. It is extremely important that employees not only follow the procedures, but also understand the reasoning. The Hazard Communication Program is an integral part of **GEI's** effort to provide its employees with a healthy and safe workplace.

Although most **GEI** field projects do not involve the use of hazardous substances, it is imperative that all hazardous materials be managed in accordance with this program. This applies to any usage of hazardous materials regardless of volume.

## **2.0 PURPOSE**

To make information available to employees concerning chemical hazards known to be present in the workplace under normal conditions, or in a foreseeable emergency.

## **3.0 SCOPE**

This Hazard Communication Program (HCP) applies to any chemical obtained in excess of retail amounts known to be present in the workplace that employees may be exposed to under normal conditions of use, or may be exposed to in a foreseeable emergency. The HCP describes procedures for: determining chemical hazards in operations; providing training on chemical hazards to employees; and transmitting chemical hazard information through proper labeling and Material Safety Data Sheets (MSDSs). Field staff are responsible for keeping MSDSs for work performed at each job site.

## **4.0 RESPONSIBILITIES**

The following individuals and groups are responsible for implementing the Hazard Communication Program (HCP).

1. Health and Safety Assessment Division
  - a. Provide general training to all new and existing employees as appropriate under the HCP. This training will include hazardous material monitoring and recognition, emergency response and understanding labels.
  - b. Maintain documentation for HCP training, inform division/section managers of annual training requirements.
  - c. Periodically update and review Hazard Communication Program.

- d. Maintain file of current MSDSs and arrange for retention of all obsolete MSDSs.
- e. Review operations with division/section managers to determine what jobs require HCP training.
- f. Obtain all missing MSDSs.
- g. Audit job sites and work areas for compliance with the HCP.
- h. Annually audit chemical listing to ensure that the most current MSDSs are on file and maintain a complete chemical inventory of chemicals in use.
- i. Act as liaison to outside authorities responding to chemical emergencies or conducting inspections to verify compliance with the HCP.

2. Department/Section Manager

- a. Inventory and compile listing of chemicals used in Department/Section annually and each job site.
- b. Provide specific training as appropriate for Department/Section/Client location.
- c. Notify H&S Division of any changes in operations that could affect the way hazardous chemicals are handled.
- d. Identify all jobs requiring the use or handling of hazardous chemicals.
- e. Notify H&S Division of employees requiring hazard specific training.
- f. Notify H&S Division when new hazards are presented.
- g. Ensure proper labeling procedures and MSDS review is being followed.

3. Employee

- a. Follow HCP procedures.
- b. Use PPE as instructed by training procedures.
- c. Inform division/section manager or H&S Division of:
  - Any symptoms of overexposure that may be related to handling hazardous chemicals.
  - Missing or inappropriate labels.
  - Missing or unavailable MSDSs.

- Malfunctioning or unavailable safety equipment.
- Read, understand and comply with information on labels and MSDSs.
- Leave labels affixed to containers.
- Use only approved containers for hazardous chemicals.
- Know the location of emergency equipment on site and in the facility (if applicable).
- Know your role in contingency plans.
- Understand all changes in chemical handling and procedures.
- Attend training sessions as scheduled.

4. Purchasing Department

- a. Request Material Safety Data Sheets (MSDS) from suppliers on each order of a chemical subject to this Program.
- b. Document the request for an MSDS on the purchase order.

## 5.0 TRAINING

1. General Training: Training on this program will be part of **GEI's** annual refresher training or supplied on an as-needed basis.

General training will consist of the following items:

- a. Requirement of OSHA HCS (29 CFR 1910.1200)
- b. Details of **GEI's** HCP including:
  - Labeling
  - MSDSs
  - How employees can obtain and use appropriate hazard information.
- c. Detailed explanation on how to read and interpret an MSDS including:
  - Description
  - Sections
  - Explanations of each section
  - Usefulness of each section
  - Applicability of each section

2. Specific Training

- a. Listing of hazardous materials in each department/location/site.
- b. Location of MSDSs in each department/site.
- c. Methods and observations to detect hazardous materials in the workplace, including:
  - Exposure monitoring
  - Continuous monitoring
  - Visual inspection
  - Odor
  - Other physical or unusual appearances
- d. Physical and health hazards of chemicals present in the workplace.
- e. Protection measures and procedures:
  - Appropriate work practices
  - Emergency procedures
  - PPE
- f. Field operations where hazardous chemicals are present.

#### 5.1 Nonroutine Tasks

**GEI** typically uses low quantities of hazardous materials on job sites and in the laboratory. **GEI** projects that involve large quantities of hazardous materials, extremely hazardous substances or exposure to a client's hazardous materials that are not on **GEI**'s inventory are to be reviewed on a case by case basis to determine the necessary training to safely work with these materials. Clients regulated under the Process Safety Management program require affected employees to attend the Client's site-specific safety training program before being allowed access to the site. The **GEI** Safety Department will provide training to employees when client training is not provided. All training will be documented and repeated as necessary. For example, **GEI** does provide task specific training to DOT regulated employees for General Awareness, Shipping and Driving for workers involved in the shipping of hazardous materials and this training is provided every three years. Project Managers will notify the Safety Department when conducting non-routine tasks or when working with extremely hazardous substances in order to properly train employees before the project commences.

### 6.0 TRAINING DOCUMENTATION

- a. Record names of attendee(s).
- b. Request that employees initial by their names.
- c. Complete training documentation form.
- d. Submit copies to H&S Coordinator for employee training file.

## **7.0 MATERIAL SAFETY DATA SHEETS (MSDSs)**

### **1. MSDS Requirements**

- a. An MSDS must be available for each hazardous material used in the workplace. Field staff are responsible for keeping MSDSs for work performed at each job site. The Windsor MSDSs are located at the entrance to the laboratory where all chemicals are stored. Copies of MSDSs can be obtained by contacting the Safety Department. MSDSs for each office should be located near the area where hazardous materials are stored.
- b. The H&S Assessment Division will ensure that all MSDSs are complete, legible and in English. Employees that cannot read or understand English will be provided training as needed in a manner that the employee can understand.
- c. A file containing appropriate MSDSs for each **GEI** facility will be readily available to all employees.
- d. A cover sheet will identify all MSDSs in the file – Appendix B.
- e. The H&S Assessment Division will audit the file.
- f. The Facility Manager will keep a master list of chemicals by department and listed alphabetically, by division.
- g. The H&S Assessment Division will distribute, to each department, new or updated MSDSs as they become available and make changes in the master list.
- h. Old MSDSs will remain on file permanently.
- i. MSDSs must be capable of being cross-referenced to their container labels, where appropriate.
- j. Where a process or group of hazardous chemicals presents a health hazard greater than or not indicated by the individual MSDSs, written operating procedures will also be provided or readily accessible. Standard operating procedures by the manufacturer, job descriptions, etc. may be useful for this information.

### **2. Procedure for Obtaining MSDSs**

- a. The Purchasing Department will make an initial request for an MSDS from the manufacturer, either by phone, facsimile or mail. A copy of the request will be maintained with the name of the individual contacted and the date and included in the purchase order.
- b. Employees who are working at a manufacturing location should request a MSDS from the site contact for both raw materials and finished product.

- c. If MSDSs are not received within a reasonable time, approximately 30 days, the H&S Assessment Division or Facility Manager will send a second request to the manufacturer via certified mail, with a return receipt requested.
- d. If, after the second request, no MSDS is sent, the H&S Assessment Division will contact the appropriate local OSHA area office by telephone, informing them of **GEI's** inability to obtain an MSDS from the manufacturer.
- e. The H&S Assessment Division will document the following information: date; name; title of OSHA contact; and, summary of conversation.
- f. A copy of this information will be placed in the master file with the H&S Division for a 30-day period.
- g. If the MSDS is not received or OSHA does not contact the H&S Assessment Division within 30 days, H&S Assessment Division will contact the local OSHA area office again.
- h. If the MSDS is not received within 60 days, the H&S Assessment Division will contact the regional OSHA office.

### 3. Labeling

- a. All manufacturers' labels will be left on containers.
- b. All container labels will be legible, prominently displayed, and in English as well as any other prevalent language. **GEI** will provide interpretation to employees who do not read or understand English when necessary.
- c. Minimum label contents include chemical identity; appropriate hazard warnings; and the name and address of the manufacturer.
- d. **GEI** has generated a label for use when portable containers are poured off from the original container to a compatible unlabeled container for field, laboratory or facility use. This label should also be used for samples and mixtures suspected of containing hazardous materials. The appropriate MSDS will be referenced in order to complete the "Hazard Warning" portion of the label and determine if the chemical is compatible with the container in which it is being stored.
- e. **GEI** uses the International Air Transport Association/Department of Transportation Hazard Classification System for labeling hazardous material shipments by **GEI**. Each office that ships hazardous materials must obtain appropriate labels for the shipment and transport of hazardous materials.

### 4. Outside Contractors

- a. Unless required by the nature of services to be provided, **GEI** will attempt to restrict contractors from contact with hazardous chemicals on **GEI** property or projects.
- b. The Office Manager will notify the H&S Coordinator of all outside contractors on **GEI** property or subcontracted to perform on **GEI** projects.
- c. The Project Manager will review the work and determine all hazardous chemicals to which the outside contractor's employees may be exposed.
- d. The Project Manager will provide to the contractor a list of hazardous chemicals to which their employees may be exposed, and copies of corresponding MSDSs.
- e. The Project Manager will inform the contractor of precautionary measures contained within the MSDS.
- f. The Project Manager will inform the contractor of the labeling system used in the location of the contractor's work.
- g. Records will be retained permanently with the H&S Coordinator.

References:

- 1. 29 CFR 1910.1200, Hazard Communication.
- 2. OSHA Instruction CPL 2-2.38A, CH-1, July 18, 1986.
- 3. ACGIH, Threshold Limit Values and Biological Exposure Indices for 1991-92, 1991.
- 4. Genium Publishing Corporation, MSDS Pocket Dictionary, August, 1988.
- 5. National Institute of Occupational Safety and Health, Pocket Guide to Chemical Hazards, June, 1990.
- 6. United States Department of Agriculture, Hazard Communication: A Program Guide for Federal Agencies; August, 1987.

## **APPENDIX C**

### **COLD STRESS PROGRAM**

## **1.0 PURPOSE & INTRODUCTION**

The purpose of this document is to educate the employee about exposure to cold environments and the effects of hypothermia and other cold-related injuries. Through proper use of Personal Protective Equipment (PPE), engineering and administrative controls; and education, cold injury, both to the extremities and the body's core temperature, can be prevented.

## **2.0 SCOPE**

This program is intended for use by employees engaged in work with the potential for exposure to cold environments. This program will be reviewed annually by the Health and Safety Division. Training will be provided annually to all those potentially affected, and will include this written program.

## **3.0 WORKING IN COLD ENVIRONMENTS**

### **1. Metabolic Responses**

The human body is designed to function best at a rectal temperature of 99-100F. The body maintains this temperature in two ways: by gaining heat from food and muscular work; or, by losing it through radiation and sweating. By constricting blood vessels of the skin and/or shivering, the body uses its first line of cold defense.

Temperature control of the body is better understood by dividing the body into two main parts: the shell; and, the core. The shell is comprised of the skin, capillaries, nerves, muscles and fat. Other internal organs such as the heart, lungs, brain and kidneys make up the core.

During exposure to cold, the skin is first affected. Blood in the peripheral capillaries is cooled, sending a signal to a portion of the brain called the hypothalamus. Regulating body temperature is one of the many basic body functions of the hypothalamus. Acting like a thermostat, adjustments are performed in order to maintain normal body temperatures. When a chill signal is received, two processes are begun by the hypothalamus: conserve heat already in the body; and, generate new heat.

Heat conservation is performed through constriction of the blood vessels in the skin (shell), thus reducing heat loss from the shell and acting as an insulator for the core. Sweat glands are also inhibited, thus preventing heat loss by evaporation.

Additional fuel for the body is provided in the form of glucose. Glucose causes the heart to beat faster, sending oxygen and glucose-rich blood to the tissue where needed. In an attempt to produce heat, the muscles rapidly contract. This process is better known as "shivering", and generates heat similarly to that created by strenuous activity, raising the body's metabolic rate.

During physical activity and fatigue, the body is more prone to heat loss. As exhaustion approaches, blood vessels can suddenly enlarge, resulting in rapid loss of heat. Exposure to extreme cold causes nerve pulses to be slowed, resulting in fumbling, sluggish and clumsy reactions.

#### **4.0 COLD INJURIES**

Cold injuries are classified into two categories: local; or, general. Local injuries include frostbite, frostnip, chilblain and trenchfoot. General injuries include hypothermia and blood vessel abnormalities (genetically or chemically induced). Major factors contributing to cold injury are exposure to humidity and high winds; contact with wetness or metal; inadequate clothing; age; and, general health. Allergies, vascular disease, excessive smoking and/or drinking, and certain drugs and medicines are physical conditions that can compound the effects of exposure to a cold environment.

##### **1. Hypothermia**

Hypothermia is a condition of reduced body temperature. Most cases develop in air temperatures between 30-50°F, not taking wind-chill factor in consideration.

Symptoms of hypothermia are uncontrolled shivering and the sensation of cold. The heartbeat slows and sometimes becomes irregular, weakening the pulse and changing blood pressure. Changes in the body chemistry cause severe shaking or rigid muscles; vague or slow slurred speech; memory lapses; incoherence; and, drowsiness. Cool skin, slow irregular breathing, low blood pressure, apparent exhaustion, and fatigue after rest can be seen before complete collapse.

As the core temperature drops, the victim can become listless, confused, and make little or no effort to keep warm. Pain in the extremities can be the first warning of dangerous exposure to cold. Severe shivering must be taken as a sign of danger. At a core body temperature of about 85°F, serious problems develop due to significant drops in blood pressure, pulse rate and respiration. In some cases, the victim may die.

Sedative drugs and alcohol increase the risk of hypothermia. Sedative drugs interfere with the transmission of impulses to the brain. Alcohol dilates blood vessels near the skin's surface, increasing heat loss and lowering body temperature.

Table I provides information on the onset of hypothermia and metabolic responses at different body temperatures.

2. Raynaud's Phenomenon

Raynaud's Phenomenon is the abnormal constriction of the blood vessels of the fingers on exposure to cold temperatures, resulting in blanching of the ends of the fingers. Numbness, itching, tingling or a burning sensation may occur during related attacks. The disease is also associated with the use of vibrating hand tools in a condition sometimes called White Finger Disease. Persistent cold sensitivity, ulceration and amputations can occur in severe cases.

3. Acrocyanosis

Acrocyanosis is caused by exposure to the cold and reduces the level of hemoglobin in the blood, resulting in a slightly blue, purple or gray coloring of the hands and/or feet.

4. Thromboangitis Obliterans

Thromboangitis obliterans is clotting of the arteries due to inflammation and fibrosis of connective tissue surrounding medium-sized arteries and veins. This is one of the many disabling diseases that can also result from tobacco use. Gangrene of the affected limb often requires amputation.

5. Frostbite

Frostbite is the freezing of the body tissues due to exposure to extremely low temperatures, resulting in damage to and loss of tissue. Frostbite occurs because of inadequate circulation and/or insulation, resulting in freezing of fluids around the cells of the body tissues. Most vulnerable parts of the body are the nose, cheeks, ears, fingers and toes.

Frostbite can affect outer layers of skin or can include the tissues beneath. Damage can be serious, with permanent loss of movement in the affected parts, scarring, necrotic tissue, and amputation are all possibilities. Skin and nails that slough off can grow back.

The freezing point of the skin is about 30F. As wind velocity increases, heat loss is greater and frostbite will set in more rapidly.

There are three (3) degrees of frostbite: first degree, freezing without blistering and peeling; second degree, freezing with blistering and peeling; and, third degree, freezing with death of skin tissues and possibly the deeper tissues.

The following are symptoms of frostbite:

- a. Skin changes color to white or grayish-yellow, progresses to reddish-violet, and finally turns black as the tissue dies;
- b. Pain may be felt at first, but subsides;

- c. Blisters may appear;
- d. Affected part is cold and numb.

The first symptom of frostbite is usually an uncomfortable sensation of coldness followed by numbness. Tingling, stinging, cramping and aching feelings will be experienced by the victim. Frostbite of the outer layer of the skin has a waxy or whitish look and is firm to the touch. Cases of deep frostbite cause severe injury. The tissues are cold, pale and solid. The victim is often unaware of the frostbite until someone else observes these symptoms. It is therefore important to use the "buddy system" when working in cold environments, so that any symptoms of overexposure can be noted.

Table II describes the cooling power of wind on exposed flesh. This information can be used as a guide for determining equivalent chill temperatures when the wind is present in cold environments.

#### 6. Trench Foot and Chilblains

Trench foot is swelling of the foot caused by long, continuous exposure to cold without freezing, combined with persistent dampness or immersion in water. Edema (swelling), tingling, itching and severe pain occurs, followed by blistering, necrotic tissue and ulcerations. Chilblains have similar symptoms as trench foot, except that other areas of the body are affected.

#### 7. Frostnip

Frostnip occurs when the face or extremities are exposed to a cold wind, causing the skin to turn white.

### 5.0 PREVENTION OF COLD STRESS

Cold Stress can be prevented through a combination of various factors: acclimation; water and salt displacement; medical screening, proper clothing selection; and, training and education. Through the use of engineering controls, work practices, work/rest schedules, environmental monitoring and consideration of the wind-chill temperature, the employee can be protected.

#### 1. Acclimation

Acclimation can be achieved to some degree. Sufficient exposure to cold causes the body to undergo changes to increase comfort and reduce the risk of injury. But, these changes are minor and require repeated exposure to cold and uncomfortable temperatures to induce them.

## 2. Dehydration

The dryness of cold air causes the body to lose a significant amount of water through the skin and lungs. It is essential that caffeine-free, non-alcoholic beverages be available at the worksite for fluid replacement. Dehydration also increases the risk of injury due to cold and affects blood flow to the extremities.

## 3. Diet

A well-balanced diet is important for employees working in cold environments. Diets restricted only to certain foods may not provide the necessary elements for the body to withstand cold stress, leaving the worker vulnerable.

## 4. Control Measures

When the windchill factor results in an equivalent temperature of -26F, continuous exposure of the skin will not be permitted. Any worker exposed to temperatures of 36F or less who becomes immersed in water will be given dry clothing immediately and treated for hypothermia at the local hospital if any symptoms of hyperthermia are present. Notification of this incident will be provided to the Health and Safety Division immediately after sending the worker to the hospital.

## 5. Engineering Controls

The following are some ways that environmental controls can be used to reduce the effects of a cold environment:

- a. General or spot heating should be used to increase temperature in certain areas in the workplace;
- b. Warm air jets, radiant heaters or contact warm plates can be used to warm the worker's hands if fine work is to be performed with bare hands for 10 to 20 minutes or more;
- c. Shield the work area if air velocity at the work site is increased by wind, draft or ventilating equipment;
- d. Metal handles of tools and control bars should be covered with thermal insulating material at temperatures below 30F;
- e. Unprotected metal chair seats will not be used in cold environments;
- f. When appropriate and feasible, equipment and processes will be substituted, isolated, relocated, or redesigned;
- g. Power tools, hoists, cranes or lifting aids will be used to reduce the metabolic workload;

- h. Heated warming shelters will be made available for continuous work being performed in an equivalent temperature of 20F or below. Workers will be encouraged to use the shelters regularly.

## 6. Administrative Work Practice Controls

Work practices and guidelines can be designed and developed to reduce exposure to cold stress. Some of these may include:

- a. Work-rest schedules to reduce the peak of cold stress;
- b. Enforce scheduled breaks;
- c. Enforce intake of caffeine-free, non-alcoholic beverages;
- d. Schedule work that has potential exposure to cold stress for the warmest part of the day;
- e. Move work to warmer areas, whenever possible;
- f. Assign extra workers for high-demand tasks;
- g. Provide relief workers for other workers needing breaks;
- h. Teach basic principles of recognizing and preventing cold stress;
- i. Use the buddy system for work at 10F or below, and keep within eyeshot;
- j. Allow new employees to adjust to the conditions before they work full-time in cold environments;
- k. Minimize sitting and standing in one place for long periods of time;
- l. Include weight and bulkiness of clothing when estimating work performance requirements and weights to be lifted;

Table III provides a work/warm-up schedule for cold environments, with wind chill taken into account.

## 7. Special Considerations

Older workers and workers with circulatory problems should be extra careful in cold environments. Sufficient sleep and good nutrition are important preventive measures for maintenance tolerance to the cold. Double shifts and overtime work should be avoided when working in cold environments.

If any of the following symptoms are observed on site, the affected worker will immediately go to warm shelter:

- Onset of heavy shivering;
- Frostnip;
- Feeling of excessive fatigue;
- Drowsiness;
- Euphoria.

After entering the warm shelter, the outer layer of clothing should be removed. If the clothing is wet from sweat and perspiration, dry clothing should be provided. If this is not feasible, then the clothing should be loosened to allow sweat to evaporate.

Anyone working in cold environments and on prescribed medication should consult their physician concerning any possible side effects due to cold stress. Those individuals suffering from diseases and/or taking medication that interferes with normal body temperature regulation or reduces the tolerance to cold will not be allowed to work in temperatures of 30F or below.

## **6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)**

In choosing PPE for cold environments, it is important to maintain airspace between the body and outer layer of clothing to retain body heat. The more air pockets, the better the insulation. The clothing should also allow for the evaporation of sweat if the skin is wet.

The most important parts of the body to protect are the feet, hands, head and face. Hands and feet become cooled most easily, because of their distance from the heart. Keeping the head covered is equally important. As much as 40% of body heat loss is through the head when it is exposed.

Ideal clothing for exposure to cold environments is made of cotton. Cotton picks up sweat off the body and brings it to the surface. Loosely fitted clothing also aids in sweat evaporation. Recommended clothing may include the following:

- a. Polypropylene under shirt and shorts under thermal underwear (preferably two-piece);
- b. Wool socks;
- c. Wool or thermal pants, lapped over boot tops to keep out snow and water;
- d. Suspenders (belts can constrict and reduce circulation);
- e. Insulated work boots, preferably waterproof. Safety toe, if necessary;
- f. Wool or cotton shirt;
- g. Parka;
- h. Knit cap/hard hat liner;
- i. Wool mittens or gloves (depending on the dexterity required);

j. Face mask or scarf.

Dirty or greasy clothing loses much of its insulation value. Dirty clothing crushes air pockets, allowing air to escape more easily. Also, denim is not a good protective fabric. It is loosely woven and allows water to penetrate and wind to blow away body heat.

TABLE I  
Progressive Clinical Presentation of Hypothermia\*

Core Temperature		Clinical Signs
Deg. C	Deg. F	
37.6	99.6	"Normal" rectal temperature.
37	98.6	"Normal" oral temperature.
36	96.8	Metabolic rate increases in an attempt to compensate for heat loss.
35	95.0	Maximum shivering.
34	93.2	Victim conscious and responsive, with normal blood pressure.
33	91.4	Severe hypothermia below this temperature.
32	89.6	Consciousness clouded; blood pressure becomes difficult to obtain;
31	87.8	pupils dilated but react to light; shivering ceases.
30	86.0	Progressive loss of consciousness; muscular rigidity increases;
29	84.2	pulse and blood pressure difficult to obtain; respiratory rate decreases.
28	82.4	Ventricular fibrillation possible with myocardial irritability.
27	80.6	Voluntary motion ceases; pupils non-reactive to light; deep tendon and superficial reflexes absent.
26	78.8	Victim seldom conscious.
25	77.0	Ventricular fibrillation may occur spontaneously.
24	75.2	Pulmonary edema.
22	71.6	Maximum risk of ventricular fibrillation.
20	68.0	Cardiac standstill.
18	64.4	Lowest accidental hypothermia victim to recover.
17	62.6	Isoelectric electroencephalogram.
9	48.2	Lowest artificially cooled hypothermia patient to recover.

\* Presentations approximately related to core temperature. Reprinted from the January 1982 issue of American Family Physician, published by the American Academy of Family Physicians.

TABLE II  
Cooling Power of Wind on Exposed Flesh as Equivalent Temperature (under calm conditions)\*

Estimated Wind Speed (mph)	Actual Temperature Reading (Degrees Fahrenheit)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect).	LITTLE DANGER In < hr with dry skin. Maximum danger of false sense of security.				INCREASING DANGER Danger from freezing of exposed flesh within one minute.			GREAT DANGER Flesh may freeze within 30 seconds.				
	Trenchfoot and immersion foot may occur at any point on this chart.											

\* Developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA

Note #1: Wind speeds greater than 40 mph have little additional effect.

Note #2: Trenchfoot and immersion foot may occur at any point on this chart

TABLE III  
Threshold Limit Values Work/Warm-up Schedule for 4 Hour Shift (\*)

Air Temp.-Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approx)	°F (approx)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26° to -28°	-15° to -19°	(Norm. Breaks) 1		(Norm.Breaks) 1		75 min.	2	55 min.	3	40 min.	4
-29° to -31°	-20° to -24°	(Norm. Breaks) 1		75 min	2	55 min.	3	40 min.	4	30 min.	5
-32° to -34°	-25° to -29°	75 min	2	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease	
-35° to -37°	-30° to -34°	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease			
-38° to -39°	-35° to -39°	40 min.	4	30 min.	5	Non-emergency work should cease					
-40° to -42°	-40° to -44°	30 min.	5	Non-emergency work should cease							
-43° & below	-45° & below	Non-emergency work should cease									

Notes for TABLE III:

1. Schedule applies to moderate to heavy work activity with warm-up breaks of 10 minutes in a warm location. For light to moderate work (limited physical motion), apply the schedule one step lower. For example, at -30F with no noticeable wind (step 4, a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4 hour period.
2. The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph, light flag moves; 10 mph, light flag fully extended; 15 mph, raises newspaper sheet; 20 mph, blowing drifting snow.
3. If only the wind-chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be: 1) special warm-up breaks should be initiated at a wind-chill cooling rate of about 17 W/m<sup>2</sup>; 2) all non-emergency work should have ceased at or before a wind-chill of 2250 W/m<sup>2</sup>. In general the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart over-compensates for the actual temperatures in the colder ranges, since windy conditions prevail at extremely low temperatures.
4. TLVs apply only for workers in dry clothing.

\* Adapted from Occupational Health and Safety Division, Saskatchewan Department of Labour.

**APPENDIX D**

**HEAT STRESS PROGRAM**

## **1.0 INTRODUCTION**

Heat stress is one of the most common (and potentially serious) illnesses at job sites. Although it is caused by a number of interacting factors, the wearing of PPE puts the worker at a much higher risk during warmer environmental conditions. The results of heat stress range from fatigue to serious illness or death. Through regular fluid replacement and other preventive measures, heat stress can be controlled, leading to increased efficiency and a higher level of safety on the job.

## **2.0 PURPOSE**

To create an awareness among employees concerning the body's physiologic responses to heat; different types of heat stress that can affect the body; recognition of signs and symptoms; first aid treatment; and, preventive measures.

## **3.0 SOURCES OF HEAT**

There are two sources of heat that are important to anyone working in a hot environment:

- Internally generated metabolic heat;
- Externally imposed environmental heat.

## **4.0 PHYSIOLOGIC RESPONSES TO HEAT**

The human body maintains a fairly constant internal temperature, even though it is exposed to varying environmental temperatures. To keep internal body temperatures within safe limits, the body must get rid of its excess heat, primarily through varying the rate and amount of blood circulation through the skin and the release of fluid onto the skin by the sweat glands. These automatic responses usually occur when the temperature of the blood exceeds 98.6°F and are kept in balance and controlled by the brain. In this process of lowering internal body temperature, the heart begins to pump more blood, blood vessels expand to accommodate the increased flow, and the microscopic blood vessels (capillaries) which thread through the upper layers of the skin begin to fill with blood. The blood circulates closer to the surface of the skin, and the excess heat is lost to the cooler environment.

If the heat loss from increased blood circulation through the skin is not adequate, the brain continues to sense overheating and signals the sweat glands in the skin to release large quantities of sweat onto the skin surface. Evaporation of sweat cools the skin, eliminating large quantities of heat from the body.

As environmental temperatures approach normal skin temperature, cooling of the body becomes more difficult. If air temperature is as warm as or warmer than the skin, blood brought to the body surface cannot lose its heat. Under these conditions, the heart continues to pump blood to the body surface, the sweat gland pour liquids containing electrolytes onto the surface of the skin, and the evaporation of the sweat becomes the principal effective means of maintaining a constant body temperature. Sweating does not cool the body unless the moisture is removed from the skin by evaporation. In high humidity, the evaporation of sweat from the skin is decreased and the body's efforts to maintain an acceptable body temperature may be significantly impaired.

These conditions adversely affect an individual's ability to work in the hot environment. With so much blood going to the external surface of the body, relatively less goes to the active muscles, the brain, and other internal organs; strength declines; and fatigue occurs sooner than it would otherwise. Alertness and mental capacity also may be affected. Workers who must perform delicate or detailed work may find their accuracy suffering, and others may find their comprehension and retention of information lowered.

When temperature differences exist between two or more bodies, heat can be transferred. Net heat transfer is always from the body (or object) of higher temperature to that of lower temperature and occurs by one or more of the following mechanisms:

**Conduction.** The transfer of heat from one point to another within the body, or from one body to another when both bodies are in physical contact. Conduction can be a localized source of discomfort from direct physical contact with a hot or cold surface, it is normally not a significant factor to total heat stress.

**Convection.** The transfer of heat from one place to another by moving gas or liquid. Natural convection results from differences in density caused by temperature differences. Thus warm air is less dense than cool air.

**Radiation.** The process by which energy, electromagnetic (visible and infrared), is transmitted through space without the presence or movement of matter in or through this space.

## 5.0 PREDISPOSING FACTORS TO HEAT STRESS

Factors that may predispose an individual to heat stress vary according to the individual. These factors include:

- Lack of physical fitness;
- Lack of acclimatization;
- Age;
- Dehydration;
- Obesity;
- Drug/alcohol abuse;
- Infection;
- Sunburn;
- Diarrhea;
- Chronic disease.

Predisposing factors and an increased risk of excessive heat stress are both directly influenced by the type and amount of PPE worn. PPE adds weight and bulk, reduces the body's access to normal heat exchange mechanisms (evaporation, convection and radiation) and increases energy expenditure.

## 6.0 FORMS OF HEAT STRESS AND FIRST AID

(The following excerpts were taken from NIOSH Publication No. 86-112, Working in Hot Environments):

"Excessive exposure to a hot work environment can bring about a variety of heat-induced disorders. Among the most common are heat stroke, heat exhaustion, heat cramps, fainting and heat rash.

### Heat Stroke

**Heat Stroke** is the most serious of health problems associated with working in hot environments. It occurs when the body's temperature regulatory system fails and sweating becomes inadequate. The body's only effective means of removing excess heat is compromised with little warning to the victim that a crisis stage has been reached.

A heat stroke victim's skin is hot, usually dry, red or spotted. Body temperature is usually 105°F or higher, and the victim is mentally confused, delirious perhaps in convulsions, or unconscious. Unless the victim receives quick and appropriate treatment, death can occur.

Individuals with signs or symptoms of heat stroke require immediate hospitalization. First aid should be immediately administered. This includes removing the victim to a cool area, thoroughly soaking the clothing with water, and vigorously fanning the body to increase cooling. Further treatment, at a medical facility, should be directed to the continuation of the cooling process and the monitoring of complications which often accompany heat stroke. Early recognition and treatment are the only means of preventing permanent brain damage or death.

### Heat Exhaustion

**Heat Exhaustion** includes several clinical disorders having symptoms which may resemble the early symptoms of heat stroke. Heat exhaustion is caused by the loss of large amounts of fluid by sweating, sometimes with excessive loss of salt. A worker suffering from heat exhaustion still sweats but experiences weakness or fatigue, giddiness, nausea or headache. In more serious cases, the victim may vomit or lose consciousness. The skin is clammy and moist, the complexion is pale or flushed, and the body temperature is normal or only slightly elevated.

In most cases, treatment involves having the victim rest in a cool place and drink plenty of liquids. Victims with mild cases of heat exhaustion usually recover spontaneously with this treatment. Those with severe cases may require extended care for several days. There are no known permanent effects.

## Heat Cramps

**Heat cramps** are painful spasms of the muscles that occur among those who sweat profusely in heat, drink large quantities of water, but do not adequately replace the body's salt loss. The drinking of large amounts of water tends to dilute the body's fluids, while the body continues to lose salt. Shortly after, the low salt level in the muscles causes painful cramps. The affected muscles may be part of the arms, legs, or abdomen; but tired muscles (those used in performing the work) are usually the ones most susceptible to cramps. Cramps may occur during or after work hours and may be relieved by taking salted liquids by mouth.

## Fainting

**Fainting** occurs in workers not accustomed to hot environments and who stand erect and immobile in the heat.

With enlarged blood vessels in the skin and in the lower part of the body due to the body's attempts to control internal temperature, blood may pool there rather than return to the heart to be pumped to the brain. Upon lying down, the worker should soon recover. By moving around, and thereby preventing blood from pooling, the patient can prevent further fainting.

## Heat Rash (Prickly Heat)

**Heat rash**, also known as prickly heat, is likely to occur in hot, humid environments where sweat is not as easily removed from the surface of the skin by evaporation and the skin remains wet most of the time. The sweat ducts become plugged, and a skin rash soon appears. When the rash is extensive or when it is complicated by infection, prickly heat can be very uncomfortable and may reduce a worker's performance. The worker can prevent this condition by resting in a cool place part of each day and by regularly bathing and drying the skin.

## **7.0 SELECTION OF PERSONAL PROTECTIVE EQUIPMENT (PPE)**

During work periods where the increased risk of heat stress exists, each item's benefit will be carefully evaluated. Once the PPE is chosen, safe work durations/rest periods will be determined based on the following conditions:

- Anticipated work rate;
- Ambient temperature and humidity;
- Level of protection.

## **8.0 PREVENTION OF HEAT STRESS**

Prevention of heat stress will be addressed in the following manner:

1. Adjustment of work schedules.
  - a. Modify work/rest schedules.
  - b. Enforce work slowdowns, as needed.
  - c. Rotate personnel to minimize overstress or overexertion.
  - d. When possible, work will be scheduled and performed during cooler hours.
1. Provide shelter or shaded areas to protect personnel during rest periods.
2. Maintain worker's body fluids at normal levels.
  - a. Drink approximately 12 to 16 ounces of non-caffeinated liquid (preferably water, Gatorade or equivalent) prior to the start of work. Caffeinated fluids act to dehydrate the worker.
  - b. Workers will be urged to drink a cup or two every 15 to 20 minutes, or at each break. A total of 1 to 1.5 gallons of water per individual per day are recommended for fluid replacement under heat stress conditions, but more may be required.
3. Encourage physical fitness among the workers.

Gradually acclimatize workers on site to help build up an "immunity" to the conditions.

  - Heat acclimatization can usually be induced in 5 to 7 days of exposure at a hot job. For workers with previous experience with the job, acclimatization will include exposures of 50% for day 1, 60% for day 2, 80% for day 3, and 100% for the remaining additional days.
4. Provide cooling devices during prolonged work or severe heat exposure.
  - a. Supply field showers or hose down areas.
  - b. Supply personnel with cooling jackets, vests, and suits.
5. Train workers in recognition and treatment of heat stress.
6. Use of the buddy system that depends on the recognition of signs and symptoms of heat stress.
7. Identification of heat-intolerant individuals through medical screening.

**APPENDIX E**

**PROCESS SAFETY MANAGEMENT**

## **1.0 PROCESS SAFETY INTRODUCTION**

The OSHA Process Safety Management (PSM) Standard applies to users of extremely hazardous substances and flammable substances that exceed certain thresholds. The regulation requires users of these substances to conduct a thorough comprehensive analysis of processes that use these hazardous materials. The EPA Risk Management Program regulations are closely related to the OSHA Standard. Many **GEI** clients must comply with PSM/RMP and it is **GEI**'s responsibility to meet the Client's requirements as a vendor to the client. The purpose of the OSHA PSM and EPA RMP regulations is to minimize the impact of catastrophic releases of extremely hazardous materials. These substances include toxic, reactive, flammable and explosive substances. **GEI** employees are required to be properly trained and informed when working at sites regulated under the PSM/RMP rule.

## **2.0 PROCESS HAZARD ANALYSIS**

Regulated facilities are required to conduct a Process Hazard Analysis of all regulated processes. All **GEI** project managers are required to discuss the applicability of the Process Hazard Analysis to **GEI**'s work. Copies of the Process Hazard Analysis (PHA) should be obtained if available prior to starting the work. The PHAs applicable to **GEI**'s work will be identified and provided to **GEI**'s affected employees. Each employee will be familiar with the hazards related to **GEI**'s work and the proper response in the event of an emergency. This response could include evacuation, sheltering in place or the use of emergency escape equipment. The escape routes must be known before beginning work. **GEI** staff should meet with the Client's Safety Department whenever possible to review safety issues associated with **GEI**'s work.

## **3.0 TRAINING**

All **GEI** employees will receive site-specific training prior to working at a site regulated by the Process Safety Standard. Training will review the known potential fire, explosion, and toxic hazards present on site. Most clients provide this training as part of the site admissions process. Varying levels of training may be needed depending on the type of access and proximity to regulated processes. Only documented trained **GEI** employees will be allowed to work at a site regulated by the Process Safety Standard. Records of the training will be maintained in each employee's personnel record.

## **4.0 SITE SPECIFIC EMERGENCY ACTION PLAN**

### **4.1 Emergency Action Plan**

Emergency Action Plans are required by all facilities. The plan will be reviewed by **GEI** staff before beginning work on site. Exit routes, gathering locations and shelters in place will be reviewed relative to **GEI**'s work. The review of the plan will be part of **GEI**'s daily toolbox safety meeting.

### **4.2 Response Procedures**

**GEI** will be familiar with the alarms or other notification systems used by the client. **GEI** will place all equipment in a neutral state, if possible, before leaving the work area during an

emergency. **GEI** employees should remain together and identify themselves to the response coordinator. Re-access to the work area will not take place until permission has been obtained and the emergency mitigated.

#### 4.3 Material Safety Data Sheets

**GEI** will maintain on-site a compilation of MSDSs for chemicals used by **GEI**. **GEI** will obtain from the client MSDSs for facility chemicals that could be encountered by **GEI** employees during this work. **GEI** will review **GEI**'s work with the client including the chemical usage to determine if there will be significant impact with the client's processes.

#### 4.4. Accidents/Incidents

Accidents and near-miss incidents will be investigated in accordance with client and **GEI** Corporate Health and Safety requirements.

### 5.0 TRADE SECRETS

All **GEI** employees have an obligation to keep client information confidential and are not allowed to discuss the client's processes with outside personnel. All communication with regulatory personnel or other observers of **GEI**'s work is to be directed to the client unless written permission has been obtained from the client. The results of all data collected by **GEI** is also considered confidential and must not be discussed without client permission.

### 6.0 SAFE WORK PRACTICES

**GEI**'s work is typically non-intrusive and should not interfere with the clients operation. Unique hazards associated with **GEI**'s work should be identified and reviewed with the client. Special procedures that may need to be followed could include lockout/tagout, confined space entry, hot work, or other operational issues that may need to be addressed. **GEI** will review **GEI**'s work with the Client to determine if **GEI**'s work will create unique hazards or interfere with the client's operation.

#### 6.1 Hot-work and Lockout/tagout

**GEI** will adhere to client's requirements for lockout/tagout procedures. Hot work permits may be necessary in certain situations and **GEI** will discuss these permit conditions with the client before starting work.

## **APPENDIX F**

### **PERSONAL PROTECTIVE EQUIPMENT (PPE) PROGRAM: SELECTION AND USE**

## **1.0 PURPOSE**

This program has been written to help the worker choose the correct Personal Protective Equipment (PPE) for the job. Familiarity with the different levels of protection (A, B, C and D) will help speed up the selection process. Careful selection and use of adequate PPE should protect the respiratory system, skin, eyes, face, hands, feet, head, body and hearing. **GEI** employees may work at a variety of job sites and locations which may require different types of protective equipment. Client specific requirements will always be adhered to. **GEI** will supply all PPE or reimburse the employee for the costs of PPE if the PPE is required as part of the project.

## **2.0 SCOPE**

This program establishes criteria for the selection, use, donning and doffing, inspection, maintenance, storage, decontamination of PPE, and evaluation. This information is general, and specific PPE use should be included in the site-specific health and safety plan prepared for each project.

## **3.0 OSHA REQUIREMENTS (29 CFR 1910.120)**

A written personal protective equipment program, which is part of the employer's safety and health program and also part of the site-specific health and safety plan shall be established. The PPE program shall address the elements listed below.

- PPE selection based upon site hazards;
- PPE use and limitations of the equipment;
- Work mission duration;
- PPE Maintenance and storage;
- PPE decontamination and disposal;
- PPE training and proper fitting;
- PPE donning and doffing procedures;
- PPE inspection procedures prior to, during and after use;
- Evaluation of the effectiveness of the PPE program; and
- Limitations during temperature extremes, heat stress, and other appropriate medical considerations.

OSHA Standard 29 CFR 1910.132 requires employers to assess the employer's workplace and determine if hazards are present that necessitate the use of personal protective equipment (PPE). This assessment must be certified in writing and documented.

Due to the variety of job sites and situations that **GEI** personnel may be involved in, it is important that **GEI** maintain a consistent approach in complying with health and safety procedures. The project manager and/or site supervisor are responsible for ensuring that all personnel wear the appropriate PPE. Failure to comply with these requirements may result in disciplinary action. Employee safety is a paramount concern for all **GEI** managers and employees. We all must make every effort to protect ourselves and each other from harm. These procedures will now require the following:

1. Protective footwear must be worn by all field personnel working in the field. Footwear must at a minimum include steel toe and shank protection. **GEI** will reimburse employees up to \$90 for the purchase of protective footwear which must be dedicated for work. Protective footwear must meet ANSI Z41-1991. Additionally, chemical protective footwear may also be required if the potential for contaminated materials exists. This type of protection will be required on a site-specific basis.
2. Eye protection must be worn by all field personnel during all sampling activities, stack sampling, and inside manufacturing facilities. Eye protection must include side shields. Prescription lenses worn as eye protection and other protective eyewear must meet ANSI Z87.1-1989.
3. Hardhats are to be worn by all field personnel when in the field. New hardhats must meet ANSI Z89-1986.
4. Hand protection is to be worn on a site-specific basis. The hand protection must be selected based on the chemical hazards expected to be encountered. **GEI** maintains a stock of a variety of gloves including:

Best:       Nitrile N-Dey  
              PVC  
              Latex  
              Vinyl  
              Solvex, Nitrile  
              Leather Work Gloves

These gloves are available on a project specific basis.

Additionally, nitrile coated Kevlar gloves or other types of puncture resistant gloves are to be worn by all personnel working with or cleaning glass impingers. Manufacturers that supply these gloves include Ansell Edmont, Jomac and Wells Lamont. Insulated electrical gloves with outer leather gloves is required when working around high-voltage systems. **GEI** is responsible for supplying all personal protective equipment required for **GEI**'s projects.

5. Personnel entering within *5 feet of any energized electrical equipment* OR entering within *15 feet of overhead electrical lines* OR working within *15 feet of equipment with electrical potential* such as working within 15 feet of overhead lines (i.e. excavator bucket) will wear fire resistant clothing as outlined in OSHA standards: "Apparel which meets the flame resistant clothing requirements of the American Society For Testing and Materials (ASTM) standard, ASTM F1506-1994, is acceptable under all flame and electric arc hazard conditions for compliance with the paragraph 1910.269(l)(6)(iii) standard." This includes long pants and long-sleeved shirts to provide protection from burns in the case of coming in contact with electrical arcing. Clothing worn should have a designation citing this ASTM Standard, or be labeled as meeting "NFPA 70E," which meets the ASTM standard.

#### **4.0 WORK MISSION DURATION**

Before donning any PPE ensembles, workers will estimate their anticipated work duration. There are several limiting factors that affect the length of work time. These factors must be addressed:

- Air supply consumption
- Permeation and penetration of the Chemical Protective Clothing/ensemble;
- Ambient temperature; and
- Coolant supply (ice or chilled area to keep the worker's body temperature at a normal temperature).

#### **5.0 LEVEL OF PROTECTION**

The following section describes the different levels of protection (A through D). Each level is described in the following manner: the protection provided; when this particular level of protection should be used; recommended and optional equipment; and, any limiting criteria.

1. Level A
  - a. Protection provided:
    - Level A provides the highest available level of respiratory, skin and eye protection.
  - b. Should be used when:
    - The chemical substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on any of the following circumstances;
    - Measured (or potential for) high concentration of atmospheric vapors, gases or particulates;

- Site operations and work functions involving a high potential for splash, immersion, or exposure to unexpected vapors, gases or particulates of materials that are harmful to skin or capable of being absorbed through intact skin;
- Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible;
- The Operations must be conducted in confined, poorly ventilated areas until absence of conditions requiring Level A protection is determined.

c. Recommended equipment:

- Pressure-demand, full facepiece SCBA or pressure-demand supplied-air respirator with escape SCBA;
- Fully-encapsulating, chemical-resistant suit (pressure-tested immediately before use);
- Inner chemical-resistant suit;
- Inner chemical-resistant gloves;
- Chemical-resistant safety boots/shoes; and
- Two-way radio communications.

d. Optional equipment:

- Cooling unit;
- Coveralls;
- Long cotton underwear;
- Hard hat; and
- Disposable gloves and boot covers.

e. Limiting criteria:

- Fully encapsulating suit material must be compatible with the substances involved.

2. Level B

a. Protection provided:

- The same level of respiratory protection, but less skin protection than Level A.

b. Should be used when:

- The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection. This involves atmospheres with IDLH concentrations of specific substances that do not represent a severe skin hazard, or that do not meet the criteria for use of air purifying respirators;
- Atmospheres contain less than 19.5% oxygen; and
- Presence of incompletely identified vapors or gases indicated by direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the intact skin.

c. Recommended equipment:

- Pressure-demand, full facepiece SCBA or pressure-demand supplied-air respirator with escape SCBA;
- Chemical-resistant clothing (coveralls and long-sleeved jacket; hooded, one- or two-piece chemical splash suit; disposable chemical-resistant one-piece suit);
- Inner and outer chemical-resistant gloves;
- Chemical-resistant safety boots/shoes;
- Hard hat; and
- Two-way radio communications.

d. Optional equipment:

- Coveralls;
- Disposable boot covers;
- Face shield; and
- Long cotton underwear.

e. Limiting criteria:

- Use only when the vapors or gases present are not suspected of containing high concentrations of chemicals that are harmful to skin or capable of being absorbed through the intact skin.
- Use only when it is highly unlikely that the work being done will generate either high concentrations of vapors, gases or splashes of material that will affect the exposed skin.

3. Level C

a. Protection provided:

- Level C provides the same level of skin protection as Level B, but a lower level of respiratory protection.

b. Should be used when:

- The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any exposed skin;
- The types of air contaminants have been identified, concentrations measured, and a canister/cartridge is available that can remove the contaminant; and
- All criteria for the use of air-purifying respirators are met.

c. Recommended equipment:

- Full facepiece or half facepiece air-purifying negative pressure respirator;
- Chemical-resistant clothing;
- Inner and outer chemical-resistant gloves;
- Chemical-resistant safety boots and shoes;
- Disposable boot covers;
- Hard hat; and
- Two-way radio communications.

d. Optional equipment:

- Coveralls;
- Face shield;
- Escape bottle; and
- Long cotton underwear.

- e. Limiting criteria:
  - Atmospheric concentration of chemicals must not exceed IDLH levels; and
  - The atmosphere must contain at least 19.5% oxygen.

#### 4. Level D

- a. Protection provided:
  - No respirator protection and minimal skin protection.
- b. Should be used when:
  - The atmosphere contains no known hazard; and
  - Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.
- c. Recommended equipment:
  - Coveralls;
  - Safety boots/shoes;
  - Safety glasses or chemical splash goggles; and
  - Hardhat.
- d. Optional equipment:
  - Gloves;
  - Escape bottle; and
  - Face shield.
- e. Limiting criteria:
  - This level should not be worn in the exclusion zone; and
  - The atmosphere must contain at least 19.5% oxygen.

### 6.0 LEVEL OF PROTECTION UTILIZED BY GEI PERSONNEL

Due to the nature of our work, it can be reasonably expected that personnel will not be performing any work that will require the use of Level A protection. **GEI** will not directly undertake assignments and **GEI** does not generally train or equip its personnel to handle circumstances involving Level A protection. If **GEI** is working on a site and Level A is deemed necessary, the work will be subcontracted to a qualified firm. **GEI** personnel should not directly undertake these tasks.

Sites where **GEI** is working often require the use of Level C or D, with Level B equipment available on-site for emergency rescue. Any questions concerning the level of protection necessary to complete a certain task will be directed to the Health and Safety Assessment Division before setting up the job.

## **7.0 TYPES OF PPE OWNED AND UTILIZED BY GEI**

The following list contains all types of PPE owned by **GEI** and their uses on the job, as they may apply to a specific site.

1. Respiratory Equipment:
  - a. SCBAs:
    - Used for emergency rescue and exposures greater than maximum use concentration limits set for canister/cartridge type negative pressure respirators.
  - b. Supplied-air respirators:
    - MSA Premaire system.
  - c. Negative pressure respirators:
    - Half face and full face, used for exposure to certain types of acid gases, organic vapors and particulates not greater than the canister/cartridge maximum use concentration limit.
2. Chemical protective apparel suits:
  - a. Polycoated Tyvek, Saranex, Chemrel and Tyvek (porous). Provide protection against certain liquid chemicals.
    - Tyvek provides protection against particulates only.
  - b. Fire/flame retardant coveralls:
    - Provide protection against flash fires.
3. Insulated clothing (Provides protection against exposure to the cold:
  - a. Chemical resistant gloves:
    - Provide protection for the hands against chemical splashes.

- b. Disposable boot covers:
  - Protect safety boots from contamination and feet from contact with chemicals.
- 4. Eye protection:
  - a. Safety glasses and chemical splash goggles.
    - Safety glasses protect the eyes against large particles and projectiles.
    - Chemical splash goggles protect the eyes against vaporized chemicals, splashes, large particles, and projectiles.
  - b. Vented goggles do not provide protection against vapors and are not adequate for splashes, as material may seep inside the goggles.
- 5. Hard hat:
  - Provides protection against blows to the head. When worn with a liner, provides protection against the cold.
- 6. Construction safety boots:
  - Steel-toe and shank construction boots with chemically resistant soles protect the feet from heavy and sharp objects, and contact with chemicals.
- 7. Safety harnesses and lifelines:
  - Enable the individual to work in elevated areas or enter confined spaces to prevent falls and aid in rescue.
- 8. Hearing protection:
  - Provides protection against physiological damage and psychological effects.
- 9. Canvas work gloves:
  - Provide protection for the hands against abrasions and slivers.

## **8.0 SELECTION OF CHEMICALLY PROTECTIVE CLOTHING**

1. Chemically-protective clothing (CPC) will be chosen in the following manner:
  - a. Determine what chemicals are present on the site.
  - b. CPC chosen must be resistant to permeation, degradation and penetration of the chemical(s).
    - Permeation - Process by which a chemical dissolves in and/or moves through a protective clothing material on a molecular level.
    - Degradation - The loss of or change in the fabric's chemical resistance or physical properties due to exposure to chemicals, use or ambient conditions (e.g., sunlight).
    - Penetration - The movement of chemicals through zippers, stitched seams or imperfections (e.g., pinholes) in CPC.
  - c. Review manufacturer's permeation data to determine the performance characteristics of the material to the specific chemical. See Appendix A for "Permeation Guides".
  - d. Select CPC that protects against the greatest range of chemicals on the site and has the longest breakthrough time.
  - e. Discuss choice of CPC with the Health and Safety division prior to setting up the job.

## 9.0 DONNING AND DOFFING PROCEDURES

The following procedures will be used by **GEI** employees for donning and doffing PPE at protection Levels B and C. Donning and doffing will be performed with the assistance of an individual(s) located in the Support Zone and Contamination Reduction Zone, respectively. This individual will help the worker tape up and adjust PPE for proper fit, as well as remove PPE after decontamination.

### 1. Donning PPE

- Inspect the clothing and respirator before donning.
- Unzip the suit.
- Step into the legs of the suit, slipping the feet through the legs. Push arms through the sleeves.
- Pull leg cuffs over the feet.
- Put on chemical-resistant safety boots over the feet. Tape the leg cuff over the tops of the boots.
- Pull over chemical-resistant boot covers and tape over the leg cuff.
- If suit contains protective feet, wear chemical-resistant safety boots inside the suit with chemical-resistant boot covers over the suit and taped securely to the leg.
- If wearing a SCBA, don the facepiece and adjust it to be secure, but comfortable. Do not connect the breathing hose. Open valve on the air tank.
- If wearing a negative pressure respirator, pull hood over the head and perform positive and negative pressure facepiece seal test.
- Pull on chemical protective inner gloves.
- Pull on chemical protective outer gloves and tape securely to the sleeve of the suit.
- Securely tape the suit to protect all exposed skin around the neck area, and if wearing a full facepiece, tape around the edge of the hood-to-facepiece junction.
- Put on hardhat, if needed, and tape securely on top of head so that the hard hat does not slide off.

## 2. Doffing PPE

- Doffing of PPE will not take place until the individual has been properly decontaminated by a suitably attired assistant. Both the worker and assistant will make every effort to avoid any direct contact with the outside of the suit.
- If the individual is wearing a SCBA, the hose connection to the diaphragm will be disconnected, leaving the facepiece on the wearer. The remainder of the unit will be removed and decontaminated before proceeding further.
- If the individual is wearing a half-face or full-face negative pressure respirator, she/he will be instructed to leave it on until the doffing procedure is complete.

NOTE: Decontamination is to be performed in accordance with the Site-Specific Health and Safety Plan for the site.

## 10.0 DECONTAMINATION OF PPE

Whenever possible, disposable PPE will be used on-site. Disposable PPE includes the following:

- Chemical protective suits;
- Gloves; and
- Chemical protective boot covers.

After decontaminating the worker, PPE is disposed of on-site in labeled disposal containers.

## 11.0 INSPECTION OF PPE

PPE will be inspected prior to, during and after each use according to the procedure outlined below.

### 1. Prior to use (Reusable and Disposable PPE):

- a. Through reviewing available literature, determine that the clothing material is correct for the task.
- b. Visually inspect for:
  - Imperfect seams;
  - Non-uniform coatings;
  - Tears or holes; and
  - Malfunctioning closures.
- c. Hold up to the light and check for pinholes (inflate gloves and check for leaks).

- d. Flex and check for:
    - Cracks; and
    - Shelf deterioration.
  - e. If previously used, check for:
    - Discoloration;
    - Swelling;
    - Stiffness and cracking; and
    - Holes and tears.
2. During use (Reusable and Disposable PPE), check for:
- a. Evidence of chemical attack.
  - b. Discoloration, swelling, stiffening, softening and/or cracking.
  - c. Tears.
  - d. Punctures.
  - e. Seam discontinuities.

**Note:** Report any sense of breakthrough to the Health and Safety Assessment Division. Medical monitoring may be necessary to determine the extent of exposure.

3. After use (Reusable PPE), check for:
- a. Malfunctioning parts.
  - b. Evidence of chemical attack.
  - c. Punctures.
  - d. Tears.
  - e. Cracks.

## **12.0 MAINTENANCE AND STORAGE OF PPE**

PPE, other than respiratory equipment, will be maintained and stored in accordance with the manufacturer's recommendations at a minimum to prevent damage due to exposure to dust, moisture, sunlight, chemicals, temperature extremes and sudden impact.

Employees are given Field Operations Equipment bags prior to working on any **GEI** sites. PPE that is given to the individual solely for his/her use will be stored in this bag. Before and after each use, the PPE will be inspected to determine whether or not it is still "field worthy". Any PPE found to be defective will be reported to the Health and Safety Assessment Division and either discarded or repaired, as appropriate. Under no circumstances will defective PPE be used in the field.

- a. The Health and Safety Assessment Division will periodically inspect PPE issued for individual use.

- b. Unless the equipment can be repaired, any PPE found to be defective will be removed from service and discarded immediately.
- c. Repairable PPE will be tagged, returned to the Facility Manager and sent out for repair.

### **13.0 EVALUATION OF PPE PROGRAM**

**GEI's** Personal Protection Equipment Program will be reviewed annually by the Health and Safety Assessment Division. Any program deficiencies that are identified by a **GEI** employee will be reported to the Health and Safety Assessment Division, so that changes will be made immediately. All employees affected by the change(s) will be notified in writing.

Review of the PPE Program will include, but not be limited to, the following:

- Accident and illness experience on various job sites.
- Type and degree of exposure.
- Adequacy of equipment selection process.
- Degree of fulfillment of program objectives.
- Employee acceptance.
- Coordination with overall health and safety program elements.
- Recommendations for program improvements and modifications.
- Adequacy of program records.

## **APPENDIX G**

### **MONITORING INSTRUMENTS: USE, CARE, AND CALIBRATION**

## 1.0 INTRODUCTION

Prior to beginning any work at **GEI** sites, a preliminary site evaluation must be conducted to identify the hazards or suspected hazards of the site. Through area and personal monitoring with direct-reading instruments and personal sampling pumps, hazardous conditions can be evaluated, and the proper level of protection chosen for the specific type of work activity. Monitoring equipment used by **GEI** personnel includes the following: Oxygen/Combustible Gas Meters (CGM); Organic Vapor Analyzers (OVA); Photoionization Detectors (PID); Personal Sampling Pumps; and, Colorimetric Tubes. This program contains a description of each type of monitoring equipment; hazards for which it can be used to monitor; Applications; Care and Maintenance; Limitations; and, Calibration.

## 2.0 SCOPE

This program covers the use, application, care and maintenance, limitations and calibration of CGMs, OVAs, PIDs, Personal Sampling Pumps and Colorimetric Tubes used by **GEI** employees in hazardous materials operations. **GEI** employees engaged in activities involving hazardous materials includes the Hazardous Waste Division and the Air Division.

## 3.0 INSTRUMENTATION

### 1. Photoionization Detectors (PIDs)

#### Introduction

PIDs measure a variety of gases in many industrial, as well as hazardous material, operations. These analyzers employ the principle of photoionization, which is the absorption of ultraviolet light by molecules, for detection.

The sensor consists of a sealed ultraviolet light. The energy ionizes many trace species (particularly organics) but does not ionize the major components of air, such as O<sub>2</sub>, N<sub>2</sub>, CO, CO<sub>2</sub>, or H<sub>2</sub>O. A chamber adjacent to the ultraviolet source contains a pair of electrodes. When a positive potential is applied to one electrode, the field created drives any ions, which are formed by absorption of the UV light, to the collector electrode, where the current (proportional to the concentration) is measured.

To minimize absorption of various sample gases, the ion chamber is made up of an inert fluorocarbon material, located at the sampling point, and a rapid flow of sampling gas is maintained through the small ion chamber volume.

The analyzer will operate either from a rechargeable battery for up to 10 hours, or continuously from the AC battery charger.

The useful linear range of the instrument is from a fraction of a part per million to about 2000 PPM.

## Theory

**GEI** utilizes the HNu meter as its PID. The HNu is a portable, non-specific vapor/gas detector. The HNu employs the principle of photoionization to detect a variety of chemical compounds, both organic and inorganic.

The HNu contains an ultraviolet light source within its sensor chamber. Ambient air is drawn into the chamber with the aid of a small fan (PI-101) or positive displacement pump (HW-101). If the ionization potential (IP) of any contaminant present in the ambient air is equal to or lower than the energy of the UV light source, ionization will take place, causing a deflection in the meter.

Response time for the HNu is approximately 90% at 3 seconds. The meter reading is expressed in parts per million (PPM) relative to the calibration gas. All readings must be stated as equivalent readings that depend on the calibration gas being used to calibrate the HNu. The calibration gas used is Isobutylene. Formerly, benzene was used as the calibration gas, but due to its hazard it is no longer used. Isobutylene, used as an equivalent in place of benzene, allows the instrument to provide results in benzene equivalents.

A list of IPs for various gases is provided in the latest edition of the NIOSH Pocket Guide to Chemical Hazards.

## Basic Operation of the HNu

A sample of air is drawn through a chamber and an ultraviolet light causes certain contaminants present to be broken apart into positive and negative charged particles. These charged particles are passed between electrodes and converted into an electrical impulse displayed on the readout.

## Checkout and Use Procedures

Attach the probe to the readout assembly. Be sure pins and "slot/key" are properly aligned. **DO NOT FORCE CONNECTION INTO THE RECEPTACLE.** Turn the connector clockwise until it snaps into place with a clicking noise, which will be both heard and felt.

Turn the function switch to "BATT". The needle should deflect to the right ("BATT CHK"). Listen for the humming of the fan or the pump. Look briefly into the probe and check to see if the lamp is on (look for a purple glow). Do not use the probe extension. Do not look into the lamp for more than a brief moment to see if the lamp is on. Prolonged exposure to the ultraviolet light rays of the lamp will cause eye damage.

Turn the function switch to "STANDBY". The fan will stay on, but the light will go out. Check the readout, which will read close to 0, and adjust the "ZERO" control knob. Check the "SPAN", which should be 9.8 for the 10.2 eV lamp. The lock should be on and should not be touched unless the unit is being calibrated.

Turn the function switch to "0-20". Check the unit with a magic marker, lighter (unlit), etc. to make sure it is working properly. Turn the function switch to 0-200, 0-2000 or 0-20 to sample, as necessary.

#### Field Applications/Limitations

- a. The HNu will only detect organic materials with an ionization potential less than 10.2eV.
- b. It is a non-specific detection device, but provides continuous information on airborne concentrations.
- c. It will not respond equally to all contaminants, and does not detect methane.
- d. High humidity will cause the instrument to give lower readings than the actual airborne concentration.
- e. Transfer of the instrument from a cold to a warm environment may cause condensation to form on the UV light source window, causing erroneous results.
- f. The readout may also be affected by electrical power lines or power transformers.
- g. Total concentrations are relative to the calibration gas used (isobutylene). Therefore, true concentrations cannot be identified. And, while the instrument scale reads 0-2000 ppm, response is linear (to isobutylene) from 0-600 ppm.
- h. Wind speeds of greater than 3 mph may affect the fan speed on the PI-101 and readings, depending on the position of the probe relative to wind direction.

#### Calibration Procedure

Calibration Checklist: HNu Meter (Probe and box); Span gas (HNu Manufactured); Regulator; Tygon tubing.

Cleaning and Calibration Checklist: Same materials as above; HNu cleaning compound; Fine screwdrivers, flat and Phillips head; Sonnicator; Drying/Toaster oven.

Inventory Items: Battery; Lamp; ION chamber; O-Rings; Screws.

- a. Obtain calibration gas, Isobutylene at Span 9.8 with 10.2 eV, manufactured by HNu.
- b. Connect the calibration gas to the end of the probe extension. Open the gas flow valve.
- c. Turn the selection knob to the 0-200 range and observe the meter needle. The concentration should read the same as that listed on the cylinder. If not, the span should be adjusted until the meter reads accurately.

- d. The above procedure can be used until the span reading is approximately 5. At this time, the meter needs to be cleaned and internally calibrated. See Step 5.
- e. For cleaning and internal calibration:
  - Disassemble the probe, carefully removing the lamp.
  - Clean the lamp.
  - Clean the ION chamber and probe extension.
  - Remove the instrument from its housing to expose the calibration screw, located on the side of the instrument.
  - Once the probe parts have cooled (assuming it has been used), assemble the probe and connect it to the instrument.
  - Connect the calibration gas to the end of the probe extension and open the gas flow.
  - Turn the selection knob to the 0-200 range and observe the needle. The concentration should read the same as the concentration listed on the cylinder. If not, then the calibration screw must be adjusted with a fine screwdriver.

#### Maintenance and Calibration Records

- a. Protect the instrument from excessive abuse, such as moisture, shock, vibration, etc.
- b. Maintenance and calibration records will be recorded in a logbook specific to the HNu meter.

#### Troubleshooting

Below are some points that should be considered if the instrument is not running appropriately:

- a. Check the battery condition. Recharge it if necessary.
- b. If unstable readings are obtained, a faulty probe cable or electrical connection could be the problem. To check this, hold the probe normally and flex the cable firmly. Watch the meter needle for fluctuations as the cable is flexed. Individual wires in the readout can be checked in a similar way.
- c. Check the coaxial connector on the amplifier board in the probe for any separation.
- d. Determine whether or not the meter is being used in close proximity to AC power lines or power transformers. This can cause the instrument to read erroneously. To check for this interference, zero the instrument in an electrically quiet area in the standby

position, and then move the instrument into the area in question. If AC pick-up is a problem in the area, then the meter will indicate the magnitude of the problem.

- e. No response on any setting may mean that the meter movement is broken. Tip the instrument from side-to-side. The needle should move freely and return to zero.
- f. No response may mean that the electrical connection to the meter is broken. Check all wires leading to the meter and clean the contacts of the quick-disconnects.
- g. No response may mean that the battery is completely dead. Disconnect the battery and check the voltage with a volt-ohm meter. Also check the 2-amp fuse.
- h. If the meter responds in the BATT CHK mode, but reads zero or near zero for all other modes, the power supply may be defective.
  - Replace the power supply.
  - Check the input signal connection, which may be broken in the probe or readout.
  - Check the input connector on the printed circuit board inside the probe. It should be firmly pressed down.
  - Check the components on the backside of the circuit board. All connections should be solid and no wires should touch any other object.
  - Check all wires in the readout for solid connections.
- i. When the instrument responds appropriately in the "BATT CHK" and "STANDBY" positions, but not in the measuring mode, check to see that the light source is on.
- j. If the instrument responds correctly in all settings, but the signal is lower than expected:
  - Check the span setting.
  - Clean the window of the light source.
  - Check the fan for proper insertion.
- k. If the instrument response is slow and/or not reproducible, either the fan is operating improperly (check the fan voltage), or the instrument needs to be recalibrated.
- l. A low battery indication comes on if the battery charge is low. It will also come on if the ionization voltage is too high.

## 2. Organic Vapor Analyzer

### Introduction

The OVA 128 is a sensitive instrument designed to measure trace quantities of organic materials in air. It is essentially a flame ionization detector such as that utilized in laboratory gas chromatographs and has similar analytical capabilities. The Flame Ionization Detector (FID) is an almost universal detector for organic compounds with the sensitivity to measure in parts per million range in the presence of atmospheric moisture, nitrogen oxides, carbon monoxide and carbon dioxide.

The instrument has broad application since it has a chemically resistant air sampling system and can be readily calibrated to measure almost all organic vapors. It has a single linearly scaled readout from 0 ppm to 10 ppm with a X1, X10, X100 range switch. This range expansion feature provides accurate readings across a wide concentration range with either the 10, 100, or 1000 ppm full-scale deflection. Designed for use as a portable survey instrument, it can also be readily adapted to fixed remote monitoring or mobile installations. It is ideal for the determination of many organic air pollutants and for monitoring the air in potentially contaminated areas.

The OVA 128 is certified by Factory Mutual Research Corporation for use in Class 1, Groups A, B, C and D Division 1 hazardous locations. Similar foreign certifications have been obtained, including BSEEFA. This requirement is especially significant in industries where volatile flammable petroleum or chemical products are manufactured or used and for instruments which are used in portable surveying or for analyzing concentrations of gases and vapors. Such instruments must not be capable, under normal or abnormal conditions, of causing ignition of hazardous mixtures in the air. In order to maintain the certified safety, it is important that the precautions outlined in this manual be practiced and that no modifications be made to these instruments.

### Theory

The OVA 128 analyzer is designed to detect and measure hazardous organic vapors and gases found in most industries. It has broad application since it has a chemically resistant sampling system and can be calibrated to almost all organic vapors. It can provide accurate indication of gas concentration in one of three ranges: 0-10 ppm, 0-100 ppm, 0-1000 ppm. While designed as a lightweight portable instrument, it can be permanently installed to monitor a fixed point.

The instrument utilizes the principle of hydrogen flame ionization for detection and measurement of organic vapors. The instrument measures organic vapor concentration by producing a response to an unknown sample, which can be related to a gas of known composition to which the instrument has previously been calibrated. During normal survey mode operation, a continuous sample is drawn into the probe and transmitted to the detector chamber by an internal pumping system.

The sample stream is metered and passed through particle filters before reaching the detector chamber. Inside the detector chamber, the sample is exposed to a hydrogen flame which

ionizes the organic vapors. When most organic vapors burn, they leave positively charged carbon-containing ions. An electric field drives the ions to a collecting electrode. As the positive ions are collected, a current corresponding to the collection rate is generated. This current is measured with a linear electrometer preamplifier which has an output signal proportional to the ionization current. A signal-conditioning amplifier is used to amplify the signal from the pre-amp and to condition it for subsequent meter or external recorder display. The display is an integral part of the probe/readout assembly and has 270-degree scale deflection.

In general, the hydrogen flame ionization detector is more sensitive for hydrocarbons than any other class of organic compounds. The response of the OVA varies from compound to compound, but gives repeatable results with all types of hydrocarbons, i.e. saturated hydrocarbons (alkanes), unsaturated hydrocarbons (alkenes and alkynes) and aromatic hydrocarbons.

### Applications

- a. Measurement of most toxic organic vapors present in industry for compliance with OSHA requirements.
- b. Evaluation and monitoring applications in the air pollution field.
- c. Source identification and measurement for fugitive emissions (leaks) as defined by the EPA.
- d. Forensic science applications.
- e. Controlling and monitoring atmospheres in manufacturing and packaging operations.
- f. Leak detection related to volatile fuel handling equipment.
- g. Monitoring the background level of organic vapors at hazardous waste sites.
- h. Quality control procedures geared to leak checking, pressurized system checks, combustion efficiency checks, etc.

### Limitations

- a. The OVA will not detect any inorganic compounds.
- b. The OVA will see methane, which is explosive, but relatively non-toxic in other than high concentrations. The user should determine if the contaminant involved is or is not methane.
- c. DOT shipping regulations are strict for the OVA when shipping pressurized oxygen.
- d. A relative humidity greater than 95% will cause inaccurate and unstable responses.

- e. A temperature of less than 40 deg. F will cause poor and slow response.
- f. Actual contaminant concentrations are measured relative to the calibration gas used. Therefore, specific contaminants and their quantities cannot be easily identified.

#### Battery Charging

- a. Plug charging connector into mating connector on battery cover and insert AC plug into 115V AC wall outlet.
- b. Move the battery charger switch to the ON position. The lamp above the switch button should illuminate.
- c. Battery charge condition is indicated by the meter on the front panel of the charger; meter will deflect to the left when charging. When fully charged, the pointer will be in line with "CHARGED" marker above the scale.
- d. Approximately 1 hour of charging time is required for each hour of operation. However, an overnight charge is highly recommended. The charger can be left on indefinitely without damaging the battery. When finished, move the battery charger switch to "OFF" and disconnect from the SIDE PACK ASSEMBLY.

#### Calibration

The OVA 128 is capable of responding to nearly all organic compounds. At the time of manufacture, the analyzer is calibrated to mixtures of methane in air.

The instrument is calibrated by using a mixture of a specific vapor in air, with a known concentration. After the instrument is in operation and the normal background is zeroed, draw a sample of the calibration gas into the instrument. The GAS SELECT knob on the panel is then used to set the readout meter indication to correspond to the concentration of the calibration gas mixture.

The instrument has now been calibrated to the vapor mixture being used. After this adjustment, the setting on the DIGIDIAL should be recorded for that particular organic vapor compound. This exercise can be performed for a variety of compounds, thereby generating a library which can be used for future reference without need for additional calibration standards.

To read a particular compound, the GAS SELECT control is turned to the predetermined setting for the compound. Calibration on any one range automatically calibrates the other 2 ranges.

## Startup Procedure

- a. Connect the Probe/Readout Assembly to the Sidepack Assembly by attaching the sample line first, then connect electronic jack to the side pack.
- b. Select the desired sample probe (close area sampler or telescoping probe) and connect the probe handle. Before tightening the knurled nut, check that the probe accessory is firmly seated against the flat seals in the probe handle and in the tip of the telescoping probe.
- c. Move the instrument/BATT switch to the test position. The meter needle should move to a point beyond the white line, indicating that the integral battery has more than four (4) hours of operating life before recharging is necessary.
- d. Move the instrument/BATT switch to the "ON" position and allow a five (5) minute warm-up.
- e. Move PUMP switch to "ON" position, then place instrument panel in vertical position and check SAMPLE FLOW RATE indication. The normal range is 1.5 - 2.5 units. If less, check filters.
- f. Perform a leak test. (See "Sampling Fixtures")
- g. Activate audible alarm:
  - Use the CALIBRATE ADJUST knob to set the meter needle to the level desired for activating the audible alarm. If this alarm level is other than zero, the CALIBRATE SWITCH must be set to the appropriate range.
  - Turn the VOLUME knob fully clockwise.
  - Using the ALARM LEVEL ADJUST knob, turn the knob until the audible alarm is activated.
- h. Move the CALIBRATION SWITCH to X1 and adjust the meter reading to zero using the CALIBRATE ADJUST (zero knob).
- i. Open the Hydrogen TANK VALVE one or two turns and observe the reading on the HYDROGEN TANK PRESSURE INDICATOR. Approximately 150 psi of pressure is required for each hour of operation.
- j. Open the HYDROGEN SUPPLY VALVE one or two turns and observe the reading on the HYDROGEN SUPPLY PRESSURE INDICATOR. The reading should be between 8 and 12 psi.
- k. After approximately 10 seconds, depress the IGNITER BUTTON until the hydrogen flame lights. The meter needle will travel upscale and begin to read "TOTAL ORGANIC VAPORS".

**CAUTION:** Do not depress the igniter for more than 6 seconds. If the flame does not ignite, wait one minute and try again.

- l. Calibrate instrument (see "Calibration").
- m. The instrument is ready for use.

**NOTE:** If the ambient background organic vapors are "zeroed out" using the CALIBRATE ADJUST KNOB, the meter may move off scale in the negative direction when the OVA is moved to a location with lower background levels. If the OVA are to be used in the 0-10 ppm range, it should be "zeroed" in an area with very low background.

#### Shut Down Procedure

- a. Close the HYDROGEN SUPPLY VALVE.
- b. Close the HYDROGEN TANK VALVE.
- c. Move the INSTR switch and PUMP switch to OFF.
- d. Instrument is now in the shut down configuration.

#### Operation Procedure

Set the CALIBRATE switch to the desired range. Survey the areas of interest while observing the meter and/or listening for the audible alarm indicator. For ease of operation, carry the SIDE PACK ASSEMBLY positioned on the side opposite the hand which holds the PROBE/READOUT ASSEMBLY. For broad surveys outdoors, the pick-up fixture should be positioned several feet above ground level. When making quantitative readings or pinpointing, the pick-up fixture should be positioned at the point of interest.

When organic vapors are detected, the meter pointer will move upscale. If the audible alarm is utilized, it will sound when the set point is exceeded. The frequency of the alarm will increase as the detection level increases.

If a flameout occurs, check that the pump is running, then press the igniter button. Under normal conditions, flameout results from sampling a gas mixture that is above the Lower Explosion Limit (LEL) which causes the hydrogen flame to extinguish. If this is the case, re-ignition is all that is required to resume monitoring. Another possible cause for flameout is restriction of the sample flow line which would not allow sufficient air into the chamber to support combustion. The normal cause for such restriction is a clogged particle filter.

It should be noted that the chamber exhaust port is on the bottom of the case and blocking this port with the hand will cause fluctuations and/or flameout.

#### Maintenance and Troubleshooting

**IMPORTANT NOTE:** This section describes a routine maintenance procedures for troubleshooting instrument malfunctions. Maintenance personnel should be thoroughly familiar with instrument operation before performing maintenance. All written portions of this section must be thoroughly understood relating to safety of operation, servicing and maintenance. There should be no potential ignition sources in the area when filling, emptying or purging the hydrogen system and the instrument should be turned off.

Replacement parts that are specified by Foxboro must be used for repair. No modifications are permitted. Disassembly of the instrument must take place in a non-hazardous atmosphere only.

#### Primary Filter Cleaning

This filter is located behind the sample inlet connector (fitting assembly) on the SIDE PACK ASSEMBLY and is removed for cleaning by using a 7/16" thin screwdriver to unscrew the fitting assembly. The filter cup, "O" ring and loading spring will then come out. The porous stainless filter cup can be cleaned by blowing out. Reassemble in reverse order, ensuring that the "O" ring seal on the fitting assembly is intact.

#### Secondary Filter Cleaning

A particle filter is located in each pick-up fixture. One of these filters must be in the sample line whenever the instrument is in use. The OVA 128 uses a porous metal filter which can be replaced and cleaned.

#### Mixer/Burner Assembly Filter

A porous metal particle filter is incorporated in the Mixer/Burner Assembly, which screws into the Pre-Amp Assembly. This filter is used as the sample mixer and inlet flame arrestor in the chamber. The filter should not become contaminated under normal conditions but can be cleaned or the assembly replaced, if necessary.

Access to this filter or output surface does not require removing the instrument from the case. For access, remove the safety cover using a hex key wrench (supplied) then unscrew the exhaust port. The Filter Assembly can now be seen on the side of the chamber (Pre-Amp Assembly) and can be cleaned with a small wire brush.

#### Exhaust Flame Arrestor

A porous metal flame arrestor is located in the exhaust port of the detector chamber (Pre-Amp Assembly). It acts as a particle filter on the chamber output and restricts foreign matter from entering the chamber. This filter may be cleaned by removing the exhaust port. For access, see Mixer/Burner section above. Note that the filter is captive to the exhaust port.

#### Sampling Fixtures

Sampling fixtures should be periodically cleaned with an air hose and/or detergent solution to eliminate foreign particle matter.

The OVA is equipped with a flow gauge that provides a method to check for air leaks. Assemble the pick-up probe selected for use to the readout assembly and then position the side pack vertically so the flow gauge may be observed. Cover the end of the pick-up probe with your finger and observe that the ball in the flow gauge goes to the bottom, indicating no air flow (If the ball has a slight chatter while on the bottom, this is acceptable). Cover the center of the chamber exhaust port with your thumb and again observe the ball going to the bottom. Another simple check is to expose the pick-up probe to cigarette smoke or a light vapor (butane) and observe that the meter responds in approximately 2 seconds. It should be noted that the slow meter response might also indicate restriction in the air sampling.

Failure of the ball to go to the bottom when the inlet is blocked indicates a leak in the system between the probe and the pump inlet or the inlet check valve. To isolate the problem, remove the parts, one at a time, and again block off the air inlet. Remove the pick-up probes and cover the air inlet at the readout assembly. If the ball goes to the bottom, check that the "readout to probe" seal washer is in place and replace the probes, holding them back against this seal while tightening the nut. Recheck, and if leakage is still present, it is probably in the probe (pick-up fixture), which should be repaired or replaced.

If leakage is indicated as being past the readout handle when the connection to the sidepack is tight, disconnect the sample line at the fitting on the sidepack and cover this inlet with your finger. If the flow gauge ball goes to the bottom, the problem should be a leak in the umbilical cord/readout assembly, which should be investigated and repaired. There is also the possibility of a leaking check valve in the pump which would not show up on this test. If the leakage is not found in the umbilical cord, it is most likely in the pump check valve. If the ball does not go to the bottom following these corrective actions, contact the manufacturer for further instructions, and do not use the instrument.

### Using Empirical Data

Relative response data can be used to estimate the concentration of a vapor without need to recalibrate the analyzer. With the instrument calibrated to methane, obtain the concentration reading for a calibration sample of the test vapor. The response factor (**R**) in percent for that vapor is:

$$R = \frac{\text{Actual Conc.}}{\text{Measured Conc.}}$$

To determine the concentration of an unknown sample of that vapor, multiply the measured concentration by **R**. See the alphabetical list of compounds and Relative Response values in Appendix B.

### 3. Colorimetric Indicator Tubes

Colorimetric indicator tubes are used to measure concentrations of specific gases and vapors, both organic and inorganic. When used appropriately, an indicator tube specific to a certain compound will produce a stain in the tube. The length of the stain (or color change) is

proportional to the compound's concentration. Minimal operator training and expertise is required to operate this type of sampling instrument.

### Limitations

Colorimetric indicator tubes are cross-sensitive, meaning that other compounds may trigger a similar response, which will give the user a false reading. The user must take this fact into account when he/she dealing with a situation containing unknowns.

Other limitations include individual interpretation concerning the length of the stain, the limited accuracy of the tube, and use in high humidity. The greatest sources of error occur in different interpretations that are obtained between individuals as to how far the stain has gone on the tube, and the tubes limited accuracy. Users must remember that the tubes are **25% accurate**. A simple calculation will tell the user the range in which the correct reading could possibly occur.

With this in mind, any discoloration on the tube should alert the user as to the appropriate protection required for the site. High humidity also affects the readings. Use in humid environments tends to clog the filtering medium, not allowing the gases or vapors to be drawn properly through the tube.

### Maintenance and Calibration

**GEI** utilizes the Draeger Model 31 Bellows-type pump for colorimetric tube sampling. General maintenance for this type of instrument includes: avoiding rough handling which may cause channeling; performing a leakage test before sampling each day (including documentation); calibrating the unit at least quarterly; providing an inventory of tubes, with expiration dates; and, appropriate storing.

Rough handling of this instrument may cause erroneous results due to channeling (leakage). Therefore, the unit must be handled carefully and not be stored outside of its protective carrying case when not in use.

It may be necessary to clean the rubber bung (tube holder) if a large number of tubes have been taken with the pump. A mild soap and water solution can be used.

### Leak Test

Before each day's use, the user will perform a leak test on the instrument. This is a simple test and includes the following:

- a. Squeeze the bellows of the pump and insert an unopened detector tube, attempting to draw 100 ml of air.
- b. After a few minutes, examine the bellows for any expansion. Document the findings in the Site Monitoring Log Book. If the pump does not pass the leak test, it will be removed from service immediately and returned to the Facility Manager, to be sent out for repair.

### Calibration Test

At least quarterly, the instrument will be calibrated for proper volume measurement. Equipment needed for the calibration test is: 100 ml burette and ring stand; stopwatch; soap solution; detector tube with both ends broken off; and, tygon tubing.

The calibration test is performed as follows:

- a. Break both ends of a colorimetric tube and connect it in-line with the pump.
- b. Connect the instrument directly to a bubble burette, and create a bubble inside the burette by touching the bottom of the burette to the soap solution.
- c. Squeeze the bellows to exhaust all the air out of the unit.
- d. Release the bellows and wait 5 minutes for the full volume of air to be drawn into the bellows. The bubble should stop between the 95 and 105 cc marks. Errors of 5% are permissible; if the error is greater than 5%, return the pump to the Facility Manager, to be sent out for repair.

### Inventory and Storage Requirements

To inventory the tubes, check the expiration date marked on the storage container. No tubes will be allowed for use past the manufacturer's expiration date. A listing of tubes that are readily available will be maintained by the Health and Safety Coordinator. This list will contain the name of the tube and the expiration date of those available. The list will be updated monthly and provided to the Facility Manager and each Field Division. All colorimetric tubes will be stored in the refrigerator in the Chemical Storage Area. Refrigeration helps to maintain shelf life. Any tubes that have been previously opened and inadvertently stored in the refrigerator will not be used in the field. Colorimetric tubes are not reusable, and any reuse will result in erroneous results.

#### 4. Personal Monitoring Pumps

Personal monitoring involves the collection of an air sample by a sampling device worn by the worker. The sampling device is worn as close as possible to the breathing zone of the individual so that the data collected closely approximates the concentration inhaled. Personal monitoring pumps are used when it is necessary to monitor the workers' exposure to air contaminants.

Personal monitoring pumps can be classified into three basic categories:

- a. Low-Flow Pumps (0.5 - 500 ml/min);
- b. High-Flow Pumps (500 - 4500 ml/min);
- c. Dual Range Pumps.

Low-flow pumps are used for gas and vapor sampling. For example, the common flow rate for organic vapors is 200 ml/min.

High-flow pumps are used for particulate sampling as well as gas and vapor sampling. A common flow rate for fumes or dust sampling (i.e. zinc fume or asbestos) is 2 L/min.

##### Limitations

The major disadvantage in personal monitoring is the lag time between sampling and obtaining analysis results, which may take weeks, days or months if a remote laboratory is used. If a situation requires an immediate decision concerning worker safety, this can be a serious problem. Therefore, personal monitoring is rarely used for site characterization. Its main purpose is to assure effectiveness of work practice and engineering controls.

A second disadvantage is that multiple exposures may require the use of a variety of sampling media. Unfortunately, workers cannot carry multiple sampling media because of the added strain. Also, it is not usually possible to draw air through different sampling media using a single, portable battery operated pump. Several days may be required to measure the exposure of a specific individual to the variety of chemicals on site. Alternatively, if workers are in teams, a different monitoring device can be assigned to each team member.

##### Calibration

The following procedure will be used for calibration with a primary calibration source for all personal monitoring pumps used by **GEI**. It has been taken from OSHA Instruction CPL 2-2.20B, Appendix 1-C, Manual Bubble Meter Technique.

Electronic bubble meters are also used as primary calibration sources. These meters have a digital read-out and the ability to give a printed copy for documentation of the pump flow rate. **GEI** uses a Spectrex Model BFM-4000 for this purpose.

**NOTE:**

When calibrating with a bubble meter (either manual or electronic), the use of adapters can cause moderate to severe pressure drop in the sampling train, which will affect the calibration result. If adapters are used for sampling, then they should be used when calibrating.

- a. Connect the collection device, tubing, pump and calibration apparatus.
- b. Conduct a visual inspection on all tygon tubing connections.
- c. Wet the inside of a one-liter burette with a soap solution.
- d. Turn on the pump and adjust the pump rotameter to the appropriate flow rate setting.
- e. Momentarily submerge the opening of the burette in order to catch a film of soap.
- f. Draw 2 or 3 bubbles up to the burette in order to insure that the bubbles will complete their run.
- g. Visually capture a single bubble and time the bubble from 0 - 1000 ml for high flow pumps or 0 - 100 ml for low flow pumps.
- h. The timing accuracy must be within 1 second of the time corresponding to the desired flow rate.
- i. If the time is not within the range of accuracy, adjust the flow rate and repeat steps g and h until the correct flow rate is achieved.
- j. While the pump is running, mark the pump or record on the air sampling worksheet the position of the center of the float in the pump rotameter as a reference.
- k. Repeat bubble timing for 3 times. Calculate the average time given by these measurements.
- l. Calculate the flow rate as follows:  
(NOTE: 1L = 1000 ml)

$$\frac{\text{Measured Volume (L)}}{\text{Average Seconds}} \times \frac{60 \text{ Seconds}}{1 \text{ Min}} = \text{L/min}$$

For Example:

$$\frac{1 \text{ L}}{38 \text{ sec}} \times \frac{60 \text{ Sec}}{\text{min}} = 1.6 \text{ L/min (round to m)} \\ \text{2 digits)}$$

Repeat the procedures for all pumps to be used for all calibrations involving the same sampling method.

Different contaminants have different sampling protocols, which may result in different calibration protocol. Contact the **GEI** Certified Industrial Hygienist or Health and Safety Coordinator for chemical-specific calibration protocols.

#### Checklist for Using Personal Monitoring Pumps

- a. Look at measurement method in NIOSH Pocket Guide to Chemical Hazards (Latest edition).
- b. Calibrate with a primary calibration source, as described in the calibration procedures.
- c. Record information of air sampling worksheet and calibration logbook.
- d. Make sure battery is fully charged. Air pumps have NiCd battery, which creates a memory. Care needs to be used so as to not recharge a battery that has been used for only a few hours. Recharge a battery only if it has been used for at least 8 hours. There are chargers which will completely discharge a battery before recharging; or, the pumps can be left running until the battery is rundown completely and then recharged to eliminate this memory, also.
- e. Check sample requirement sheet or NIOSH method to see the minimum time/volume for the sample. An 8-hour sample period would allow for the best measure, giving an 8-hour TWA exposure.

#### 5. Combination Oxygen and Combustible Gas Meter

Combination meters measure the concentration of combustible gas or vapor present in an area, as well as the oxygen content. The concentration is reported as a percent, with 1% equal to 10,000 ppm. Although it is an easy instrument to operate, its effective use requires that the operator understand the operating principles and procedures behind the instrument. Certain atmospheres may cause erroneous readings or damage to the instrument. Typically, the instrument can be used as long as the battery lasts, or for the recommended interval between calibrations.

#### Maintenance

Maintenance of combination meters is fairly simple. Batteries must be recharged at the end of a continuous day's use. Occasionally, the rechargeable battery must be replaced. Most batteries last for approximately 2 years of continued use. Also, oxygen and combustible gas sensors will need to be replaced periodically. These sensors last approximately 6 months with continued use. Sensors that can no longer be calibrated within the manufacturers' acceptable range indicate the need for replacement.

If, after an attempted calibration, the instrument cannot be calibrated due to problems other than the need for battery or sensor replacement, the problem must be reported to the Facility Manager immediately, so that the instrument can be sent out for repair.

#### Detection Method

The instrument contains 2 analyzers: 1 for combustible gases and vapors; and 1 for oxygen content. The combustible gas analyzer contains a battery operated electrical circuit called a Wheatstone Bridge. Basically, the Wheatstone Bridge is a filament, usually made of platinum, that is exposed to the air in the instrument. When heated by a burning combustible gas or vapor, the increase in heat over the filament is measured as electrical resistance. Another part of the bridge contains similar filaments, but it has been sealed. They are heated in the same fashion, but not directly in the air stream. Thus, this filament is not capable of causing combustion of the gas or vapor, because it is sealed. The net effect of the change in resistance to the electrical current flow in the air stream is due only to the presence of a combustible gas. These changes in electrical current are registered as "percent LEL" (Lower Explosion Limit) on the instrument.

The oxygen analyzer senses oxygen concentration by a galvanic cell. The cell contains 1 gold and 1 lead electrode, and is encapsulated in inert plastic. Oxygen diffusing through the plastic initiates a redox reaction, which generates a small electrical current that is proportional to the oxygen partial pressure. The instrument contains a temperature-compensated electronic circuit that converts the electrical current to a proportional voltage. This voltage is displayed on the instrument as the concentration of oxygen.

### Limitations

The combination meter contains some inherent limitations. Knowledge of these limitations will help the user make an educated decision regarding the accuracy of the instrument.

Accuracy of the instrument depends, in part, on the difference between the calibration and sampling temperatures. Differences in temperature may cause a lack of sensitivity in the instrument when brought from a warm to a cold environment.

Another aspect of sensitivity of the instrument is a function of the differences in the chemical and physical properties between the calibration gas (pentane) and the gas being sampled. The chemical and physical properties of the calibration gas are slightly different from those being sampled, so all gases being sampled are compared to the combustion of pentane. In order to get a true reading of the LEL, the gas that is present must also be used as the calibration gas.

The filament can be damaged by certain compounds such as silicones, halides, tetraethyl lead, and oxygen enriched atmospheres. Each manufacturer's instrument handbook should contain a listing of compounds that should not be sampled with this instrument, or serious damage could result.

Under oxygen deficient atmospheres, the oxygen analyzer must be read first. Otherwise, the CGM analyzer may not provide a valid reading and give the user a false sense of security.

**APPENDIX H**

**INCIDENT REPORTING**

## **1.0 ACCIDENT AND INCIDENT REPORTING**

It is important that all accidents and incidents that result in injury, illness, or medical treatment be reported immediately. Reporting consists of calling the Teleclaim Center and providing information on the injury. The Teleclaim Center will complete the first report of injury and file it accordingly. Copies will be sent to the Safety Director. Supervisors are required to complete the Supervisor's Report of Accident included in this section. It is **GEI**'s responsibility to investigate each incident, file appropriate paperwork and conduct a follow-up analysis of each incident.

## **2.0 REPORTING PHONE NUMBERS**

Corporate Health and Safety Officer	813-774-6564 (Office) 813-323-6220 (Cell)
Human Resources Director:	860-368-5376

## **3.0 FIRST AID AND MEDICAL TREATMENT**

**GEI** provides a First Aid Kit on each site and in each Company vehicle. It is there for use in the treatment of minor scratches, burns, headaches, nausea, etc. Each employee should verify the location of the nearest first aid kit and should make use of it whenever needed. Each kit is fully stocked and restocked monthly by an outside vendor. The kit includes bandages, over the counter medications, disinfecting supplies and topical ointments. The user of each kit is responsible for contacting the vendor to replace items used or submitting the kit to **GEI** for replacement. Kits are to be inventoried by the Project Manager before being sent in the field. Only completely stocked kits are to be brought into the field. The kits are maintained in a weatherproof container and in accordance with ANSI Standard Z308.1-1998. The first aid supplies in each kit are included in Exhibit D.

Any work related injury or illnesses that requires professional medical assistance should be reported immediately. Failure to promptly notify of a work related injury could make the claim questionable and subject to stricter review. The nearest medical center or hospital will be identified for each project. The phone number and location for this center will be determined before commencing field activities and be included in the Health and Safety Plan. The phone numbers will be posted by Health and Safety Director or the Project Manager and available to all employees in order to provide prompt response to all injuries. The Project Manager will contact the nearest medical facility to determine the facility's capabilities and verify that the facility is willing to provide emergency medical services.

## **4.0 FIRST AID**

Each **GEI** project will have at least one certified CPR/first aid trained person on site at all times. All Project Managers and anyone acting as the on-site Health and Safety Officer must be current in First Aid/CPR. First aid training sponsored by the American Red Cross is acceptable and must be renewed every three years. CPR training must be renewed annually. Other first aid training will be reviewed to see if it is comparable to the Red Cross training.

1. Minor First Aid Treatment

First aid kits are stored in each company vehicle. If an injury is sustained or results in minor first aid treatment:

- a. Inform your supervisor.
- b. Administer first aid treatment to the injury or wound.
- c. If a first aid kit is used, indicate usage on the accident investigation report.
- d. Access to a first aid kit is not intended to be a substitute for medical attention.
- e. Provide details for the completion of the accident investigation report.

2. Non-Emergency Medical Treatment

For non-emergency work-related injuries requiring professional medical assistance, management must first authorize treatment. If you sustain an injury requiring treatment other than first aid:

- a. Inform your supervisor.
- b. Proceed to the posted medical facility. Your supervisor will assist with transportation, if necessary.
- c. Provide details for the completion of the accident investigation report.

3. Emergency Medical Treatment

If you sustain a severe injury requiring emergency treatment:

- a. Call for help and seek assistance from a co-worker.
- b. Use the emergency telephone numbers and instructions posted next to the telephone in your work area to request assistance and transportation to the local hospital emergency room.
- c. Provide details for the completion of the accident investigation report.
- d. The Project Manager will identify an ER provider for each long-term project for emergency medical services. The phone number will be posted at each job site.

4. First Aid Training

Each employee will receive training and instructions from his or her supervisor on our first aid procedures.

5. Wounds

- a. Minor - Cuts, lacerations, abrasions, or punctures

- Wash the wound using soap and water; rinse it well.
- Cover the wound using clean dressing.

b. Major - Large, deep and bleeding

- Stop the bleeding by pressing directly on the wound, using a bandage or cloth.
- Keep pressure on the wound until medical help arrives.

6. Broken Bones

a. Do not move the victim unless it is absolutely necessary.

b. If the victim must be moved, "splint" the injured area. Use a board, cardboard, or rolled newspaper as a splint.

7. Burns

a. Thermal (Heat)

- Rinse the burned area, without scrubbing it, and immerse it in cold water; do not use ice water.
- Blot dry the area and cover it using sterile gauze or a clean cloth.

c. Chemical

- Flush the exposed area with cool water immediately for 15 to 20 minutes.

8. Eye Injury

a. Small particles

- Do not rub your eyes.
- Use the corner of a soft clean cloth to draw particles out, or hold the eyelids open and flush the eyes continuously with water.

b. Large or stuck particles

- If a particle is stuck in the eye, do not attempt to remove it.
- Cover both eyes with bandage.

c. Chemical

- Immediately irrigate the eyes and under the eyelids, with water, for 30 minutes.

9. Neck and Spine Injury

If the victim appears to have injured his or her neck or spine, or is unable to move his or her arm or leg, do not attempt to move the victim unless it is absolutely necessary.

10. Heat Exhaustion

- a. Loosen the victim's tight clothing.
- b. Give the victim "sips" of cool water.
- c. Make the victim lie down in a cooler place with the feet raised.

## 5.0 WORKERS' COMPENSATION

Every state has a Workers' Compensation Law to provide benefits to employees for lost wages and medical bills resulting from a work related injury or illness. You are covered under Workers' Compensation. You may request Workers' Compensation benefits from your supervisor. Qualification for benefits is determined by the state, not **GEI**. Employees are responsible for keeping appointments, following doctors' instructions on and off the job, maintaining good communication with your supervisor, and to fully cooperating with all instructions given.

**Workers' Compensation provides wages at a lower pay scale than what you may earn by working.**

1. Employee Safety Rights

Employees have several important rights concerning safety, which are protected by federal, state and local laws that you should be aware of. They are:

- a. The right to a safe work-place free from recognized hazards.
- b. The right to request information on safety and health hazards in the workplace, precautions that may be taken, and procedures to be followed if an employee is injured or exposed to toxic substances.
- c. The right to know about the hazards associated with the chemicals you work with, and the safety procedures.
- d. The right to question any instruction which may violate a safety rule, which puts someone in unnecessary danger of serious injury.
- e. The right of freedom from retaliation for demanding safety rights.

2. Safety Responsibilities

Employees also have some important responsibilities concerning safety. These are:

- a. The responsibility of reporting all injuries and illnesses to your supervisor, no matter how small.
- b. The responsibility of always following the safety rules for every task performed.
- c. The responsibility of reporting any hazards seen.
- d. The responsibility of helping co-workers recognize unsafe actions or conditions.
- e. The responsibility of asking about the safety rules.

### 3. Employee Safety Rules

It is impossible to list or include all safety rules for all the possible tasks. But the following rules have been prepared to help the employee avoid hazards, which may cause injury while doing some of the more common tasks. Failure to follow safety rules and /or safe practices will result in disciplinary action, up to and including termination.

## **6.0 GENERAL SAFETY RULES**

- a. Read and follow the safety notices and other information that is posted.
- b. Observe and follow all safety instructions, signs, and operation procedures.
- c. Help your fellow employee when they ask for assistance or when needed for their safety.
- d. Never participate in “horseplay”. Horseplay that results in injury is often not covered by Workers’ Compensation.
- e. Clean up spills immediately.
- f. Report all unsafe conditions, hazards, or equipment immediately. Make sure other people are warned of the problem so that they may avoid it.
- g. Wear personal protective equipment as required to reduce injury potential. Use gloves, safety glasses, back support belts, etc., as necessary.
- h. Never stand on chairs, furniture, or anything other than an approved ladder or step stool.
- i. Never use intoxicating beverages or controlled drugs before or during work. Prescription medication should only be used at work with your Doctor’s approval.

## 1. Fire Safety

- a. Report all fire hazards to your supervisor immediately.
- b. Fire fighting equipment shall be used only for fire fighting purposes.
- c. Smoking is not permitted at any time in the areas where “No Smoking” signs are posted.
- d. Do not block off access to fire fighting equipment.
- e. Keep doors, aisles, fire escapes and stairways completely unobstructed at all times.
- f. In the case of a fire, your first consideration must be the safety of all persons, then attention should be directed to the protection of property.
- g. Change clothes immediately if they are soaked with oil, gasoline, paint thinner or any other flammable liquid.
- h. Know how to report a fire and how to turn on a fire alarm.
- i. Know the location of all fire extinguishers, and how to use them.
- j. Know the fire exits to be used in an emergency.

## 7.0 HAND TOOL SAFETY

- a. Wear protective equipment necessary for the job you are performing. Discuss any required safety equipment with your supervisor as changes occur.
- b. Defective tools must not be used.
- c. Do not carry sharp hand tools in clothing.
- d. Check all wiring on electric hand tools for proper insulation and 3-prong plug grounding.
- e. **Hammers:** Use eye protection at all times!
- f. **Screwdrivers:** Use the right size and type of screwdriver for the job. Do not use a screwdriver as a chisel.

- g. **Wrenches:** In using any wrench, it is better to pull than to push. If you have to push, use your open palm. Use the proper wrench for the job.
- h. **Handsaws:** Saws that are sharp and rust free are less likely to bind or jump. Insure the object being cut is secured tightly to a flat surface.

## **8.0 PROTECTIVE EQUIPMENT**

- a. Approved eye protection (safety glasses with side shields, goggles, etc.) must be worn at all times when assigned any certain job classifications. It is important to check with your supervisor to assure compliance.
- b. Moccasins and shoes with open toes or high heels are not permitted.
- c. Wear protective clothing and equipment as required by your job classification to protect against hazards at hand. These include, but are not limited to, hard hats, steel-toed shoes, gloves, fall safety harnesses, earplugs, etc.

## **9.0 MATERIAL HANDLING SAFETY RULES**

- a. When lifting, lift properly. Keep the back straight, stand close to the load, and use your leg muscles to do the lifting, keeping the load close to the body. Never twist your upper body while carrying a load.
- b. When lifting heavy objects, utilize a two-wheeled dolly, or, ask for assistance from another employee.
- c. Inspect the object you are going to lift for sharp corners, nails, black widow spiders, or other things that may cause injury.
- d. Use gloves when handling rough or sharp materials.

## **10.0 HOUSEKEEPING**

- a. Do not place materials in aisles, stairways, or any designated path of travel.
- b. Stack material at a safe height so that material will not fall if bumped. Insure heavy loads have proper support, and make sure there is no overhanging or irregular stacking of material.
- c. Place all trash or scrap in places provided. Clean up all spills immediately.
- d. Report worn or broken flooring, stair treads, handrails, furniture, or other office equipment.
- e. Smoking is permitted only in designated areas. Use ashtrays for disposing of butts. Do not throw butts on the floor.

## Supervisor's Report of Accident

**Supervisor's Name:** \_\_\_\_\_

### ***Basic Rules for Accident Investigation***

- Find the cause to prevent future accidents - Use an unbiased approach during investigation
- Interview witnesses & injured employees at the scene - conduct a walkthrough of the accident
- Conduct interviews in private - Interview one witness at a time.
- Get signed statements from all involved.
- Take photos or make a sketch of the accident scene.
- What hazards are present - what unsafe acts contributed to accident
- Ensure hazardous conditions are corrected immediately.

<b>Date &amp; Time</b>		<b>Location</b>	
<b>Tasks performed</b>		<b>Witnesses</b>	
<b>Resulted in</b>	___ Injury    ___ Fatality ___ Property Damage	<b>Property Damage</b>	
<b>Injured</b>		<b>Injured</b>	
<b>Describe Accident Facts &amp; Events</b>			

Supervisor's Root Cause Analysis		<i>Check ALL that apply to this accident</i>	
Unsafe Acts		Unsafe Conditions	
Improper work technique		Poor Workstation design	
Safety rule violation		Unsafe Operation Method	
Improper PPE or PPE not used		Improper Maintenance	
Operating without authority		Lack of direct supervision	
Failure to warn or secure		Insufficient Training	
Operating at improper speeds		Lack of experience	
By-passing safety devices		Insufficient knowledge of job	
Protective equipment not in use		Slippery conditions	
Improper loading or placement		Excessive noise	
Improper lifting		Inadequate guarding of hazards	
Servicing machinery in motion		Defective tools/equipment	
Horseplay		Poor housekeeping	

Drug or alcohol use		Insufficient lighting	
<b>Unsafe Acts require a written warning and re-training <u>before</u> the Employee resumes work</b>			
<b>Date</b>		<b>Date</b>	
Re-Training Assigned		Unsafe Condition Guarded	
Re-Training Completed		Unsafe Condition Corrected	
Supervisor Signature		Supervisor Signature	

### Accident Report Review

Supervisor \_\_\_\_\_

Date \_\_\_\_\_

Department Superintendent \_\_\_\_\_

Date \_\_\_\_\_

Safety Manager \_\_\_\_\_

Date \_\_\_\_\_

Plant Manager \_\_\_\_\_

Date \_\_\_\_\_

## **EXHIBIT D**

### **First Aid Kits**

Each first aid kit is in a weather proof container and contains the following:

<u>Item</u>	<u>Amount</u>
Ear Plugs	2 pair
Band-aids	2 boxes
Sterile pads	5 2"x2"
Oval eye pads	2
Tylenol	10
Burn cream	1 tube
Tweezers	1 each
Scissors	1 each
Triangular bandage	1
Antiseptic wipes	1 box
Ammonia inhalants	1 box
Flexible gauze	1 roll
First aid guide	
Latex gloves	2 pair

**APPENDIX I**  
**LOCK OUT/TAG OUT**

## **1.0 INTRODUCTION**

The Lock Out/Tag Out Standard, 29 CFR 1910.147, is believed to prevent about 120 deaths and 60,000 injuries per year, according to OSHA officials. Although this standard is aimed at the industrial community, in environmental engineering applications, it is very important that employees understand and implement these procedures when working with and around energized equipment. Under this standard, GEI is required to establish a program that utilizes procedures for locking out and/or tagging to isolate and disable the equipment to prevent accidental start-up or release of stored energy. GEI employees will identify, locate and control these energy sources, as necessary.

## **2.0 PURPOSE**

To establish procedures for locking out and/or tagging to isolate and disable equipment to prevent accidental startup or release of stored energy, and possible injury to employees.

## **3.0 SCOPE**

This procedure applies to all field/facility operations that require all operative energy sources, including line breaking, in the work area to be shut down, locked out and tagged, so that GEI employees may safely perform their job. GEI and GEI's subcontractors performing work on GEI projects will be required to comply with these requirements if their employer does not have a comparable lock out/tag out program already in place.

## **4.0 PROCEDURE**

1. The authorized employee will evaluate the scope of work and all equipment, machines or industrial processes in the area that require the use of stored energy. Energized equipment that may cause a safety hazard will be shut down as required to eliminate the potential for injury.
2. Prior to beginning the work, the authorized employee will be sure that appropriate lock out/tag out equipment is available to isolate the energy source.
3. The authorized employee will ensure that all affected employees have been advised of the following topics:
  - Scope of Work;
  - Energy sources;
  - Energy isolation devices;
  - Lock out devices;
  - Tags;
  - Test procedures; and
  - Authorized personnel. (Those individuals charged with the responsibility for de-energizing and re-energizing energy sources).

4. Documentation of the safety meeting will be placed in the job folder for future reference. All employees will sign the Lockout Worksheet prior to starting the work. See Attachment A for a copy of the Lockout Worksheet.
5. The specified energized equipment will be shut down before GEI personnel or its Contactor/subcontractors begin work on site. Shut down will take place in the following manner:
  - The authorized employee will inform the client's representative of the need to shut down the equipment.
  - The authorized employee, with assistance from the client's representative, will locate all power sources on the process or equipment.
  - All power sources will be shut down and verified as such by the authorized employee.
  - When possible, a lockout device will be applied by both parties to isolate each source.
  - Any necessary testing of equipment will be conducted to ensure that the process or equipment is free of residual energy (per item 6).
  - The authorized employee will attempt to operate the machine to be sure that it remains inoperative. All activation controls will be returned to the "off" position after testing.
  - The authorized employee will apply a tag that bears the following warning, "DANGER - EQUIPMENT LOCKOUT" along with the authorized employee's name, the date, and the time of the lockout.
  - The authorized employee will complete the Lockout Worksheet.
  - Equipment may now be released for work by the authorized employee. No release will be given until all required inspections and testing are performed.
6. Residual energy: Pneumatic/hydraulic power, spring compression, and residual electrical energy in transformers are examples of residual energy that, when not accounted for, may present a greater hazard to the employee. These sources of energy will be identified, located and controlled in the following manner:
  - Residual electrical energy can be controlled through grounding.
  - Pneumatic/hydraulic line pressure can be released, allowing the weight to come to a rest.
  - Spring tensions can be relieved.
  - Product lines will be double blocked (panned) and bled to prevent product from being released.
  - A lockout device and tag will be applied and secured by the authorized employee for the duration of the job to prevent residual energy from reaccumulating and creating a hazard to employees.

- The lockout/tagout will be documented by the authorized employee on the Lockout Worksheet.
7. After all work is completed, the authorized employee will perform the following:
- The authorized employee will inform everyone that the job is complete.
  - The Lockout Worksheet will be reviewed by the authorized employee with all employees to make sure that all employees are accounted for before re-energizing the equipment.
  - The authorized employee will be sure that all tools, debris or other material that could be placed into motion are removed before the equipment or process is re-energized. All employees will be instructed to stay clear of movable parts of the equipment or process.
  - All residual energy controls will be removed by the authorized employee, as well as all energy isolation lockouts and tags.
  - In the presence of the client's representative, energy will be restored to the equipment or process.
  - All lockout equipment removal will be documented on the Lockout Worksheet by the authorized employee. The Lockout Sheet will be placed in the job file at the end of the shift.
8. All employees must be accounted for before re-energizing equipment. When employees that have worked on the job are absent from the final inspection before re-energizing the equipment, the authorized employee will initiate the following:
- The lockout sheet will be checked to account for all employees.
  - The authorized employee will obtain a Lockout/Tagout Absent Employee form (See Appendix B).
  - The authorized employee will appoint employees to look for the individual, paying special attention to high hazard areas where physical harm could result from the start-up of the equipment or process.
  - After a complete search of the equipment or process, and it has been determined by the authorized employee that the employee is not present, all outlying areas surrounding the site will be searched.
  - The area surrounding the site will be guarded to prevent the absent employee from inadvertently entering a hazardous situation.
  - The equipment or process will be cleared for re-energization only by the authorized employee once all of the above conditions are met.
  - A copy of the completed Absent Employee form will be posted conspicuously in the work area, and not removed until the employee has been located. The client's representative will be notified of the situation so that the absent employee does not endanger himself/herself by entering an energized process or equipment.

9. When appropriate, Contractor and Subcontractors working under GEI's direction will be informed of their responsibilities, under the Lockout/Tagout Standard, to provide protection against hazardous energy.
- When necessary within the scope of work, Contractors and Subcontractors without such a program, at the discretion of GEI, will be disqualified from working on these projects.
  - The Contractor or Subcontractor's program must be comparable or more strict than GEI's program.
    1. Programs found to be insufficient in some areas will be returned, with the requested changes to be made before the program is acceptable for implementation.
    2. The copy of the program will be returned to the contractor or subcontractor, and will not be duplicated by GEI or any of its employees.
  - All affected employees will be given training in these procedures prior to performing any lockout/tagout work. This training will be documented and maintained in the employees' training file with the Health and Safety Division.
  - This procedure will be reviewed annually to ensure that it remains relevant to GEI operations.

## 5.0 DEFINITIONS

**Affected Employee:** An employee whose job requires operation/use of equipment or machines on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed. All GEI personnel or subcontractors working in these circumstances are "affected employees".

**Authorized Employee:** A person who locks out or implements a tagout system procedure on machines or equipment in connection with the servicing or maintenance on that machine or equipment. An authorized person and an affected employee may be the same person when the affected employee's duties also include performing a lock out or tag out on a machine or equipment.

**Capable of being Locked Out:** An energy isolating device will be considered to be capable of being locked out either if it designed with a hasp or other attachment or integral part to which, or through which, a lock can be affixed, or if it has a locking mechanism built into it. Other energy isolating devices will also be considered to be capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

**Energized:** Connected to an energy source or containing residual or stored energy.

**Energy Isolating Device:** A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently; a slide gate; a slip blind; a line valve; a block; and, any similar device used to block or isolate energy. The term does not include a push button, selector switch, and other control circuit type devices.

**Energy Source:** Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

**Lockout:** The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

**Lockout Device:** A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment.

**Tagout:** The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

**Tagout Device:** A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

**ATTACHMENT A**  
**LOCKOUT WORKSHEET**

## LOCKOUT WORKSHEET

Job Location: \_\_\_\_\_ Project Manager: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ a.m./p.m.

Description of Lockout to be Performed: \_\_\_\_\_

Energy source(s): \_\_\_\_\_

Pre-Work Safety Meeting Minutes: \_\_\_\_\_

Lockout Hardware Used: \_\_\_\_\_

### Energy Restoration (Check each as you Progress):

### Time Completed

\_\_\_\_\_ All personnel accounted for and in the clear \_\_\_\_\_

\_\_\_\_\_ Point(s) of operation free of tools and debris. \_\_\_\_\_

\_\_\_\_\_ Lockout hardware removed. \_\_\_\_\_

\_\_\_\_\_ Personnel clear of points of operation. \_\_\_\_\_

\_\_\_\_\_ Energy restored. \_\_\_\_\_

\_\_\_\_\_ Equipment operation verified. Client's rep on site. \_\_\_\_\_

\_\_\_\_\_ Lockout terminated \_\_\_\_\_

Employees'  
Signatures:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**ATTACHMENT B**  
**LOCKOUT/TAGOUT ABSENT EMPLOYEE FORM**

Effective date : 2/6/2006

## LOCKOUT/TAGOUT ABSENT EMPLOYEE FORM

### NOTICE

Upon completion of work performed under lockout/tagout conditions, the following employee(s) listed below could not be located or accounted for:

---

---

---

All attempts have been made to locate this employee at the jobsite. It has been verified that this employee is not in the vicinity of the hazardous energy source and will not be affected by the startup of equipment which was under lockout conditions.

---

Signature of Authorized Employee

---

Date

**APPENDIX J**  
**GEI Consultants, Inc.**  
**Confined Space Entry Program**

Effective date : 2/6/2006

***GEI Consultants, Inc.***

**Confined Space Entry Program**

GEI Consultants, Inc. (GEI) is committed to providing its employees with a safe and healthy work environment. The objectives established for the Corporate Health and Safety Program are to:

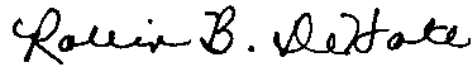
- Reduce the risk of injury, illness and loss of life to GEI employees.
- Maintain compliance with federal, state, and other applicable safety regulations.
- Minimize GEI employees' work exposure to potential physical, chemical, biological, and radiological hazards.

To maintain a safe work environment, GEI has established a Confined Space Entry Program that promotes the objectives set forth in GEI's health and safety policy. The GEI Confined Space Entry Program establishes written procedures, employee training requirements, and other procedures that will promote employee usage of sound health and safety principles.

Any recommended modifications to this program should be directed to the Corporate Health and Safety Officer.



Francis D. Leathers  
President



---

Robin B. DeHate  
Corporate Health and Safety Officer

**GEI Consultants, Inc.**

***Confined Space Entry Program***

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**GEI Consultants, Inc.**

***Confined Space Entry Program***

**1.0 POLICY**

The purpose of the GEI Consultants, Inc. program is to protect employees from potentially hazardous confined spaces at various locations. Entrance into an area identified as a confined space shall be in strict compliance with the following confined space entry program. The primary goal is to ensure employee health and safety during confined space work-related activities through use of the permit system.

The following procedures comply with the OSHA standard, 29 CFR 1910.146, Permit-required Confined Spaces.

**2.0 PROGRAM ADMINISTRATION RESPONSIBILITIES**

The GEI Corporate Health & Safety Officer (CHSO) will be responsible for all facets of this program and has support to make decisions to ensure the program's success. The CHSO will make recommendations based on changes in the field to update the confined space entry (CSE) policies/procedures and remain in compliance with the CSE program. It is the Regional Managers' responsibility to ensure local compliance and implementation of this program.

The entry supervisor is responsible for enforcing proper entry. He/she will ensure proper entry procedures are followed at all times. Subcontractors assisting GEI personnel will comply with the Confined Space Entry Program and are responsible for completing their own training requirements per the standard. GEI Consultants, Inc. employees have the authority to halt any confined space operation when danger of personal injury exists or external danger exists.

### 3.0 DEFINITIONS

- 3.1 **Attendant** – means an individual stationed outside one or more the permit-required confined spaces who monitors the authorized entrants and who performs all attendant’s duties assigned in the confined space entry program.
- 3.2 **Authorized entrant** – means an employee who is authorized by the employer to enter a permit space.
- 3.3 **Confined space** – (As defined by the General Industry standard, 29 CFR 1910.146)  
**A space that:**
- 3.3.1 Is large enough and so configured that an employee can bodily enter and perform assigned work and,
  - 3.3.2 Has limited or restricted means for entry or exit and,
  - 3.3.3 Is not designed for continuous employee occupancy.
- 3.4 **Engulfment** - The surrounding and effective capture of a person by a liquid or solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.
- 3.5 **Entry** – The action by which a person passes through an opening in a permit required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant’s body breaks the plane of an opening into the space.
- 3.6 **Entry permit** - A written document that contains specific information about the conditions of the space and how the work will be conducted.
- 3.7 **Entry supervisor** - The person responsible for determining if acceptable entry conditions are present, authorizing entry, overseeing entry operations, and terminating the permit.
- 3.8 **Hazardous atmosphere** – GEI has a more stringent definition of a hazardous atmosphere to protect employees from exposures that may expose employees to the risk of death or incapacitation, impair the employee to self-rescue, or cause injury or acute illness from one or more of the following causes:
- 3.8.1 Flammable gas, vapor, or mist in excess of 10% of its lower explosive limit (LEL)

- 3.8.2 Airborne combustible dust at a concentration that meets or exceeds its LEL. *Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less.*
  - 3.8.3 Oxygen concentrations of less than 20.7% or greater than 21.9%.
  - 3.8.4 Hazardous substance concentrations greater than the published permissible exposure limit (PEL).
  - 3.8.5 Hazardous substance concentrations recognized as immediately dangerous to life and health (IDLH).
- 3.9 **Line breaking** – The intentional opening of a pipe, line or duct that is or has been carrying flammable, corrosive, toxic, inert gas or any fluid at a volume, pressure or temperature capable of causing injury.
- 3.10 **Lockout/Tagout** - The placement of lockout and tagout devices, on an energy isolating device.
- 3.11 **Non-permit confined space** - A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.
- 3.12 **Permit-required confined space** - A **defined confined space** (see 3.3) that has **one or more** of the following characteristics:
- 3.12.1 Contains or has the potential to contain a hazardous atmosphere,
  - 3.12.2 Contains a material that has the potential to engulf an entrant (i.e. water),
  - 3.12.3 Has a configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or a floor which slopes and tapers to a small cross-section, and/or
  - 3.12.4 Contains any other recognized serious safety or health hazard (i.e. fall potential).

#### 4.0 HAZARD RECOGNITION

The Project Manager is responsible for conducting a hazard analysis at each work site to determine the presence and type of confined spaces.

## **5.0 ELEMENTS**

Elements of the Confined Space Entry Program include permit required entry procedures, the permit, training and duties of authorized entrants, attendants, entry supervisors, and rescue/emergency procedures.

## **6.0 NON-PERMIT REQUIRED CONFINED SPACE ENTRY PROCEDURES**

Activities in non-permit required confined spaces, such as welding, drilling, and the use of solvents or paints, can create hazardous atmospheres. GEI employees must recognize the inherent hazards created by work being conducted in these spaces and determine if the status of the space has the potential to be a permit-required confined space.

## **7.0 PERMIT-REQUIRED CONFINED SPACE ENTRY PROCEDURES**

The following procedures are mandatory for entry into a "permit-required confined space" as defined in Section 3.11. The steps specifically outline acceptable and safe entry conditions. The steps include completing the applicable information in the permit found in Appendix A.

### *7.1 Physical Hazard Identification Checks*

#### **7.1.1 Assessment**

Physical hazards may be mechanical equipment such as grinders, agitators, pumps, or loose debris such as wood, loose concrete, slag, or rusted manhole ladders; or may be slip, trip or fall hazards.

The Entry Supervisor will assess the space for physical hazards and assure that proper protective procedures have been completed and documented prior to entry.

#### **7.1.2 Isolation**

Isolation must be completed prior to entry. Isolation means the process by which a confined space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

## 7.2 *Atmospheric Hazard Checks*

### 7.2.1 Assessment

Atmospheric hazards such as oxygen deficiencies, explosive (flammable) gases or toxic vapors may exist in the confined space.

Four questions need to be asked to determine potential atmospheric hazards in the identified confined spaces:

- What was in the space?
- What is stored nearby?
- What could have formed in the space?
- What work is going to be done in the space?

The atmosphere of the space **must** be tested (without entering the space) with a direct reading instrument prior to confined space entry. The entry supervisor will do this testing. **It is mandatory to test the confined space by monitoring the atmosphere in the following order:**

#### (1) Test Oxygen Deficiencies

Oxygen in a confined space may be consumed by chemical reactions such as rusting. Certain gases also displace oxygen. For example, carbon dioxide, a by-product of fermentation, is commonly found in wastewater plants. Methane, a simple asphyxiant, is commonly found on landfill sites or where organic matter is decomposing either by process or in a trench. Both gases cause oxygen displacement.

**No confined space will be entered if the oxygen level is below 20.7% or above 21.1%. See Section 7.2.2.**

#### (2) Check Explosive/Flammable Gases

Due to the potential for decomposing organic materials, explosive atmospheres may result from methane or hydrogen sulfide. In order for an explosion to occur, these vapors must be present within well-defined limits. The lowest concentration where there is sufficient vapor to cause an explosion is called the Lower Explosive Limit (LEL). The concentration above where there is too much vapor for an explosion to occur is called the Upper Explosive Limit (UEL). **Never enter a space containing more than 10% of the LEL.** This can be determined through use of a calibrated combustible gas indicator (CGI).

Keep in mind that if a substance like gasoline is the explosive hazard, the combustible gas indicator needs to be re-calibrated using a substance with a similar flammable range (LEL to UEL) or apply a correction factor or calibration curve supplied by the manufacturer of the instrument.

The LEL of many combustible gases is usually well above the concentration which may pose a health hazard. This means that although the meter may indicate less than 10% of the explosive level, a "toxic" atmosphere from the chemical itself may still exist.

If a combustible dust is present in the space a particulate meter must be used. If one is not available then the OSHA guideline of less than 5 feet visibility will be considered a flammable/explosive atmosphere.

### (3) Check Toxic Air Contaminants

Toxic vapors, gases or particulates may result from a substance in the space, or the breakdown of materials in the space. Testing for toxic materials in a confined space must be done using direct reading instruments to verify the atmospheric contaminant **before entry**.

Levels of dust, fume, and vapor or gas must be below the Permissible Exposure Limits (PELs) established by OSHA for each toxic substance in the space if it is to be entered without respiratory protection. (In the absence of PELs, other published data, such as Threshold Limit Values [TLVs] may be used.)

Use the following instrumentation and procedures to compile accurate data prior to safe entry.

#### (a) Air Monitoring Equipment

- Multi-gas meter: Oxygen/CGI/Toxic sensors (using a hydrogen sulfide and carbon monoxide sensors)
- Detector tubes (designed for specific substances)

***(Note: The Combustible Gas Indicator (CGI) is often referred to as a LEL meter)***

#### (b) Air Monitoring Procedure

Prior to using the listed instruments, refer to the manufacturer's instructions and the company procedure manual. The multi-gas meter must be calibrated prior to each use and according to manufacturer's instructions. Document all calibration and test results to verify the actions taken during the confined space entry.

Any equipment problems will be brought to the attention of the Entry Supervisor, and other appropriate personnel.

*Remember that the space must first be tested for oxygen deficiency, then explosives or flammables, then toxic substances, if applicable. (As oxygen levels decrease so does the accuracy of the CGI meter.)*

Air monitoring of the confined space will be done remotely, in the bottom third, middle third, and top third of the space. If descending into a stratified space, each atmospheric envelope should be from top to bottom and side to side. Dependent upon the meter's capabilities adequate time must be given at each level for proper characterization of the atmosphere. Additional tests will be completed depending on the size and shape of the space, the location of the work to be done, and the tasks to be performed. Record all testing results (including the time of testing) on the permit.

## 7.2.2 Protection Using Engineering Controls

### (1) Ventilation

Ventilation is the first step in making the confined space atmosphere safe. The two goals to reach when determining how to successfully ventilate a space are:

- **to maintain an oxygen level of at least 20.7%,**
- **keep the toxic gases and vapors below the PELs, and**
- **to keep flammable gases and vapors below 10% of the LEL .**

See Section 12 for use of forced air ventilation and only follow the alternate procedures in Section 12 if the space can be reclassified from permit required to non-permit required by following the guidelines for reclassification in Section 11.

### (2) Personal Protective Equipment

The environment and the planned activities in the confined space will dictate the necessary personal protective equipment (PPE). Required equipment will be listed on the permit.

### (3) Protective Equipment

- Protective hearing devices for noise levels exceeding 85dB
- Communications equipment

- Adequate lighting devices for working safely and to exit quickly if an emergency arises
- Barriers and shields to keep external hazards away from confined space entry workers and unauthorized personnel away from the work site
- Ladders for safe ingress and egress for authorized entrants
- Miscellaneous equipment necessary for safe entry and rescue from permit spaces

## **8.0 THE PERMIT**

Entry into any area classified as a permit-required confined space must comply with procedures set forth for permit-required confined space entry in this document including completing the permit found in Appendix A. The permit itself is effective as long as the assigned task on the document is in progress. A new permit is required at the beginning of each assigned work shift. The entry permit is specific to the space being entered and must document the following information:

- Space to be entered
- Permit number
- Location of space
- Purpose of entry
- Date and duration of entry
- Authorized entrants
- Entry attendants
- Entry supervisor
- Hazards of the space
- Measures to isolate the space (i.e. lockout/tagout)
- Acceptable entry conditions (adequate oxygen levels and air quality)
- Testing results - both initial and periodic
- Rescue and emergency procedures and means to summon the rescue teams
- Communication procedures
- Equipment list
- Additional permits
- Additional information

**A permit number will be obtained and assigned in numeric order from the Corporate Health and Safety Officer. The number will be recorded on the permit. When the entry is complete or canceled, a copy of the permit will be forwarded to the CHSO, Copies of confined space permits will be maintained for two years.**

## 9.0 TRAINING AND DUTIES

Confined space entry training will be provided prior to the assignment of confined space duties. Training will also be provided if there is a change in work conditions or duties. See Appendix D for the training outline.

Documentation of the training will be kept by GEI and located at the branch and/or corporate offices of GEI. Each record contains the employee's name, dates of training, a training outline, and the signature(s) of the trainer(s).

See Appendices B and C for duties of entrants, attendants, and entry supervisors.

## 10.0 RESCUE

GEI employees will perform only non-entry rescue and will predetermine and utilize the rescue services of local fire rescue services or rescue services supplied by the client, as approved by the CHSO. Rescue procedures will be established **before entry into the identified permit-required confined spaces** and will be specific for each confined space. The Entry Supervisor will contact the selected rescue service to alert them to the confined space entry. The entry will not take place until rescue services have been alerted.

When visual monitoring of the worker is not possible, an explosion-proof voice or alarming communication device will be attached to the entrant, ensuring his/her safety. In addition to communication systems, there will be a person readily available in the area who is currently certified in cardiopulmonary resuscitation (CPR) and basic first aid procedures whenever a permit-required confined is entered. In most cases, this person will be the attendant. Information regarding local emergency medical facilities is located on the permit. Please note that if an injured entrant is exposed to a substance for which a Material Safety Data Sheet exists in the field, the MSDS must be made available to the local medical facility outlined on the permit.

## 11.0 RECLASSIFICATION

There are two exemptions to the permit-required confined space regulation.

- 11.1 If actual or potential atmospheric hazards can be eliminated through ventilation and remain eliminated, and all the physical hazards can be abated or controlled without entering the space (i.e. lockout/tagout), the space may be reclassified to non-permit required. **Control of atmospheric hazards through continuous forced-air ventilation does not constitute "no actual or potential atmospheric hazards."**

- 11.2 GEI Consultants, Inc. will document that all hazards in a permit space have been eliminated. Additionally, GEI Consultants, Inc. will complete the reclassification permit and forward to the CHSO when work is complete or the permit has been cancelled. Copies of reclassification permits will be maintained for 2 years.

## **12.0 ALTERNATE PROCEDURES**

Alternate procedures may **only** be used when approved by the CHSO.

**Attachment A**

***CONFINED SPACE ENTRY PERMIT***

**GEI CONSULTANTS, INC.**  
**CONFINED SPACE ENTRY PERMIT**

Permit Number:

Confined Space (Name and Location): \_\_\_\_\_

Purpose of Entry: \_\_\_\_\_

Entry Date: \_\_\_\_\_ Entry Start Time: \_\_\_\_\_

Duration of Entry Permit (Not Valid for longer than regular shift): \_\_\_\_\_Hours

Entry Supervisor: \_\_\_\_\_

Name	&	Title
------	---	-------

Authorized Entrants: \_\_\_\_\_

<u>Entrant One (1)</u>	<u>Entrant Two (2)</u>
------------------------	------------------------

Attendants: \_\_\_\_\_

Attendant One (1)	Attendant Two (2)
-------------------	-------------------

PRECAUTIONS	YES	NO	PRECAUTIONARY MEASURES USED
Lockout/De-energize	<input type="checkbox"/>	<input type="checkbox"/>	
Secure Area	<input type="checkbox"/>	<input type="checkbox"/>	
Atmosphere Safe for Entry	<input type="checkbox"/>	<input type="checkbox"/>	
Lines Blanked or Disconnected	<input type="checkbox"/>	<input type="checkbox"/>	
Traffic Controlled	<input type="checkbox"/>	<input type="checkbox"/>	
Fall Protection	<input type="checkbox"/>	<input type="checkbox"/>	
Rescue Team Onsite	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	

EMERGENCY TELEPHONE NUMBERS	
Local Fire	(     )     -
Local Police	(     )     -
Local Rescue (EMS)	(     )     -
Local Hospital	(     )     -
	(     )     -

**CONTACT \_\_\_\_\_ TO SUMMONS RESCUE SERVICES.**

**LIST THE POTENTIAL HAZARDS OF THIS ENTRY: \_\_\_\_\_**

SAFETY EQUIPMENT	YES	NO	SAFETY EQUIPMENT	YES	NO
Body Harness	<input type="checkbox"/>	<input type="checkbox"/>	Ventilation (Type:_____)	<input type="checkbox"/>	<input type="checkbox"/>
Rope & Rope Grab	<input type="checkbox"/>	<input type="checkbox"/>	Protective Clothing	<input type="checkbox"/>	<input type="checkbox"/>
Lanyard	<input type="checkbox"/>	<input type="checkbox"/>	Air-purifying respirator	<input type="checkbox"/>	<input type="checkbox"/>
Shock Absorber	<input type="checkbox"/>	<input type="checkbox"/>	First Aid Kit	<input type="checkbox"/>	<input type="checkbox"/>
Tripod & Winch	<input type="checkbox"/>	<input type="checkbox"/>	Two Way Radios	<input type="checkbox"/>	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	Other: _____	<input type="checkbox"/>	<input type="checkbox"/>

GAS MONITOR			
MAKE	MODEL	SERIAL NUMBER	CALIBRATION DATE

GAS MONITORING DATA				
GAS & P.E.L.	TIME	UPPER	MIDDLE	LOWER
% Oxygen: > 20.7% and < 21.9%				
% Explosive: < 10% L.E.L.				
Toxic PPM: < 10 PPM H <sub>2</sub> S				
CO PPM: < 35 PPM				
GAS & P.E.L.	TIME	UPPER	MIDDLE	LOWER
% Oxygen: > 20.7% and < 21.9%				
% Explosive: < 10% L.E.L.				
Toxic PPM: < 10 PPM H <sub>2</sub> S				
CO PPM: < 35 PPM				
GAS & P.E.L.	TIME	UPPER	MIDDLE	LOWER
% Oxygen: > 20.7% and < 21.9%				
% Explosive: < 10% L.E.L.				
Toxic PPM: < 10 PPM H <sub>2</sub> S				
CO PPM: < 35 PPM				

P.E.L.: Permissible Entry Level, L.E.L.: Lower Explosive Limit

<b>ENTRY SUPERVISOR AUTHORIZING THAT ALL THE ABOVE CONDITIONS HAVE BEEN SATISFIED AND AUTHORIZING ENTRY</b>		
<div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="width: 40%; border-bottom: 1px solid black;"></div> <div style="width: 20%; border-bottom: 1px solid black;"></div> <div style="width: 20%; border-bottom: 1px solid black;"></div> <div style="width: 20%; border-bottom: 1px solid black;"></div> </div> <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 5px;"> <div><b>Entry Supervisor Signature</b></div> <div><b>Date</b></div> <div><b>&amp;</b></div> <div><b>Time</b></div> </div>		
<b>ENTRANT'S TIME IN AND OUT OF THE CONFINED SPACE</b>		
Time In: _____	Time In: _____	Time In: _____
Time Out: _____	Time Out: _____	Time Out: _____

**Comments:**

\_\_\_\_\_  
 \_\_\_\_\_

<b>CONFINED SPACE AREA CLEARED/SECURED AND PERMIT CANCELED BY:</b>	
<div style="border-bottom: 1px solid black; width: 100%;"></div>	<div style="border-bottom: 1px solid black; width: 100%;"></div>
Signature	Date & Time

**This permit must be retained for one year.**

# Attachment B

## Duties of Authorized Entrants and Attendants

1. Know the hazards that may be faced during entry including the signs, symptoms, and consequences of exposure.

2. Communication

All entrants and attendants must maintain contact while working in the confined space.

- a) The entrant **must** notify the attendant if immediate exit of the space is necessary. Notification can be either by hand signal, rope pull or other communication device.
  - b) The attendant **must** order evacuation of the confined space when:
    - 1) a condition develops that is not allowed in the entry permit.
    - 2) behavioral changes appear that may be due to symptoms of exposure.
    - 3) an endangering situation develops outside of the confined space.
    - 4) an uncontrolled hazard is detected.
    - 5) the attendant must leave.
  - c) The attendant must position himself to be able to summon emergency/rescue and may not leave the observation point until relieved by another attendant or all entrants are out of the space safely and the job is complete.
  - d) The attendant must perform the following actions when unauthorized persons approach or enter a confined space.
    - 1) Warn them,
    - 2) Request exit of the unauthorized person(s), and
    - 3) Inform entrants and others if unauthorized entry has occurred.
  - e) The attendant must be currently certified in CPR and first aid.
3. Rescue
    - a) The attendant must first summon help.
    - b) Entrants must leave the space immediately when the attendant orders withdrawal from the space, danger is perceived or an automatic alarm is activated.

## **Attachment C**

### **Duties of Entry Supervisor**

1. Know the hazards that may be faced during entry including the signs, symptoms and consequences of exposure.
2. Determine if the entry permit contains the necessary information including alerting rescue.
3. Determine if the equipment, procedures and practices are in place prior to entry.
4. Determine, at intervals during the entry, if operations and conditions are consistent with the permit.
5. Take necessary measures to prevent entry of unauthorized personnel while work is performed.
6. If training is complete for entrant and/or attendant duties, a supervisor may perform either role during an entry.
7. Cancel authorization and terminate entry if conditions are not acceptable.
8. Terminate permit when the work is completed and forward a copy to the CHSO.

# **Attachment D**

## **Training Outline**

- I. Overview of Standard
- II. Important Definitions
- III. General Requirements
  - A. Evaluation of Workplace
  - B. Posting of Spaces
  - C. Policies and Procedures
  - D. The Permit
  - E. Rescue and Emergency Services
  - F. Training
- IV. Entry Procedures
  - A. Physical Hazards
    - 1. Assessment
    - 2. Protection
  - B. Atmospheric Hazards
    - 1. Assessment
    - 2. Protection
    - 3. Testing
      - a. Air Monitoring Instrumentation
      - b. Air Monitoring Procedures

## **Training Outline**

*(Continued)*

- IV. The Specifics of the Permit
- V. Duties
  - A. Authorized Entrants
  - B. Attendants
  - C. Entry Supervisors
  - D. Rescue
- IV. Alternate Procedures for Confined Space Entry – 1910.146 (c)(5)
- V. Reclassification to a Non-Permit Space – 1910.146 (c)(7)