Prepared for:
National Grid USA
175 East Old Country Road
Hicksville, NY 11801

Remedial Design/Remedial Action Work Plan

Former MGP Site
Sag Harbor, Suffolk County, New York
Site No.: 1-52-159

ENSR
August 13, 2008
Document No.: 01765-066

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Reviewed By Dave Work, P.E., Senior Engineer

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Executive Summary

On behalf of National Grid USA (National Grid), ENSR Corporation (ENSR) has prepared this Remedial Design (RD)/Remedial Action (RA) Work Plan for the Sag Harbor former Manufactured Gas Plant (MGP) Site located on Bridge Street in the Village of Sag Harbor. This Work Plan provides the framework for implementing the New York State Department of Environmental Conservation (NYSDEC) selected remedy in accordance with the Record of Decision (ROD) for the Site [NYSDEC, 2006] and the Administrative Order on Consent [Index No. D1-0002-98-11, (NYSDEC, 2005)] between KeySpan Energy (now National Grid) and the NYSDEC. The selected remedy will remove most of the contamination present in the site soils.

A Manufactured Gas Plant operated at the site from approximately 1859 through 1931, at which time gas production ended. The plant originally produced gas from coal or wood rosin and was switched to a water gas process in 1892. The byproducts of gas production that either spilled, leaked, or were disposed on the site are responsible for the contamination.

In 1999, KeySpan (now National Grid), as the successor to LILCO, signed a consent order with the NYSDEC to conduct a Remedial Investigation and remediation of the site, which had been classified as a Class 2 Inactive Hazardous Waste Disposal Site by the NYSDEC. From 2000 through 2004, field work was performed to define the nature and extent of the contamination at the Sag Harbor former MGP site. This work included the collection of surface and subsurface soil, groundwater, soil vapor, and ambient air samples for analysis. The samples were taken from locations over the entire site as well as beyond the perimeter of the site. Off-site samples were located along Long Island Avenue, Bridge Street, and on the private properties adjacent to the site itself. Sediment, pore water, and surface water samples were also collected from Sag Harbor Cove.

Based on the investigations, the chemicals of concern at the site are residues of the former MGP process and include volatile organic compounds, semi-volatile organic compounds, and cyanide. The volatile organic compounds of concern are benzene, toluene, ethylbenzene, and xylene. Together they are known as BTEX. The semi-volatile organics of concern are polycyclic aromatic hydrocarbons (PAHs). BTEX and PAHs are the primary constituents of coal tar which was the main byproduct of gas production. The principle waste material at this site is coal tar, a thick, black, oily liquid which was a byproduct of the gas production process. The coal tar typically appears as a Dense Non-aqueous Phase Liquid (DNAPL) which is a flowable product which does not readily mix with water and is denser than water. Coal tar is a subsurface soil contaminant and is a source of groundwater contamination. Coal tar has been found underneath most of the site and most of it is located in the upper ten feet above a peat layer.

There are currently no ongoing exposures to contamination from this site. The site is fenced to restrict access, and a layer of stone at the surface further reduces the likelihood of direct contact with contaminated soil. Exposure to contaminated groundwater is not occurring, as there are no supply wells located in the contaminated area. The area surrounding the site is served by a public water supply, which is regularly tested to ensure that it meets state and federal drinking water standards for a number of contaminants, including those associated with the site. Indoor air samples from buildings surrounding the site have not shown evidence of site-related contamination.

A ROD was signed by the NYSDEC on March 31, 2006 confirming a Remedial Action Plan to address the by-products of gas production that were disposed of on the site. The elements of the Remedial Action Plan are:

- Excavation of surface soils
- Excavation of source material (coal tar) areas to a depth of ten to fifteen feet
- Installation of wells to recover liquid contaminants
- Placing an engineered cap over the surface of the site

- Institutional controls to limit future uses that could disturb remaining wastes
- Engineering controls to monitor groundwater contamination and indoor air quality in buildings later constructed over the remediated area, including properties not presently part of the site

The remediation work will consist of excavation of contaminated soil in the top ten to fifteen feet of the site and on several surrounding properties. Constructing and completing the remedy consists of several activities:

- Site preparation including: mobilization; relocation of existing security fencing as needed for the proper implementation of the remedy; installation of erosion and sedimentation controls; installation of temporary site facilities; surveying to establish baseline conditions and grades; utility location, protection, and relocation, as necessary; demolition of existing surface and subsurface structures; and installation of traffic controls at the project site.
- Closure of portion of Bridge Street at Long Island Avenue during the entire project and lane closures on Long Island Avenue. Portions of the Village Parking Lot behind the Post Office will be used to support the project. Road closures will be coordinated with the Village Department of Public Works, identified with signs noting detours.
- Prior to excavation, a soil mix wall will be installed around the perimeter of the excavated area. The purpose of the wall is to provide stability during the excavation and to assist in dewatering the excavation. A soil wall was chosen instead of sheet piling to reduce the impacts of noise and vibration on the community. The wall will extend approximately 1000 feet around the perimeter and be ten to fifteen feet wide.
- Once the wall is installed, a temporary fabric structure (tent) will be erected on the site over the area being excavated. This structure helps control the release of vapors and dust during the excavation activities. The tent is operated under negative pressure, air from within the tent will be continually evacuated and treated using carbon filtration prior to release. The tent will be moved from one area to another through the course of the excavation activities. Between 15,000 and 20,000 cubic yards of material will be excavated from the site. Excavation and backfilling will generate approximately 40 trucks per day. A trucking plan to minimize traffic impacts has been developed and no trucking is planned on weekends.
- During excavation activities a dewatering system will be used to lower the groundwater levels at the site, allowing more efficient and complete removal of impacted soils. Water will be removed from the subsurface using a series of pumps and well points. The water will be treated to remove site related contaminants to meet state permit limits prior to discharge. Estimates of the rates of pumping range from 750,000 to 1,000,000 gallons per day. The treated water will be discharged through a pipe to a point in the outer harbor near the breakwater chosen to allow mixing with seawater and avoid affects to the salinity in the waters of the inner coves and harbor. The pipe will be located and clearly marked to avoid interference with marine navigation.
- Soil will be excavated and stockpiled under the tent prior to loading into trucks for transport and disposal. The truck beds used to transport the soils are lined with a plastic liner and the tops of the trucks covered to prevent leaks or spills in transit.
- Shallow soil will be excavated from a limited area along the south side of Long Island Avenue to the west of Bridge Street. This work will be performed without the use of the enclosure. Other common engineering controls, including foam application, small excavation areas, etc. will be used to control the release of vapors and dust.
- Soils excavated from the site will be sent offsite for thermal treatment at a permitted disposal facility. There are several such facilities located in Delaware, New Jersey, Pennsylvania and New York.

- The hole will be backfilled using certified clean soil from a local source. Backfilling will occur as the excavation of other areas of the site goes forward. Following the completion of activities, the site will be returned to current grade and all of the equipment used during the remediation will be demobilized.

- Following demobilization, the site will be restored, including establishment of vegetation by seeding and installation of concrete or pavement surfaces.

Comprehensive research is currently being conducted to identify every local, regional, state, and federal permit, approval, or notification required to implement the remedial work. Table 3-1 presents a listing of potentially applicable federal, state, and local permit requirements.

Quality assurance procedures will be implemented during the work to ensure that work is completed in conformance with the RD, and to provide the basis for implementation of contingency actions, if necessary, to bring the work into conformance with the RD. A Community Air Monitoring Plan (CAMP) will be in place throughout the project to make sure that site-related contamination is detected if it leaves the site and actions are taken to prevent any future releases. Continued testing of the water discharged from the dewatering system will also be conducted. The excavation will be continually monitored to ensure that all accessible source material is removed.

This Work Plan also presents details of the Pre-Design Investigation (PDI) activities conducted in 2007 to identify the edge of contamination to be excavated, to collect soil for pre-characterization analysis, and to provide geotechnical data for design parameters including excavation, shoring, and dewatering.

The Remedial Design Work Plan is expected to be implemented starting September 2008 through May 2009.

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Acronyms and Abbreviations

AOC	Administrative Order on Consent
ASTM	American Society for Testing and Materials
bgs	below ground surface
BOD	biochemical oxygen demand
BTEX	benzene, toluene, ethylbenzene, and xylene
BTU	British Thermal Unit
CAMP	Community Air Monitoring Plan
CPP	Citizen's Participation Plan
DER	Declaration of Environmental Restriction
DNAPL	dense nonaqueous phase liquid
DOT	Department of Transportation (U.S.)
FS	Feasibility Study
GAC	granular activated carbon
HASP	Health and Safety Plan
hsa	hollow stem auger
IC/EC	institutional controls and engineering controls
IDW	investigation derived waste
IRM	interim remedial measure
MGP	manufactured gas plant
msl	mean sea level
NGVD	National Geodetic Vertical Drum
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OM&M	operation, maintenance, and monitoring
OSHA	Occupational Safety and Health Administration
OVDCP	Odor, vapor, and dust control plan
PAH	polycyclic aromatic hydrocarbons
PDI	Pre-Design Investigation
PPE	personal protective equipment
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RD	Remedial Design
RIR	Remedial Investigation Report

ROD	Record of Decision
ROW	right of way
SCGs	standards, criteria, and guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SPT	standard penetration testing
SVOCs	semivolatile organic compounds
TCLP	Toxicity Characteristics Leaching Procedure
TKN	total Kieldahl nitrogen
TOC	total organic carbon
TP	test pit
TPH	total petroleum hydrocarbons
VOCs	volatile organic compounds

1.0 Introduction

ENSR Corporation (ENSR), on behalf of National Grid USA (National Grid) has prepared this Remedial Design (RD)/Remedial Action (RA) Work Plan for removal and disposal of soils from the former manufactured gas plant (MGP) site located in Sag Harbor, Suffolk County, New York (Figure 1-1). The RD detailed within this Work Plan is being completed as a part of the Order on Consent [Index No. D1-0002-98-11, (NYSDEC, 2005)] between National Grid and the New York State Department of Environmental Conservation (NYSDEC).

The NYSDEC, in consultation with the New York State Department of Health (NYSDOH), has selected the remedy for the Sag Harbor former MGP Site, as established in the Record of Decision (ROD) for the site [NYSDEC, 2006]. A Remedial Investigation Report [(RIR); D&B, 2003] and a Feasibility Study [(FS); GEI, 2005] were completed for the Sag Harbor former MGP site and approved by the NYSDEC. The FS proposed excavation of on-site and off-site source material to a depth of ten feet, nonaqueous phase liquid (NAPL) recovery, institutional controls, and a site management plan. NYSDEC subsequently approved the FS recommendations for implementation in the ROD. The components of the remedy as specified in the ROD are as follows:

- A remedial design program to provide the details necessary to implement the remedy;
- Installation of an excavation support system; removal of the commercial building to the north of the property; excavation and off-site disposal of the top ten feet of impacted soil; and backfilling of the excavated area with clean fill from an offsite source approved by NYSDEC;
- Site restoration, including establishment of vegetation by seeding and installation of concrete or pavement surfaces;
- Installation of several passive NAPL recovery wells;
- Development of a site management plan to address residual contamination, evaluate buildings for soil vapor impacts, address any use restrictions, and provide for the operation, maintenance, and monitoring of components of the remedy;
- Imposition of an institutional control in the form of an environmental easement; and
- Periodic certification of the institutional and engineering controls.

As a part of the remedial design program, a pre-design investigation (PDI) was completed at the Sag Harbor former MGP site and off-site areas from April 2007 through July 2007 to better delineate the perimeter of excavation, collect soil samples for waste pre-characterization analysis, and to collect data for design parameters including excavation, shoring, and dewatering. A summary of the PDI is included as Section 2 of this Work Plan.

Based on the results of the PDI, the depth of excavation as specified in the ROD was modified to vary from 10 till 15 feet below ground surface (bgs). The vertical and horizontal limits of excavation have been presented in Figure C-05 of the final design documents (Appendix A). The remedy will be implemented in the following three phases:

- The first phase of the remedy will involve excavation and off-site disposal of the on-site and off-site soils and site restoration. The first phase of the remedy is described in this RD/RA Work Plan.

- In the second phase of the remedy, if necessary, a NAPL recovery program will be implemented to remove any remaining NAPL from the subsurface. A separate remedy design document will be prepared for the second phase.

- In the third phase of the remedy, a site management plan will be submitted in accordance with the Order on Consent and the ROD and any required institutional controls will be imposed. The site management plan will include a schedule for operation, maintenance, and monitoring of components of the remedy and for the submission of the periodic certification of the institutional and engineering controls.

In accordance with the Order on Consent and the Draft DER-10, Technical Guidance for Site Investigation and Remediation [(DER-10); NYSDEC, 2002], the remedial design program will consist of the following documents:

- Remedial Design Report (This RD/RA Work Plan is submitted in lieu of the RD Report);

- Biddable quality design documents for the RD, consisting of Specifications and Drawings (Appendix A of this Work Plan);

- Schedule to implement the Remedial Design (Section 6 of this Work Plan);

- Protocols to determine the effectiveness of the Remedial Design (Section 5 of this Work Plan);

- Contingency Plan (will be submitted separately under National Grid cover);

- Health and Safety Plan [(HASP), Appendix G of this Work Plan - will be submitted separately]; and

- Citizen's Participation Plan [(CPP), will be submitted separately under National Grid cover].

The following additional documents were not explicitly required by the Consent Order but are integral to the remedial design program:

- Community Air Monitoring Plan [(CAMP), Submitted under a separate cover];

- Traffic Route Study (Appendix H of this Work Plan);

- Transportation Plan (Appendix H of this Work Plan);

- Odor, Vapor and Dust Control Plan [(OVDCP), Appendix K of this Work Plan]; and

- Permitting Plan and associated permits and review correspondence (Table 3-1 of this Work Plan).

1.1 DER-10 Requirements

To satisfy the requirements stated in Section 5.2 (b) of the DER-10, the ROD has been included with this document as Appendix B. The following DER-10 requirements are included in the ROD:

- Summary of the findings and recommendations detailed in the RIR and the FS;

- Summary of sampling results collected to date of the publication of the ROD;

- Identification of all applicable standards, criteria, and guidance (SCGs);

- Figure(s) detailing location, depth, and parameters of all contaminants in excess of the remediation standard;

- Figure detailing wetlands, streams or other habitats potentially impacted by the remedial action; and

- Figure showing the vertical and horizontal extent of the area to be remediated.

As mentioned earlier, a summary of the PDI is included as Section 2 detailing the results of the PDI.

1.2 Report Format

Section 2 presents the summary of the PDI while Section 3 describes the Work Plan for the implementation of the remedial design. All required permits and/or substantive permit requirements are provided in Section 4. The quality assurance project plan (QAPP) is summarized in Section 5 while Section 6 details the proposed schedule for the implementation of the remedial design program.

2.0 Pre-Design Investigation

The Sag Harbor former MGP site is situated on the east end of Long Island in the Village of Sag Harbor in Suffolk County, New York. The current site layout with the locations of former MGP structures is illustrated on Figure 1-2. The site covers approximately 0.8 acres and is located on the north shore of the south fork of Long Island. The site is situated on the east side of Bridge Street where it intersects West Water Street and Long Island Avenue, which is approximately 200 feet south (inland) of the confluence of Sag Harbor Bay with Sag Harbor Cove.

The site surface is comprised of bluestone and the site is enclosed and secured by an 8-foot high chain-link fence. A 100,000-cubic foot Hortonsphere gas storage tank, three natural gas storage tanks on concrete cradles, and a compressor station building were formerly present on site some time after demolition of the MGP. The site is surrounded by commercial properties, a residence, and residential condominiums to the north, a post office, bank, laundromat, and a parking lot to the east, a commercial building to the south, and Bridge Street and residential condominiums to the west.

2.1 Pre-Design Investigation Field Activities and Results

Investigation activities were conducted to delineate the perimeter of impacts to be excavated, to collect soil for pre-characterization analysis, and to provide geotechnical data for design parameters including excavation, shoring, and dewatering. Field activities were completed between April 17 and July 24, 2007.

Investigation activities were completed both within and outside of the current site boundary. Field activities included soil boring and sampling for geotechnical parameters, impact extent delineation, and pre-characterization, test pit excavation, a pump test, groundwater sampling, and air monitoring. Figure 2-1 provides the location of the PDI activities.

2.1.1 Geotechnical Borings and Sample Collection

A total of ten (10) geotechnical borings were advanced using hollow stem auger (HSA) methods around the perimeter of the proposed excavation. Soil samples were collected to evaluate geotechnical parameters necessary for barrier wall and dewatering design. Prior to borehole advancement, locations were pre-cleared to between 4 and 5 feet below ground surface (ft bgs) with a hand auger or post hole digger. Borings were advanced to 30 ft bgs, with the exception of SB-210, which was advanced to 37 ft bgs. Geotechnical soil boring locations are shown in Figure 2-1 and Table 2-1 provides a summary of geotechnical borings. Table 2-2 provides a summary of the impacts found within the geotechnical borings.

All borings were completed by Fenley & Nicol Environmental, Inc. (F&N) with a Canterra CT450 truck-mounted rig under the supervision of an ENSR geologist or environmental scientist. Continuous soil samples were collected using 2 ft split-spoon samplers according to Standard Penetration Testing (SPT) protocol. Soils were logged for composition, visible and olfactory impacts, and field screened with a photoionization detector (PID) for volatile organic compounds (VOCs). Boring logs are provided in Appendix C.

Geotechnical samples were collected from each location at a depth corresponding to the intended base of the barrier wall and another at the approximate base of the excavation. A total of 20 geotechnical soil samples were collected during the PDI. Samples were taken directly from the split-spoon, double-bagged in one gallon size freezer bags, and sent under chain-of-custody protocol via courier to GeoTesting Express in Boxborough, Massachusetts to be analyzed for particle size. Boreholes were tremie grouted upon completion. All soil cuttings were containerized in 55 gallon drums and disposed at an approved off-site facility. A summary of the geotechnical soil sample activities is provided in Table 2-3. The results of the laboratory analyses for geotechnical samples are provided in Appendix D.

2.1.2 Delineation Borings and Sample Collection

A total of 27 delineation borings were advanced using direct push methods. Soil samples collected from these locations were used to determine the horizontal extent of impacts. Prior to borehole advancement, locations were pre-cleared to between 4 and 5 ft bgs with a hand auger or post hole digger. All borings were completed to a depth of 10 ft bgs and continued to 15 ft bgs if peat or impacts were present at 10 ft bgs. Delineation soil boring locations are shown in Figure 2-1.

All borings were completed by F&N with a track mounted Geoprobe® 6620DT rig under the supervision of an ENSR geologist or environmental scientist. Continuous samples were collected using a single-use 2.5 inch inner diameter, 5 foot long MacroCore® acetate liner. Soils were logged for composition, visible and olfactory impacts, and field screened with a PID for VOCs. Boreholes were backfilled with either clean soil or bentonite pellets upon completion. Impacted soil was containerized in 55 gallon drums to await sampling and disposal at an approved offsite facility. Summary of the observations made during the completion of the delineation borings is presented in Table 2-1 while the delineation soil boring logs are provided in Appendix C.

A total of 24 environmental samples were collected during PDI field activities. Environmental soil samples were collected from locations displaying no visible impacts at depth intervals above and below the peat layer. If a peat layer was not encountered, soil samples were collected at depths corresponding with the depths above and below the peat layer found in previous near-by borings. Soil samples were taken directly from the acetate liner and placed in laboratory supplied glassware. Environmental soil samples were also collected from two geotechnical boring locations. Samples were kept at 4 degrees Celsius (ºC) and sent under chain-of-custody protocol via courier to Severn Trent Laboratories, Inc. in Pittsburgh, Pennsylvania. Samples were analyzed for VOCs, semi-volatile organic compounds (SVOCs), metals, total cyanide, and mercury. The results of the laboratory analyses are summarized in Table 2-4.

2.1.3 Pre-Characterization Borings and Sample Collection

Within the current site boundary, a total of 86 pre-characterization soil borings were completed using direct push methods under the supervision of an ENSR geologist or environmental scientist. A total of 42 composite samples for analytical analysis were collected from the pre-characterization boring locations. The property was divided into 30 ft by 30 ft cells and two 15 ft x 60 ft cells. Two (2) to three (3) pre-characterization borings were advanced in each cell, with the exception of the two 15 ft by 60 ft cells at the northeast end of the site, in which three (3) soil borings were advanced. Soil borings were typically completed to a depth of 10-15 ft bgs, corresponding with either the bottom of the peat layer or until no further visible impacts were observed.

All borings were completed by (F&N) with a track-mounted Geoprobe® 6620DT rig under the supervision of an ENSR geologist or environmental scientist. Continuous samples were collected using a single-use 2.5 inch inner diameter, 5 foot long MacroCore® acetate liner. Soils were logged for composition, visible and olfactory impacts, and field screened with a PID for VOCs.

A soil sample was generated for each pre-characterization cell by homogenizing all of the soil from the borings within a given cell and placing the homogenized soil in laboratory supplied glassware. Samples were kept at 4ºC and sent under chain-of-custody protocol via courier to Severn Trent Laboratories, Inc. in Pittsburgh, Pennsylvania. Samples were analyzed for VOCs, SVOCs, total petroleum hydrocarbons (TPH), toxicity, polychlorinated biphenyls (PCBs), British Thermal Unit (BTU) content, ignitability, corrosivity, reactivity, cyanide, pH, moisture, sulfur, Toxicity Characteristic Leaching Procedure (TCLP) (inclusive of VOCs, SVOCs, metals, pesticides, and herbicides), metals, mercury, and hexavalent chromium. All pre-characterization boreholes were backfilled with bentonite pellets upon completion. All soils generated from pre-characterization drilling were containerized in 55 gallon drums and disposed at an approved off-site facility. A figure of the grid system used in determining pre-characterization soil boring locations is shown in Figure 2-2.

Data from the geotechnical, delineation, and pre-characterization borings were used to develop figures with contours of the top and bottom of the peat layer, along with the top and bottom of impacts. This information was incorporated into the remedial design to determine the limits of the barrier wall and the excavation. Figure 2-2 show the locations of visual impacts observed during the PDI while the Figures 2-3 and 2-4 present the top and bottom of the peat layer.

2.1.4 Test Pit Completion

One test pit (3 ft by 5 ft by 5 ft) was completed in the southwest portion of the site. Excavation was accomplished using a trackhoe under the supervision of an ENSR engineer.

Two soil samples were collected and analyzed for free drainage and chemical dewatering from within the test pit. Samples were collected in one gallon sized freezer bags, kept at 4ºC, and sent under chain-of-custody protocol via courier to GeoTesting Express in Boxborough, Massachusetts. Test pit samples were analyzed for specific gravity, moisture content, and bulk density with corn, quicklime, and polymer additives. Samples were also subjected to gravity drainage testing. Upon completion, the test pit was backfilled with sand and onsite soil. Laboratory analyses show that a variety of reagents can be used to reduce the water content of the soil with corn providing the maximum effectiveness.

2.1.5 Groundwater Sampling

Three monitoring wells were purged and sampled using low flow methodology with regard to parameter stabilization during PDI field activities. Monitoring wells SHMW-15I and SHMW-18S were sampled on July 10, 2007 and SHMW-6I on July 11 and July 24, 2007. Well locations are shown in Figure 2-1.

Wells were purged from the depth of the screened interval using dedicated tubing and a peristaltic pump. Water was passed through a Horiba U-22 flow-through cell to monitor specific conductivity, pH, oxidation reduction potential, dissolved oxygen and temperature at 15 minute intervals. Water was sampled from the flow-through cell discharge at 15 minute intervals, and was analyzed for turbidity with a LaMotte 2020 or a LaMotte 2020e turbidity meter. Wells were purged until parameters reached pre-determined stabilization criteria prior to sampling.

Water samples were collected in laboratory supplied glassware and kept at 4ºC. Samples were sent under chain-of-custody protocol via courier to Severn Trent Laboratories Inc. in Pittsburgh, Pennsylvania. Samples were analyzed for VOCs, SVOCs, dioxin, metals, pesticides and PCBs, bromide, chloride, fluoride, nitrate, nitrite, sulfate, hexavalent chromium, total sulfides, total phosphorus, ammonia, biochemical oxygen demand (BOD), total Kjeldahl nitrogen (TKN), and settleable solids. Results of the groundwater analyses are presented in Table 2-5 and field forms from the sampling events are available upon request. All liquid generated during sampling was temporarily stored in 5 gallon buckets and transferred to 55 gallon drums and disposed at an approved offsite facility.

2.1.6 Pumping Test Completion

Figure 2-1 identifies the wells used for the pump test. Results and information regarding pump test completion are provided in Appendix E.

2.1.7 Air Monitoring

Ambient air quality and dust concentrations were monitored upwind and downwind of activities during all ground intrusive operations in accordance with the methods outlined in the PDI CAMP. Data was collected using PIDs and aerosol monitors. Real time readings were recorded by ENSR personnel in 15 minute intervals and logged continuously by the apparatus to monitor for VOCs and aerosols. Minor exceedences of the pre-determined action limits set for the site of 1 part per million (ppm) above ambient background levels for VOCs were noted and only one instance of an exceedance of the action level of 100 ug/m^3 above ambient background for aerosols. Any noted exceedances in the VOC data were caused by factors other than PDI activities, including humidity and traffic emissions. Only one exceedance noted by the aerosol monitors was due to increased dust generated during PDI activities. In this instance dust concentrations reduced below action levels within four minutes and further action was not necessary. Any further exceedances recorded by the aerosol monitors were also due to humidity and traffic emissions. Logged data has been reviewed and is provided in Appendix F.

3.0 Design Basis

For purposes of further discussion in this RD/RA Work Plan, the term site will include the Sag Harbor former MGP Site as well as all or portions of adjacent private properties to the north, south and west of the site, Village of Sag Harbor roads to the west and north and a small portion of the village parking lot to the east consistent with the ROD [NYSDEC, 2006].

3.1 Remedial Goals

The remedial goals for the site have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. As stated in the ROD, “At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles” [NYSDEC, 2006].

In accordance with the ROD, the remediation goals for this site are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to VOCs, SVOCs, and cyanide in surface soil, subsurface soil, groundwater and soil vapor;
- environmental exposures of flora or fauna to VOCs, SVOCs, and cyanide in surface soil, subsurface soil, and groundwater;
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and
- the release of contaminants from surface soil, subsurface soil, groundwater, sediment, and soil vapor into ambient air, indoor air, sediment, and surface water through desorption, storm water erosion, vaporization, windborne dust and dissolution.

Further, the remediation goals for the site include attaining the following, to the extent practicable:

- ambient groundwater quality standards; and
- recommended soil cleanup values for surface soils.

To achieve the remedial goals, the proposed overall approach for remediation includes removal via excavation and offsite disposal of the impacted soil. The area to be excavated is shown in drawing C-05 of the design package included in Appendix A.

The proposed remedial program will include the following components:

- mobilization and site preparation including demolition;
- installation of a barrier wall around the perimeter of the excavation area;
- erection of a temporary fabric structure for vapor containment and control over areas with significant impacts and potential for odor generation;
- air monitoring to evaluate potential fugitive emissions;
- excavation of impacted soils and MGP structures, including piping;
- transportation and management of impacted material at an offsite permitted facility; and

  surveying, backfilling, site restoration, and demobilization.

The remainder of this report describes these activities and provides the information used as the basis for the design.

3.2 Site Preparation

The site will be prepared for the required excavation and restoration work. The site preparation activities include: mobilization; relocation of existing security fencing as needed for the proper implementation of the remedy; installation of erosion and sedimentation controls; installation of temporary site facilities; surveying to establish baseline conditions and grades; utility location, protection, and relocation, as necessary; demolition of existing surface and subsurface structures; and installation of traffic controls at the project site. Any monitoring wells that will be damaged during the remedy implementation will be cut at the excavation bottom and grouted or abandoned per NYSDEC regulations during the site preparation activities. Documentation required for the abandonment and removal of these wells will be included in the Remedy Completion Report.

All necessary engineering controls to control odors will be installed prior to the start of excavation activities.

3.2.1 Mobilization

Mobilization activities will include obtaining required permits; arranging for waste transportation; arranging for utility hook-ups (as needed); mobilizing field offices, constructing temporary water collection and treatment facilities, staging necessary equipment and personnel; preparing the Health and Safety Plan (HASP) and holding an on-site health and safety training session; and installing an on-site decontamination facility.

3.2.2 Fence Relocation

Fencing between the former MGP Site and the Schiavoni Property to the north and between the former MGP site and the commercial buildings to the south will be removed and disposed of as necessary to conduct removal actions in these areas of the site. Temporary fencing will be installed outside the excavation zones. A visual block, such as black fabric attached to fence sections, will also be installed around any open excavation to help control dust, prevent horizontal migration of odors, elevate the discharge point of emissions of vapors to facilitate dispersion, minimize effect of vapors on downwind receptors, and limit visibility of the excavation.

In addition, all work areas will be secured and barricaded with temporary fencing and caution tape to ensure the safety of the facility workers, visitors, and to prevent vandalism and unauthorized access. The fencing will have professionally made signs stating that access to the site is limited to authorized personnel, and work within the site must be done with the appropriate personal protective equipment (PPE).

3.2.3 Erosion and Sediment Controls

Erosion and sediment controls, including silt fences, will be installed prior to any disruption of site soil, in accordance with local, state, and federal regulations. The erosion and sediment controls will be maintained throughout the duration of the work. Erosion and sediment controls are further described in Section 3.7.3 and illustrated in drawings C-02 and C-09 (Appendix A).

3.2.4 Site Facilities

Site facilities will be installed as needed to support and execute the work. The following site facilities will be needed during remedial construction:

- construction offices;
- utilities (electric, water, sewer, and telephone);
- lighting;

- fuel storage and dispensing;
- sanitary facilities;
- haul roads;
- decontamination pad(s);
- health and safety equipment;
- material laydown areas;
- soil stockpile areas;
- temporary fabric structure;
- traffic control signage; and
- parking areas.

Work zones will be established within the site boundaries in accordance with the site-specific HASP and site control areas that define the initial Exclusion Zones, the Decontamination Zones, and the Support Zone. These zones will change as the work progresses in order to maintain safety and allow for practical completion of the work.

3.2.5 Surveying

A New York State-licensed surveyor will provide initial benchmarks and stakeout for horizontal and vertical excavation limits. This initial survey will be used to confirm and maintain horizontal and vertical limits as the work proceeds. The licensed surveyor will return to the site as needed to document actual excavation work limits, measurement of unit cost bid items, and to complete an as-built survey of the finished work.

3.2.6 Utility Protection

Public utilities that are active will be protected or relocated during implementation of the remedial action. These utilities include sanitary and storm sewers, gas lines, gas meter pits, water, telephone, and overhead power lines. Utility clearance for all work at the site will be conducted prior to start of any intrusive work.

3.2.7 Demolition

Surface and subsurface structures that currently exist within the excavation area will be removed. Surface structures include the Schiavoni Commercial Building in the northern portion of the site, the support structures for the former hortonsphere structure, various pavements, and chain link fences. Subsurface structures include former MGP foundations, piping, and monitoring wells. Paving, fencing, trees, and other surface features that impede access to the impacted soils and MGP wastes will be demolished, removed, and transported offsite for disposal. Paving and fencing will be replaced and restored to its original condition at the end of the project.

All aboveground vegetation will be cleared wherever ground disturbance is anticipated or material laydown areas are needed. Cleared vegetation will be chipped and disposed of offsite. To the extent practicable, trees greater than 3-inches in diameter outside of the excavation will not be removed. Subsurface vegetation (root balls, *etc*.) within the excavation areas will be disposed of offsite as impacted material.

Subsurface structures within the excavation area will be broken up using excavation and demolition equipment and will be removed for decontamination, if required. Decontamination will take place in lined decontamination areas and will include brushing and washing impacted soil and MGP residues from the debris. Decontaminated debris will be transported offsite for landfill disposal. Monitoring wells in the excavation will be cut at the excavation bottom during the process of the excavation and grouted or abandoned according to NYSDEC requirements.

3.2.8 Traffic Management

A Transportation Plan has been prepared for the site and describes the procedures and the specific offsite transportation routes that will be followed to manage construction traffic during the work in a manner that minimizes disturbance to the community. The Transportation Plan has been based on discussions with Village of Sag Harbor public works and traffic department personnel. The draft Transportation Plan is included as Appendix H.

3.3 Excavation

Excavation will begin following utility relocation, demolition of surface structures, site clearing and grading, construction of a shoring wall, installation of site-wide and localized dewatering systems, and erection of a temporary vapor containment structure. Excavation will achieve the specific performance and design requirements summarized in Section 3.1. The limit of excavation is shown in drawing C-05 of the design drawings (Appendix A). The excavation will extend down upto a depth of 10 to 15 ft bgs representing a total in-place volume of approximately 16,800 cubic yards. Fill material is expected to be encountered in the first two ft bgs of the excavation followed by sandy material down to approximately 6 to 8 ft bgs. Peat, silt, and clay material is expected to be removed from the bottom two to four feet across most of the excavation area. The water table is very shallow ranging from 6 to 18 inches bgs.

Subsurface concrete foundations of former MGP structures, cable, pipe, brick, and other debris may be encountered within the excavation limits. These materials will be broken up with an excavator bucket or a hoe ram device if needed, segregated from the soil, stockpiled, and shipped offsite for disposal as described in Section 3.4.

Soils will be excavated with standard track-mounted equipment. All excavation will be carried out under a temporary fabric structure to control vapor migration as described in Section 3.7 except for a limited area along the south side of Long Island Avenue to the west of Bridge Street. This work will be performed without the use of the enclosure. Other common engineering controls, including foam application, small excavation areas, etc. will be used to control the release of vapors and dust. Sequencing of excavation work and the size of the fabric structure will be selected to maximize production rate and minimize overall project cost.

During much of the work, the rate of excavation will most likely exceed daily trucking and disposal facility capacity. Therefore, direct loading of trucks from the excavation may be inefficient. Under these circumstances, the excavated soil and debris will be transported via on-site haul roads or front-end loader to a secure soil stockpile area within the same temporary structure. Management of soil within the stockpile area is described in Section 3.4.

Based on the proximity of the soil excavation area to surrounding buildings and streets and the presence of a shallow water table, engineering controls including benching and/ or structural shoring and a dewatering system will be required. The structural shoring or barrier wall will be constructed inside the perimeter of the excavation area to provide excavation wall stability as well as reduce the amount of lateral groundwater infiltration into the excavations. Additionally, site-wide and/or localized dewatering systems will be installed to lower the water table across the excavation area to prevent groundwater infiltrations into the excavations. Details on the barrier wall and dewatering activities are provided in the following sections.

3.3.1 Soil Mix Wall Construction

A low permeability shoring system such as an auger cast soil mix wall will be constructed along and to the inside of the perimeter of the excavation area. The inner soil mix wall will primarily provide excavation wall support while the outer will primarily minimize the lateral flow of groundwater into the excavation.

Soil will be solidified using an auger mixing rig in an overlapping sequence so that a monolithic solidified mass is created within the horizontal limits of excavation. The outer soil mix wall will extend down to approximately

20 ft bgs while the inner soil mix wall will extend from 9 ft bgs to 12 ft bgs as presented in Figures C-05 and C-10 of the design package (Appendix A). Quality Control (QC) testing of the solidified material will be conducted to confirm that it meets the performance criteria detailed in the QAPP. Samples will be collected and tested for the performance criteria for every 500 cubic yards of material solidified, at a minimum. Solidified material that does not meet the performance criteria will be reprocessed until the performance criteria are met.

Geotechnical soil samples were collected from various locations on the perimeter of the excavation area during the PDI to characterize the soils for construction of a soil mix wall. Additionally, a bench-scale mixing study using site soils and various grout mixes has been conducted to aid in the design of the auger cast wall.

A groundwater flow model has been developed to evaluate the potential impact on the groundwater flow regime in response to the construction of the soil mix wall around the excavation area. Based on the modeling results, the soil mix wall is anticipated to have minimal effect on groundwater elevations in the vicinity of the site. Under reasonably anticipated conditions, an increase in groundwater elevation at the upgradient side of the wall is estimated at 0.073 feet (less than an inch), and the maximum increase in groundwater elevation over a wide range of hydraulic conductivity is 0.3 feet (less than 4 inches). Restoration plans for the site include removing the barrier wall to 2 ft bgs, which will further reduce mounding of groundwater upgradient of the wall.

3.4 Waste Management

3.4.1 On-Site Waste Management

Because of construction sequencing and off-site disposal facility scheduling issues, and in order to consolidate large amounts of waste material for bulk truck shipments, it will likely be necessary to store waste material on site prior to loading and shipment.

To the extent possible, wastes generated during excavation will be loaded directly into trucks for offsite transportation. Generally, however, excavated soil will be transported by loader or onsite haul truck from the excavation areas to the stockpile area within the temporary fabric structure. To the extent practicable stockpile areas will be located over areas to be excavated, negating the need for liners and berms. If stockpile areas are placed in unimpacted or restored areas, berms and liners will be used to protect underlying materials from becoming impacted.

On-site storage will take place in accordance with all laws and regulations dealing with the type of waste being stored. Liquid wastes will be stored in appropriate tanks or drums. Other (non-soil) solid materials will be stored in roll-off containers or covered stockpiles.

Debris generated during demolition and excavation will be broken down or cut into pieces suitable for disposal. For subsurface structures all debris greater than the acceptable to the thermal treatment facility will be segregated for disposal at the approved debris landfill. All debris of a size acceptable to the thermal treatment facility or smaller shall be excavated with the soil for transportation to the approved soil disposal facility.

Soils not meeting TCLP requirements will be shipped to a thermal treatment facility permitted to accept such soils under the New York State conditional exclusion for soils exhibiting the toxicity characteristic for benzene (D018). If the soils are shipped out of state, the handling and disposal of the soil will be in compliance with the regulations of the receiving state.

Soils that must be excavated wet, such as following a heavy storm event or if heavy infiltration of water in the excavation hole is observed, will be staged to remove excess moisture. Soils that are too wet for shipment (greater than approximately 20% moisture content) will be amended with a drying agent (fly ash or equivalent) or staged onsite to allow the moisture content to be reduced to < 20% through draining or evaporation.

3.4.2 Waste Characterization

All wastes at the site that have been impacted by MGP residues will be classified as non-hazardous industrial waste unless they are determined to exhibit the characteristics of ignitability, corrosivity, reactivity, or TCLP benzene, as determined by laboratory testing. If they do exhibit one or more of these characteristics, they will be classified as hazardous wastes.

The soils within the Sag Harbor former MGP Site were pre-characterized during the PDI. Pre-characterization will facilitate the profiling and pre-acceptance of the materials to the disposal facilities. Once the soils are pre-characterized and accepted they can be direct loaded from the excavation into transport trucks or stockpiled on the site so not to impede the progress of the excavation.

3.4.3 Off-Site Transportation

Excavated materials will be transported in dump trucks to the receiving facilities. Transportation of impacted materials from the site will be performed in accordance with all hazardous waste and transportation regulatory requirements and in accordance with the Transportation Plan.

All haul trucks will be permitted waste transporters in the State of New York and have poly bed liners and poly covers and, if there is the potential for liquids or tarry material leaking from the waste, they will have gasketed tailgates. Both hazardous and non-hazardous material trucks may be sprayed, as necessary, with odor suppressive foam prior to covering to reduce vapor and odor emissions. Trucks will be loaded in such a way as to avoid contamination of their exteriors, including tires. In the case when truck exteriors do become contaminated, they will be decontaminated prior to leaving the site. All trucks will be checked before leaving the site and all loose soil or other materials will be brushed off to prevent spreading to streets or other areas off-site.

Hazardous waste shipments will be documented using standard hazardous waste manifests as required by applicable hazardous waste regulations. Other waste materials that have no specific documentation requirements will be documented using waste tracking forms, bills of lading, and receipts. All shipments of waste from the site will be documented, describing the type and amount of waste and the receiving facility.

3.4.4 Off-Site Disposal or Treatment

Six facilities have been selected for the thermal desorption and disposal of impacted soil from the site. These include:

1. Environmental Soil Management Inc. of New York, located at 304 Tow Path Road, Fort Edward, NY 12828.

2. Environmental Soil Management of New Jersey, LLC, located at 75 Crows Mill Rd., Keasbey, NJ 08832.

3. Clean Earth of New Castle, Inc., Pyles Lane, New Castle, Delaware 19720.

4. Clean Earth of Philadelphia, 3201 South 61st Street, Philadelphia, PA 19153.

5. Clean Earth of Southeast Pennsylvania, 7 Steel Road East, Morrisville, PA 19067.

6. Mid-Atlantic Recycling Technologies, located at 3209 North Mill Road, Vineland, NJ 08360.

These treatment facilities are suitable for the disposal of non-hazardous industrial waste and contaminated debris that has been crushed to appropriate size.

Debris which cannot be reduced to the appropriate size will be transported to an approved and licensed landfill disposal facility. Additional disposal facilities may be required for the treatment or recycling of NAPL if sufficient quantities are encountered in the excavations.

3.5 Water Management

Significant volumes of construction water will be generated during the dewatering activities conducted to support excavation. Water containing MGP constituents will also be generated during decontamination of debris and equipment. Stormwater run-off from impacted areas will also be collected. The work, performed under an Order on Consent, will meet the substantive requirements of a State Pollutant Discharge Elimination System (SPDES) discharge permit.

The water generated as a result of the remedial action will be treated to meet the limits established by NYSDEC for discharge from the site. Following treatment, the water will be sampled and discharged in compliance with NYSDEC requirements. If no sampling requirements are detailed by NYSDEC, a minimum of one sampling event per week will be completed to document the effluent water. Disposal characterization samples will be submitted to a New York State certified laboratory for analysis required by NYSDEC.

The treated water will be discharged via surface, subsurface pipes and underwater pipelines to the Sag Harbor Bay (Bay). A hydraulic and biological study was completed to determine the impact of freshwater discharge into the Cove/Bay. The salinity and hydraulic modeling determined a discharge location in the outer harbor near the breakwater that will allow mixing with seawater and avoid affects to the salinity in the waters of the inner coves and harbor. The biological study determined that no sensitive species were present in the vicinity of the discharge location. The salinity modeling results are presented in Appendix I while the biological survey results are presented in Appendix J. All the requirements specified by NYSDEC will be followed and documented in the Remedial Action Completion Report along with a copy of the analytical testing completed pursuant to NYSDEC requirements.

All sediment, coal tar residue, or other solid materials/sludge generated by water management will either be collected in onsite drums and disposed of in accordance with applicable federal and state regulations or shipped with site soils to an approved thermal treatment facility. At no time shall the addition of these materials allow the site soils to be classified as hazardous waste or raise the moisture level to greater than 20%.

3.5.1 Excavation Dewatering

The entire excavation will be carried out in the saturated zone. During development of this RD/RA Work Plan, the alternatives of dry excavation via hydraulic containment or wet excavation were considered. Wet excavation poses serious health and safety issues like odors and vapors as well as implementability issues like slower excavation rates and greater effort required for soil handling, storage and transportation. Thus, dry excavation was selected as the excavation technique. To ensure a dry excavation, it was decided to control groundwater infiltration via a two-part approach of constructing a soil mix wall, which will prevent lateral flow into the site, as well as to install site-wide and localized dewatering systems, which will draw the water table down to below the excavation limits of 15-ft bgs.

Two pump tests were completed to aid in the design of the dewatering system. The first pumping test, completed in 2006, [PS&S, 2006] concluded a dewatering rate of approximately 700 gallon per minute (gpm) or 1 million gallons per day (gpd). A second small scale pumping test was completed during the PDI activities to determine specific design parameters for the dewatering system. Details of the dewatering system were already submitted to NYSDEC under a separate cover.

3.5.2 Water Treatment

A temporary water collection and treatment system will be constructed at the site to manage construction water generated during the soil removal activities. The treatment system will run continuously until the remediation project is complete. The treatment system will be designed to meet the limits stated by the NYSDEC. Based on the first pump test and preliminary data collected from the second pump test, it is anticipitated that approximately 1 million gpd of construction water will be managed in the system with a limit of 1.5 million gpd. The collection and treatment system for treating MGP impacted construction water is comprised of the following major subsystems:

- construction pit sump pump/vacuum pump dewatering pumps;
- influent surge tanks;
- de-emulsifiers;
- pH adjustment tank;
- coagulant drums;
- caustic drums;
- coalescer/ clarifier tank;
- sand filter tanks;
- granulated activated carbon tanks; and
- effluent surge tanks.

A conceptual treatment process has been presented in the design drawings (Appendix A). As mentioned earlier, treated water for this project will ultimately be discharged to the harbor.

3.6 Site Restoration

Following excavation activities, the excavation will be backfilled with fill that is clean as per NYSDEC 6 NYCRR Part 375 Subpart 6.7 (d), in 12-inch lifts and properly compacted, to restore the site as per the restoration plan detailed in drawing C-08 and C-11 (Appendix A). The backfill will be sampled at least once for each borrow source. All remnants of the remediation activities will be removed from the site after completion of remediation activities. Disturbed areas shall be re-graded to match the surrounding areas. The entire excavation area will be covered with gravel. The Bridge Street excavation area will be restored. The fence surrounding the site and within the excavation area will be restored to its original location prior to site work. Utilities relocated during site preparation activities will be re-routed through original locations as deemed necessary.

3.7 Environmental Monitoring and Controls

Environmental controls will ensure that the work activities do not spread impacted soil and MGP wastes outside the impacted areas and maintain the protection of human health and the environment throughout the remedial activity.

3.7.1 Odor, Vapor, and Dust Control

Odor, vapor, and dust control Plan has been prepared and describes the potential sources of fugitive emissions, the potential receptors and the three levels of controls that will be implemented at the site.

3.7.2 Air Monitoring

Site perimeter and work zone air monitoring will be performed per NYSDOH and Occupational Safety and Health Administration (OSHA) requirements, and according to the site-specific HASP and the CAMP. The contaminants of concern are VOCs and particulates.

Monitoring will be continuous during the excavation and handling of impacted soils. Monitoring will be periodic during non-intrusive activities such as mobilization and equipment decontamination.

Summaries of all air monitoring data will be provided to the appropriate parties' regulatory agencies on a weekly basis to facilitate the transfer of information related to potential health risks.

3.7.3 Erosion and Sediment Control

The remediation activities will disturb an area greater than one acre in size. Therefore, the work, being performed under an Order on Consent, will meet the substantive requirements of a SPDES Phase II Construction Storm Water Permit.

Erosion will be prevented and sediment will be controlled during all onsite earthwork activities in accordance with the applicable New York State guidance. Stormwater run-on will be controlled to prevent contact with impacted soils. Any stormwater that does contact impacted soils will be diverted to the temporary water treatment system. Hay bales, silt fence, and rip rap will be used as presented in drawing C-02 and C-09 of the design package to prevent erosion of exposed soils.

Onsite decontamination pads will be used to remove mud from truck tires and prevent tracking of mud and impacted soil onto the streets.

3.7.4 Decontamination

During and upon completion of the excavation phase of the project, decontamination of equipment will be performed in order to prevent contaminated material from being spread offsite during waste hauling activities and to prevent the spreading of impacted material to un-impacted areas of the site. Trucks used for transport of excavated material will be decontaminated using dry decontamination methods (*i.e.*, removal of loose material with a broom or brush) to limit the volume of decontamination water, which will require treatment and disposal. These methods, along with parking of trucks on plastic sheeting during loading, will effectively prevent the spread of contaminated materials onto roadways during transport to disposal facilities. Decontamination of the earth-moving equipment will occur at the completion of the excavation phase and prior to the handling of clean backfill or mobilization offsite. The method of equipment decontamination will consist of pressure washing to remove any impacted soil. Decontamination water generated during cleaning of tools and equipment will be discharged to the dewatering system treatment and disposal stream. Water generated from decontaminating personnel will be minimal due to the availability of disposable PPE such as tyvek coveralls, booties, and nitrile gloves. The volume of decontamination water is assumed to be negligible compared to flow rates for dewatering and stormwater removal in the disturbed areas of the site.

4.0 Permitting and Regulatory Requirements

4.1 Permitting

In addition to performance requirements established to ensure that the design of the remedial action meets the remedial action objectives set in the Feasibility Study (GEI ,2005), the design will also be prepared to meet permitting and other regulatory requirements of local, state, and federal laws and regulations. Comprehensive research is currently being conducted to identify every local, regional, state, and federal permit, approval, or notification required to implement the work. Table 3-1 presents a listing of potentially applicable federal, state, and local permit requirements. As specified in Appendix 7B of the Draft DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC, December 2002), NYSDEC may grant exemption from most state permits required for completion of this remedial action, provided the substantive requirements of the permit programs are followed. For federal and local permits that will be required, a plan will be developed to identify the application requirements, a summary of information required, and application forms. Government contacts will be identified for each permit and a potential schedule for meetings with regulators and application submittals will be developed.

4.2 Regulatory Requirements

Compliance with regulatory requirements applicable to this work was discussed in Section 2, including the following work activities:

- wastewater treatment and discharge requirements (described in Section 3.5);
- hazardous and non-hazardous waste management (described in Section 3.4); and
- air quality maintenance and monitoring (described in Section 3.7).

4.2.1 Occupational Safety and Health Regulations

Regulations promulgated by OSHA specify safety and health requirements for work procedures at all work places and specifically at construction sites and hazardous waste sites.

Industry standards for work at hazardous waste sites presented in 29 CFR 1910.120 describe specific requirements, including the following:

- preparation of a site-specific HASP;
- training and medical monitoring of personnel who may be exposed to hazardous substances; and
- air monitoring, respiratory protection, and PPE.

A site-specific HASP will be produced prior to any remedial activity. Procedures outlined in the site-specific HASP will provide requirements for daily health and safety review meetings, proper use of safety equipment, proper mechanical equipment use, and other policies. At a minimum, the PPE to be worn on site will include safety glasses, hard hat, and steel-toed shoes or boots. The subjects covered in the HASP will include:

- Health & Safety Risk Analysis;
- PPE;
- OSHA Air Monitoring & Action Levels;
- Site Control;
- Decontamination;
- Emergency Response Plan;
- Lockout/Tagout;

- Heavy Equipment Operations;
- Excavation and Trenching;
- Material Safety Data Sheets; and
- Health and Safety Records and Reports.

4.3 Transportation Requirements

The federal Department of Transportation (DOT) has developed requirements that regulate the transportation of hazardous materials by road and rail. Among the hazardous materials identified in these regulations are coal tar distillates. In addition, as discussed above, hazardous waste regulations specify that shipments of hazardous wastes must meet certain requirements presented in the DOT regulations. Specific requirements for hazardous material shipments include the following:

- Shipping papers must include a description of hazardous materials included in the shipment along with the DOT designated identification number and hazard class. Hazardous wastes may not be shipped without a manifest (49 CFR 172.200).
- Each container, package, or vehicle containing a hazardous material must be marked or labeled with the DOT shipping name, technical name, identification number, and hazard class (49 CFR 172.300 and .400).
- Each vehicle or container containing a hazardous material must be appropriately placarded (49 CFR 172.500).
- When hazardous materials are transported, emergency response information must be available at the point of loading, unloading, and during transport.
- Truck routes to and from the site will comply with the Transportation Plan (Appendix H).
- All trucks will have the required licenses and permits, including 6 NYCRR Part 364 Waste Transporter Permits.

5.0 Quality Assurance

Quality assurance procedures will be implemented during the work to ensure that work is completed in conformance with the RD, and to provide the basis for implementation of contingency actions, if necessary, to bring the work into conformance with the RD.

5.1 Quality Assurance Procedures

The following quality assurance procedures and tests will be implemented:

- Submittal of weigh tickets for all earthen materials transported to or from the site;
- Submittal, prior to the work, of sieve analyses for all imported earthen materials;
- Evaluation of the proposed borrow source(s) for imported earthen materials. Analytical data indicating that imported material is non-contaminated will also be submitted.
- Surveying of the work limits as necessary;
- Field verification of excavation and placed material depths, areas, and volumes;
- Field observations of excavation limits; and
- Performance testing of solidified soils within the structural support wall as described in Section 3.4.
- All wastewater influent and effluent will be testing according the requirements of the State Pollution Discharge Elimination System (SPDES) permit equivalent as approved by the NYSDEC.

6.0 Schedule

The remedial activities are planned to begin in September 2008 and be substantially completed by the end of May 2009. The schedule for submission of various documents as stated in the Order on Consent is detailed in Table 6-1.

7.0 References

Dvirka and Bartilucci, Consulting Engineers, 2003. *Final Remedial Investigation Report, Sag Harbor Former Manufactured Gas Plant Site*, December 2003.

GEI Consultants, Inc. (GEI), 2005. *Supplemental Field Program Report, Sag Harbor Former MGP Site*, February 2005.

GEI, 2005. *Feasibility Study, Sag Harbor Former Manufactured Gas Plant Site, Sag Harbor, Suffolk County, NY, September 2005.*

New York State Department of Environmental Conservation, (NYSDEC), 2002. *Draft DER-10, Technical Guidance for Site Investigation and Remediation*.

NYSDEC, 2005. *Order on Consent, Index No. D1-0002-98-11*, October 2005.

NYSDEC, 2006. *Record of Decision, Sag Harbor MGP Site, Suffolk County, New York,* March 2006.

Paulus, Sokolowski and Sartor Engineering, PC., 2006. *Pumping Test Results and Dewatering Volume Estimate.* June 14, 2006.

Tables

Table 2-1
Summary of PDI geotechnical and delineation soil borings
Sag Harbor Former MGP
Sag Harbor, New York

Boring ID	Start date	Completion date	Boring depth (ft bgs)
SB200	4/24/2007	4/24/2007	14.0
SB201	4/24/2007	4/24/2007	30.0
SB202	4/24/2007	4/24/2007	14.0
SB203	4/25/2007	4/25/2007	30.0
SB204	4/26/2007	4/26/2007	30.0
SB205	4/25/2007	4/25/2007	13.5
SB206	4/26/2007	4/27/2007	30.0
SB207	4/25/2007	4/25/2007	14.0
SB208	4/24/2007	4/24/2007	30.0
SB209	4/26/2007	4/26/2007	14.0
SB210	5/1/2007	5/1/2007	37.0
SB211	4/26/2007	4/26/2007	14.0
SB212	4/18/2007	4/18/2007	30.0
SB213	4/25/2007	4/25/2007	14.0
SB214	4/19/2007	4/19/2007	30.0
SB215	4/25/2007	4/25/2007	14.0
SB216	4/30/2007	4/30/2007	30.0
SB217	4/24/2007	4/24/2007	13.0
SB218	4/20/2007	4/20/2007	30.0
SB219	4/26/2007	4/26/2007	9.0
SB220	5/1/2007	5/1/2007	14.0
SB221	5/1/2007	5/1/2007	9.0
SB222	5/1/2007	5/1/2007	14.0
SB223	5/1/2007	5/1/2007	14.0
SB224	5/8/2007	5/8/2007	10.0
SB225	5/8/2007	5/8/2007	10.0
SB226	5/7/2008	5/7/2008	10.0
SB227	5/7/2007	5/7/2007	10.0
SB228	5/9/2007	5/9/2007	15.0
SB229	7/11/2007	7/11/2007	15.0
SB230	7/11/2007	7/11/2007	15.0
SB231	7/11/2007	7/11/2007	10.0
SB232	7/17/2007	7/17/2007	15.0
SB233	7/17/2007	7/17/2007	15.0
SB234	7/17/2007	7/17/2007	15.0
SB235	7/17/2007	7/17/2007	15.0
SB236	7/17/2007	7/17/2007	15.0
SB237	7/17/2007	7/17/2007	15.0

Notes:
bgs - below ground surface

Table 2-2
Visual Observations during PDI Activities
Sag Harbor Former MGP
Sag Harbor, New York

Soil boring ID	Total depth (ft bgs)	Saturated impacted soil	Unsaturated impacted soil	Unsaturated impacted soil intervals (ft bgs)	Highest PID reading (ppm)	Depth of highest PID reading (ft bgs)
SB200	14.0 (terminated)	7.50 - 8.00	TC	6.00 - 7.50	73.0	7.5-7.8
			SH	8.00 - 9.00, 12.7		
SB201	30.0 (terminated)	6.00 - 9.50*, 13.50 - 14.00, 15.40 - 15.60	TC	11.90 - 13.5*, 14.00 - 15.40*, 15.6 - 18.00*, 23.90 - 24.00	374	9.3
SB202	14.0 (terminated)	none	TC	4.00 - 6.00, 7.30 - 7.50, 7.80 - 8.10, 9.00 - 12.50	49.1	4.0-6.0
			SH	12.50 - 13.00		
SB203	30.0 (terminated)	3.00 - 4.00, 6.00 - 7.00, 8.00 - 9.50	TC	4.00 - 6.00, 7.00 - 8.00	240	4.8
SB204	30.0 (terminated)	none	none	none	6.5	16.0-17.25
SB205	13.5 (terminated)	5.90 - 6.60, 11.60 (2mm. thick)	B	13.00	38.1	10.3-10.5
SB206	30.0 (terminated)	none	none	none	131	13.3
SB207	14.0 (terminated)	6.50 - 7.20	TC	4.50 - 6.50	740	7.2-9.0
			B	7.20 - 9.00		
SB208	30.0 (terminated)	4.00 - 6.60*	TC	1.00 - 5.00*, 11.00*	875	5.5
SB209	14.0 (terminated)	none	TC	5.60 - 7.20	71.2	5.6-7.2
SB210	37.0 (terminated)	4.00 - 5.50*	none	none	318	8.8
SB211	14.0 (terminated)	2.00 - 4.50, 7.60 - 8.00	SH	12.30	201	9.0-12.0
			ST	5.70 - 6.40		
SB212	30.0 (terminated)	6.00 - 7.30*, 12.50 - 12.70*, 14.70 - 15.00	TC	5.00 - 6.00*, 7.30 - 7.90, 9.50 - 9.90* (trace), 10.80 - 12.00*, 14.00 - 14.70	65.1	11.5
SB213	14.0 (terminated)	2.50 - 4.00, 7.00 - 8.10	SH	4.00 - 7.00, 10.5 - 12.00	324	
SB214	30.0 (terminated)	6.00 - 7.60* (trace), 8.00 - 9.20, 15.80 - 15.84	TC	3.00 - 5.60, 18.90 - 19.60, 20.00 - 21.70*, 22.00 - 25.20* (trace)	39.1	6.5
			SH	16.00 - 18.00		
SB215	14.0 (terminated)	6.00 - 6.20	-	none	107	4.0-6.2
SB216	30.0 (terminated)	4.80 - 5.00*, 6.00 - 8.00*	TC	4.00 - 4.80*, 5.00 - 5.50, 8.00 - 8.20	274	4.0-5.0
SB217	13.0 (terminated)	none	TC	5.90 - 6.10	12.9	3.0-4.0
			SH	4.00		
			ST	3.00 - 4.00		
SB218	30.0 (terminated)	2.00 - 4.00*, 4.00 - 6.90**, 8.80 - 10.00**, 13.40 - 13.42**	TC	8.80 - 10.00, 19.60 - 19.70	176	5.5
			SH	10.00 - 11.00, 14.00 - 16.00		
			ST	21.30 - 21.40		
SB219	9.0 (terminated)	none	none	none	1.1	0.0-2.0
SB220	14.0 (terminated)	4.00 - 6.60*	none	none	121	3.0-4.5
SB221	9.0 (terminated)	6.00 - 6.20	TC	4.00 - 6.00*	124	4.0-6.2
SB222	14.0 (terminated)	none	TC	7.10 - 8.20	152	8.2-9.0
			SH	5.80 - 6.10		
SB223	14.0 (terminated)	none	none	none	104	13.0-14.0
SB224	10.0 (terminated)	none	none	none	4.6	0.0-1.0
SB225	10.0 (terminated)	5.80 - 6.00*, 6.10 - 6.30*,	TC	4.50 - 5.80*	174	5.0-6.0
			SH	6.00 - 6.10, 6.30 - 6.40		
SB226	10.0 (terminated)	4.20 - 4.35*	SH	4.10 - 4.20	125	4.3
			ST	3.00 - 3.70		
SB227	10.0 (terminated)	none	SH	3.00 - 4.00	34.6	6.0
SB228	15.0 (terminated)	4.70 - 4.80*	TC	3.90 - 4.70*	152	4.0-4.5
SB229	15.0 (terminated)	2.00-3.00*, 5.00-6.00'**	ST	1.00-2.00	70.3	5.0-6.0
SB230	15.0(terminated)	none	none	none	14.6	3.0-4.0
SB231	15.0(terminated)	none	none	none	0.6	2.0-3.0
SB232	15.0(terminated)	none	none	none	13	2.0-3.0
SB233	15.0(terminated)	none	B	4.0-7.5	13.5	2.0-3.0
SB234	15.0(terminated)	none	none	none	10.7	3.0-4.0
SB235	15.0(terminated)	none	none	none	3.2	4.0-5.0
SB236	15.0(terminated)	none	none	none	2.5	2.0-3.0, 3.0-4.0
SB237	15.0(terminated)	none	none	none	7.3	0.0-1.0

Notes:
bgs - below grade surface
* - with sheen
** - fuel oil saturation
B - blebs
SH - sheen
TC - tar coated
ST - staining

Table 2-3
Summary of Sampling Activities during PDI
Sag Harbor Former MGP
Sag Harbor, New York

Sample ID	Sample location	Boring depth (ft bgs)	Sample depth (ft bgs)	Rationale	Laboratory analysis			
					VOC	BNA	metals	cyanide
SB204(4-10)-042607	Northeast wall	30.0	4-10	Delineation of impacted soil at the northeast side of the site	X	X	X	X
SB204(16-18)-042607			16-18		X	X	X	X
SB206(2-8)-042707	Northeast wall	30.0	2-8	Delineation of impacted soil at the northeast side of the site	X	X	X	X
SB219(2-8)-042607	Northwest wall step-out	9.0	2-8	Delineation of impacted soil at the northwest side of the site	X	X	X	X
SB220(4-9)-050107	Southwest wall step-out	14.0	4-9	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB220(4-9)-050107MS			4-9		X	X	X	X
SB220(4-9)-050107MSD			4-9		X	X	X	X
SB221(5-8)-050107	Southwest wall step-out	9.0	5-8	Delineation of impacted soil at the south side of the site	X	X	X	X
SB222(5-9)-050107	Southeast wall step-out	14.0	5-9	Delineation of impacted soil at the east side of the site	X	X	X	X
SB223(4-8)-050107	Northeast wall step-out	14.0	4-8	Delineation of impacted soil at the northeast side of the site	X	X	X	X
SB224(8-10)-050807	Northwest wall step-out	10.0	8-10	Delineation of impacted soil at the west side of the site	X	X	X	X
SB225(4-5)-050807	Southwest wall step-out	10.0	4-5	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-230(7.5-10)	Southwest wall step-out	15.0	7.5-10	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-230(5-6)	Southwest wall step-out	15.0	5-6	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-231(5-6)	Southwest wall step-out	10.0	5-6	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-231(8-10)	Southwest wall step-out	10.0	8-10	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-232(5-6)	Southwest wall step-out	15.0	5-6	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-232(10-12)	Southwest wall step-out	15.0	10-12	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-234(5-6)	Southwest wall step-out	15.0	5-6	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-234(10-12)	Southwest wall step-out	15.0	10-12	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-235(6.5-7.5)	Southwest wall step-out	15.0	6.5-7.5	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-235(10-12)	Southwest wall step-out	15.0	10-12	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-236(6-7)	Southwest wall step-out	15.0	6-7	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-236(10-12)	Southwest wall step-out	15.0	10-12	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-237(2-3)	Southwest wall step-out	15.0	2-3	Delineation of impacted soil at the southwest side of the site	X	X	X	X
SB-237(7-8)	Southwest wall step-out	15.0	7-8	Delineation of impacted soil at the southwest side of the site	X	X	X	X
DUP01	Northwest wall step-out	9.0	2-8	Duplicate of SB219(2-8)-042607	X	X	X	X

Notes:
bgs - below ground surface

Table 2-3
Summary of Sampling Activites during PDI
Sag Harbor Former MGP
Sag Harbor, New York

Sample ID	Sample location	Boring depth (ft bgs)	Sample depth (ft bgs)	Rationale	Laboratory analysis		
					Particle size	Gravity drainage	Specific gravity
SB201(12-16)	Northwest wall	30.0	12-16	Cutoff wall and dewatering system design for the northwest excavation wall	X		
SB201(20-24)			20-24		X		
SB203(12-16)	Northwest wall	30.0	12-16	Cutoff wall and dewatering system design for the northwest excavation wall	X		
SB203(26-30)			26-30		X		
SB204(12-16)	Northeast wall	30.0	12-16	Cutoff wall and dewatering system design for the northeast excavation wall	X		
SB204(26-30)			26-30		X		
SB206(14-18)	Northeast wall	30.0	14-18	Cutoff wall and dewatering system design for the northeast excavation wall	X		
SB206(26-30)			26-30		X		
SB208(12-16)	Northeast wall	30.0	12-16	Cutoff wall and dewatering system design for the northeast excavation wall	X		
SB208(26-30)			26-30		X		
SB210(14-18)	Southeast wall	37.0	14-18	Cutoff wall and dewatering system design for the southeast excavation wall	X		
SB210(33-37)			33-37		X		
SB212(14-18)	Southeast wall	30.0	14-18	Cutoff wall and dewatering system design for the southeast excavation wall	X		
SB212(22-26)			22-26		X		
SB214(16-20)	Southeast wall	30.0	16-20	Cutoff wall and dewatering system design for the southeast excavation wall	X		
SB214(26-30)			26-30		X		
SB216(12-16)	Southwest wall	30.0	12-16	Cutoff wall and dewatering system design for the southwest excavation wall	X		
SB216(20-24)			20-24		X		
SB218(16-20)	Southwest wall	30.0	16-20	Cutoff wall and dewatering system design for the southwest excavation wall	X		
SB218(23.2-24)			23.2-24		X		
SH-1	Excavation boundary composite	n/a	0-?	Cutoff wall and dewatering system design for the southwest excavation wall		X	X
SH-2	Excavation boundary composite	n/a	0-?	Cutoff wall and dewatering system design for the southwest excavation wall		X	X

Notes:
bgs - below ground surface

Table 2-4
PDI Soil Sampling Analytical Results
Sag Harbor Former MGP
Sag Harbor, New York

Location ID	A4	A5	A6	A7	A8	B4	B5	B6	B7	B8	C4	C5	C6	C7	C8	D4	D5	D6	D7	D8	E4	E5	E6	E7
Sample ID	A4-050707	A5-050707	A6-050807	A7-050807	A8-042607	B4-050707	B5-050707	B6-050707	B7-050707	B8-042607	C4-050707	C5-050707	C6-050707	C7-050207	C8-050207	D4-050307	D5-050307	D6-050307	D7-050207	D8-050207	E4-050307	E5-050307	E6-050307	E7-05020
Sample date	5/7/2007	5/7/2007	5/8/2007	5/8/2007	4/26/2007	5/7/2007	5/7/2007	5/7/2007	5/7/2007	4/26/2007	5/7/2007	5/7/2007	5/7/2007	5/2/2007	5/2/2007	5/3/2007	5/3/2007	5/3/2007	5/2/2007	5/2/2007	5/3/2007	5/3/2007	5/3/2007	5/2/2007
SW8260 (ug/Kg)																								
1,1,1-Trichloroethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,1,2,2-Tetrachloroethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,1,2-Trichloro-1,2,2-trifluoroethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,1,2-Trichloroethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,1-Dichloroethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,1-Dichloroethene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,2,4-Trichlorobenzene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,2-Dibromo-3-chloropropane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,2-Dibromoethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,2-Dichlorobenzene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,2-Dichloroethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,2-Dichloropropane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,3-Dichlorobenzene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
1,4-Dichlorobenzene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
2-Butanone	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
2-Hexanone	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
4-Methyl-2-pentanone	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Acetone	< 1600 U	< 3800 U	< 1300 U	< 1300 U	< 1400 U	< 1200 U	< 1300 U	< 1300 U	< 1300 U	< 60 U	< 1400 U	< 1200 U	< 1700 U	**430 J**	**430 J**	**480 J**	**440 J**	**560 J**	**470 J**	**780 J**	< 13000 U	**570 J**	**360 J**	**480**
Benzene	< 400 U	< 950 U	< 320 U	**200 J**	**180 J**	< 310 U	< 310 U	< 330 U	**170 J**	**8.8 J**	**2300**	**150 J**	**310 J**	**210 J**	**170 J**	**1100**	**3300**	**720**	**96 J**	**620**	**2900 J**	**3700**	**1300**	**650**
Bromodichloromethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Bromoform	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Bromomethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Carbon disulfide	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Carbon tetrachloride	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Chlorobenzene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Chloroethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Chloroform	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Chloromethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
cis-1,2-Dichloroethene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
cis-1,3-Dichloropropene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Cyclohexane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Dibromochloromethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Dichlorodifluoromethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Ethylbenzene	**550**	**1900**	**370**	**1300**	**2000**	**960**	**770**	**690**	**3000**	**310**	**7300**	**2500**	**4400**	**1500**	**1500**	**4800**	**1200**	**1200**	**710**	**2300**	**40000**	**2800**	**4000**	**4600**
Isopropylbenzene	**86 J**	**240 J**	< 320 U	**120 J**	**240 J**	**140 J**	**150 J**	**81 J**	**400**	**53**	**470**	**360**	**460**	**190 J**	**170 J**	**520**	**130 J**	**190 J**	**150 J**	**410**	**6300**	**340 J**	**420**	**460**
Methyl acetate	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Methyl tert-butyl ether	< 400 U	< 950 U	**150 J**	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Methylcyclohexane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Methylene chloride	< 400 U	**160 J**	< 320 U	**53 J**	**110 J**	**58 J**	< 310 U	< 330 U	**71 J**	**5.6 JB**	**72 J**	**62 J**	**92 J**	**190 J**	**180 J**	**130 J**	**140 J**	**150 J**	**150 J**	**330 J**	**1000 J**	**150 J**	**110 J**	**180**
Styrene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Tetrachloroethene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Toluene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	**71 J**	**4.8 J**	**3500**	**97 J**	**120 J**	< 370 U	< 320 U	**210 J**	< 390 U	< 490 U	< 320 U	**79 J**	**1500 J**	**180 J**	**67 J**	**120**
trans-1,2-Dichloroethene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
trans-1,3-Dichloropropene	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Trichloroethene	< 400 U	< 950 U	< 320 U	< 310 U	**440**	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Trichlorofluoromethane	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Vinyl chloride	< 400 U	< 950 U	< 320 U	< 310 U	< 350 U	< 310 U	< 310 U	< 330 U	< 330 U	< 15 U	< 350 U	< 310 U	< 420 U	< 370 U	< 320 U	< 350 U	< 390 U	< 490 U	< 320 U	< 350 U	< 3200 U	< 370 U	< 350 U	< 400
Xylenes (total)	**630 J**	**2100 J**	**380 J**	**1300**	**2700**	**960**	**880 J**	**850 J**	**3400**	**350**	**7100**	**3500**	**5200**	**1600**	**1700**	**5400**	**1600**	**1400 J**	**1000**	**2400**	**64000**	**4000**	**4400**	**5000**
SW8260B-TCLP (mg/L)																								
1,1-Dichloroethene	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
1,2-Dichloroethane	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
2-Butanone	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
Benzene	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	**0.046 J**	< 0.2 U	< 0.2 U	**0.0092 J**	< 0.05 U	< 0.05 U	**0.013 J**	< 0.05 U	**0.013 J**	**0.0092 J**	**0.019 J**	**0.02 J**	**0.031 J**	**0.022**
Carbon tetrachloride	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
Chlorobenzene	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
Chloroform	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
Tetrachloroethene	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
Trichloroethene	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	**0.0091 J**	< 0.05 U	< 0.05
Vinyl chloride	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
SW8270 (ug/Kg)																								
1,1'-Biphenyl	**3900 J**	**6000 J**	< 4200 U	**4000 J**	**5900**	**6300 J**	**5600 J**	**3500 J**	**14000**	**3800 J**	**27000**	**8600**	**13000**	**15000 J**	**14000 J**	**24000 J**	**7000 J**	**9600 J**	**9700 J**	**13000 J**	**22000 J**	**6900 J**	< 70000 U	**22000**
2,2'-oxybis(1-Chloropropane)	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
2,4,5-Trichlorophenol	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
2,4,6-Trichlorophenol	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
2,4-Dichlorophenol	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
2,4-Dimethylphenol	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	**170 J**	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
2,4-Dinitrophenol	< 25000 U	< 61000 U	< 20000 U	< 20000 U	< 22000 U	< 39000 U	< 40000 U	< 42000 U	< 42000 U	< 19000 U	< 45000 U	< 39000 U	< 54000 U	< 120000 U	< 100000 U	< 330000 U	< 100000 U	< 160000 U	< 100000 U	< 110000 U	< 310000 U	< 120000 U	< 340000 U	< 130000
2,4-Dinitrotoluene	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
2,6-Dinitrotoluene	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
2-Chloronaphthalene	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
2-Chlorophenol	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
2-Methylnaphthalene	**22000**	**43000**	**5200**	**23000**	**39000**	**42000**	**39000**	**22000**	**130000**	**32000**	**270000**	**61000**	**110000**	**97000**	**110000**	**190000**	**51000**	**65000**	**59000**	**79000**	**180000**	**55000**	**90000**	**140000**
2-Methylphenol	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
2-Nitroaniline	< 25000 U	< 61000 U	< 20000 U	< 20000 U	< 22000 U	< 39000 U	< 40000 U	< 42000 U	< 42000 U	< 19000 U	< 45000 U	< 39000 U	< 54000 U	< 120000 U	< 100000 U	< 330000 U	< 100000 U	< 160000 U	< 100000 U	< 110000 U	< 310000 U	< 120000 U	< 340000 U	< 130000
2-Nitrophenol	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
3,3'-Dichlorobenzidine	< 25000 U	< 61000 U	< 20000 U	< 20000 U	< 22000 U	< 39000 U	< 40000 U	< 42000 U	< 42000 U	< 19000 U	< 45000 U	< 39000 U	< 54000 U	< 120000 U	< 100000 U	< 330000 U	< 100000 U	< 160000 U	< 100000 U	< 110000 U	< 310000 U	< 120000 U	< 340000 U	< 130000
3-Nitroaniline	< 25000 U	< 61000 U	< 20000 U	< 20000 U	< 22000 U	< 39000 U	< 40000 U	< 42000 U	< 42000 U	< 19000 U	< 45000 U	< 39000 U	< 54000 U	< 120000 U	< 100000 U	< 330000 U	< 100000 U	< 160000 U	< 100000 U	< 110000 U	< 310000 U	< 120000 U	< 340000 U	< 130000
4,6-Dinitro-2-methylphenol	< 25000 U	< 61000 U	< 20000 U	< 20000 U	< 22000 U	< 39000 U	< 40000 U	< 42000 U	< 42000 U	< 19000 U	< 45000 U	< 39000 U	< 54000 U	< 120000 U	< 100000 U	< 330000 U	< 100000 U	< 160000 U	< 100000 U	< 110000 U	< 310000 U	< 120000 U	< 340000 U	< 130000
4-Bromophenyl phenyl ether	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
4-Chloro-3-methylphenol	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000

Table 2-4
PDI Soil Sampling Analytical Results
Sag Harbor Former MGP
Sag Harbor, New York

Location ID Sample ID Sample date	A4 A4-050707 5/7/2007	A5 A5-050707 5/7/2007	A6 A6-050807 5/8/2007	A7 A7-050807 5/8/2007	A8 A8-042607 4/26/2007	B4 B4-050707 5/7/2007	B5 B5-050707 5/7/2007	B6 B6-050707 5/7/2007	B7 B7-050707 5/7/2007	B8 B8-042607 4/26/2007	C4 C4-050707 5/7/2007	C5 C5-050707 5/7/2007	C6 C6-050707 5/7/2007	C7 C7-050207 5/2/2007	C8 C8-050207 5/2/2007	D4 D4-050307 5/3/2007	D5 D5-050307 5/3/2007	D6 D6-050307 5/3/2007	D7 D7-050207 5/2/2007	D8 D8-050207 5/2/2007	E4 E4-050307 5/3/2007	E5 E5-050307 5/3/2007	E6 E6-050307 5/3/2007	E7 E7-05020 5/2/2007
4-Chloroaniline	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
4-Chlorophenyl phenyl ether	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
4-Methylphenol	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
4-Nitroaniline	< 25000 U	< 61000 U	< 20000 U	< 20000 U	< 22000 U	< 39000 U	< 40000 U	< 42000 U	< 42000 U	< 19000 U	**13000 J**	< 39000 U	< 54000 U	< 120000 U	< 100000 U	< 330000 U	< 100000 U	< 160000 U	< 100000 U	< 110000 U	< 310000 U	< 120000 U	< 340000 U	< 130000
4-Nitrophenol	< 25000 U	< 61000 U	< 20000 U	< 20000 U	< 22000 U	< 39000 U	< 40000 U	< 42000 U	< 42000 U	< 19000 U	< 45000 U	< 39000 U	< 54000 U	< 120000 U	< 100000 U	< 330000 U	< 100000 U	< 160000 U	< 100000 U	< 110000 U	< 310000 U	< 120000 U	< 340000 U	< 130000
Acenaphthene	**34000**	**53000**	**11000**	**44000**	**51000**	**60000**	**52000**	**39000**	**190000**	**30000**	**470000**	**94000**	**150000**	**100000**	**110000**	**220000**	**64000**	**97000**	**70000**	**83000**	**160000**	**76000**	**99000**	**140000**
Acenaphthylene	**8000**	**13000**	**6000**	**12000**	**6800**	**9800**	**15000**	**16000**	**20000**	**5200**	**64000**	**18000**	**37000**	**14000 J**	**18000 J**	**41000 J**	**14000 J**	**11000 J**	**11000 J**	**14000 J**	**23000 J**	**15000 J**	**8300 J**	**16000**
Acetophenone	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Anthracene	**21000**	**32000**	**8200**	**28000**	**31000**	**33000**	**34000**	**31000**	**97000**	**19000**	**420000**	**56000**	**110000**	**53000**	**63000**	**150000**	**45000**	**61000**	**45000**	**41000**	**77000**	**50000**	**46000 J**	**74000**
Atrazine	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Benzaldehyde	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Benzo(a)anthracene	**16000**	**30000**	**9900**	**21000**	**21000**	**22000**	**26000**	**31000**	**47000**	**16000**	**170000 J**	**36000**	**82000**	**39000**	**49000**	**85000**	**27000**	**40000**	**36000**	**39000**	**54000 J**	**35000**	**34000 J**	**53000**
Benzo(a)pyrene	**11000**	**27000**	**8300**	**32000**	**18000**	**13000**	**25000**	**27000**	**45000**	**15000**	**150000 J**	**33000**	**71000 J**	**35000**	**40000**	**66000 J**	**21000**	**24000 J**	**33000**	**38000**	**37000 J**	**26000**	**22000 J**	**40000**
Benzo(b)fluoranthene	**7500**	**16000**	**5800**	**16000**	**12000**	**9200**	**17000**	**19000**	**25000**	**11000**	**110000 J**	**20000**	**57000**	**28000**	**34000**	**46000 J**	**15000 J**	**16000 J**	**27000**	**33000**	**22000 J**	**17000 J**	**16000 J**	**30000**
Benzo(ghi)perylene	**6500**	**20000**	**5500**	**12000**	**13000**	**7000 J**	**15000**	**15000**	**21000**	**11000**	**120000 J**	**18000**	**52000**	**15000 J**	**18000 J**	< 69000 U	**18000 J**	**14000 J**	**15000 J**	**17000 J**	**26000 J**	**20000 J**	**13000 J**	**13000**
Benzo(k)fluoranthene	**2500 J**	**5800 J**	**2300 J**	**5100**	**4600**	**3600 J**	**5700 J**	**6700 J**	**9700**	**3700 J**	**48000**	**7800 J**	**19000**	**11000 J**	**12000 J**	**17000 J**	**6100 J**	**6800 J**	**10000 J**	**10000 J**	**11000 J**	**7200 J**	**4700 J**	**12000**
bis(2-Chloroethoxy)methane	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
bis(2-Chloroethyl) ether	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
bis(2-Ethylhexyl) phthalate	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Butyl benzyl phthalate	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Caprolactam	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Carbazole	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	**260 J**	< 4000 U	**6900 J**	< 8100 U	< 11000 U	< 25000 U	**1100 J**	< 69000 U	< 21000 U	< 32000 U	< 21000 U	**530 J**	< 63000 U	< 25000 U	< 70000 U	< 26000
Chrysene	**13000**	**28000**	**8700**	**18000**	**17000**	**19000**	**24000**	**29000**	**41000**	**15000**	**190000**	**31000**	**73000**	**38000**	**49000**	**77000**	**26000**	**34000**	**37000**	**37000**	**46000 J**	**31000**	**29000 J**	**47000**
Dibenz(a,h)anthracene	**1300 J**	**4300 J**	**1200 J**	**2600 J**	**2100 J**	**1400 J**	**3100 J**	**3000 J**	**4000 J**	**1700 J**	**23000**	**3100 J**	**9000 J**	**3300 J**	**4000 J**	< 69000 U	< 21000 U	< 32000 U	**3400 J**	**3800 J**	**6900 J**	< 25000 U	< 70000 U	**3400**
Dibenzofuran	**930 J**	**1400 J**	**340 J**	**990 J**	**1500 J**	**1600 J**	**1500 J**	**1300 J**	**3000 J**	**1000 J**	**20000**	**2500 J**	**3300 J**	**4200 J**	**4700 J**	< 69000 U	< 21000 U	< 32000 U	**2600 J**	**3400 J**	< 63000 U	< 25000 U	< 70000 U	**5100**
Diethyl phthalate	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Dimethyl phthalate	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Di-n-butyl phthalate	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Di-n-octyl phthalate	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Fluoranthene	**38000**	**47000**	**19000**	**40000 J**	**47000**	**48000**	**51000**	**67000**	**110000**	**31000**	**440000**	**59000 J**	**160000**	**75000**	**92000**	**170000**	**56000**	**78000**	**68000**	**68000**	**110000**	**71000**	**59000 J**	**100000**
Fluorene	**15000**	**22000**	**5600**	**16000**	**19000**	**24000**	**23000**	**21000**	**52000**	**10000**	**190000**	**40000**	**64000**	**46000**	**56000**	**100000**	**26000**	**39000**	**36000**	**38000**	**63000**	**34000**	**36000 J**	**71000**
Hexachlorobenzene	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Hexachlorobutadiene	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Hexachlorocyclopentadiene	< 25000 U	< 61000 U	< 20000 U	< 20000 U	< 22000 U	< 39000 U	< 40000 U	< 42000 U	< 42000 U	< 19000 U	< 45000 U	< 39000 U	< 54000 U	< 120000 U	< 100000 U	< 330000 U	< 100000 U	< 160000 U	< 100000 U	< 110000 U	< 310000 U	< 120000 U	< 340000 U	< 130000
Hexachloroethane	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Indeno(1,2,3-cd)pyrene	**5300**	**15000**	**4400**	**11000**	**8800**	**5700 J**	**13000**	**13000**	**17000**	**7500**	**93000 J**	**14000**	**39000**	**12000 J**	**14000 J**	**31000 J**	**12000 J**	**10000 J**	**12000 J**	**13000 J**	**17000 J**	**13000 J**	**9400 J**	**10000**
Isophorone	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Naphthalene	**38000**	**60000**	**10000**	**50000**	**91000**	**91000**	**53000**	**28000**	**300000**	**79000**	**980000**	**150000**	**300000**	**170000**	**210000**	**390000**	**62000**	**77000**	**86000**	**140000**	**370000**	**85000**	**220000**	**380000**
Nitrobenzene	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
N-Nitrosodi-n-propylamine	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
N-Nitrosodiphenylamine	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Pentachlorophenol	< 25000 U	< 61000 U	< 20000 U	< 20000 U	< 22000 U	< 39000 U	< 40000 U	< 42000 U	< 42000 U	< 19000 U	< 45000 U	< 39000 U	< 54000 U	< 120000 U	< 100000 U	< 330000 U	< 100000 U	< 160000 U	< 100000 U	< 110000 U	< 310000 U	< 120000 U	< 340000 U	< 130000
Phenanthrene	**95000**	**140000**	**28000**	**96000**	**110000**	**120000**	**89000**	**130000**	**370000**	**62000**	**1100000**	**200000**	**340000**	**150000**	**160000**	**440000**	**130000**	**200000**	**120000**	**130000**	**310000**	**170000**	**160000**	**190000**
Phenol	< 5200 U	< 13000 U	< 4200 U	< 4100 U	< 4600 U	< 8100 U	< 8300 U	< 8600 U	< 8700 U	< 4000 U	< 9300 U	< 8100 U	< 11000 U	< 25000 U	< 21000 U	< 69000 U	< 21000 U	< 32000 U	< 21000 U	< 23000 U	< 63000 U	< 25000 U	< 70000 U	< 26000
Pyrene	**66000**	**140000**	**46000**	**84000**	**53000**	**67000**	**71000**	**130000**	**240000**	**44000**	**670000**	**120000**	**380000**	**110000**	**130000**	**240000**	**74000**	**99000**	**96000**	**99000**	**150000**	**94000**	**92000**	**150000**
SW8270C-TCLP (mg/L)																								
1,4-Dichlorobenzene	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
2,4,5-Trichlorophenol	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
2,4,6-Trichlorophenol	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
2,4-Dinitrotoluene	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
2-Methylphenol	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
3-Methylphenol & 4-Methylphenol-TCLP	< 0.05 U	< 0.05 U		< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U		< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
Cresols (total)-TCLP	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
Hexachlorobenzene	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
Hexachlorobutadiene	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
Hexachloroethane	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
Nitrobenzene	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05
Pentachlorophenol	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25
Pyridine-TCLP	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1
Total Metals (mg/Kg)																								
Antimony	< 1.6 U	**5.2 J**	< 1.3 U	< 1.3 U	**0.17 B**	< 1.2 U	< 1.3 U	**0.2 BJ**	< 1.3 U	**0.11 B**	< 1.4 U	< 1.2 U	< 1.7 U	< 1.5 U	< 1.3 U	**0.28 BJ**	**0.18 BJ**	**0.41 BJ**	< 1.3 U	< 1.4 U	**0.14 BJ**	**0.48 BJ**	**0.41 BJ**	< 1.6
Arsenic	**1.8**	**7**	**2.2**	**1 B**	**0.66 B**	**1.1 B**	**2**	**2.5**	**2.7**	**0.86 B**	**2.1**	**1.9**	**2.2**	**0.98 B**	**1.6**	**2.9**	**1.7**	**1.3 B**	**1.2 B**	**1.1 B**	**4.8**	**2.5**	**0.79 B**	**1.2**
Barium	**35.7**	**25.1 B**	**11.5 B**	**10.3 B**	**7.3 B**	**11 B**	**9.9 B**	**54.3**	**69.3**	**7.3 B**	**35.8**	**15.1 B**	**12.3 B**	**14.2 B**	**21.6 B**	**38.6**	**18.6 B**	**70.9**	**16 B**	**18.1 B**	**13.1 B**	**5.2 B**	**5.4 B**	**11.4**
Beryllium	**0.25 B**	**0.42 B**	**0.11 BJ**	**0.14 BJ**	**0.079 B**	**0.16 B**	**0.2 B**	**0.14 B**	**0.25 B**	**0.08 B**	**0.2 B**	**0.15 B**	**0.23 B**	**0.22 B**	**0.21 B**	**0.26 B**	**0.17 B**	**0.17 B**	**0.2 B**	**0.21 B**	**0.078 B**	**0.093 B**	**0.1 B**	**0.25**
Cadmium	< 0.8 U	**0.34 B**	< 0.64 U	< 0.63 U	**0.097 B**	< 0.62 U	< 0.63 U	**0.49 B**	**0.2 B**	< 0.6 U	< 0.7 U	< 0.61 U	< 0.84 U	< 0.75 U	< 0.63 U	**0.15 B**	< 0.79 U	**0.098 B**	< 0.65 U	< 0.69 U	< 0.64 U	< 0.75 U	< 0.71 U	< 0.8
Chromium	**7.6**	**7.9**	**2.8**	**2.8**	**1.9**	**2.6**	**2.8**	**5.3**	**9.6**	**1.8**	**3.3**	**3.4**	**4**	**3.1**	**3.4**	**4.1**	**3.3**	**13.1**	**4.3**	**3.7**	**2.5**	**2.2**	**2.5**	**3.5**
CR, Hexavalent			< 0.51 U			< 0.49 U			< 0.52 U		< 0.55 U					< 0.54 U			< 0.52 U	< 0.57 U			< 0.56 U	
Copper	**13.7**	**36.2**	**8.8**	**6.2**	**4.9**	**14.5**	**8**	**11.1**	**15.8**	**2.9 B**	**11.9**	**11.8**	**9.5**	**16.3**	**6.7**	**34.9**	**12.8**	**7.2**	**5.5**	**6**	**13.2**	**6.4**	**3 B**	**5.3**
Lead	**73.5 J**	**354 J**	**48.8**	**36.8**	**67.8**	**42.3 J**	**59.3 J**	**260 J**	**565 J**	**21.6**	**78.7 J**	**72.2 J**	**80.8 J**	**44.1 J**	**104 J**	**73.4**	**58.3**	**246**	**50.1 J**	**107 J**	**73.4**	**20.4**	**6.8**	**16.4**
Mercury	**0.051 B**	**0.65**	**0.059**	**0.054**	**0.028 B**	**0.078**	**0.065**	**0.09**	**0.049**	**0.014 B**	**0.15**	**0.054**	**0.085**	**0.053**	**0.025 B**	**0.08**	**0.075**	**0.26**	**0.088**	**0.52**	**0.06**	**0.029 B**	**0.018 B**	**0.027**
Nickel	**3.2 B**	**6.6 B**	**1.7 B**	**1.5 B**	**1.3 B**	**3.4 B**	**2.4 B**	**3.7 B**	**5.9**	**1.2 B**	**3 B**	**2.4 B**	**3.5 B**	**1.6 B**	**2.8 B**	**15.3**	**2.5 B**	**2.7 B**	**2.4 B**	**2.2 B**	**1.9 B**	**1.9 B**	**1.5 B**	**2.3**
Selenium	< 0.8 U	**1.5 B**	**0.47 B**	**0.66**	< 0.69 U	< 0.62 U	**0.48 B**	< 0.65 U	**1.2**	< 0.6 U	< 0.7 U	**0.53 B**	**0.65 B**	< 0.75 U	< 0.63 U	**0.71**	< 0.79 U	< 0.98 U	< 0.65 U	< 0.69 U	**0.4 B**	**0.47 B**	**0.47 B**	< 0.8
Silver	**0.083 B**	**0.19 B**	< 0.64 U	< 0.63 U	**0.053 B**	**0.063 B**	< 0.63 U	**0.093 B**	**0.21 B**	**0.059 B**	< 0.7 U	**0.072 B**	< 0.84 U	< 0.75 U	< 0.63 U	**0.06 B**	< 0.79 U	< 0.98 U	< 0.65 U	**0.053 B**	**0.062 B**	< 0.75 U	< 0.71 U	< 0.8
Thallium	< 1.6 U	< 3.8 U	< 1.3 U	< 1.3 U	**0.57 B**	< 1.2 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.2 U	< 1.4 U	< 1.2 U	< 1.7 U	< 1.5 U	< 1.3 U	< 1.4 U	< 1.6 U	< 2 U	< 1.3 U	< 1.4 U	< 1.3 U	< 1.5 U	< 1.4 U	< 1.6
Vanadium	**6.1 B**	**13.9 B**	**3.8 B**	**4.4 B**	**2 B**	**3.9 B**	**4.4 B**	**4.1 B**	**7.9**	**2.6 B**	**5.1 B**	**4 B**	**6 B**	**4.4 B**	**5 B**	**8.9**	**4.7 B**	**6.4 B**	**5.1 B**	**4.9 B**	**3.7 B**	**3.2 B**	**4.2 B**	**6.5**
Zinc	**19.6 J**	**164 J**	**29.3 J**	**22.4 J**	**27.4 J**	**15.6 J**	**30.4 J**	**114 J**	**176 J**	**9.5 J**	**34.1 J**	**24.4 J**	**28.9 J**	**15.3**	**36.2**	**87.3**	**30**	**53.7**	**19.8**	**29.2**	**13.3**	**9.2**	**4.5**	**10.3**

Table 2-4
PDI Soil Sampling Analytical Results
Sag Harbor Former MGP
Sag Harbor, New York

Location ID	A4	A5	A6	A7	A8	B4	B5	B6	B7	B8	C4
Sample ID	A4-050707	A5-050707	A6-050807	A7-050807	A8-042607	B4-050707	B5-050707	B6-050707	B7-050707	B8-042607	C4-050707
Sample date	5/7/2007	5/7/2007	5/8/2007	5/8/2007	4/26/2007	5/7/2007	5/7/2007	5/7/2007	5/7/2007	4/26/2007	5/7/2007
Metals TCLP (mg/L)											
Arsenic	0.2 B	0.19 B	0.17 B	0.16 B	0.19 B	0.16 B	0.17 B	0.18 B	0.19 B	0.25 B	0.15 B
Barium	0.1 B	0.16 B	0.21 B	0.085 B	0.078 B	0.12 B	0.074 B	0.049 B	0.16 B	0.042 B	0.45 B
Cadmium	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U
Chromium	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	0.0014 B	0.0015 B	< 0.5 U	< 0.5 U	< 0.5 U
Copper	0.0016 B	0.0068 B	< 0.025 U	< 0.025 U	< 0.025 U	0.0015 B	< 0.025 U	< 0.025 U	< 0.025 U	< 0.025 U	< 0.025 U
Lead	0.1 B	2.1	0.23 B	0.49 B	0.059 B	0.11 B	0.11 B	0.023 B	0.097 B	0.017 B	0.064 B
Mercury	< 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	< 0.0002 U	< 0.0002 U
Nickel	< 0.04 U	0.0091 B	0.0059 B	0.0057 B	0.0036 B	0.0097 B	0.0044 B	< 0.04 U	< 0.04 U	< 0.04 U	0.018 B
Selenium	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U
Silver	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Zinc	0.098 J	1.5 J	0.29 J	0.13 J	0.16 J	0.12 J	0.2 J	0.1 J	0.12 J	0.05 J	0.33 J
SW8081A-TCLP (mg/L)											
Chlordane (technical)-TCLP	< 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	< 0.005 U	< 0.005 U
Endrin-TCLP	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Heptachlor epoxide-TCLP	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Heptachlor-TCLP	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Lindane-TCLP	0.00026 J	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	0.00022 J
Methoxychlor-TCLP	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U
Toxaphene-TCLP	< 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	< 0.02 U	< 0.02 U
SW8082 (ug/Kg)											
Aroclor 1016	< 27 U	< 64 U	< 21 U	< 21 U	< 23 U	< 21 U	< 21 U	< 22 U	< 22 U	< 20 U	< 23 U
Aroclor 1221	< 27 U	< 64 U	< 21 U	< 21 U	< 23 U	< 21 U	< 21 U	< 22 U	< 22 U	< 20 U	< 23 U
Aroclor 1232	< 27 U	< 64 U	< 21 U	< 21 U	< 23 U	< 21 U	< 21 U	< 22 U	< 22 U	< 20 U	< 23 U
Aroclor 1242	< 27 U	< 64 U	< 21 U	< 21 U	< 23 U	< 21 U	< 21 U	< 22 U	< 22 U	< 20 U	< 23 U
Aroclor 1248	< 27 U	< 64 U	< 21 U	< 21 U	< 23 U	< 21 U	< 21 U	< 22 U	< 22 U	< 20 U	< 23 U
Aroclor 1254	< 27 U	< 64 U	< 21 U	< 21 U	< 23 U	< 21 U	< 21 U	< 22 U	< 22 U	< 20 U	< 23 U
Aroclor 1260	< 27 U	< 64 U	< 21 U	< 21 U	< 23 U	< 21 U	< 21 U	< 22 U	< 22 U	< 20 U	< 23 U
SW8151A-TCLP (mg/L)											
2,4,5-TP (Silvex)-TCLP	< 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	< 0.01 U	< 0.01 U
2,4-D-TCLP	< 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	< 0.04 U	< 0.04 U
SW846 (mg/Kg)											
Reactive Cyanide	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U
Reactive Sulfide	< 500 U	77.8 BJ	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U
Cyanide, Total (mg/Kg)											
Cyanide, Total	0.15 B	0.36 B	< 0.64 U	8 J	0.41 B	0.12 B	< 0.63 U	0.79	< 0.66 U	< 0.6 U	0.29 B
SW9023 (mg/kg)											
Total Extractable Organic Halogens	< 318 U	< 763 U	< 256 U	< 250 U	< 277 U	< 246 U	< 251 U	< 261 U	< 263 U	< 242 U	< 281 U
SW9045											
pH	7.3	7.2	7.7	7.5	7.7	7.2	7.2	7.6	7.8	7.5	6.8
ASTM D240											
BTU (BTU/lb)	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200
TPH (mg/Kg)	1060	1520	614	2120	610	2290	2350	5240	6860	3300	6670
ASTM D-4239 (%)											
Sulfur	0.12	0.21	0.05	0.19	0.41	0.15	0.17	0.12	0.17	0.31	0.2
E160.3 (%)											
Percent Moisture	37.1	73.8	21.9	20.1	27.8	18.8	20.4	23.4	24	17.3	28.9
SW7.1.2											
Ignitability	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU

Location ID	C5	C6	C7	C8	D4	D5	D6	D7	D8	E4	E5	E6	E7
Sample ID	C5-050707	C6-050707	C7-050207	C8-050207	D4-050307	D5-050307	D6-050307	D7-050207	D8-050207	E4-050307	E5-050307	E6-050307	E7-05020
Sample date	5/7/2007	5/7/2007	5/2/2007	5/2/2007	5/3/2007	5/3/2007	5/3/2007	5/2/2007	5/2/2007	5/3/2007	5/3/2007	5/3/2007	5/2/2007
Metals TCLP (mg/L)													
Arsenic	0.18 B	0.17 B	0.17 B	0.18 B	0.2 B	0.22 B	0.2 B	0.2 B	0.19 B	0.18 B	0.19 B	0.19 B	0.19
Barium	0.14 B	0.13 B	0.24 B	0.13 B	0.058 B	0.098 B	0.24 B	0.19 B	0.094 B	0.059 B	0.039 B	0.039 B	0.086
Cadmium	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1
Chromium	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	0.0014 B	0.0012 B	< 0.5 U	< 0.5 U	< 0.5 U	0.0013 B	< 0.5 U	< 0.5
Copper	0.0024 B	< 0.025 U	< 0.025 U	< 0.025 U	< 0.025 U	0.0028 B	< 0.025 U	< 0.025 U	< 0.025 U	0.0024 B	< 0.025 U	< 0.025 U	< 0.025
Lead	0.082 B	0.15 B	0.049 B	0.35 B	0.036 B	0.051 B	0.31 B	0.13 B	0.068 B	0.025 B	0.018 B	< 0.5 U	0.016
Mercury	< 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	< 0.0002 U	< 0.0002 U	< 0.0002 U	< 0.0002
Nickel	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U	0.027 B	0.005 B	0.008 B	0.0055 B	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04
Selenium	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25
Silver	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5
Zinc	0.1 J	0.14 J	0.09	0.14	0.094	0.078	0.22	0.13	0.077	0.043	0.033	0.041	0.04
SW8081A-TCLP (mg/L)													
Chlordane (technical)-TCLP	< 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	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005
Endrin-TCLP	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005
Heptachlor epoxide-TCLP	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005
Heptachlor-TCLP	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005
Lindane-TCLP	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005
Methoxychlor-TCLP	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001
Toxaphene-TCLP	< 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	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02
SW8082 (ug/Kg)													
Aroclor 1016	< 20 U	< 28 U	< 25 U	< 21 U	< 23 U	< 26 U	< 33 U	< 22 U	< 23 U	< 21 U	< 25 U	< 24 U	< 27
Aroclor 1221	< 20 U	< 28 U	< 25 U	< 21 U	< 23 U	< 26 U	< 33 U	< 22 U	< 23 U	< 21 U	< 25 U	< 24 U	< 27
Aroclor 1232	< 20 U	< 28 U	< 25 U	< 21 U	< 23 U	< 26 U	< 33 U	< 22 U	< 23 U	< 21 U	< 25 U	< 24 U	< 27
Aroclor 1242	< 20 U	< 28 U	< 25 U	< 21 U	< 23 U	< 26 U	< 33 U	< 22 U	< 23 U	< 21 U	< 25 U	< 24 U	< 27
Aroclor 1248	< 20 U	< 28 U	< 25 U	< 21 U	< 23 U	< 26 U	< 33 U	< 22 U	< 23 U	< 21 U	< 25 U	< 24 U	< 27
Aroclor 1254	< 20 U	< 28 U	< 25 U	< 21 U	< 23 U	< 26 U	< 33 U	< 22 U	< 23 U	< 21 U	< 25 U	< 24 U	< 27
Aroclor 1260	< 20 U	< 28 U	< 25 U	< 21 U	< 23 U	< 26 U	790	< 22 U	< 23 U	< 21 U	< 25 U	< 24 U	< 27
SW8151A-TCLP (mg/L)													
2,4,5-TP (Silvex)-TCLP	< 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	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01
2,4-D-TCLP	< 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	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04
SW846 (mg/Kg)													
Reactive Cyanide	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200
Reactive Sulfide	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500
Cyanide, Total (mg/Kg)													
Cyanide, Total	0.12 B	0.46 B	0.62 B	0.72	< 0.69 U	< 0.79 U	< 0.98 U	0.3 B	0.26 B	0.45 B	< 0.75 U	< 0.71 U	0.15
SW9023 (mg/kg)													
Total Extractable Organic Halogens	< 246 U	< 337 U	< 300 U	< 252 U	< 277 U	< 316 U	< 393 U	< 259 U	< 278 U	< 257 U	< 299 U	< 282 U	< 319
SW9045													
pH	7.4	7.6	7.7	7.5	7.2	7.2	8.3	8.3	8	7	7.4	7.8	8.9
ASTM D240													
BTU (BTU/lb)	< 200	< 200	< 200	200	< 200	< 200	< 200	< 200	500	< 200	< 200	< 200	224
TPH (mg/Kg)	6570	4580	590	1110	3450	2980	2590	469	383	16100	14500	2860	1960
ASTM D-4239 (%)													
Sulfur	0.19	0.2	0.26	0.08	0.22	0.41	0.26	0.16	0.28	0.18	0.18	0.22	0.19
E160.3 (%)													
Percent Moisture	18.6	40.7	33.3	20.7	27.7	36.7	49.1	22.7	28	22	33.1	29.1	37.3
SW7.1.2													
Ignitability	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU

Table 2-4
PDI Soil Sampling Analytical Results
Sag Harbor Former MGP
Sag Harbor, New York

Location ID / Sample ID / Sample date		E8 / E8-050107 / 5/1/2007	F4 / F4-050207 / 5/2/2007	F5 / F5-050207 / 5/2/2007	F6 / F6-050307 / 5/3/2007	F7 / F7-050207 / 5/2/2007	F8 / F8-050107 / 5/1/2007	G4 / G4-043007 / 4/30/2007	G5 / G5-043007 / 4/30/2007	G6 / G6-043007 / 4/30/2007	G7 / G7-042707 / 4/27/2007	G8 / G8-042707 / 4/27/2007	H4 / H4-043007 / 4/30/2007	H5 / H5-043007 / 4/30/2007	H6 / H6-043007 / 4/30/2007	H7 / H7-042707 / 4/27/2007	H8 / H8-042707 / 4/27/2007	I5 / I5-050807 / 5/8/2007	I7 / I7-050807 / 5/8/2007
SW8260 (ug/Kg)																			
1,1,1-Trichloroethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,1,2,2-Tetrachloroethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,1,2-Trichloro-1,2,2-trifluoroethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,1,2-Trichloroethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,1-Dichloroethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,1-Dichloroethene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,2,4-Trichlorobenzene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,2-Dibromo-3-chloropropane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,2-Dibromoethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,2-Dichlorobenzene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,2-Dichloroethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,2-Dichloropropane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,3-Dichlorobenzene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
1,4-Dichlorobenzene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
2-Butanone	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
2-Hexanone	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
4-Methyl-2-pentanone	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Acetone	J	**470 J**	**180 J**	**640 J**	< 3100 U	**230 J**	**530 J**	< 2800 U	**260 J**	**670 J**	< 130 U	< 180 U	< 6100 U	**320 J**	< 7000 U	< 3100 U	< 75 U	< 1200 U	< 3400 U
Benzene		**180 J**	**600 J**	**1200**	**3800**	**620**	**170 J**	**2100**	**540**	**810**	**200**	**59**	**2800**	**690**	**18000**	**2700**	**28**	**110 J**	**590 J**
Bromodichloromethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Bromoform	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Bromomethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Carbon disulfide	U	< 380 U	< 680 U	**130 J**	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Carbon tetrachloride	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Chlorobenzene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Chloroethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Chloroform	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Chloromethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
cis-1,2-Dichloroethene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
cis-1,3-Dichloropropene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Cyclohexane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Dibromochloromethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Dichlorodifluoromethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Ethylbenzene		**4200**	**14000**	**12000**	**19000**	**3200**	**2400**	**22000**	**6600**	**14000**	**1100**	**1100**	**29000**	**3000**	**34000**	**19000**	**49**	**420**	**21000**
Isopropylbenzene		**480**	**3400**	**2300**	**1700**	**400**	**340 J**	**4700**	**1300**	**1700**	**120**	**140**	**8100**	**320 J**	**2300**	**1400**	**13 J**	< 300 U	**1800**
Methyl acetate	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Methyl tert-butyl ether	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Methylcyclohexane	U	< 380 U	< 680 U	**190 J**	**190 J**	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	**1800**	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Methylene chloride	J	**92 J**	**340 J**	**330 J**	**300 J**	**170 J**	**130 J**	< 710 U	< 310 U	< 410 U	**5.8 JB**	< 45 U	< 1500 U	< 330 U	< 1700 U	**280 J**	**3.1 JB**	**49 J**	< 840 U
Styrene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Tetrachloroethene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Toluene	J	**100 J**	**1600**	**430**	**380 J**	**94 J**	**94 J**	**2700**	**590**	**270 J**	**27 J**	**25 J**	**2000**	**60 J**	**28000**	**650 J**	< 19 U	< 300 U	**760 J**
trans-1,2-Dichloroethene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
trans-1,3-Dichloropropene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Trichloroethene	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	**110 J**	**250 J**	**93 J**	**110 J**	< 33 U	< 45 U	**660 J**	**190 J**	**1200 J**	< 780 U	< 19 U	< 300 U	< 840 U
Trichlorofluoromethane	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Vinyl chloride	U	< 380 U	< 680 U	< 430 U	< 780 U	< 350 U	< 470 U	< 710 U	< 310 U	< 410 U	< 33 U	< 45 U	< 1500 U	< 330 U	< 1700 U	< 780 U	< 19 U	< 300 U	< 840 U
Xylenes (total)		**4800**	**25000**	**17000**	**23000**	**3400**	**2700**	**36000**	**9900**	**15000**	**1100**	**1300**	**36000**	**3100**	**35000**	**20000**	**77**	**370 J**	**23000**
SW8260B-TCLP (mg/L)																			
1,1-Dichloroethene	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
1,2-Dichloroethane	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
2-Butanone	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Benzene	J	< 0.05 U	**0.036 J**	**0.029 J**	**0.035 J**	**0.033 J**	**0.016 J**	**0.15 J**	< 0.2 U	**0.059 J**	**0.058**	**0.068**	**0.054 J**	**0.05 J**	**0.52**	**0.33**	**0.023 J**	< 0.05 U	< 0.05 U
Carbon tetrachloride	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Chlorobenzene	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Chloroform	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Tetrachloroethene	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Trichloroethene	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Vinyl chloride	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
SW8270 (ug/Kg)																			
1,1'-Biphenyl	J	**29000**	**48000**	**42000**	**13000 J**	**25000**	**14000 J**	**27000 J**	< 41000 U	< 110000 U	**10000**	**7800 J**	**23000 J**	**4600 J**	**48000**	**42000**	**7500 J**	**1600 J**	**15000**
2,2'-oxybis(1-Chloropropane)	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
2,4,5-Trichlorophenol	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
2,4,6-Trichlorophenol	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
2,4-Dichlorophenol	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
2,4-Dimethylphenol	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
2,4-Dinitrophenol	U	< 120000 U	< 110000 U	< 140000 U	< 250000 U	< 110000 U	< 150000 U	< 450000 U	< 200000 U	< 530000 U	< 42000 U	< 58000 U	< 390000 U	< 42000 U	< 45000 U	< 50000 U	< 48000 U	< 19000 U	< 27000 U
2,4-Dinitrotoluene	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
2,6-Dinitrotoluene	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	**130 J**	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
2-Chloronaphthalene	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
2-Chlorophenol	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
2-Methylnaphthalene		**220000**	**440000**	**290000**	**120000**	**160000**	**100000**	**230000**	**63000**	**200000**	**71000**	**63000**	**160000**	**44000**	**580000**	**440000**	**60000**	**8700**	**100000**
2-Methylphenol	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
2-Nitroaniline	U	< 120000 U	< 110000 U	< 140000 U	< 250000 U	< 110000 U	< 150000 U	< 450000 U	< 200000 U	< 530000 U	< 42000 U	< 58000 U	< 390000 U	< 42000 U	< 45000 U	< 50000 U	< 48000 U	< 19000 U	< 27000 U
2-Nitrophenol	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
3,3'-Dichlorobenzidine	U	< 120000 U	< 110000 U	< 140000 U	< 250000 U	< 110000 U	< 150000 U	< 450000 U	< 200000 U	< 530000 U	< 42000 U	< 58000 U	< 390000 U	< 42000 U	< 45000 U	< 50000 U	< 48000 U	< 19000 U	< 27000 U
3-Nitroaniline	U	< 120000 U	< 110000 U	< 140000 U	< 250000 U	< 110000 U	< 150000 U	< 450000 U	< 200000 U	< 530000 U	< 42000 U	< 58000 U	< 390000 U	< 42000 U	< 45000 U	< 50000 U	< 48000 U	< 19000 U	< 27000 U
4,6-Dinitro-2-methylphenol	U	< 120000 U	< 110000 U	< 140000 U	< 250000 U	< 110000 U	< 150000 U	< 450000 U	< 200000 U	< 530000 U	< 42000 U	< 58000 U	< 390000 U	< 42000 U	< 45000 U	< 50000 U	< 48000 U	< 19000 U	< 27000 U
4-Bromophenyl phenyl ether	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
4-Chloro-3-methylphenol	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U

Table 2-4
PDI Soil Sampling Analytical Results
Sag Harbor Former MGP
Sag Harbor, New York

Location ID Sample ID Sample date		E8 E8-050107 5/1/2007	F4 F4-050207 5/2/2007	F5 F5-050207 5/2/2007	F6 F6-050307 5/3/2007	F7 F7-050207 5/2/2007	F8 F8-050107 5/1/2007	G4 G4-043007 4/30/2007	G5 G5-043007 4/30/2007	G6 G6-043007 4/30/2007	G7 G7-042707 4/27/2007	G8 G8-042707 4/27/2007	H4 H4-043007 4/30/2007	H5 H5-043007 4/30/2007	H6 H6-043007 4/30/2007	H7 H7-042707 4/27/2007	H8 H8-042707 4/27/2007	I5 I5-050807 5/8/2007	I7 I7-050807 5/8/2007
4-Chloroaniline	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
4-Chlorophenyl phenyl ether	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
4-Methylphenol	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	370 J	< 10000 U	< 9900 U	< 4000 U	< 5600 U
4-Nitroaniline	U	< 120000 U	< 110000 U	< 140000 U	< 250000 U	< 110000 U	< 150000 U	< 450000 U	< 200000 U	< 530000 U	< 42000 U	< 58000 U	< 390000 U	< 42000 U	< 45000 U	< 50000 U	< 48000 U	< 19000 U	< 27000 U
4-Nitrophenol	U	< 120000 U	< 110000 U	< 140000 U	< 250000 U	< 110000 U	< 150000 U	< 450000 U	< 200000 U	< 530000 U	< 42000 U	< 58000 U	< 390000 U	< 42000 U	< 45000 U	< 50000 U	< 48000 U	< 19000 U	< 27000 U
Acenaphthene		170000	180000	220000	120000	170000	110000	110000	54000	180000	76000	67000	140000	40000	490000	390000	71000	11000	110000
Acenaphthylene	J	33000	40000	61000	15000 J	36000	20000 J	36000 J	18000 J	39000 J	14000	12000	31000 J	9700	65000	47000	9000 J	2700 J	19000
Acetophenone	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Anthracene		100000	110000	150000	67000	120000	65000	60000 J	29000 J	98000 J	53000	32000	66000 J	19000	260000 J	220000 J	38000	7500	58000
Atrazine	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Benzaldehyde	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Benzo(a)anthracene		79000	83000	180000	47000 J	98000	56000	48000 J	30000 J	71000 J	29000	18000	53000 J	11000	66000	170000 J	23000	6000	57000
Benzo(a)pyrene		76000	89000	160000	27000 J	83000	57000	44000 J	26000 J	56000 J	19000	13000	44000 J	10000	110000 J	130000 J	14000	4800	37000 J
Benzo(b)fluoranthene		77000	80000	170000	19000 J	80000	47000	24000 J	17000 J	44000 J	11000	7300 J	28000 J	7700 J	79000 J	58000	8600 J	3300 J	36000
Benzo(ghi)perylene	J	42000	45000	80000	17000 J	39000	36000	53000 J	26000 J	41000 J	19000	14000	46000 J	3800 J	21000	110000 J	14000	2500 J	22000
Benzo(k)fluoranthene	J	23000 J	22000	60000	6800 J	21000 J	16000 J	9200 J	7400 J	16000 J	4800 J	3100 J	9400 J	2400 J	40000	18000	3500 J	1200 J	13000
bis(2-Chloroethoxy)methane	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
bis(2-Chloroethyl) ether	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
bis(2-Ethylhexyl) phthalate	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Butyl benzyl phthalate	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Caprolactam	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Carbazole	U	1100 J	5700 J	7700 J	< 52000 U	< 23000 U	970 J	< 94000 U	< 41000 U	< 110000 U	470 J	400 J	< 81000 U	330 J	1600 J	650 J	< 9900 U	< 4000 U	< 5600 U
Chrysene		81000	82000	170000	37000 J	92000	56000	47000 J	30000 J	69000 J	27000	17000	49000 J	8100 J	68000	81000	21000	5700	38000
Dibenz(a,h)anthracene	J	9100 J	12000 J	21000 J	< 52000 U	8700 J	6500 J	< 94000 U	< 41000 U	< 110000 U	3100 J	2100 J	< 81000 U	730 J	960 J	18000	2300 J	420 J	4800 J
Dibenzofuran	J	7900 J	13000 J	18000 J	< 52000 U	9700 J	4600 J	< 94000 U	1400 J	11000 J	3000 J	2100 J	4200 J	1400 J	13000	4200 J	1600 J	250 J	1600 J
Diethyl phthalate	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Dimethyl phthalate	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Di-n-butyl phthalate	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Di-n-octyl phthalate	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Fluoranthene		150000	140000	310000	87000	160000	100000	61000 J	41000	140000	43000	39000	87000	34000	210000 J	290000	51000	11000	89000
Fluorene		95000	100000	150000	49000 J	110000	52000	50000 J	21000 J	83000 J	40000	26000	54000 J	15000	220000 J	160000 J	27000	4500	41000
Hexachlorobenzene	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Hexachlorobutadiene	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Hexachlorocyclopentadiene	U	< 120000 U	< 110000 U	< 140000 U	< 250000 U	< 110000 U	< 150000 U	< 450000 U	< 200000 U	< 530000 U	< 42000 U	< 58000 U	< 390000 U	< 42000 U	< 45000 U	< 50000 U	< 48000 U	< 19000 U	< 27000 U
Hexachloroethane	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Indeno(1,2,3-cd)pyrene	J	32000	32000	61000	12000 J	30000	26000 J	33000 J	19000 J	34000 J	14000	10000 J	30000 J	3300 J	22000	79000	11000	1900 J	20000
Isophorone	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Naphthalene		450000	770000	430000	300000	350000	200000	450000	150000	560000	170000	160000	350000	160000	1900000	1600000	83000	24000	330000
Nitrobenzene	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
N-Nitrosodi-n-propylamine	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
N-Nitrosodiphenylamine	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Pentachlorophenol	U	< 120000 U	< 110000 U	< 140000 U	< 250000 U	< 110000 U	< 150000 U	< 450000 U	< 200000 U	< 530000 U	< 42000 U	< 58000 U	< 390000 U	< 42000 U	< 45000 U	< 50000 U	< 48000 U	< 19000 U	< 27000 U
Phenanthrene		400000	520000	450000	220000	370000	170000	300000	110000	350000	140000	130000	280000	98000	930000	840000	110000	27000	240000
Phenol	U	< 25000 U	< 22000 U	< 28000 U	< 52000 U	< 23000 U	< 31000 U	< 94000 U	< 41000 U	< 110000 U	< 8600 U	< 12000 U	< 81000 U	< 8700 U	< 9200 U	< 10000 U	< 9900 U	< 4000 U	< 5600 U
Pyrene		240000	280000	330000	110000	250000	150000	170000	91000	230000	91000	67000	210000	35000	640000	500000	62000	23000	180000
SW8270C-TCLP (mg/L)																			
1,4-Dichlorobenzene	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
2,4,5-Trichlorophenol	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
2,4,6-Trichlorophenol	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
2,4-Dinitrotoluene	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
2-Methylphenol	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
3-Methylphenol & 4-Methylphenol-TCLP	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U		< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Cresols (total)-TCLP	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Hexachlorobenzene	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Hexachlorobutadiene	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Hexachloroethane	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Nitrobenzene	U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
Pentachlorophenol	U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U
Pyridine-TCLP	U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U
Total Metals (mg/Kg)																			
Antimony	U	0.16 BJ	< 1.4 U	< 1.7 U	0.49 BJ	0.32 BJ	< 1.9 U	0.22 B	< 1.2 U	0.36 B	0.19 BJ	0.94 BJ	0.14 B	0.31 B	0.28 B	0.28 BJ	< 1.5 U	< 1.2 U	0.22 BJ
Arsenic	B	0.96 B	1.7	2.7	1.6	3	2.1	1.5	1.6	4.6	1.7	3.5	1.2	2.3	2.9	1 B	1.7	0.8 B	7.2
Barium	B	14.2 B	11.1 B	18.7 B	12.7 B	30.3	21 B	8.1 B	18.8 B	24.4 B	15.2 B	17.8 B	14.8 B	21.6 B	23.2 B	6.9 B	20 B	9.7 B	121
Beryllium	B	0.25 B	0.22 B	0.25 B	0.15 B	0.3 B	0.3 B	0.082 B	0.057 B	0.072 B	0.38 BJ	0.64 BJ	0.071 B	0.098 B	0.081 B	0.42 BJ	0.5 BJ	0.15 BJ	0.23 BJ
Cadmium	U	< 0.76 U	< 0.68 U	0.15 B	0.083 B	0.3 B	< 0.93 U	0.075 B	0.13 B	0.33 B	< 0.65 U	0.12 B	0.11 B	0.15 B	0.17 B	< 0.78 U	< 0.75 U	< 0.61 U	< 0.84 U
Chromium		4.5	3.9	4.4	3.8	3.3	4.5	3.1	2.8	3.8	2.9	4.2	3.2	3.4	4.1	2.4	4.3	2.2	5.3
CR, Hexavalent						< 0.55 U				< 0.66 U		11.2	< 0.5 U				< 0.61 U	< 0.47 U	
Copper		7.3	10.8	20.8	7.4	12.5	11.4	8.6	8.9	16.3	22.1	14.5	9.2	16.5	15	4.7	13.2	5	34.4
Lead	J	47.6 J	85.6 J	95.1 J	50.2	328 J	73.6 J	30.9	75.6	143	45	78.1	25.6	299	136	21.2	50.4	32.6	136
Mercury	B	0.045 B	0.14	0.35	0.027 B	0.2	0.19	0.29	0.25	0.57	0.7	0.093	0.34	1.3	1.6	0.18	0.13	0.15	0.53
Nickel	B	2.4 B	1.9 B	3.9 B	2.9 B	3.6 B	3.4 B	2.2 B	1.9 B	3.7 B	2.7 B	4.4 B	1.9 B	3 B	2.8 B	1.7 B	3.3 B	1.5 B	5.2 B
Selenium	U	0.49 B	0.66 B	0.57 B	< 0.78 U	0.59 B	0.92 B	< 0.71 U	< 0.62 U	0.59 B	0.58 B	0.85 B	< 0.61 U	0.45 B	0.63 B	0.48 B	0.47 B	0.5 B	< 0.84 U
Silver	U	0.15 B	< 0.68 U	< 0.85 U	< 0.78 U	0.14 B	< 0.93 U	0.1 BJ	0.076 BJ	0.071 BJ	0.11 B	0.1 B	0.11 BJ	0.062 BJ	0.16 BJ	< 0.78 U	0.11 B	< 0.61 U	0.14 B
Thallium	U	< 1.5 U	0.44 B	< 1.7 U	< 1.6 U	< 1.4 U	< 1.9 U	< 1.4 U	< 1.2 U	< 1.6 U	< 1.3 U	0.93 B	< 1.2 U	< 1.3 U	< 1.4 U	< 1.6 U	< 1.5 U	< 1.2 U	< 1.7 U
Vanadium	B	6.6 B	5.7 B	7.8 B	5.4 B	6.3 B	7.8 B	7.3	4 B	6 B	4.6 B	8.2 B	4.3 B	6.1 B	5.7 B	5.1 B	7 B	3.3 B	12.4
Zinc		20.6	31.7	61.8	21.7	49.2	39.2	20.2	34.2	125	18.8 J	38.4 J	47.2	56.3	62.1	11.8 J	31.8 J	24.2 J	65.7 J

Table 2-4
PDI Soil Sampling Analytical Results
Sag Harbor Former MGP
Sag Harbor, New York

Location ID		E8	F4	F5	F6	F7	F8	G4	G5	G6	G7	G8	H4	H5	H6	H7	H8	I5	I7
Sample ID	7	E8-050107	F4-050207	F5-050207	F6-050307	F7-050207	F8-050107	G4-043007	G5-043007	G6-043007	G7-042707	G8-042707	H4-043007	H5-043007	H6-043007	H7-042707	H8-042707	I5-050807	I7-050807
Sample date		5/1/2007	5/2/2007	5/2/2007	5/3/2007	5/2/2007	5/1/2007	4/30/2007	4/30/2007	4/30/2007	4/27/2007	4/27/2007	4/30/2007	4/30/2007	4/30/2007	4/27/2007	4/27/2007	5/8/2007	5/8/2007
Metals TCLP (mg/L)																			
Arsenic	B	**0.18** B	**0.18** B	**0.19** B	**0.18** B	**0.17** B	**0.19** B	**0.21** B	**0.2** B	**0.19** B	**0.21** BJ	**0.21** BJ	**0.21** B	**0.21** B	**0.18** B	**0.23** BJ	**0.21** BJ	**0.17** B	**0.16** B
Barium	B	**0.2** B	**0.22** B	**0.13** B	**0.048** B	**0.18** B	**0.12** B	**0.11** BJ	**0.31** BJ	**0.12** BJ	**0.34** BJ	**0.077** BJ	**0.3** BJ	**0.15** BJ	**0.29** BJ	**0.075** BJ	**0.19** BJ	**0.1** B	**0.31** B
Cadmium	U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U
Chromium	U	< 0.5 U	< 0.5 U	< 0.5 U	**0.0012** B	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.0011** B
Copper	U	< 0.025 U	**0.0026** B	**0.0019** B	< 0.025 U	**0.002** B	< 0.025 U	< 0.025 U	< 0.025 U	< 0.025 U	**0.0018** B	**0.0026** B	< 0.025 U	**0.0017** B	< 0.025 U	**0.0021** B	**0.0018** B	< 0.025 U	**0.0031** B
Lead	B	**0.17** B	**0.79**	**0.12** B	**0.018** B	**0.1** B	**0.086** B	**0.073** B	**0.19** B	**0.067** B	**0.34** B	**0.024** B	**0.024** B	**0.24** B	**0.044** B	**0.036** B	**0.061** B	**0.042** B	**0.073** B
Mercury	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	< 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	< 0.0002 U
Nickel	U	< 0.04 U	**0.004** B	**0.0062** B	< 0.04 U	**0.014** B	< 0.04 U	**0.005** B	**0.0049** B	**0.0055** B	**0.01** B	**0.01** B	**0.0087** B	**0.0062** B	**0.0042** B	**0.0052** B	**0.0088** B	< 0.04 U	**0.0091** B
Selenium	U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U
Silver	U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Zinc		**0.25**	**0.5**	**0.38**	**0.027**	**0.29**	**0.19**	**0.16**	**0.15**	**0.35**	**0.21** J	**0.08** J	**0.92**	**0.31**	**0.14**	**0.079** J	**0.24** J	**0.19** J	**0.25** J
SW8081A-TCLP (mg/L)																			
Chlordane (technical)-TCLP	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	< 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	< 0.005 U
Endrin-TCLP	U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Heptachlor epoxide-TCLP	U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Heptachlor-TCLP	U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Lindane-TCLP	U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	**0.00018** J	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	**0.00021** J	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Methoxychlor-TCLP	U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U
Toxaphene-TCLP	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	< 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	< 0.02 U
SW8082 (ug/Kg)																			
Aroclor 1016	U	< 25 U	< 23 U	< 28 U	< 26 U	< 23 U	< 31 U	< 24 U	< 21 U	< 27 U	< 22 U	< 30 U	< 20 U	< 22 U	< 23 U	< 26 U	< 25 U	< 20 U	< 28 U
Aroclor 1221	U	< 25 U	< 23 U	< 28 U	< 26 U	< 23 U	< 31 U	< 24 U	< 21 U	< 27 U	< 22 U	< 30 U	< 20 U	< 22 U	< 23 U	< 26 U	< 25 U	< 20 U	< 28 U
Aroclor 1232	U	< 25 U	< 23 U	< 28 U	< 26 U	< 23 U	< 31 U	< 24 U	< 21 U	< 27 U	< 22 U	< 30 U	< 20 U	< 22 U	< 23 U	< 26 U	< 25 U	< 20 U	< 28 U
Aroclor 1242	U	< 25 U	< 23 U	< 28 U	< 26 U	< 23 U	< 31 U	< 24 U	< 21 U	< 27 U	< 22 U	< 30 U	< 20 U	< 22 U	< 23 U	< 26 U	< 25 U	< 20 U	< 28 U
Aroclor 1248	U	< 25 U	< 23 U	< 28 U	< 26 U	**25**	< 31 U	< 24 U	< 21 U	< 27 U	< 22 U	< 30 U	< 20 U	< 22 U	< 23 U	< 26 U	< 25 U	< 20 U	< 28 U
Aroclor 1254	U	< 25 U	< 23 U	< 28 U	< 26 U	< 23 U	< 31 U	< 24 U	< 21 U	< 27 U	< 22 U	< 30 U	< 20 U	< 22 U	< 23 U	< 26 U	< 25 U	< 20 U	< 28 U
Aroclor 1260	U	< 25 U	< 23 U	**99**	< 26 U	< 23 U	< 31 U	< 24 U	**41**	< 27 U	< 22 U	< 30 U	**170**	**61**	**32**	< 26 U	< 25 U	**43**	< 28 U
SW8151A-TCLP (mg/L)																			
2,4,5-TP (Silvex)-TCLP	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	< 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	< 0.01 U
2,4-D-TCLP	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	< 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	< 0.04 U
SW846 (mg/Kg)																			
Reactive Cyanide	U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U
Reactive Sulfide	U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U
Cyanide, Total (mg/Kg)																			
Cyanide, Total	B	**0.63** B	**0.42** B	**1.1**	< 0.78 U	**0.42** B	**0.82** B	**0.15** B	**0.44** B	**0.97**	**0.56** B	**0.58** B	**0.16** B	**0.63** B	**1.2**	**0.3** B	< 0.75 U	< 0.61 U	< 0.84 U
SW9023 (mg/kg)																			
Total Extractable Organic Halogens	U	< 304 U	< 271 U	< 340 U	< 313 U	< 277 U	< 372 U	< 284 U	< 246 U	< 328 U	< 261 U	< 363 U	< 244 U	< 264 U	< 279 U	< 314 U	< 301 U	< 242 U	< 337 U
SW9045																			
pH		**7.7**	**7.8**	**7.6**	**7.4**	**9**	**7.8**	**7.9**	**7.8**	**7.7**	**7.1**	**7.6**	**9**	**8**	**10.3**	**7.8**	**7.6**	**7.8**	**7.3**
ASTM D240																			
BTU (BTU/lb)		< 200	**291**	< 200	< 200	< 200	< 200	**232**	**268**	< 200	< 200	< 200	< 200	**277**	**204**	< 200	< 200	< 200	< 200
TPH (mg/Kg)		**3330**	**4750**	**2940**	**5980**	**3380**	**1300**	**3840**	**546**	**2690**	**3020**	**2420**	**1280**	**374**	**996**	**383**	**447**	**764**	**3290**
ASTM D-4239 (%)																			
Sulfur		**0.28**	**0.07**	**0.28**	**0.28**	**0.39**	**0.29**	**0.17**	**0.36**	**0.28**	**0.11**	**0.39**	**0.33**	**0.33**	**0.08**	**0.48**	**0.43**	**0.25**	**0.29**
E160.3 (%)																			
Percent Moisture		**34.2**	**26.2**	**41.3**	**36.2**	**27.8**	**46.3**	**29.6**	**18.8**	**39.1**	**23.3**	**44.9**	**18.1**	**24.3**	**28.3**	**36.3**	**33.5**	**17.4**	**40.7**
SW7.1.2																			
Ignitability		< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU	< --NOU

Table 2-5
PDI Groundwater Analytical Results
Sag Harbor Former MGP
Sag Harbor, New York

Compounds	SHMW-15I 7/10/2007	SHMW-18S 7/10/2007	SHMW-6I 7/11/2007 *
Volatile organic compounds (µg/L)			
Chloroprene	1.0 U	1.0 U	1.0 U
2-Chlorethyl vinyl ether	2.0 U	2.0 U	2.0 U
Allyl chloride	1.0 U	1.0 U	1.0 U
Dibromomethane	1.0 U	1.0 U	1.0 U
trans-1,4-Dichloro-2-butene	1.0 U	1.0 U	1.0 U
Iodomethane (methyl iodide)	1.0 U	1.0 U	1.0 U
Methacrylonitrile	1.0 U	1.0 U	1.0 U
1,1,1,2-Tetrachlorethane	1.0 U	1.0 U	1.0 U
1,2,3-Trichloropropane	1.0 U	1.0 U	1.0 U
Acrolein	20.0 U	20.0 U	20.0 U
Acrylonitrile	20.0 U	20.0 U	20.0 U
Methyl methacrylate	1.0 U	1.0 U	1.0 U
Acetone	5.0 U	5.0 U	5.0 U
Benzene	1.0 U	**630**	1.0 U
Bromodichloromethane	1.0 U	1.0 U	1.0 U
Bromoform	1.0 U	1.0 U	1.0 U
Bromomethane (methyl bromide)	1.0 U	1.0 U	1.0 U
2-Butanone (methly ethyl ketone)	5.0 U	5.0 U	5.0 U
Carbon disulfide	1.0 U	**0.39 J**	1.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U
Chlorobenzene	1.0 U	1.0 U	1.0 U
Chloroethane	1.0 U	1.0 U	1.0 U
Chloroform	1.0 U	1.0 U	1.0 U
Chloromethane (methyl chloride)	1.0 U	1.0 U	1.0 U
Cyclohexane	1.0 U	**0.26 J**	1.0 U
Dibromochloromethane	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloro-propane	1.0 U	1.0 U	1.0 U
1,2-Dibomoethane (ethylene dibromide)	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropane	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropane	1.0 U	1.0 U	1.0 U
Ethylbenzene	1.0 U	**130**	1.0 U
2-Hexanone	5.0 U	5.0 U	5.0 U
Isopropylbenzene	1.0 U	**5.5**	1.0 U
Methyl acetate	1.0 U	1.0 U	1.0 U
Methylene chloride	1.0 U	1.0 U	1.0 U
Methylcyclohexane	1.0 U	1.0 U	1.0 U
4-Methyl-2-pentanone	5.0 U	5.0 U	5.0 U
Methyl tert-butyl ether	1.0 U	**0.14 J**	**0.31 J**
Styrene	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1.0 U	1.0 U	1.0 U
Trichloroethene	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U	1.0 U	1.0 U
Toluene	1.0 U	**12**	1.0 U
Vinyl chloride	1.0 U	1.0 U	1.0 U
Xylenes (total)	3.0 U	**110**	3.0 U

Table 2-5
PDI Groundwater Analytical Results
Sag Harbor Former MGP
Sag Harbor, New York

Compounds	SHMW-15I 7/10/2007	SHMW-18S 7/10/2007	SHMW-6I 7/11/2007 *
Semivolatile organic compounds (µg/L)			
4-Aminobiphenyl	9.6 U	9.7 U	9.4 U
alpha,alpha-dimethylphenethylamine	9.6 U	9.7 U	9.4 U
o-Toluidine	9.6 U	9.7 U	9.4 U
Aramite	9.6 U	9.7 U	9.4 U
Aniline	1.9 U	1.9 U	1.9 U
Benzidine	190 U	190 U	190 U
1,2-Diphenylhydrazine	1.9 U	1.9 U	1.9 U
Pyridine	9.6 U	9.7 U	9.4 U
p-Phenylene diamine (1,4-phenylene diamide)	190 U	190 U	190 U
3,3'-Dimethylbenzidine	48 U	48 U	47 U
1,3-Dintrobenzene	9.6 U	9.7 U	9.4 U
Diphenylamine	9.6 U	9.7 U	9.4 U
Hexachloropropene	96 U	97 U	94 U
N-Nitrosodimethylamine	9.6 U	9.7 U	9.4 U
N-Nitro-o-toluidine	19 U	19 U	19 U
Pentachlorobenzene	9.6 U	9.7 U	9.4 U
1,2,4,5-Tetrachlorobenzene	9.6 U	9.7 U	9.4 U
1,3,5-Trinitrobenzene	48 U	48 U	47 U
Acenaphthene	1.9 U	**91**	1.9 U
Acenaphthylene	1.9 U	**5.5**	1.9 U
Acetophenone	1.9 U	1.9 U	1.9 U
Anthracene	1.9 U	**5.7**	1.9 U
Atrazine	1.9 U	1.9 U	1.9 U
Benzo(a)anthracene	1.9 U	1.9 U	1.9 U
Benzo(a)pyrene	1.9 U	1.9 U	1.9 U
Benzo(b)fluoranthene (3,4-benzofluoranthene)	1.9 U	1.9 U	1.9 U
Benzo(ghi)perylene	1.9 U	1.9 U	1.9 U
Benzo(k)fluoranthene	1.9 U	1.9 U	1.9 U
Benzaldehyde	1.9 U	1.9 U	1.9 U
1,1'-Biphenyl	1.9 U	**9.2**	1.9 U
bis(2-Chloroethoxy) methane	9.6 U	9.7 U	9.4 U
bis(2-Chloroethyl) ether	1.9 U	1.9 U	1.9 U
bis(2-Ethylhexyl) phthalate	**4.2 J**	**7.5 J**	**4.1 J**
4-Bromophenyl phenyl ether	9.6 U	9.7 U	9.4 U
Butyl benzyl phthalate	9.6 U	9.7 U	9.4 U
Caprolactam	**5.2 J**	5.8 U	5.6 U
Carbazole	1.9 U	1.9 U	1.9 U
4-Chloroaniline	9.6 U	9.7 U	9.4 U
4-Chloro-3-methylphenol	9.6 U	9.7 U	9.4 U
2-Chloronaphthalene	1.9 U	1.9 U	1.9 U
2-Chlorophenol	9.6 U	9.7 U	9.4 U
4-Chlorophenyl phenyl ether	9.6 U	9.7 U	9.4 U
Chrysene	1.9 U	1.9 U	1.9 U
Dibenz(a,h)anthracene	1.9 U	1.9 U	1.9 U
Dibenzofuran	9.6 U	**1.9 J**	9.4 U
3,3'-Dichlorobenzidine	9.6 U	9.7 U	9.4 U
2,4-Dichlorophenol	1.9 U	1.9 U	1.9 U
Diethyl phthalate	9.6 U	9.7 U	9.4 U
2,4-Dimethylphenol	9.6 U	9.7 U	9.4 U
Dimethyl phthalate	9.6 U	9.7 U	9.4 U
Di-n-butyl phthalate	9.6 U	9.7 U	9.4 U
4,6-Dinitro-2-methylphenol (4,6-dinotro-o-cresol)	48 U	48 U	47 U
2,4-Dinitrophenol	48 U	48 U	47 U
2,4-Dinitrotoluene	9.6 U	9.7 U	9.4 U
2,6-Dinitrotoluene	9.6 U	9.7 U	9.4 U
Di-n-octyl phthalate	9.6 U	9.7 U	9.4 U
Fluoranthene	1.9 U	**2.4**	1.9 U
Fluorene	1.9 U	**26**	1.9 U
Hexachlorobenzene	1.9 U	1.9 U	1.9 U
Hexachlorobutadiene	1.9 U	1.9 U	1.9 U
Hexachlorocyclopentadiene	9.6 U	9.7 U	9.4 U
Hexachloroethane	9.6 U	9.7 U	9.4 U

Table 2-5
PDI Groundwater Analytical Results
Sag Harbor Former MGP
Sag Harbor, New York

Compounds	SHMW-15I 7/10/2007	SHMW-18S 7/10/2007	SHMW-6I 7/11/2007 *
Indeno(1,2,3-cd)pyrene	1.9 U	1.9 U	1.9 U
Isophorone	9.6 U	9.7 U	9.4 U
2-Methylnaphthalene	1.9 U	**110**	1.9 U
2-Methylphenol	9.6 U	9.7 U	9.4 U
4-Methylphenol	9.6 U	9.7 U	9.4 U
Naphthalene	1.9 U	**290**	1.9 U
2-Nitroaniline	48 U	48 U	47 U
3-Nitroaniline	48 U	48 U	47 U
4-Nitroaniline	48 U	48 U	47 U
Nitrobenzene	1.9 U	1.9 U	1.9 U
2-Nitrophenol	9.6 U	9.7 U	9.4 U
4-Nitrophenol	48 U	48 U	47 U
N-Nitrosodi-n-propyl-amine	1.9 U	1.9 U	1.9 U
N-Nitrosodiphenylamine	1.9 U	1.9 U	1.9 U
2,2'-oxybis(1-Chloropropane) [bis(2-chloroisopropyl)ethene]	1.9 U	1.9 U	1.9 U
Pentachlorophenol	9.6 U	9.7 U	9.4 U
Phenanthrene	1.9 U	**28**	1.9 U
Phenol	1.9 U	**34**	1.9 U
Pyrene	1.9 U	**3.0**	1.9 U
2,4,5-Trichlorophenol	9.6 U	9.7 U	9.4 U
2,4,6-Trichlorophenol	9.6 U	9.7 U	9.4 U
Pesticides (µg/L)			
alpha-BHC	0.048 U	0.048 U	0.050 U
beta-BHC	0.048 U	0.048 U	0.050 U
delta-BHC	0.048 U	**0.019 J**	0.050 U
gamma-BHC (Lindane)	0.048 U	**0.022 J, PG**	0.050 U
Heptachlor	0.048 U	0.048 U	0.050 U
Aldrin	0.048 U	0.048 U	0.050 U
Heptachlor epoxide	0.048 U	0.048 U	0.050 U
Endosulfan I	0.048 U	0.048 U	0.050 U
Dieldrin	0.048 U	0.048 U	0.050 U
4,4'-DDE	0.048 U	**0.017 J, PG**	0.050 U
Endrin	0.048 U	0.048 U	0.050 U
Endrin ketone	0.048 U	0.048 U	0.050 U
Endrin aldehyde	0.048 U	0.048 U	0.050 U
Endosulfan II	0.048 U	0.048 U	0.050 U
4,4'-DDD	0.048 U	0.048 U	0.050 U
Endosulfan sulfate	0.048 U	0.048 U	0.050 U
4,4'-DDT	0.048 U	0.048 U	0.050 U
Methoxychlor	0.095 U	0.095 U	0.099 U
alpha-Chlordane	0.048 U	0.048 U	0.050 U
gamma-Chlordane	0.048 U	**0.013 J, PG**	0.050 U
Toxaphene	1.9 U	1.9 U	2.0 U
Polychlorinated biphenyls (PCBs) (µg/L)			
Aroclor 1016	0.38 U	0.38 U	0.38 U
Aroclor 1221	0.38 U	0.38 U	0.38 U
Aroclor 1232	0.38 U	0.38 U	0.38 U
Aroclor 1242	0.38 U	0.38 U	0.38 U
Aroclor 1248	0.38 U	0.38 U	0.38 U
Aroclor 1254	0.38 U	0.38 U	0.38 U
Aroclor 1260	0.38 U	0.38 U	0.38 U
Dioxins (pg/L)			
2,3,7,8-TCDD	9.5 U	9.5 U	9.5 U
Metals (µg/L)			
Boron	**24.6 J**	**114 J**	**60.7 J**
Molybdenum	**9.3 J**	40 U	40 U
Tin	100 U	100 U	100 U
Titanium	**0.38 J**	**2.6 J**	**0.38 J**
Silver	5.0 U	5.0 U	5.0 U
Aluminum	**41.1 BJ**	**84.2 BJ**	200 U
Arsenic	10.0 U	10.0 U	10.0 U
Barium	**28.5 J**	**26.9 J**	**44.5 J**
Beryllium	4.0 U	4.0 U	4.0 U

Table 2-5
PDI Groundwater Analytical Results
Sag Harbor Former MGP
Sag Harbor, New York

Compounds	SHMW-15I 7/10/2007	SHMW-18S 7/10/2007	SHMW-6I 7/11/2007 *
Calcium	**45100 B**	**54900 B**	**24000 B**
Cadmium	5.0 U	5.0 U	5.0 U
Cobalt	50.0 U	50.0 U	**2.5 J**
Chromium	5.0 U	5.0 U	5.0 U
Copper	**0.88 J**	25.0 U	25.0 U
Iron	**123**	**5910**	100 U
Potassium	**2310 J**	**11800**	**7580**
Magnesium	**13800**	**18000**	**3450 J**
Manganese	**11.1 J**	**146**	**405**
Sodium	**5250**	**28700**	**19100**
Nickel	40.0 U	40.0 U	40.0 U
Lead	3.0 U	3.0 U	3.0 U
Selenium	5.0 U	5.0 U	5.0 U
Thallium	10.0 U	10.0 U	10.0 U
Antimony	10.0 U	10.0 U	10.0 U
Vanadium	**2.4 J**	**1.9 J**	**3.6 J**
Zinc	**6.6 BJ**	**6.8 BJ**	**3.9 BJ**
Mercury	0.20 U	0.20 U	0.20 U
Other parameters (mg/L)			
Ammonia Nitrogen	**0.096 J**	**4.5**	**1.6**
Bromide	0.20 U	**0.13 J**	**0.058 J**
Chloride	**5.4**	**20.5**	**26.2 B**
Hexavalent Chromium	0.01 U	0.01 U	0.01 U
Fluoride	**0.053**	**0.28**	**0.047** J
Nitrate as N	**1.5**	0.05 U	**1.4**
Nitrite as N	**0.057**	0.05 U	0.05 U
Sulfate	**94.0**	**5.4**	**15**
Total Recoverable Phenolics	**0.038 B**	**0.025 B**	**0.0082 BJ**
Sulfide (total)	3.0 U	3.0 U	3.0 U
BOD	2.0 U	**13.7**	2.0 U
Total Phosphorus	0.1 U	**0.5**	**0.45**
Total Kjeldahl Nitrogen	3.0 U	**5.8**	**2.9 J**
Settleable Solids (in ml/L)	0.5 U	0.5 U	0.5 U

Notes:
mg/L = milligrams per liter
µg/L = micrograms per liter
pg/L = picograms per liter
ml/L = milliliters per liter
J indicates estimated result. Result is below reporting limit.
B indicates Method Blank contamination. The associated Method Blank contains the target analyte at a reportable level.
PG indicates that the percent difference of the result is greater than 40% on the confirmation analysis.
* Well SHMW-6I was resampled on 7/24/07 for hexavalent chromium, nitrate, and nitrite because the 7/11/07 samples were analyzed outside of holding time.

Table 3-1
List of Environmental
Permits, Ordinances, and Citations
KeySpan Sag Harbor Former MGP Site

Permit, Ordinance, or Citation	Statute, Regulation, or Authority	Agency	Applicable to Project?	State Exempted? [1]	Description of Applicability
Federal					
Nationwide Permit 38 - Cleanup of Hazardous and Toxic Waste	Nationwide: 33 CFR 330	US Army Corps	Yes	No	**Applicable for onsite phase of work** - Regulates work in or discharges into navigable waters or wetlands of the United States. Nationwide Permits apply to general categories of activities expected to have minimal impacts; otherwise a project may be required to apply for an individual permit. Special permit conditions for navigation, historic properties and endangered species may apply.
Spill Prevention, Control, and Countermeasure Plan 40 CFR 112.3	40 CFR 112.3	USEPA	Potentially	No	**Potentially applicable** - Requires development of a Spill Prevention, Control, and Countermeasure Plan if the site has the capacity to store more than 1,320 gallons of oil onsite. **Onsite storage of this quantity of oil is unlikely. If there is storage, the subcontractor will be responsible for developing and implementing this plan.**
State					
Protection of Waters Regulatory Program	6NYCRR, Part 608	NYS DEC	see below	see below	Protection of Waters Permits are required for the various activities listed below. NYS DEC forwards them to US Army Corps as
Disturbance of the Bed of Banks of a Protected Stream or Other Watercourse			No	Yes	**Not applicable** - Project does not involve disturbing the bed or banks of a stream or watercourse with a classification and standard of C(T) or higher (Sag Harbor class / standard = SA, Sag Harbor Cove class / standard = SC).
Construction, Reconstruction or Repair of Dams and Other Impoundment Structures			No	Yes	**Not applicable** - Project does not involve construction or alteration of dams or impoundments.

Table 3-1
List of Environmental
Permits, Ordinances, and Citations
KeySpan Sag Harbor Former MGP Site

Permit, Ordinance, or Citation	Statute, Regulation, or Authority	Agency	Applicable to Project?	State Exempted? [1]	Description of Applicability
Construction, Reconstruction or Expansion of Docking and Mooring Facilities	6NYCRR, Part 608	NYS DEC	No	Yes	**Not applicable** - Project does not involve construction of docks, platforms, or moorings.
Excavation or Placement of Fill in Navigable Waters			No	Yes	**Not applicable** - Project does not involve activities that result in excavation or fill in navigable waters and contiguous wetlands and marshes (for example, bulkheads, shoreline protection, structure installation).
Water Quality Certification for Placing Fill or Undertaking Activities Resulting in a Discharge to Waters of the United States.			Yes	Yes	**Applicable, but exempt** - Certification is required to demonstrate that the project will not violate water quality standards if the project results in discharge to the waters of the United States and is required to obtain a Federal permit (i.e. US Army Corps Section 404 permit). Exemption: if a project is authorized under certain US Army Corps Nationwide Permits then application for an individual Water Quality Certification is not required. However, a project authorized under Nationwide Permit 38 (Cleanup of Hazardous and Toxic Waste) requires application for an individual Water Quality Certification from NYS DEC.
Coastal Erosion Control Permit	6NYCRR Part 505	NYS DEC	No	Yes	**Not applicable** - Regulates activities that may be detrimental to designated Coastal Erosion Hazard Areas. Activities include: filling, dredging, excavating, construction of buildings, docks, and other structures, drainage.

Table 3-1
List of Environmental
Permits, Ordinances, and Citations
KeySpan Sag Harbor Former MGP Site

Permit, Ordinance, or Citation	Statute, Regulation, or Authority	Agency	Applicable to Project?	State Exempted? [1]	Description of Applicability
Tidal Wetlands Permit	6NYCRR Part 661	NYS DEC	Yes	Yes	**Applicable but exempt** - Regulates activities that may be detrimental to tidal wetlands (e.g. marshes, shoals, mudflats). Activities include: filling, dredging, excavating, construction of construction of buildings, docks, and other structures, drainage. Tidal wetlands are defined on the State Tidal Wetlands Inventory maps.
Freshwater Wetlands Permit	6NYCRR Parts 663, 664, and 665	NYS DEC	No	Yes	**Not applicable** - No potential freshwater wetlands identified in project area. Regulates activities that may be detrimental to freshwater wetlands (e.g. marshes, shoals, mudflats). Activities include: filling, dredging, excavating, construction of construction of buildings, docks, and other structures, drainage. Generally, a wetland must be >12.4 acres to be protected.
Long Island Well Permit	6NYCRR Part 602	NYS DEC	Yes	Yes	**Applicable but exempt** - Regulates installation and operation of groundwater extraction wells to protect groundwater resources in certain counties located on Long Island. Applies when the total capacity of well(s) on a property is in excess of 45 gallons per minute. Minor projects include temporary dewatering systems withdrawing less than 1 million gallons per day.

Table 3-1
List of Environmental Permits, Ordinances, and Citations
KeySpan Sag Harbor Former MGP Site

Permit, Ordinance, or Citation	Statute, Regulation, or Authority	Agency	Applicable to Project?	State Exempted? [1]	Description of Applicability
State Pollutant Discharge Elimination System (SPDES) Permit - Industrial Discharges	6NYCRR Parts 750-757 and several Parts of 40CFR	NYS DEC	Yes	Yes	**Applicable but exempt from full SPDES permit, instead applying for a SPDES Permit Equivalent** - Regulates water discharges to waters of the state from industrial sources to protect human health, recreation, and fish and wildlife. There are general permits that apply to specific categories of discharges and individual permits for site-specific discharges that do not fall in the general categories. Many aspects related to the discharge are regulated including: construction or use of outlet structures, construction and operation of water treatment systems, Best Management Practices, effluent monitoring schedules and procedures, and physical and chemical criteria for effluent.
State Pollutant Discharge Elimination System (SPDES) Permit - Construction Stormwater	6NYCRR Parts 750-757 and several Parts of 40CFR	NYS DEC	Yes	Yes	**Applicable but exempt** - Regulates stormwater discharges from construction activities to waters of the state to protect human health, recreation, and fish and wildlife. Projects that disturb < 1 acre are exempt. Many aspects related to the discharge are regulated including: construction or use of outlet structures, construction and operation of water treatment systems, Best Management Practices, effluent monitoring schedules and procedures, and physical and chemical criteria for effluent. **The subcontractor will be responsible for developing and implementing the SWPPP.**
Use of Lands Underwater - easements and approvals	Article 6, Section 75 of the Public Lands Law	NYS OGS	Yes	No	**Applicable for onsite phase of work** - Apply to obtain an easement for use of state-owned underwater lands for structures, slips, moorings, docks, and other purposes.
Navigation Law - Floating Objects Permit	Section 35-a of the NYS Navigation Law	NYS OPRHP	Potentially	Yes	**Potentially applicable but exempt** - Required for any anchored marker or platform floating on the surface of the water other than aids to navigation, e.g. mooring buoys, fishing buoys, and special anchorage areas.

Table 3-1
List of Environmental
Permits, Ordinances, and Citations
KeySpan Sag Harbor Former MGP Site

Permit, Ordinance, or Citation	Statute, Regulation, or Authority	Agency	Applicable to Project?	State Exempted? [1]	Description of Applicability
Air - Title 5, State permits, Registrations	6NYCRR Parts 200-201 Title V: Part 201-6 State: Part 201-5 Registration: Part 201-4	NYS DEC	No	Yes	**Not applicable and exempt** - Permits are issued for construction and operation of air pollution sources. Title 5 is not applicable as project is not likely to generate emissions that exceed major stationary source thresholds (25 tons per year volatile organic compound [VOCs] - Suffolk County is a Severe Non-Attainment Area for VOCs). State permit or registration are not applicable - if an operation is exempted from or does not qualify for a Title 5 permit, then NYS DEC will issue a State air permit, except for certain activities which qualify for Air Registration. Certain types of petroleum storage tanks are exempt from permitting and registration requirements (6NYCRR 201-3.2(c)(21)-(27)).
State Environmental Quality Review (SEQR)	6NYCRR Part 617	NYS DEC	Yes	Yes	**Applicable but exempt** - State Environmental Quality Review is not required for Type II actions, which include actions required to be taken pursuant to a judgment or an administrative or judicial order.
Navigational Warnings	33 CFR 88.15	Coast Guard	Yes	No	Applicable to onsite phase of work - Need to provide notification to the Coast Guard of navigational hazards (i.e. discharge pipeline in the harbor). The Coast Guards will specify requirements for lights and signals and issue a navigational hazard warning to mariners.

Table 3-1
List of Environmental
Permits, Ordinances, and Citations
KeySpan Sag Harbor Former MGP Site

Permit, Ordinance, or Citation	Statute, Regulation, or Authority	Agency	Applicable to Project?	State Exempted? [1]	Description of Applicability
Local					
Coastal Consistency Review	Village Code Chapter 52A	Village of Sag Harbor	Yes	Yes	**Applicable but exempt** - Required so the municipality can determine if the project is consistent with the Local Waterfront Revitalization Program. This requirement does not apply to Type II actions as defined under SEQRA, including actions required to be taken pursuant to a judgment or an administrative or judicial order (Code of the Village of Sag Harbor, New York, Chapter 52A, Section 3.B(22)).
Wetlands Permit	Village Code Chapter 53A	Village of Sag Harbor	Yes	No	**Applicable to onsite phase of work** - Regulates activities that involve drainage, dredging, or excavation of soil/sediment from or discharge of pollution to any freshwater or tidal wetlands or land underwater within the boundaries of the Village.
Environmental Quality Review	Village Code Chapter 15 6NYCRR Part 617	Village of Sag Harbor NYS DEC	Yes	Yes	**Applicable but exempt** - Environmental Quality Review is not required for Type II actions as defined under SEQRA, which include actions required to be taken pursuant to a judgment or an administrative or judicial order.
Demolition Permit	Village Code Chapter 10	Village of Sag Harbor	Yes	No	**Applicable** - A demolition permit is required to show that the demolition will be covered by sufficient liability insurance to indemnify the Village of Sag Harbor from liability for any injuries which may be sustained during the demolition. **The demolition subcontractor will be responsible for obtaining this permit.**
Building Permit	Village Code Chapter 7	Village of Sag Harbor	Yes	No	**Applicable to the onsite phase of work** - A building permit is required before erecting any building structures, including a sprung structure tent.

Table 3-1
List of Environmental Permits, Ordinances, and Citations KeySpan Sag Harbor Former MGP Site

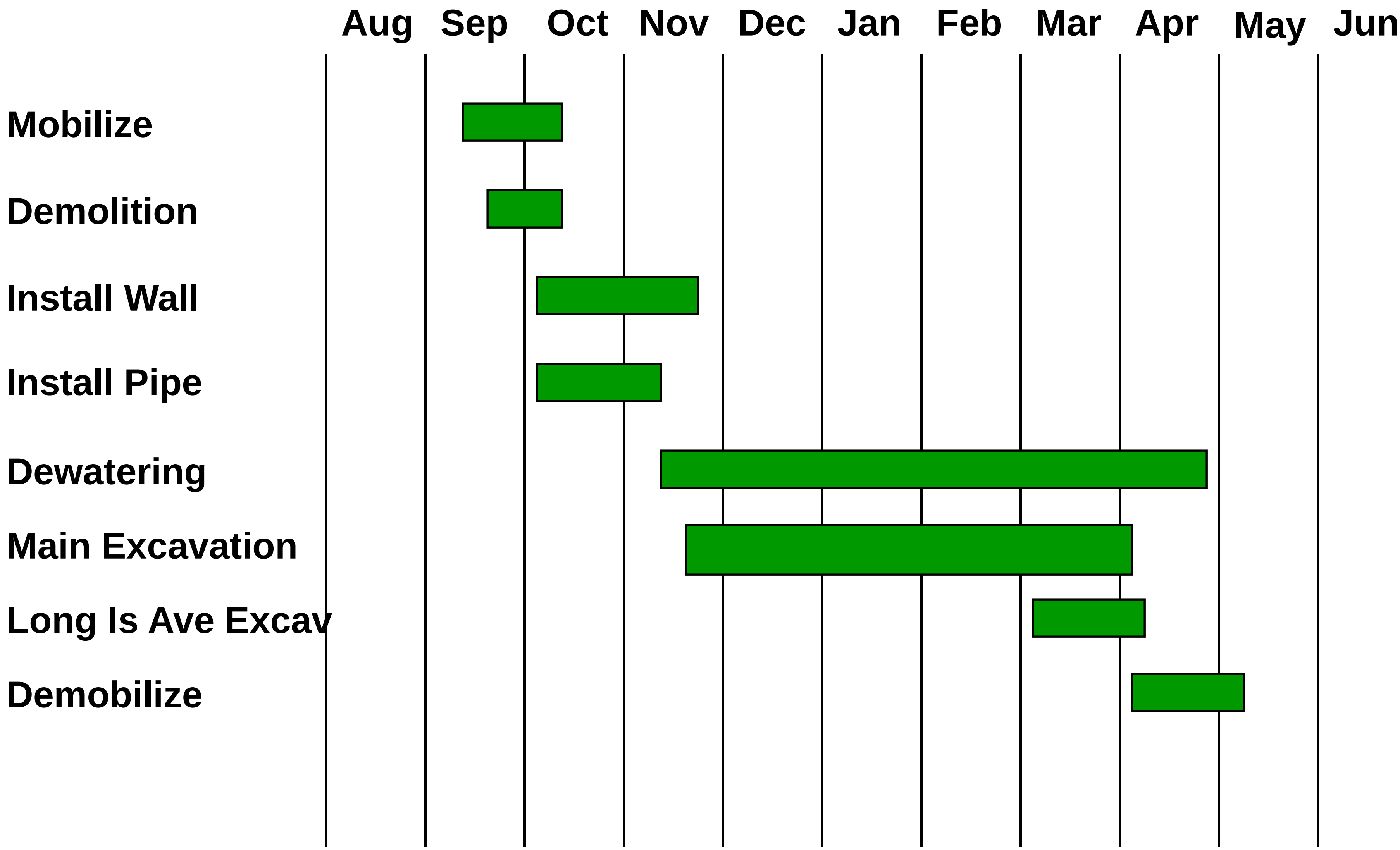
Permit, Ordinance, or Citation	Statute, Regulation, or Authority	Agency	Applicable to Project?	State Exempted? [1]	Description of Applicability
Street excavation permit Sidewalk encumbrance permit Street encumbrance permit	Village Code Chapter 45	Village of Sag Harbor	Yes	No	**Applicable** - Permits are required to excavate in Village streets or sidewalks, and to obstruct streets and sidewalks. Separate permits may be needed for different stages of work depending on their location (such as during horizontal drilling for freeze-wall activities and excavation of Bridge Street).
Toxic and Hazardous Materials Storage and Use	Village Code Chapter 18 Suffolk County Articles 7 and 12	Village of Sag Harbor Suffolk County Dept. of Health Services	Potentially	No	**Potentially applicable** - Village permits are issued by the fire marshal for use or storage of certain hazardous or dangerous materials. A permit may also be required from the County to construct and operate a hazardous materials storage facility. This could apply to materials to be stored for in situ solidification or freeze-wall activities. The subcontractor will be responsible for obtaining this permit(s).

Notes:

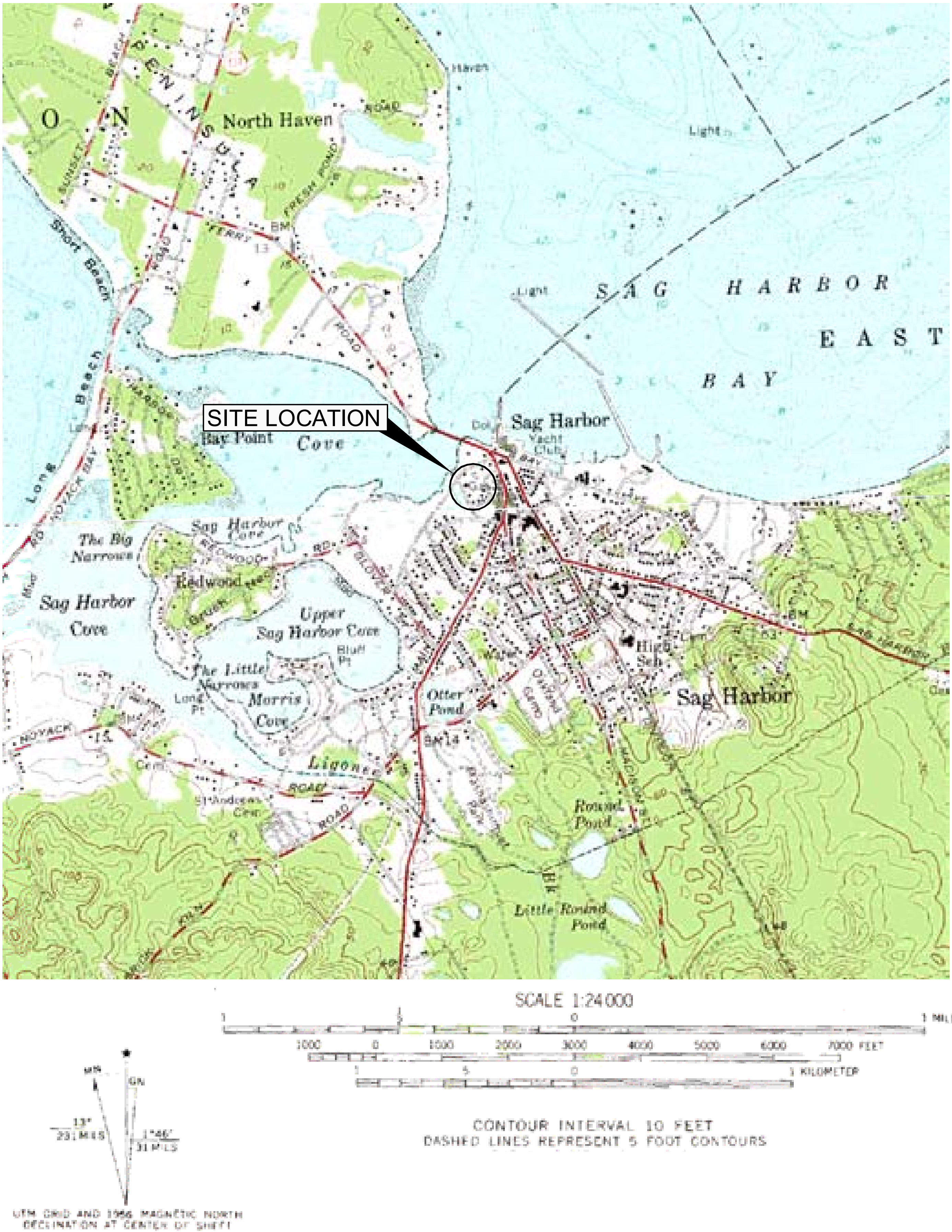
NYS - New York State
DEC - Department of Environmental Conservation
DOS - Department of State
OGS - Office of General Services
OPRHP - Office of Parks, Recreation and Historic Preservation
USEPA - United States Environmental Protection Agency
US Army Corps - United States Army Corps of Engineers
Village Code - Code of the Village of Sag Harbor, New York
SEQRA - State Environmental Quality Review Act
Coast Guard - United States Coast Guard

[1] - Remedial actions being conducted under an order are exempt from applying for certain permit from NYS DEC (Draft DER-10 Technical Guidance for Site Investigation and Remediation, December 2002, Subsection 7.3 and Appendix 7B)

Table 6-1 Design and Remedy Schedule
Sag Harbor Former MGP Site
Sag Harbor, New York



Figures



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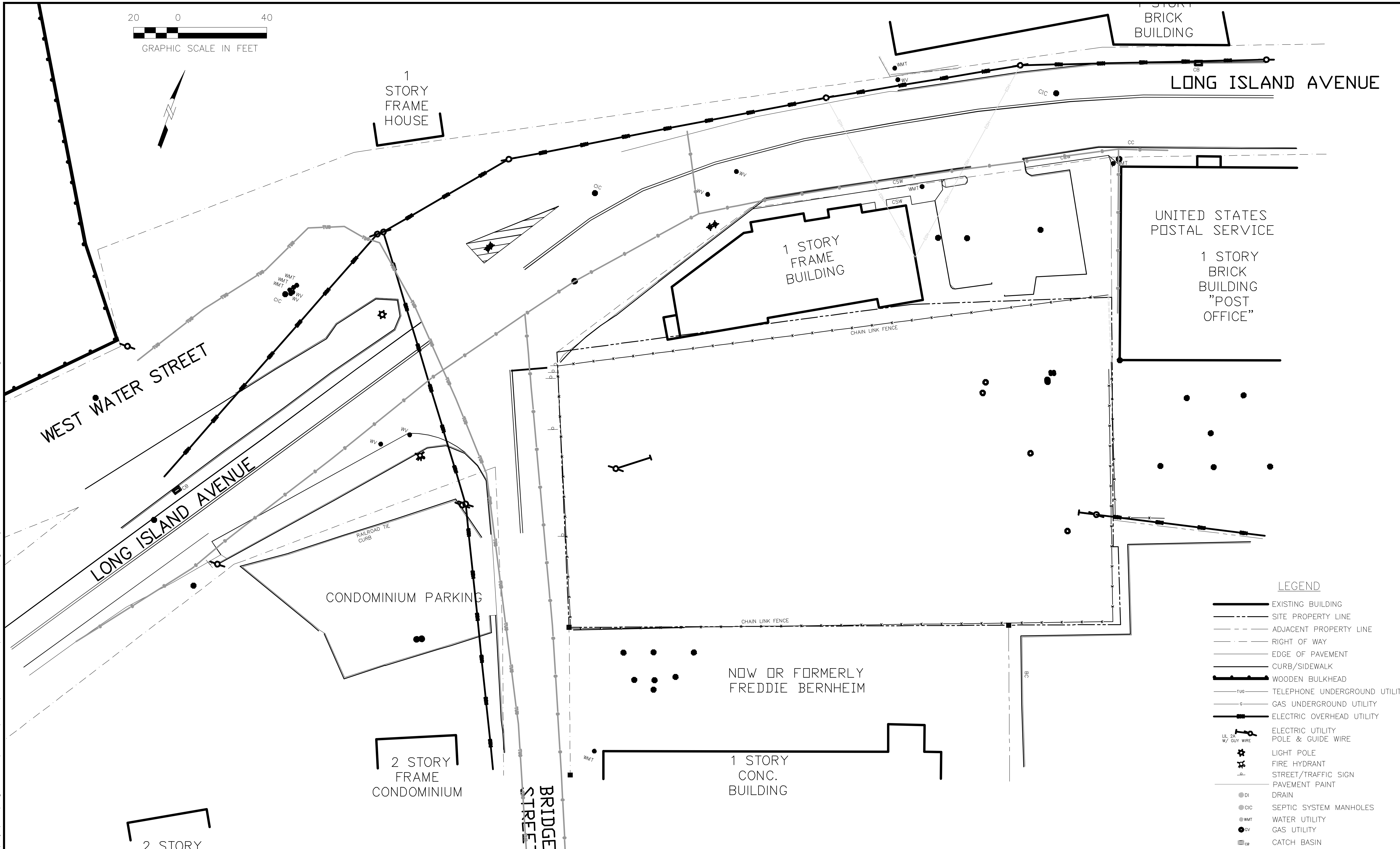
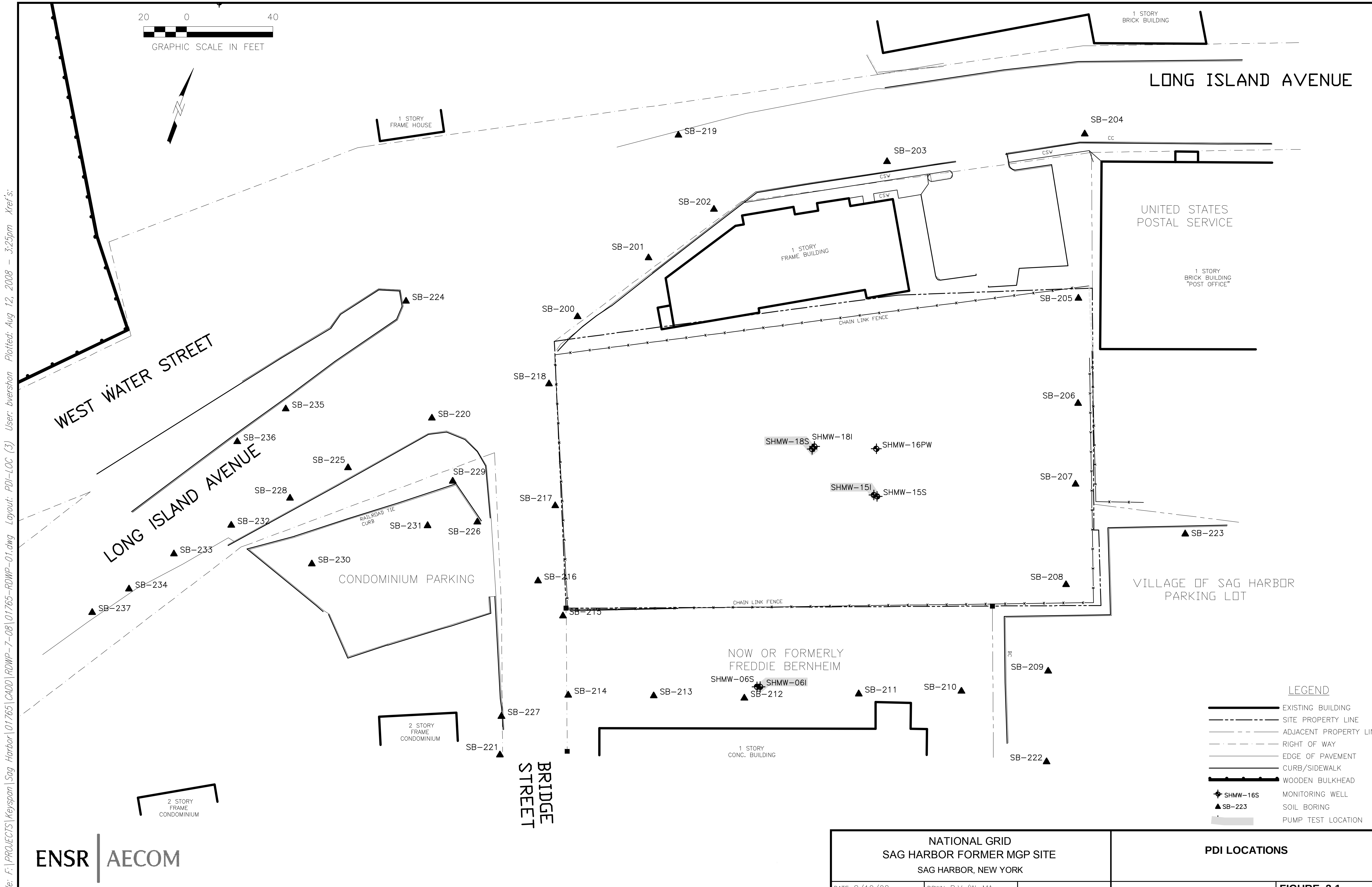
ENSR | AECOM

NATIONAL GRID SAG HARBOR FORMER MGP SITE SAG HARBOR, NEW YORK	**SITE LOCATION MAP**
DATE: 08/11/08 DRWN: BcV/W-MA	**FIGURE 1-1**



ENSR | AECOM

NATIONAL GRID SAG HARBOR FORMER MGP SITE SAG HARBOR, NEW YORK	SITE LAYOUT
DATE: 8/12/08 DRWN: B.V./W-MA	FIGURE 1-2

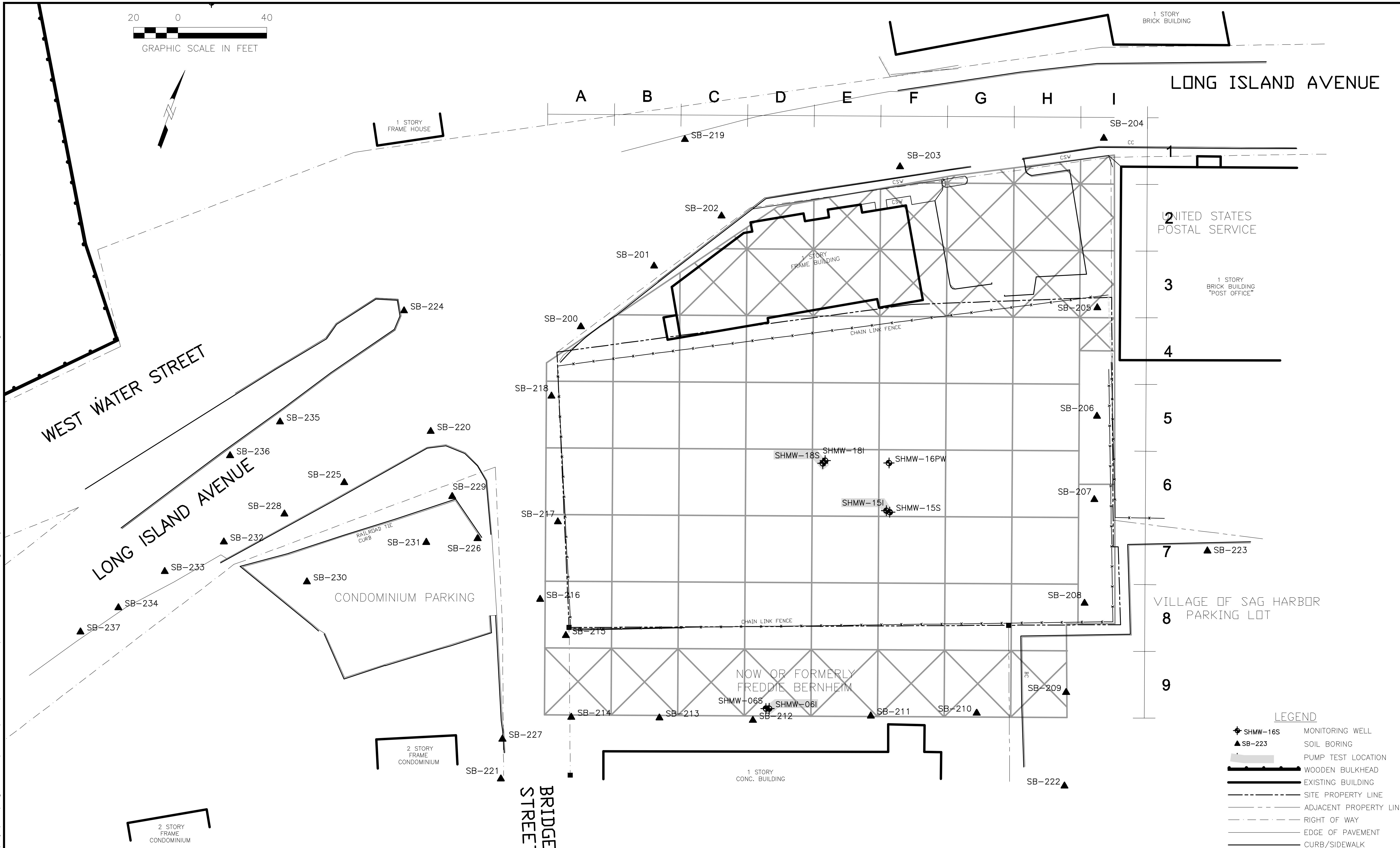


NATIONAL GRID
SAG HARBOR FORMER MGP SITE
SAG HARBOR, NEW YORK

PDI LOCATIONS

DATE: 8/12/08 | DRWN: B.V./W-MA

FIGURE 2-1



ENSR | AECOM

NATIONAL GRID
SAG HARBOR FORMER MGP SITE
SAG HARBOR, NEW YORK

DATE: 8/12/08 | DRWN: B.V./W-MA

PDI PRE-CHARACTERIZATION GRID LOCATION

FIGURE 2-2

File: F:\PROJECTS\Keyspan\Sag Harbor\01765\CADD\RDMP-7-08\01765-RDMP-01.dwg Layout: GRID-LOC User: bvershon Plotted: Aug 12, 2008 - 4:47pm Xref's:

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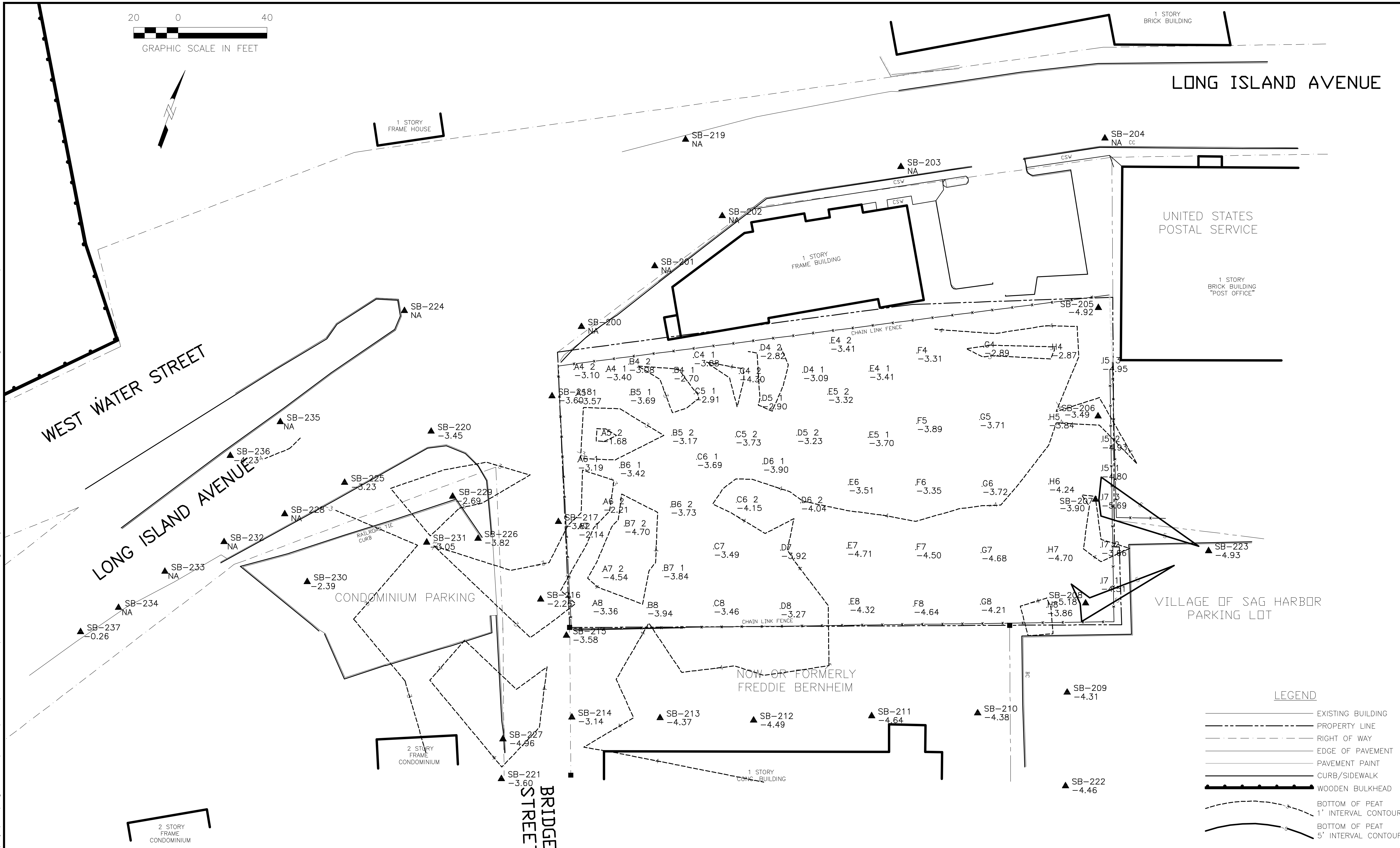
ENSR | AECOM

NATIONAL GRID SAG HARBOR FORMER MGP SITE SAG HARBOR, NEW YORK	**SUMMARY OF VISUAL IMPACTS OBSERVED DURING PDI ACTIVITIES**
DATE: 8/12/08 DRWN: B.V./W-MA	**FIGURE 2-3**



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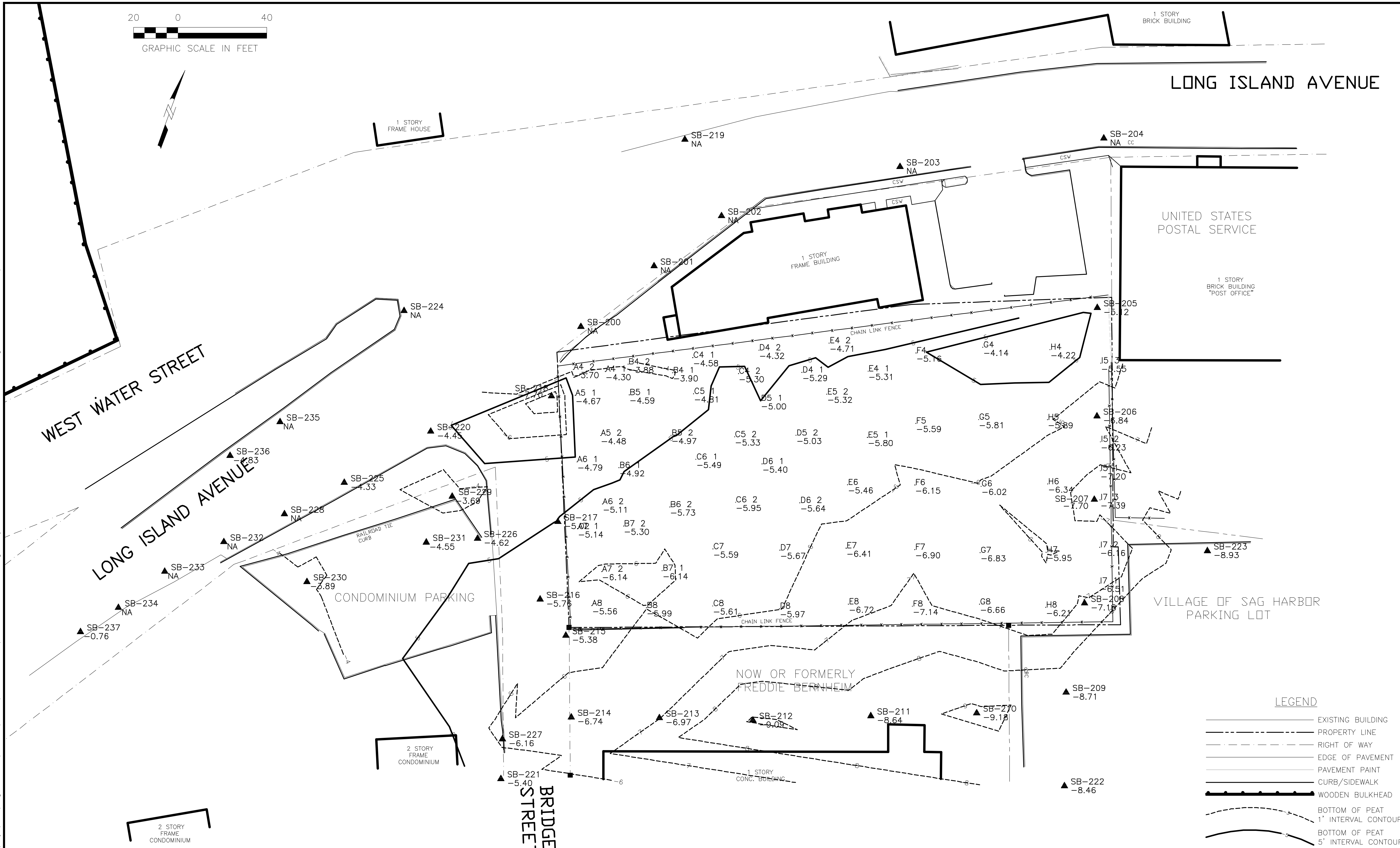
ENSR | AECOM

NATIONAL GRID
SAG HARBOR FORMER MGP SITE
SAG HARBOR, NEW YORK

DATE: 8/12/08 | DRWN: B.V./W-MA

TOP OF PEAT

FIGURE 2-4



ENSR | AECOM

NATIONAL GRID SAG HARBOR FORMER MGP SITE SAG HARBOR, NEW YORK	BOTTOM OF PEAT
DATE: 8/12/08 DRWN: B.V./W-MA	FIGURE 2-5

File: F:\PROJECTS\Keyspan\Sag Harbor\01765\CADD\RDMP-7-08\01765-RDMP-01.dwg Layout: BOT-P User: bvershon Plotted: Aug 12, 2008 - 3:49pm Xref's:

Appendices

Appendix A

Design Documents – Issued to Bid (Hard Copy and CD Format)

Technical Specifications

Remediation Design

KeySpan Corporation
Manufactured Gas Plant
Sag Harbor, New York

Prepared by:

ENSR
78 Main Street
Nyack, NY 10960

ENSR Project Number: 01765-066-003

Prepared for:

KeySpan Corporation
175 East Old Country Road
Hicksville, NY 11801

May 9, 2008

TABLE OF CONTENTS

SECTION 01110
SUMMARY OF WORK

PART 1 – GENERAL

1.01. SECTION INCLUDES:

A. Defined Terms

B. Existing Conditions

C. Project Summary

D. Work by Others

E. Work Sequence

1.02. DEFINED TERMS:

F. **Agreement:** A term synonymous with the Contract between the Owner and the Contractor.

G. **Application for Payment:** The form, set forth in the Bidding Documents and accepted by the Engineer, which is to be used by Contractor in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

H. **Bid:** The offer or construction proposal of the Bidder submitted on the prescribed form(s) setting forth the prices for the Work to be performed.

I. **Bid Form:** The form provided with the Bidding Documents, including Schedules A through G, which must be executed by the Bidder.

J. **Bid Item:** A part of the Work, listed on Schedule A, Schedule of Quantities and Prices, which is defined in the Specifications and measured for payment in accordance with the Specifications.

K. **Bidder:** One who submits a Bid directly to the Owner as distinct from a sub-Bidder, who submits a bid to a Bidder.

L. **Bidding Documents:** The documents issued by the Owner setting the requirements for the Work and the procedures for submitting bids: the advertisement or Invitation to Bid, Bid Form, Specifications, and Drawings.

M. **CAMP:** Community Air Monitoring Plan outlines requirements for ambient air monitoring at the Project Site. It is prepared and executed by the Engineer.

N. **Change Order:** A written instrument, in the specified form, executed by the Owner and Contractor that changes the Contract Price or Contract Time described in Specification Section 01250 – Contract Modification Procedures.

O. **Confirmation Sample:** Sample of soil obtained from floor or wall of an excavation, or treated water to be discharged, sent to an outside analytical laboratory to determine if the sample meets applicable requirements.

P. **COI:** Constituents of interest. The chemical compounds that are typically present at an MGP site. The COI consist of volatile organic compounds and semi-volatile organic compounds.

Q. **Construction Manager:** ENSR or it's designated agent authorized to to supervise the remedial construction activities and to ensure that the requirements of the Contract Documents are met. The term Engineer, Construction Manager, and ENSR may be used interchangeably in this Specification.

R. **Construction Milestones:** Those activities and required completion dates provided on Bid Form Schedule F – Construction Milestones that are deemed critical for ensuring that the Work progresses as required.

S. **Contract/Contract Documents:** The Contract between the Owner and the Contractor, as defined by the Contract Documents. Contract Documents include the Owner Purchase Order, Terms and Conditions, Bid Form, and Bid Form Schedules A through G, the Specifications, the Drawings, Project Plans identified in this Specifications Section, any properly executed Change Orders and Work Change Directives, and any properly executed Work Orders or addendums pertaining to Work set forth in the Specifications or Change Orders.

T. **Contract Price:** The amount payable to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement.

U. **Contract Times:** The period stated in the Bid Form Schedule F, Construction Milestones, required to complete the specified Milestones, to achieve Substantial Completion or to complete the Work.

V. **Contractor:** The person, firm, or corporation with whom the Owner has entered into the Agreement to perform the Work specified herein.

W. **Daily Construction Report**: The Contractor's Daily Construction Report described in Specifications Section 01320 – Construction Progress Documentation.

SECTION 01110
SUMMARY OF WORK

X. **Decontamination Zone:** Transition area between the Exclusion Zone(s) and the Support Zone(s) or other non-exclusion areas of the Secured Zone(s) where impacted soil and other undesirable materials can be cleaned from personnel and equipment.

Y. **Dewatering:** The process of removing surface water or groundwater that accumulates in work areas.

Z. **Disturbed Areas:** Areas that have been disrupted or otherwise changed from their pre-construction conditions by the Contractor's activities that have not been restored as required by the Contract Documents.

AA. **Drawings:** The Drawings that show the scope, extent, and character of the Work to be furnished and performed by Contractor and which have been prepared or approved by the Engineer and are included within or referred to in the Contract Documents. Shop Drawings are not Drawings as so defined.

BB. **Engineer:** ENSR or its designated agent authorized to monitor conformance of the Contractor's Work with the Contract Documents. The Engineer is also the Construction Manager for the Work. The term Engineer, Construction Manager, and ENSR may be used interchangeably in this Specification.

CC. **Engineer's HASP:** The Site-Specific Health and Safety Plan provided by the Engineer.

DD. **ENSR:** ENSR Corporation (merged with The RETEC Group, Inc. in 2007) who is the Engineer and Construction Manager for the Work and is managing the Work in the interest of the Owner.

EE. **ENSR Field Order (EFO):** A written notice by Engineer responding to RFI, clarifying contract documents or directing Contractor to comply with the Work as detailed in the Contract Documents.

FF. **Exclusion Zone:** An area within the Secured Zone with controlled access due to the presence of Impacted Materials and other potential threats to human health or safety.

GG. **HASP:** The Site-Specific Health and Safety Plan prepared by the Contractor described in Specifications Section 01415 – Health and Safety Requirements.

HH. **Impacted:** An area, object, or material that contains or has been in contact with a substance at concentrations exceeding applicable standards or guidelines for that substance.

II. **Impacted Soil; Impacted Water:** Soil or water determined to contain chemical constituents in concentrations exceeding applicable Regulatory guidelines.

SECTION 01110
SUMMARY OF WORK

JJ. **Impacted Materials:** Impacted Soil and/or Water.

KK. **Invitation to Bid:** The letter or other transmittal attached to the Bidding Documents.

LL. **Issuing Office:** The office of the Owner from which the Bidding Documents are to be issued and where the bidding procedures are to be administered is identified below:

KeySpan Energy Delivery – Long Island
175 East Old Country Road
Hicksville, NY 11801
Attn: Theodore O. Leissing
Phone: (516)545-2563
Fax: (516) 545-2582
Email: tleissing@keyspanenergy.com

MM. **Laws and Regulations; Laws or Regulations:** Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

NN. **Manufacturer:** A manufacturer, fabricator, distributor, material supplier or vendor having a direct contract with Contractor or with any Sub-Contractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Sub-Contractor.

OO. **MGP:** Manufactured Gas Plant.

PP. **MGP Residual:** By products and chemical residues of past MGP operations found as NAPL or as COI in soil, groundwater, or surface water.

QQ. **NAPL:** Non-aqueous phase liquid.

RR. **Notice of Award:** The written notice by the Owner to Contractor stating that upon compliance with the conditions stated therein, within the time period specified, the Owner shall issue the Work Order for the Work under the existing Agreement.

SS. **Non-Conforming:** An adjective, which when modifying the word Work, refers to Work that is unsatisfactory, faulty, or deficient, in that it does not meet the requirements of a specified inspection, reference standard, test, approval, or performance requirement referred to in the Specifications or Drawings, or has been damaged prior to ENSR's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion).

TT. **Normal Work Hours:** The hours during which the Contractor may perform the Work as defined in the Specifications.

UU. **NYSDEC:** New York State Department of Environmental Conservation is the State regulatory agency overseeing the work.

VV. **Off-site Disposal Facilities:** Waste management facilities, approved by the Owner, where excavated material, spoils, and construction derived liquids will be transported by the Contractor for disposal.

WW. **Odor, Vapor, and Dust Control Plan (OVDCP):** A plan documenting the fugitive emission mitigation requirements for the Project Site. It is prepared by the Engineer and executed by the Contractor.

XX. **Owner:** KeySpan Energy Delivery – Long Island owns the Work.

YY. **PPE:** Personal Protective Equipment.

ZZ. **Progress Schedule:** The Progress Schedule described in Specifications Section 01320 – Construction Progress Documentation.

AAA. **Project:** Phase I Soil Mix Wall – Sag Harbor Gas former Manufactured Gas Plant Site.

BBB. **Project Engineer:** The individual who may be assigned to the Project by the Engineer to provide on-site Engineering support during construction.

CCC. **Project Plans:** Project Plans which will be considered Contract Documents include the Contractor's Technical Execution Plan, the Contractor's and the Engineer's Health and Safety Plans, the Contractor's Stormwater Pollution Prevention Plan, the Community Air Monitoring Plan, the Citizen's Participation Plan, the Transportation Plan, the Odor, Vapor, and Dust Control Plan and the Permitting Plan.

DDD. **Project Site:** The Project Site is the Sag Harbor former MGP, located at Long Island Ave. and Water Street in the Village of Sag Harbor, Suffolk County, New York. The Project Site includes the property owned by the Owner (site), the privately owned property to the north of the site (Schiavoni Property), portions of the commercial property to the south of the site, and adjacent Village of Sag Harbor Right of Ways (including sidewalks and streets) as defined in the Drawings..

EEE. **Project Superintendent:** The Contractor's Project Superintendent described in Specifications Section 01310 – Project Management and Coordination.

FFF. **Record Documents:** The Record Documents and reports described in Specifications Section 01320 – Construction Progress Documentation.

SECTION 01110
SUMMARY OF WORK

GGG. **Remediation:** Activities performed by the Contractor or Others to remove or mitigate the environmental effects of residuals and other hazardous substances present in Project Site soil, groundwater, or surface water.

HHH. **Request for Information (RFI):** A written notice by Contractor to receive clarification, direction, or explanation from the Engineer regarding the Work.

III. **Samples:** Physical examples of material, equipment, or Workmanship that are representative of some portion of the Work, and which establish the standards by which such portion of the Work will be evaluated.

JJJ. **Schedule of Values:** The Schedule of Values as defined in paragraph 1.02(A) of Specifications Section 01290 – Payment Procedures.

KKK. **Secured Zone:** The area(s) within which Contractor shall perform the Work and where Contractor has primary responsibility for operation, security, and safety of materials, equipment, and personnel.

LLL. **Site:** The site includes a 0.8 acre parcel that is bordered by Bridge Street to the east and West Water Street and Long Island Ave. to the north and is owned by the Owner. A portion of the former Sag Harbor MGP is located on the site.

MMM. **Site Construction Manager:** The authorized representative of the Engineer who may be assigned to the Project Site or any part thereof.

NNN. **Soil Mix Wall (SMW):** A wall to be constructed along the site perimeter consisting of existing soils mixed in-place with Portland Cement using large diameter augers.

OOO. **SPDES:** State Pollution Discharge Elimination System

PPP. **Specifications:** Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, standards, workmanship, measurement, and payment as applied to the Work and certain administrative details, applicable thereto.

QQQ. **SSHO:** The Contractor’s Site Safety and Health Officer described in Specifications Section 01415 – Health and Safety Requirements.

RRR. **Subcontractor:** An individual, firm, or corporation having a direct contract with the Contractor or with any other Subcontractor for performance of a part of the Work.

SSS. **Submittals:** The Submittals described in the Specifications including, but not limited to, Specifications Section 01330 – Submittal Procedures.

SECTION 01110
SUMMARY OF WORK

TTT. **Substantial Completion:** Substantial Completion shall mean all on-site Work is complete except for demobilization, contract closeout, and ongoing maintenance activities described in the Contract Documents. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

UUU. **Successful Bidder:** The Bidder to whom the Owner awards the Contract for the Work.

VVV. **Supplier:** A manufacturer, fabricator, distributor, or vendor having a direct Contract with Contractor or with any Sub-Contractor to furnish materials or equipment to be incorporated in the Work by Contractor or any subcontractor.

WWW. **Support Zone:** Designated area within the Secured Zone that contains no Impacted Materials or construction hazards.

XXX. **T&M:** Time and materials.

YYY. **Technical Execution Plan:** A written Work plan, submitted by Bidder in accordance with the requirements of the Bidding Documents, and subsequently modified by Contractor in accordance with the Contract Documents, that describes methods, materials, and sequences of specific Work items.

ZZZ. **Transportation Plan:** A plan documenting allowable trucking routes and procedures prepared by the Engineer and executed by the Contractor.

AAAA. **Underground Facilities:** All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities that have been installed underground.

BBBB. **Weekly Progress Meetings:** The Weekly Progress Meeting referred to in Specifications Section 01310 – Project Management and Coordination.

CCCC. **Work:** The entire completed construction and the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, performing or furnishing services or transportation, performing treatment, and furnishing documents, all as required by the Contract Documents.

DDDD. **Work Change Directive:** The Work Change Directive described in Specifications Section 01250 – Contract modification Procedures.

SECTION 01110
SUMMARY OF WORK

EEEE. Work Order: The Work Order described in the Specifications Section 01290 – Payment Procedures.

FFFF. Work Zones: Areas of the site where Work is conducted. Work zones include, but are not limited to, the Decontamination Zone, Exclusion Zone, Secured Zone, and Support Zone.

1.03. EXISTING CONDITIONS:

A. The location of the Project Site is shown on the Drawings.

B. The existing surface layout of the Project Site is shown on the Drawings.

C. Utilities and Facilities shown or indicated:

1. The information and data shown or indicated on the Drawings with respect to existing utilities and facilities at or contiguous to the Project Site are based on information and data furnished to the Owner or the Engineer by the Owners of such utilities or facilities or by Others.

2. The Owner and the Engineer shall not be responsible for the accuracy or completeness of any such information or data relating to utilities or facilities. Contractor is required to verify all locations prior to subsurface Work.

3. The cost of all of the following shall be included in the Contract Price and the Contractor shall have full responsibility for:

a. Reviewing and checking all information and data regarding existing conditions.

b. Locating all existing utilities and facilities.

c. Coordination of the Work with the Owners of existing utilities and facilities during construction.

d. The safety and protection of all existing utilities and facilities designated to be protected on the Drawings, and repairing any damage resulting from the Work.

D. Environmental Conditions:

1. Subsurface soils and groundwater in some portions of the Project Site are impacted with MGP residuals. For that reason, the Work is subject to the requirements for hazardous waste operations specified in Federal Occupational Safety and Health regulation 29 CFR 1910.120.

2. The Project Site is located near the center of the Village of Sag Harbor. Condominiums, a Post Office, marina, restaurants, and other local business are located directly adjacent to and in the vicinity of the Project Site. The Contractor should expect considerable pedestrian and vehicle traffic around the Project Site.

1.04. PROJECT SUMMARY:

A. The Project includes Work required to construct a temporary Water Treatment System, construct a network of dewatering wells, construct a subsurface Soil Mix Wall (SMW),manage all SMW spoils and grading, connect WTP effluent to the offshore pipeline constructed by Others, excavate impacted soil and subsurface structures, transport impacted materials to an off-site permitted treatment/disposal facility, and site restoration. Some components of the Work, including impacted soil excavation, stockpiling and loading must be performed under a temporary fabric structure. Specific details include:

B. The Project includes Work required to construct a Soil Mix Wall (SMW) around the Project Site perimeter, manage the spoils generated during SMW installation, and restore the Project Site. Specific details include:

1. Mobilization of crew, facilities, equipment and materials required to complete the Work.

2. Install temporary facilities and controls including sediment and erosion controls, decontamination facilities, traffic control/detour signage, stockpile areas, office trailers and all other temporary facilities.

3. Furnish and install all necessary electrical connections from the main disconnect(s) as shown on the Drawings to all Contractor’s equipment and facilities.

4. Connect WWTP effluent to the offshore discharge pipeline at the location as shown on the Drawings. Including temporary piping through the site and subsurface piping from the specified location on Bridge Street to the bulkhead connection installed by Others.

5. Construct a subsurface SMW meeting the performance requirement in the Specifications as shown on the Drawings. The SMW is part of the long term remedy for the Project Site and will also be used to provide excavation support during remedial excavation. SMW work shall also include:

a. Clearing underground obstructions in wall alignment.

b. Managing and stockpile all spoils generated during SMW installation.

c. Loading SMW spoils onto trucks and transport this material to off-site disposal facilities.

6. Construct a temporary onsite Water Treatment Facility and storage tanks in areas as shown on the Drawings.

7. Install dewatering wells. Install dewatering pumps, piping, manifolds, and electrical supply. Complete the installation of the conveyance piping to the Water Treatment System.

8. Design and erect temporary fabric structure(s) (TFS) and foundation. Install and operate TFS air handling and treatment system(s) with appropriate noise controls as specified in section 02150.

9. Perform excavation within the TFS to the grades shown on the Drawings, including relocation of TFS as necessary to perform excavation as conceptually shown on the Drawings.

10. Perform Work area and personnel monitoring. The Contractor shall be required to mitigate odor, vapor, and/or dust emissions as per the OVDCP, to address third party complaints, or upon the direction of the Engineer.

11. Transport and dispose of impacted soils and debris at owner approved disposal facilities.

12. Dismantle and remove TFS.

13. Complete balance of excavation outside of the TFS to extents and elevations shown on the Drawings.

14. Backfill and grade site to the elevations shown on the Drawings.

15. Place asphalt, topsoil and seeding as required on all disturbed areas.

16. Clean site and demobilize all construction equipment, facilities and materials.

C. Details of the scopes of individual pay items are described in Specifications Section 01270 – Measurement and Payment.

SECTION 01110
SUMMARY OF WORK

1.05. WORK BY OTHERS:

A. The Engineer will collect and analyze soil samples to characterize the soil mix wall spoils for disposal. The Contractor shall stockpile spoils in piles of approximately 300 cubic yards until disposal facility acceptance is received.

B. Fence line air monitoring shall be performed by Others, as specified in the Community Air Monitoring Plan. Work area monitoring and personnel monitoring is the responsibility of the Contractor.

C. Effluent pipeline from the bulkhead along West Water Street to final discharge location in Sag Harbor Bay will be completed in the Fall 2008 by Others.

D. The following Site Preparation activities required to implement the Work will be completed by Others prior to the Contractor's mobilization to the site:

1. Removal and abandonment of all monitoring wells will be performed during Contractor mobilization.

2. Demolition of all above grade structures.

1.06. WORK SEQUENCE:

A. The Work shall begin in September 2008. Substantial completion must be by May 22, 2009.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01140
WORK RESTRICTIONS

PART 1 – GENERAL

1.01 SECTION INCLUDES:

A. Contractor's Use of Premises
B. Access Roads
C. Parking
D. Work Hours
E. Restrictions on Noise, Dust, and Odor Emissions
F. Restrictions on Air Emissions of Toxic Chemicals
G. Protection of Existing Utilities

1.02 CONTRACTOR'S USE OF PREMISES:

A. Contractor shall confine all operations, including the storage of materials, to the designated areas of the Project Site as shown in the Drawings, or as otherwise approved in writing by the Engineer. Contractor shall be responsible for arranging for, and paying the costs of, any necessary off-site storage. Any further use of the Project Site must be approved in writing by the Engineer.

B. Storage of all materials will be limited to the site (property owned by the Owner).

C. No Impacted Materials shall be stored in vehicles or stockpiled outside of the Project Site.

D. Contractor's use of the premises shall be limited to the Work being performed under the Specifications and Drawings.

E. The Owner shall execute access Agreements to obtain permission to complete any Work that is to be conducted on properties not owned by the Owner. Contractor shall not occupy, cross, or otherwise use any of the properties not owned by the Owner until such access Agreements have been executed, and the Engineer has provided written notice to the Contractor that access is permitted.

F. Contractor shall be responsible for the security and safety of Contractor's equipment and facilities. Owner and the Engineer shall not be liable for loss or damage of Contractor's tools, vehicles, equipment, or materials, whatever the cause. Such loss or damage shall not be sufficient reason for changes in the Project Schedule.

G. Contractor shall be responsible for any damage to roadways, facilities, trees, or structures on, or adjacent to, the Project Site due to negligence, carelessness, actions, errors, or omissions on the part of the Contractor.

SECTION 01140
WORK RESTRICTIONS

1.03 ACCESS ROADS:

A. Contractor vehicles shall enter and exit the Project Site only at the locations designated on the Drawings or as otherwise approved in writing by the Engineer. All truck traffic will enter Project Site from Route 79 (Main Street), to Spring Street, to Bridge Street. All truck traffic will leave the Project Site south on Long Island Avenue, to Glover Street, to Route 79 (Main Street).

B. Contractor shall be responsible for obtaining any permits and paying any fees necessary for Contractor's use of public streets or roads.

C. Contractor shall abide by the Transportation Plan, in accordance with Village of Sag Harbor, and other local, state, and federal regulations, including, but not limited to, any flaggers and signage for impeded traffic flow on public streets.

D. Contractor shall, at all times, provide for unimpeded access for emergency vehicles to the Project Site and nearby properties.

1.04 PARKING:

A. Contractor shall park construction vehicles and construction equipment only in areas designated for such purpose.

B. Contractor employees shall park personal vehicles only in an employee parking area as designated by the Engineer.

C. Vehicles shall not be parked in any locations where they impede traffic or access to areas where Work is being conducted.

1.05 WORK HOURS:

A. Normal Work Hours shall be from no earlier than 7:00 A.M. to no later than 5:00 P.M., Monday through Friday, or as otherwise approved in advance by the Engineer, and subject to availability of adequate daylight to safely perform the Work. Contractor shall submit a Staffing Plan detailing Work hours and shift requirements as part of the Technical Execution Plan.

B. Work hours established by any ordinance, Law, or Regulation shall supersede the requirements of this Specifications Section.

C. Contractor shall conduct all Work between sunrise and sunset when there is adequate light so that the Work can be conducted safely and the Engineer can effectively observe the Work, or Contractor shall furnish adequate lighting for activities conducted by prior written approval of the Engineer between sunset and sunrise. Contractor shall provide adequate lighting at all times, as deemed necessary by the Engineer for safety reasons. However, the Engineer shall not require additional lighting if Contractor can demonstrate that light levels in the Work area meet or exceed OSHA Regulations.

D. Contractor may conduct regular equipment maintenance during hours outside of the Normal Work Hours defined in this Section. The Contractor shall notify the Engineer of such activities.

E. Contractor personnel shall not work on Project Site alone.

F. Any variation from Normal Work Hours or Work on Sundays or Holidays shall be subject to approval by the Engineer and Owner. Any request for change must be made to the Engineer no less than 48 hours in advance.

G. Emergency repairs of equipment outside of Normal Work Hours may be performed without 48-hour notice, but Contractor shall verbally notify the Engineer prior to such emergency maintenance.

1.06 IMPACTED MATERIAL CONTROL

A. Contractor shall manage the Work to ensure that impacted materials (soil, water, groundwater, soil mix wall spoils, and any other impacted materials) are not discharged from the Project Site to the surrounding streets or properties.

1.07 RESTRICTIONS ON NOISE, DUST, AND ODOR EMISSIONS:

A. Contractor is responsible for conducting all Work in accordance with Laws and Regulations concerning noise or sound levels, including the provision of the Code of the Village of Sag Harbor Chapter 33 - Noise. The contractor will be required to minimize noise to less than 65 decibels between 7:00 AM and 7:00 PM. The contractor shall not emit noise levels exceeding 50 decibels between 7:00PM and 7:00AM.

B. Contractor is responsible for conducting all Work in accordance with Laws and Regulations concerning airborne dust emissions, including the provision of the Code of the Village of Sag Harbor Chapter 38 - Peace and Good Order and Chapter 55 - Zoning, CAMP, the Engineer's HASP, and the OVDCP.

C. Contractor is responsible for conducting all Work in accordance with Laws and Regulations concerning odor emissions, including the provisions of the Code of the Village of Sag Harbor Chapter 38 - Peace and Good Order and Chapter 55 – Zoning, CAMP, the Engineer's HASP, and the OVDCP.

D. Contractor shall control the Work at all times such that noise, dust, and odor measurements do not exceed the Action Levels set forth in the CAMP, the Engineer’s HASP, and the OVDCP. A copy of the CAMP, Engineer’s HASP, and OVDCP are provided in the Remedial Design Documents.

E. The Engineer shall have authority to direct Contractor to stop Work or modify Work methods or activities as necessary to enforce compliance with the Air Monitoring Action Levels, or if the Engineer deems odor emissions, noise or sound levels, or dust emissions are exceeded.

1.08 RESTRICTIONS ON AIR EMISSIONS OF TOXIC CHEMICALS:

A. Contractor shall be responsible for conducting all Work in accordance with Laws and Regulations concerning airborne emissions of toxic chemicals including the provisions of the Code of the Village of Sag Harbor Chapter 38 - Peace and Good Order and Chapter 55 - Zoning, CAMP, the Engineer’s HASP, and the OVDCP.

B. Contractor shall control the Work at all times such that concentrations of airborne constituents measured at the Project Site fence line are below the Action Levels set forth in the Air Monitoring Plans including the CAMP, the Engineer’s HASP and the OVDCP.

C. The Engineer shall have authority to direct the Contractor to stop Work or modify Work methods or activities as necessary to enforce compliance with the Action Levels for airborne emissions of toxic chemicals and/or to address any third party complaints or issues.

1.09 PROTECTION OF EXISTING UTILITIES:

A. Contractor shall contact and cooperate with utility companies to locate all utilities (including pipelines, cables, power poles, guy wires, and other structures) on the Project Site prior to beginning the Work.

B. Contractor shall comply with the requirements of specific utility protection Laws or Regulations.

C. All utilities shall be protected from damage during construction, unless otherwise indicated to be removed or abandoned. If damaged, the utilities shall be repaired as required by the utility’s Owner at the Contractor's expense.

D. If a utility is encountered that is not shown on the Drawings or otherwise made known to the Contractor prior to beginning the Work, the Contractor shall promptly take necessary steps to assure that the utility is not damaged, and give written notice to the Engineer. The Engineer shall then review the conditions and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence of the utility.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01250
CONTRACT MODIFICATION PROCEDURES

PART 1 – GENERAL

1.01. SECTION INCLUDES

A. Submittals
B. Procedures for Changes in the Work
C. Contractor Request for Change in Contract Price or Contract Time
D. Liquidated Damages
E. Correlation of Contractor Submittals
F. Field Order Form
G. Change Order
H. Work Change Directive

1.02. SUBMITTALS

A. Contractor shall submit all documentation and correspondence regarding changes in the Work in accordance with the procedures in Specifications Section 01330 – Submittal Procedures.

1.03. PROCEDURES FOR CHANGES IN THE WORK

A. Engineer will manage the work on behalf of the Owner. Engineer shall direct all scope change requests, correspondence, and communications. Contractor shall not directly contact the Owner without prior notification of Engineer.

B. Engineer may at any time make changes in the Drawings, Specifications, and requirements of any Work Order that Engineer deems necessary or as directed by the Owner. Contractor shall not make any changes to the Drawings or Specifications except upon written notice from Engineer.

C. **Field Order** (form attached to this Section): Engineer may make minor modifications to the Work, and provide interpretations or clarifications, which do not entail any change to the Contract Price or Contract Times, through the issuance of a Field Order. The Field Order will include the date, name of person issuing it, the relevant Specification Sections or Drawing number(s), and any additional information necessary for documentation.

D. **Work Change Directive** (form attached to this Section): Engineer may order an addition, deletion, or revision in the Work, or respond to differing or unforeseen physical conditions under which the Work is to be performed, such as by adding or modifying quantities established under unit price Bid Items, by issuance of a Work Change Directive. The Work Change Directive shall be signed by the Owner's Project Manager, the Engineer's representative, and by the Contractor. The Work Change Directive shall include a description of the change to the Work, including reference to the Specifications Section(s) and Drawing number(s), the method for measurement of the Work covered by the unit price, and an estimate of the expected resulting change to the Contract Price and Contract Time.

E. **Change Order** (form attached to this Section): A Change Order will be executed for any necessary change to the Work that Contractor will perform on the basis of a unit price or lump sum price for a new Work item that is not included on the Bid Form Schedule A. The Schedule of Values shall be modified by issuance of a Change Order. The Change Order shall be signed by the Owner's Project Manager, the Engineer's representative, and the Contractor, and shall include a description of the change to the Work including reference to the Specifications Sections and Drawing numbers, the new unit price, the method for measurement of the Work covered by the unit price, and an estimate of the expected resulting change to the Contract Price and/or Contract Time.

F. If a change to the Work involves a deduction value(s) from the Work Order amount, not determinable by reference to the Schedule of Quantities and Prices, the Engineer's estimate of same shall be accepted by Contractor if Contractor fails to submit its own estimate within five (5) working days following notice of such proposed change. The amount of such deduction shall, at the Owner's option, be a lump-sum amount agreed upon between the Owner and Contractor, or the actual cost saved on labor, material, and equipment usage, which would have been necessary for the portion of the Work not performed.

G. The amount to be allowed to the Contractor in excess of the Work Order amount for the performance of additional Work, unless being accomplished on a Time and Materials (T&M) or Cost Plus Percentage (CP) basis, or determined upon reference to an applicable unit price, shall be a lump sum agreed upon between parties.

H. In the event that the Contractor performs any Work on a T&M or CP basis, Contractor shall submit supporting documentation prior to the Application for Payment. No T&M work shall be performed without written Owner and Engineer approval.

I. Contractor agrees that if the Owner and Engineer are not satisfied with the price or schedule quoted by the Contractor, for any change in the Work with a value estimated by the Engineer to be more than $25,000, the Owner may engage another Contractor to perform the change in the Work.

J. If the Engineer and Contractor are not able to agree as to the amount, either of money or time, to be allowed or deducted for any changes in the Drawings, Specifications, or requirements for the Work or any Work Order, it shall, nevertheless, be the duty of the

Contractor, upon written notice from the Engineer, to proceed immediately with the changes and continue the Work as directed by the Engineer.

K. All out-of-scope work performed by the Contractor shall be brought to the attention of the Engineer immediately. Under no circumstances shall any out-of-scope work be performed prior to Engineer notification and Owner approval. Written notification must follow within 24-hours of the verbal notification.

1.04. CONTRACTOR REQUEST FOR CHANGE IN CONTRACT PRICE OR CONTRACT TIME

A. Contractor shall maintain detailed records of Work done on the basis of T&M. Contractor shall include documentation with the Daily Construction Report itemizing T&M Work for verification and approval by the Engineer each day that the Contractor performs Work on the basis of T&M.

B. Contractor shall document each request for a change in cost or time with sufficient data to allow the Engineer's evaluation of the request, and, if deemed necessary by the Engineer, Contractor shall provide the following types of additional data to support computations:

1. Quantities of products, labor, and equipment.
2. Taxes, where applicable.
3. Overhead and profit.
4. Justification for any change in Contract Time.

C. Contractor shall support each claim for additional costs with the following additional information for verification by the Engineer:

1. Origin and date of claim.
2. Dates and times Work was performed, and by whom.
3. Time records for labor and equipment solely applicable to claim.
4. Invoices and receipts for products, equipment, and Subcontractors, similarly documented.

D. Mark-up for overhead and profit is limited to 10% for work performed under Change Order.

SECTION 01250
CONTRACT MODIFICATION PROCEDURES

1.05. LIQUIDATED DAMAGES

A. Contractor shall compensate the Owner for all expenses incurred after the Milestone date for Substantial Completion as specified in Bid Form Schedule F, Construction Milestones or any approved modified Project completion date based on a properly executed Change Order.

B. Reimbursed expenses for liquidated damages include the Engineer's labor, environmental monitoring, performance monitoring, analytical testing, rental costs, and other expenses incurred by the Owner.

C. Liquidated damages shall be $3,000 per calendar day for the items listed in 1.05.B above.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01. CORRELATION OF CONTRACTOR SUBMITTALS

A. Contractor shall promptly revise the Schedule of Values and Application for Payment forms to record each authorized Work Change Directive or Change Order as a separate line item and adjust the Contract Price.

B. Contractor shall promptly revise Progress Schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of Work affected by the change, and resubmit.

C. Contractor shall promptly enter changes in Record Documents described in Specifications Section 01320 – Construction Progress Documentation.

END OF SECTION

Contract Modification Forms Follow

SECTION 01250
CONTRACT MODIFICATION PROCEDURES

ENSR
2 Technology Park Drive, Westford, MA 01886
T 978.589.3000 F 978.589.3100   www.ensr.aecom.com

FIELD ORDER FORM

F.O. NUMBER:	**PROJECT NUMBER:**
DATE:	**SITE LOCATION:**
ISSUED BY:	**COPIES TO:**

Subject:

Specification or Drawing No:

Reason for Change:

Details of Change:

SECTION 01250
CONTRACT MODIFICATION PROCEDURES

CHANGE ORDER

No. ____________

DATE OF ISSUANCE: EFFECTIVE DATE: ____________

OWNER
CONTRACTOR: ____________
Contract / Work Order: ____________
Name of Site: ____________ OWNER Project No: ____________

You are directed to make the following changes to the Work:

Reasons for Change Order:

Attachments:

CHANGE IN CONTRACT PRICE		CHANGE IN CONTRACT TIMES
Original Contract Price $ ____________		Date for Substantial Completion: ____________
Net Increase (Decrease) from previous Change Orders $ ____________		Date for Completion and Readiness for Final Payment: ____________
Contract Price prior to this Change Order: $ ____________		
Net increase (decrease) of this Change Order: $ ____________		
Contract Price with all approved Change Orders: $ ____________		

RECOMMENDED:	ACCEPTED:	APPROVED:
By: ____________ OWNER Field Representative	By: ____________ CONTRACTOR	By: ____________ OWNER Project Manager
Date: ____________ OWNER Field Representative	Date: ____________ CONTRACTOR	Date: ____________ OWNER Project Manager

SECTION 01250
CONTRACT MODIFICATION PROCEDURES

WORK CHANGE DIRECTIVE

No. ____________

DATE OF ISSUANCE: EFFECTIVE DATE: ______________

OWNER
CONTRACTOR: ____________________
Contract / Work Order: ____________________
Name of Site: ____________________ OWNER Project No: ______________

You are directed to proceed with the following changes to the Work:

Description:

Purpose for Work Change Directive:

Attachments:

If OWNER or Contractor believe that the above change has affected Contract Price, any Claim for a Change Order based thereon will involve one or more of the following methods as defined in the Agreement and the Specifications:

___ Unit Prices

___ Lump Sum $__________

___ Cost of the Work

Estimated increase (decrease) in Contract Price:	Estimated increase (decrease) in Contract Times:
$ __________.	Substantial Completion: ______ days;
If the change involves an increase, the estimated amount is not to be exceeded without further authorization.	Ready for final payment: _____ days.

RECOMMENDED:	ACCEPTED:	APPROVED:
By: ______________	By: ______________	By: ______________
OWNER Field Representative	CONTRACTOR	OWNER Project Manager
Date: ______________	Date: ______________	Date: ______________
OWNER Field Representative	CONTRACTOR	OWNER Project Manager

SECTION 01270
MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.01. SECTION INCLUDES:

- **A.** Quantity Estimates
- **B.** Payment
- **C.** Measurement of Quantities
- **D.** Assessment of Non-Conforming Work
- **E.** Eliminated Items
- **F.** Application for Payment
- **G.** Measurement and Payment of Bid Items

1.02. 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 Drawings and verified by the Engineer will determine payment.

B. The Engineer will determine the actual quantities and classifications of Unit Price Work performed by the Contractor. The Engineer will review with the Contractor the Engineer'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 Engineer.

1.03. PAYMENT:

A. 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.

B. 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.

C. Payment will be made by the Owner 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 Engineer, judgments of percent completion of lump sum items will be made in reference to the Schedule of Quantities and Prices.

D. Retainage (10 percent) shall be withheld from payments as specified in the Agreement.

1.04. 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 offsite waste management facilities and locations, 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 Engineer. 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 Engineer will be used.

C. Measurement by Area: Measured by square dimension using length and width or radius, and verified by the Engineer.

D. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord, and verified by the Engineer.

E. Measurement by Time: Measure by the actual time rounded to the nearest time unit and verified by the Engineer.

1.05. 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 Drawings, as assessed by the Engineer.

B. If, in the opinion of the Engineer, it is not practical to remove and replace the non-conforming Work, the Engineer 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 Engineer.

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 Engineer.

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.

1.06. ELIMINATED ITEMS:

A. Should any items contained in the 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.

SECTION 01270
MEASUREMENT AND PAYMENT

1.07. APPLICATION FOR PAYMENT:

A. Contractor shall submit Applications for Payment as specified in Specifications Section 01290 – Payment Procedures.

1.08. MEASUREMENT AND PAYMENT OF BID ITEMS:

A. Bid Form Schedule A, Schedule of Values, lists the Bid Items and Unit Price Items for the Work. Measurement and payment of the Work covered by the Contract Documents is specified herein below.

B. At the direction of the Engineer, Contractor may be asked to perform change order work on a T&M basis. Schedule E – List of Equipment, and Schedule G – List of Personnel, shall be the basis for measurement and payment of equipment and labor for Time and Materials Work. Hourly prices for equipment and labor listed on Schedule E and Schedule G shall include Contractor's overhead and profit for such Time and Materials Work.

C. The following paragraphs specify measurement and payment of the Bid items listed on Bid Form Schedule A (attached to this specification):

Bid Item 1 Mobilization and Demobilization

a. Work required to complete Mobilization and Demobilization includes, but is not limited to:

i. Movement of personnel, equipment, and materials to the site, if such movement is not included in any other Bid Item.

ii. Preconstruction coordination meetings.

iii. Preparation, submittal, and revision of all required pre-mobilization submittals as described in Specification 01330 – Submittal Procedures.

iv. Removal of all personnel, equipment, and materials from the Site at the completion of the Work.

b. Mobilization and Demobilization will be measured for payment as one unit, complete as specified.

c. Payment for Mobilization and Demobilization 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 and Demobilization" shall constitute full compensation for all labor, supervision, materials, equipment, start up submittals, incidentals and all other costs necessary to complete Mobilization and Demobilization Work, including the transport of all equipment, labor and temporary facilities and materials to and from the Site. No more than 70% of this bid item may be invoiced prior to demobilization from the site as substantial completion.

Bid Item 2 Temporary Facilities and Controls

a. Work required to complete the Temporary Facilities and Controls includes, but is not limited to:

i. Implement requirements for environmental protection specified in Specifications Section 01140 – Work Restrictions unless specifically identified as being provided by others.

ii. Provide and maintain temporary fencing and visual barrier fabric as shown on the Drawings.

iii. Provide a Rusmar foam unit of sufficient size to cover the impacted areas within 5 minutes (or equivalent) on Project Site for the duration of the excavation. Foam expendables will be paid under alternate bid item UP1.

iv. Implement health and safety requirements specified in Specifications Section 01415 – Health and Safety Requirements.

v. Install and maintain temporary facilities and controls specified in Specifications Section 01500 – Temporary Facilities and Controls unless specifically identified as being provided by Others.

vi. Implement and maintain temporary erosion and sediment controls specified in Specifications Section 01570 – Erosion and Sediment Controls unless specifically identified as being provided by Others.

vii. Cost to provide project management and oversight as specified in Section 01310.

viii. Install decontamination facilities specified in Specifications Section 02130 - Decontamination and management and disposal of any liquids or residues generated during decontamination.

ix. Maintain and repair of all temporary facilities and controls including those provided by Others during the period when Work is taking place at the site.

x. Conduct any surveying need to control and document the Work.

xi. 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.

b. Temporary Facilities and Controls Work will be measured for payment as one unit, complete as specified.

c. Payment for Temporary Facilities and Controls 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 "Temporary Facilities and Controls" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Temporary Facilities and Controls Work.

Bid Item 3 Structure Demolition

a. Work required to complete Structure Demolition includes, but is not limited to:

i. Demolition and removal of underground structures including, former MGP structures, building foundations, wooden or other piling, piping, utilities, concrete slabs, and asphalt as shown on the Drawings.

ii. Removal of underground piping and the removal of miscellaneous debris smaller than 3' in dimension shall be considered incidental to demolition and excavation pay items, no additional compensation will be made for this material. Demolition of all structures not shown on the Drawings will be handled on a Time and Materials basis and must be approved by the Engineer. Transportation and Disposal of debris will be paid for under Bid Item 13 for "Transportation and Disposal: Debris."

b. Structure Demolition Work will be measured for payment as one unit, complete as specified.

c. Payment for Structure Demolition Work will be made on a percent complete basis of the lump sum price for the Bid item "Structure

Demolition" listed on Bid Form Schedule A. Payment of the lump sum price for "Structure Demolition" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the demolition of structures identified in the Drawings and as specified in Specification Section 02220.

Bid Item 4 Temporary Fabric Structures and Controls Mobilization

a. Work to complete Temporary Fabric Structures and Controls Mobilization work include, but is not limited to:

i. Provide a Temporary Fabric Structure Design stamped by a Professional Structural Engineer licensed in the State of New York.

ii. Mobilize, erect, dismantle and demobilize the temporary fabric structures.

iii. Mobilize, install, and connect air handling and treatment system(s). Also to include dismantle and cleaning of carbon vessels, disposal of vapor phase carbon and other ancillary materials and equipment, and demobilization of all air handling and treatment equipment.

iv. Furnish and install all penetrations for the temporary fabric structures including electric power overhead doors and man doors as necessary to provide safe entrance and egress from the structures.

v. Furnish, and install all electrical connections and ancillary disconnects from the main disconnect to complete relocations of the temporary fabric structures as required to complete the Work.

b. Temporary Fabric Structures and Controls Mobilization Work will be measured for payment as one unit, complete as specified.

c. Payment for Temporary Fabric Structures and Controls 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 "Temporary Fabric Structures and Controls Mobilization" shall constitute full compensation for all labor, supervision, materials, including foundation materials, incidentals and all other costs necessary to complete Temporary Fabric Structures and Controls Mobilization work as specified in Section 02150 and as shown on the Drawings.

SECTION 01270
MEASUREMENT AND PAYMENT

Bid Item 5 Temporary Fabric Structures and Controls

a. Work to complete Temporary Fabric Structures and Controls work include, but is not limited to:

i. Operation and maintenance of Temporary Fabric Structures during excavation of impacted materials.

ii. Any necessary carbon exchanges during the Work.

iii. Relocation of Temporary Fabric Structures and air handling and treatment units to complete the conceptual sequencing as shown on the Drawings.

b. Temporary Fabric Structures and Controls Work will be measured for payment as one unit, complete as specified.

c. Payment for Temporary Fabric Structures and Controls 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 "Temporary Fabric Structures and Controls" shall constitute full compensation for all labor, supervision, materials, including incidentals and all other costs necessary to operate Temporary Fabric Structures including air handling and treatment system as specified in Section 02150 and as shown on the Drawings.

Bid Item 6 Soil Mix Wall Mobilization

a. Work required to complete Soil Mix Wall Mobilization includes, but is not limited to mobilization, set-up activities and demobilization for Soil Mix Wall equipment

b. Soil Mix Wall Mobilization Work will be measured for payment, as one unit, complete as specified.

c. Soil Mix Wall Mobilization Work will be made on a percent complete basis of the lump sum price listed on Bid Form Schedule A. Payment "Soil Mix Wall Mobilization" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Soil Mix Wall Mobilization work as specified in Specifications Section 02196 and as shown on the Drawings..

Bid Item 7 Construct Soil Mix Wall

a. Work required to complete Construct Soil Mix Wall includes, but is not limited to:

SECTION 01270
MEASUREMENT AND PAYMENT

i. Contractor shall pre-excavate obstruction (concrete and debris) to seven feet below ground surface at the locations shown on the Drawings. The debris shall be stockpiled for offsite disposal. Disposal will be paid for under Bid Item 13.

ii. Obstructions encountered beyond the locations shown on the Drawings will be paid for as follows: All obstructions encountered will be removed by the Contractor to the extent practicable with an excavator. The Engineer shall be notified immediately if an obstruction is encountered. If the obstruction cannot be removed within 15 minutes of Engineer notifications, the Engineer will either call the Soil Mix Wall column complete or direct the Contractor to continue to attempt to remove the obstruction. The first 15 minutes of obstruction removal shall be considered incidental and included at the Standby Rate in the Soil Mix Wall unit rates. The Contractor shall inspect the available borings and test pit data to fully understand the subsurface conditions in the Soil Mix Wall area. No Standby time will be paid if the Engineer is not notified of an obstruction.

iii. Provide Portland cement as described in Specifications Section 02196- Soil Mix Wall.

iv. Construct soil mix wall to the grades shown on the Drawings and as described in Specifications Section 02196- Soil Mix Wall.

v. Conduct all sampling, testing, and documentation at described in Specifications Section 02196- Soil Mix Wall.

vi. Construct and maintain berms, trenches, and/or lower working platforms to contain spoils (excess soil, cement, water mixture) generated during soil mix wall installation. The Bidders should take the high water table into account when planning these measures. The Contractor shall prevent discharge of any spoils from the work area to surrounding streets or properties.

vii. Excavate spoils generated during soil mix wall construction, and transport spoils to lined, bermed, stockpile areas. Each stockpile area will have a maximum capacity of 300 cubic yards. The Engineer will sample each stockpile and conduct analysis required to gain off-site disposal facility approval.

viii. Load the spoils from the stockpiles to trucks for transportation to the approved off-site disposal facilities. The Engineer will notify the Contractor when each 300 cubic yard pile is approved for disposal. It will take a maximum of seven days to sample a pile, conduct the analysis, and gain disposal facility approval.

b. Construct Soil Mix Wall will be measured for payment as one unit complete as specified.

c. Payment for Construct Soil Mix Wall will be made on a percent complete basis of the lump sum price as listed on Bid Form Schedule A. Payment of the lump sum price for "Construct Soil Mix Wall" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to construct the soil mix wall as specified in Specifications Section 02196- Soil Mix Wall and as shown on the Drawings.

Bid Item 8 Excavation, Stockpiling, and Loading

a. Work required to complete Excavation, Stockpiling, and Loading work includes, but is not limited to:

i. Excavation, stockpiling and loading of impacted soils beneath and outside of temporary fabric structures.

ii. Use of trench boxes for excavation support in areas shown on the Drawings or as needed for excavation stability and as specified in specification section 02260- Excavation.

b. Excavation, Stockpiling, and Loading Work will be measured for payment on a in place cubic yard basis as verified by survey of excavation bottom.

c. Payment for Excavation, Stockpiling, and Loading Work will be made in accordance with the unit price listed on Bid Form Schedule A. Payment of the unit price for "Excavation, Stockpiling, and Loading" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Excavation work as specified in Section 02260 and as indicated on the Drawings. Payment will only be made for soil excavated within the horizontal and vertical limits of excavation shown on the Drawings.

Bid Item 9 Landside Effluent Discharge Pipe

a. Work required to complete Landside Effluent Discharge Pipe work, includes, but is not limited to installing effluent piping from the temporary water treatment facility to the bulkhead connection previously installed by Others. Including but not limited to, required road opening permits, trenching, pipe bedding, pipe materials and fittings, freeze protection, backfill and temporary asphalt restoration.

b. Landside Effluent Discharge Pipe Work will be measured for payment as one unit, complete as specified.

c. Payment for: Landside Effluent Discharge Pipe Work will be made in accordance with the lump sum price for the Bid item "Landside Effluent Discharge Pipe" listed on Bid Form Schedule A. Payment of the lump sum price for "Landside Effluent Discharge Pipe" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete the installation of the Landside Effluent Discharge pipe as shown on the Drawings.

Bid Item 10 Construction Water Management

a. Work required to complete Construction Water Management includes, but is not limited to set-up, relocation (if necessary) and operation of construction water control, transmission and storage equipment.

b. Construction Water Management will be measured for payment as one unit, as specified.

c. Payment for Construction Water Management will be made on a percent complete basis of the lump sum price listed on Bid Form Schedule A. Payment shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete dewatering as specified in Section 02240 – Dewatering.

Bid Item 11 Construction Water Treatment, Set up, and Removal

a. Work required to complete Construction Water Treatment, Set up and Removal includes, but is not limited to mobilization, set up and removal of all water treatment system equipment, materials, and personnel.

b. Construction Water Treatment, Set up, and Removal will be measured for payment as one unit, as specified.

c. Payment for Construction Water Treatment, Set up, and Removal will be made on a percent complete basis of the lump sum price listed on Bid Form Schedule A. Payment for Construction Water Treatment, Set up, and Removal shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete, set-up, and removal of the construction water treatment system as specified in Section 02245.

SECTION 01270
MEASUREMENT AND PAYMENT

Bid Item 12 Construction Water Treatment Operation

a. Work required to complete Construction Water Treatment Operation includes, but is not limited to labor, materials, and equipment required for operation of the water treatment system, system O&M, data logging, quality control, materials and incidentals.

b. Construction Water Treatment Operation work measured for payment on a per day basis as documented by treatment system operation logs.

c. Payment for Construction Water Treatment Operation will be made on a day of operation basis listed on Bid Form Schedule A. Payment for Construction Water Treatment Operation shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to operate and maintain the construction water treatment system as specified in Section 02245. Payment will start when system is set up and operating as approved by the Engineer and while dewatering operations are required for excavation work.

Bid Item 13 Transportation and Disposal: Debris

a. Work required to complete Transportation and Disposal: Debris includes but is not limited to: truck preparation for transport, transportation, and final disposal excavated impacted debris at approved facility.

b. Transportation and Disposal: Debris Work will be measured for payment on a per ton basis, as documented by scale weight tickets.

c. Payment for Transportation and Disposal: 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: 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: Debris Work, as specified in Specifications Section 02120. The debris disposal facilities shall be proposed by the Bidder in the Technical Execution Plan as described in Section 01330.

Bid Item 14 Transportation and Disposal

a. Work required to complete the Transportation and Disposal pay item includes, but is not limited to transportation and disposal of excavated soil, incidental debris and soil mix wall spoils from the Project Site at disposal facilities approved by the Owner in accordance with Specification 02120 – Off-site Transportation and Disposal. Identify the proposed disposal facilities and trucking companies in the Schedule D –

SECTION 01270
MEASUREMENT AND PAYMENT

List of Subcontractors. The Contractor shall select a disposal facility from the six 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 Schedule F. 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 TEP and in Schedule A.

i. Clean Earth of Delaware, Inc., Thermal Desorption Services, located at 94 Pyles Lane, New Castle, Delaware, 19720

ii. Clean Earth of Philadelphia, Inc., Thermal Desorption Services located at 3201 South 61st Street, Philadelphia, Pennsylvania, 19153

iii. Clean Earth of Southeast Pennsylvania, Thermal Desorption Services located at 7 Steel Road East, Morrisville, Pennsylvania, 19067

iv. Environmental Soil Management, Inc., located at 304 Tow Path Road, Fort Edward, NY, 12828.

v. Environmental Soil Management, Inc., located at 75 Crows Mill Road, Keasbey, NJ, 08832

vi. Mid-Atlantic Recycling Technologies/Casie Protank, located at 3209 North Mill Road, Vineland, NJ, 08360.

b. Transportation and Disposal will be measured for payment on a per ton basis, as documented by approved disposal facility scale weight tickets.

c. Payment for Transportation and 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" 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 02120 – Off-site Transportation and Disposal.

Bid Item 15 Restoration: Gravel Backfill

a. Work required to complete Restoration: Gravel Backfill work includes, but is not limited to delivery of approved gravel backfill, placement and compaction, and density testing as specified in specifications section 02300- Backfill and Grading.

b. Restoration: Gravel Backfill will be measured for payment on an in place cubic yard basis as verified by survey.

c. Payment for Restoration: Gravel Backfill, as specified in Specifications Section 02300, will be made in accordance with the unit price for the Bid item “Restoration: Gravel Backfill” listed on Bid Form Schedule A. Payment of the unit price for “Restoration: Gravel Backfill” shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to furnish, and place Gravel Backfill at the location where the Gravel Backfill will be incorporated into the Work.

Bid Item 16 Restoration: Common Fill

a. Work required to complete Restoration: Common Fill work includes, but is not limited to delivery of approved common fill, placement and compaction, and density testing as specified in specifications section 02300- Backfill and Grading.

b. Restoration: Common Fill will be measured for payment on an in place cubic yard basis as verified by survey.

c. Payment for Restoration: Common Fill, as specified in Specifications Section 02300, will be made in accordance with the unit price for the Bid item “Restoration: Common Fill” listed on Bid Form Schedule A. Payment of the unit price for “Restoration: Common Fill” shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to furnish, and place Common Fill at the location where the Common Fill will be incorporated into the Work.

Bid Item 17 Restoration: Topsoil

a. Work required to complete Restoration: Topsoil work includes, but is not limited to delivery of approved topsoil material, any necessary analysis, required amendment, and placement as specified in specifications section 02300- Backfill and Grading.

b. Restoration: Topsoil will be measured for payment by in place cubic yards based on survey of the final common fill elevation and the final topsoil elevation.

c. Payment for Restoration: Topsoil, as specified in Specifications Section 02300, will be made in accordance with the unit price for the Bid item “Restoration: Topsoil” listed on Bid Form Schedule A. Payment of the unit price for "Restoration: Topsoil" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to furnish, and place topsoil at the location where the topsoil will be incorporated into the Work.

Bid Item 18 Restoration: Asphalt Paving

a. Work required to complete Asphalt Paving includes, but is not limited to preparation and placement of sub-base, binder course and surface courses as specified in section 02740 and on the Drawings.

b. Restoration: Asphalt Paving Work will be measured for payment on a square yard basis complete as specified.

c. Payment for Restoration: Asphalt Paving Work will be made in accordance with the unit price for the Bid item "Restoration: Asphalt Paving" listed on Bid Form Schedule A. Payment of the unit price for "Restoration: Asphalt Paving" shall constitute full compensation for all labor, supervision, materials, equipment, incidentals and all other costs necessary to complete Restoration: Asphalt Paving Work including asphalt placement, and line painting.

Bid Item 19 Restoration: Sidewalk and Curb

d. Work required to complete Restoration: Sidewalk and Curb pay item includes restoration of curb and sidewalk, in the areas designated on the Drawings. Specific activities include but are not limited to placement of sub-base as shown on the Drawings, placement of stored granite curbs, forming and finishing of replacement curbs and sidewalks as shown on the Drawings.

e. Restoration: Sidewalk and Curb will be measured for payment on a linear foot basis along the curb alignment, complete as specified.

f. Payment for Restoration Curbs and Sidewalk will be made in accordance with the unit price for the Bid item "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.

Bid Item 20 Miscellaneous Site Restoration

a. 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 parking lots, roadways, curb, sidewalk, and all other site features disturbed during implementation of the Work. Specific activities include but are not limited to:

i. Restore signage; replace wheel stops, grass seeding and planting, and replacement of railroad ties and other hardscaping that required removal to complete the Work.

ii. Install Permanent Fencing as shown on the Drawings and specified in section 32310.

iii. Remove landside effluent piping, backfill and perform seeding and planting along pipe alignment. Asphalt restoration of pipe alignment will be reimbursed under Bid Item 16: Restoration Asphalt Paving.

b. 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 Alternate Bid Items listed on Bid Form Schedule A

1. UP1: Odor Control Foam System – Expendables

a. Odor Control Foam System – Operation will be measured for payment by the gallon of odor suppressant concentrate(s) used.

b. 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.

2. UP2: Soil Mix Wall Standby Time - Hour

a. Payment for the Work shall be made on an hourly basis.

b. Payment for Excavation Standby Time – Hour will be made on an hourly basis unit price as listed on Bid Form Schedule A. Payment for Excavation Standby Time – Hour shall constitute full compensation for cease excavation Work at the direction of the Engineer for reasons not chargeable to the Contractor.

3. UP3: Soil Mix Wall Standby Time - Day

a. Payment for the Work shall be made on a daily basis.

b. 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 Engineer 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.

4. UP4: Excavation Standby Time - Hour

a. Payment for the Work shall be made on an hourly basis.

b. Payment for Excavation Standby Time – Hour will be made on an hourly basis unit price as listed on Bid Form Schedule A. Payment for Excavation Standby Time – Hour shall constitute full compensation for cease excavation Work at the direction of the Engineer for reasons not chargeable to the Contractor.

5. UP5: Excavation Standby Time - Day

a. Payment for the Work shall be made on a daily basis.

b. 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 Engineer 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.

6. UP6: Soil Amendment – Ton

a. Payment for the Work shall be made on a per ton basis of Lime Kiln Dust (LKD) as directed by Engineer.

b. 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 Engineer, including all labor, equipment, and incidentals to blend and mix LKD with excavated soils. Soil Amendment will be reimbursed if all dewatering and water treatment maximum flows and capacities are being performed to the Engineer's satisfaction and soils still require amendment prior to transportation and disposal.

SECTION 01270
MEASUREMENT AND PAYMENT

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01290
PAYMENT PROCEDURES

PART 1 – GENERAL

1.01. SECTION INCLUDES

A. Format
B. Submittal Procedures
C. Applications for Payment
D. Invoices
E. Substantiating Data
F. Application and Certification for Payment
G. Continuation Sheet

1.02. FORMAT

A. The Bid Form Schedule A, Schedule of Values (schedule of Quantity and Price), submitted by the Successful Bidder, as modified by any executed Change Order, will be the basis of all payments to the Contractor. The Engineer may require further breakdown of certain lump sum items to be included as deemed necessary by the Engineer. The Schedule of Values will serve as the basis for progress payments and will be incorporated into a form of Application for Payment as specified herein.

B. Contractor shall submit one Application for Payment and invoice, covering the Work, less retainage, as specified in the Agreement, performed in each calendar month, for each month for the duration of the Work.

C. Contractor shall submit to the Engineer an Application for Payment on the specified forms, and attach a separate invoice, for the Work completed in the calendar month covered by that Application for Payment.

1. Contractor shall submit each Application for Payment using Form S702 – Application and Certification for Payment, and Form S703 – Continuation Sheet, attached to this Section. The Schedule of Values shall form the basis for Form S703.

2. Contractor's invoice shall be a separate page or pages in a form of Contractor's choosing, acceptable to the Owner and Engineer, which includes the specified information. Contractor shall submit a separate invoice to the Engineer for each Work Order.

D. The Engineer shall return, without review, any invoice not accompanied by completed S702 and S703 forms.

E. Once the Engineer approves the Application for Payment he will sign it and forward it to the Contractor.

1.03. SUBMITTAL PROCEDURES

A. Contractor shall submit original Application for Payment and invoice, and one copy of each, to the Engineer's Work Order Representative for review.

B. Once invoice is approved by Engineer, Contractor shall submit invoice to Owner per the requirements in the Agreement.

C. Contractor shall submit invoices at intervals not less than 30 days. Contractor shall submit an invoice for each month no later than the invoice closing date of the following month as set by the Engineer.

D. Contractor shall prepare a final Application for Payment and invoice as specified in Specifications Section 01770 – Closeout Procedures.

1.04. APPLICATIONS FOR PAYMENT

A. An Application for Payment form is attached with this Specification. A completed copy of the attached Forms S702 and S703 shall accompany each invoice.

B. Applications for Payment shall be executed and certified by signature of authorized officer of Contractor in the space indicated on Form S702.

C. Contractor shall list original Work Order amount, and each authorized Change Order and Work Change Directive, listing Change Order or Work Change Directive number and dollar amount.

D. Retainage in the amount of 10% shall be withheld as specified in the Agreement. This retainage shall be itemized on the S702 and S703 forms.

1.05. INVOICES

A. Each invoice shall be accompanied by the specified Application for Payment form and shall show the following:

1. The date of the Contract Documents.
2. Purchase Order Number.
3. Purchase Order Date.

4. A description of the Work performed (the description of the Work shall document site location, Project code number, and detail the actual Work performed and completed).

B. Invoices that include previously approved Work performed on a Time and Materials (T&M) or Cost Plus (CP) basis shall be supported with copies of daily time sheets, and Contractor shall attach photocopies of receipts for all materials and expenses claimed as T&M or CP Work. Lack of complete documentation for T&M or CP Work will be just cause for refusal by the Engineer to certify payment for such claimed costs, pending submittal of required documentation. All documentation shall be submitted and approved prior to invoice submittal. Contractor shall submit backup copies of all required paperwork that was previously submitted as a part of a daily or weekly submittal.

C. Contractor shall address all invoices to the attention of the Owner.

1.06. SUBSTANTIATING DATA

A. Engineer may request substantiating data for any claimed payment. When Engineer requires substantiating data, Contractor shall submit within 30 days data justifying quantities of Work and dollar amounts in question. Engineer may conditionally approve any claimed payment pending submittal of acceptable substantiating data. Unsubstantiated claims for payment will result in withholding of the unsubstantiated amounts from subsequent payment claims.

B. Contractor shall submit one copy of substantiating data with cover letter for each request for substantiating data. Each submittal of substantiating data shall show Application for Payment number and date, and pay item by number and description.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

Payment Forms Follow

APPLICATION AND CERTIFICATION FOR PAYMENT — Form S702

PAGE ONE OF PAGES

TO OWNER: PROJECT: APPLICATION NO: Distribution to:
☐ ENGINEER
FROM CONTRACTOR: PERIOD ENDING: ☐ CONTRACTOR

ENGINEER'S PROJECT NO:

CONTRACT FOR: CONTRACT DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
Form S703 Continuation Sheet is attached.

1. ORIGINAL CONTRACT PRICE $ ________
2. Net change by Change Orders $ ________
3. CONTRACT PRICE TO DATE (Line 1 + 2) $ ________
4. TOTAL COMPLETED & STORED TO DATE $ ________
   (Column G on Continuation Sheet)
5. RETAINAGE:
   a. __10_% of Completed Work $ ______________
   (Column D + E on Continuation Sheet)
   b. __10_% of Stored Material $ ______________
   (Column F on Continuation Sheet)
   Total Retainage (Lines 5a + 5b or
   Total in Column I of Continuation Sheet) $ ________
6. TOTAL EARNED LESS RETAINAGE $ ________
   (Line 4 Less Line 5 Total)
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate) $ ________
8. CURRENT PAYMENT DUE $ ________
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 Less Line 6) $

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner		
Total approved this Month		
TOTALS		
NET CHANGES by Change Order		

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief, the Work covered by this Application for Payment has been completed in accordance with the Specifications and Drawings, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By:___________________________________ Date:___________________

State of: County of:
Subscribed and sworn to before me this ___ day of ______, ____
Notary Public:
My Commission expires:

ENGINEER'S CERTIFICATE FOR PAYMENT

In accordance with the Agreement, Specifications and Drawings, based on on-site observations and the data comprising the application, the Engineer certifies that to the best of the Engineer's knowledge, information and belief, the Work has progressed as indicated, the quality of the Work is in accordance with the Specifications and Drawings, and the Contractor is entitled to payment of the Amount Certified.

AMOUNT CERTIFIED $ _________________________

(Attach explanation if Amount Certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ENGINEER:

By: ___________________________ Date: ____________________

This Certificate is not negotiable. The Amount Certified is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner, Engineer, or Contractor under the Agreement, Specifications and Drawings.

CONTINUATION SHEET

Form S703

PAGE __ OF __ PAGES

1. Form S702, APPLICATION AND CERTIFICATION FOR PAYMENT, including Contractor's signed certification is attached.
2. In tabulations below, amounts are stated to the nearest dollar.
3. Use Column I on contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD ENDING:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULE D VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G/C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
			TOTAL FROM PREVIOUS APPLICATION	THIS PERIOD					
	GRAND TOTALS								

SECTION 01310
PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.01. SECTION INCLUDES:

- **A.** Contractor's Project Superintendent
- **B.** Submittals
- **C.** Project Meetings
- **D.** Coordination – General
- **E.** Coordination of Contractor's Work with Work by Others
- **F.** Layout of the Work
- **G.** Execution

1.02. CONTRACTOR'S PROJECT SUPERINTENDENT:

A. Contractor shall employ a qualified Project Superintendent for the duration of the Work. The Project Superintendent shall be experienced in excavation of Impacted Soils, construction/installation of subsurface barrier wall(s), cement soil mix walls (as required in Specifications Section 02196 – Soil Mix Wall), and coordinating truck transportation of soil and debris. Contractor shall employ an adequate Project coordination staff to assist the Project Superintendent in the required control of Subcontractors, obtaining permits and approvals, development of Progress Schedules, and preparation of Submittals.

B. Contractor shall not change the Project Superintendent for the duration of the project.

C. Any requested changes in critical site personnel shall be requested in writing no sooner than 30 days prior to the anticipated change, and must be approved by Engineer and Owner.

D. The Contractor's Project Superintendent shall be on the Project Site at all times during the Work, including any Work performed by Subcontractors.

E. The Project Superintendent shall be responsible for the completion of the Work in accordance with the Drawings and Specifications, and shall perform the following specific duties:

1. Coordinate the Work of Contractor's labor and equipment, and that of the Subcontractors.

2. Serve as the Contractor's primary point of communication with the Engineer, Owner, and Others who are responsible for other aspects of the Project.

3. Coordinate the schedule by which the various tasks are completed within the specified Construction Milestones.

4. Participate in regularly scheduled Project meetings with the Engineer and Owner.

5. Schedule and conduct meetings with Subcontractors and other concerned parties as necessary to maintain the Project schedule, resolve matters in dispute, and coordinate use of utilities and other resources.

6. Ensure that quality control objectives are met, and that quality control Work is considered in the Project Schedule so as to avoid delays in the Work.

7. Ensure compliance with all Laws and Regulations and permit requirements.

1.03. SUBMITTALS:

A. Contractor shall prepare and transmit the following Submittals, and any other Submittals described in other Sections of the Specifications, in accordance with the procedures of Specifications Section 01330 – Submittal Procedures:

1. Contractor shall submit Contractor's Daily Construction Report as specified in Specifications Section 01320 – Construction Progress Documentation by 10:00 A.M. the next Working day.

2. Contractor shall submit Applications for Payment as specified in Specifications Section 01290 – Payment Procedures.

3. Contractor shall submit quality control reports and data as specified in other Sections of the Specifications.

4. Contractor shall submit weekly revisions and updates of Progress Schedule as specified in Specifications Section 01320 – Construction Progress Documentation with a detailed 2-week look ahead.

5. Contractor shall submit monthly health and safety report, as specified in Specifications Section 01415 – Health and Safety Requirements.

1.04. PROJECT MEETINGS:

A. Weekly Progress Meetings:

1. Contractor shall attend scheduled Weekly Progress Meetings at the Project Site to review progress of the Work, Project Schedule, Submittal status and delivery schedule, contract modifications, health and safety, and other matters. The Engineer shall prepare a meeting agenda in cooperation with the Owner and the Contractor. The Engineer shall preside at meetings. The Engineer shall designate a representative to record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes. The Engineer will provide a conference call in procedure for attendees that cannot physically attend the meetings.

2. Attendees shall include:

a. The Owner.

b. The Engineer.

c. Contractor's Project Superintendent.

d. Contractor, Subcontractors, and Suppliers, as appropriate.

e. NYSDEC Representative.

f. Others as appropriate.

B. Other meetings shall be scheduled in accordance with the Specifications or as may be required by the Engineer.

1.05. COORDINATION – GENERAL:

A. Contractor shall coordinate scheduling, Submittals, and Work of the various Sections of Specifications to assure an efficient and orderly sequence of interdependent construction elements, with provisions for accommodating Work performed later.

B. Contractor shall coordinate and schedule Work in cooperation with the Engineer, the Owner, the Owner's Air Monitoring Contractor, Village of Sag Harbor, utility companies, and other construction firms that may be conducting related Work at or near the Project Site.

C. Contractor shall direct all communications regarding the Work directly to the Engineer's Site Construction Manager or Project Manager. Contractor shall not discuss the Work nor take direction from any other contractor, consultant, public official, media representative, or any other person without prior written approval by the Engineer.

D. Site Construction Manager: The Engineer shall assign a Site Construction Manager to carry out the duties of the Engineer at the Project Site.

E. Owner's Representative: Owner may assign a representative to oversee Work conducted at the site.

F. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following shall constitute an acceptance of

SECTION 01310
PROJECT MANAGEMENT AND COORDINATION

Work that is not in accordance with these Specifications or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. Observation by the Engineer.
2. Recommendation of any progress payment or final payment by the Engineer.
3. Use or occupancy of the Work or any part thereof by the Engineer or others.
4. Any acceptance by the Engineer, or failure to do so.
5. Any review and approval of a Submittal by the Engineer.
6. Any inspection, test, or approval by others.
7. Any correction of Non-Conforming Work performed by the Engineer or others.

G. Hazard Communication Program: Contractor shall be responsible for coordinating any exchange of Material Safety Data Sheets (MSDS) or other hazard communication information required to be made available to or exchange between or among employees at the site. Contractor shall compile and properly file MSDSs on site for all materials furnished by Contractor or its Subcontractors and Suppliers.

1.06. COORDINATION OF CONTRACTOR'S WORK WITH WORK BY OTHERS:

A. **Coordination of Work of Subcontractors**: Contractor shall be responsible for overall coordination of the Work in accordance with the Construction Milestones set forth in Bid Form Schedule F. Contractor shall obtain from its Subcontractors a schedule similar to Contractor's Progress Schedule and shall be responsible for Subcontractors maintaining these schedules and for coordinating any required schedule modifications.

B. **Work by Others:** The Engineer, and others under subcontract to the Engineer and Owner, including the Owner's Air Monitoring Contractor, will be Working on the Project Site while the Work is in progress. Contractor shall coordinate and schedule its Work in cooperation with the Engineer's other Contractors, adjacent property owners, Village of Sag Harbor, Owner, and the Engineer.

C. Contractor shall abide by all requirements of the Transportation Plan approved by the Village of Sag Harbor. Contractor shall obtain any necessary permits or approvals for closure of streets or sidewalks adjacent to the Site. Contractor shall notify the Owner prior to any contact with Village of Sag Harbor officials.

D. Contractor shall abide by all the requirements of the Community Air monitoring Plan and the Odor, Vapor, and Dust Control Plan developed for the Project Site.

SECTION 01310
PROJECT MANAGEMENT AND COORDINATION

E. **Utilities:** Contractor shall coordinate the Work with various utility companies serving the Project Site and shall secure any required permits and approvals. Contractor shall be solely responsible for notifying utility companies prior to commencing any Work, and for response to any emergencies that may arise during the Work. Certain active and inactive utilities may currently be present at the Project Site, the exact location and type of which shall be determined by Contractor without reliance on information provided by the Engineer. Several utilities may currently serve the Project Site or adjacent properties including, but not limited to, the following:

1. Electric.

2. Natural gas (fuel gas).

3. Water.

4. Sanitary sewer.

5. Storm sewer.

6. Telephone or other communication (fiber optic cable).

F. The Contractor shall coordinate waste shipments to off-site waste management facilities as specified in Specifications Section 02120 – Transportation and Disposal.

1.07. LAYOUT OF THE WORK:

A. Contractor shall be solely responsible for laying out the Work, including lines and grades, and for the correctness thereof in accordance with the Specifications and Drawings.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

A. Any material changes to the work, processes, staffing, sequencing, equipment, or materials will require an amendment to the Technical Execution Plan and review and approval by the Engineer.

END OF SECTION

SECTION 01320
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 – GENERAL

1.01. SECTION INCLUDES:

- **A.** Submittals
- **B.** Construction Milestones
- **C.** Progress Schedule
- **D.** Daily Construction Report
- **E.** Health and Safety Reports
- **F.** Record Documents
- **G.** Progress Schedule Reviews, Acceptance, Updates, and Revisions

1.02. SUBMITTALS:

A. Work and progress payments shall not start without an initial Progress Baseline Schedule reviewed and approved by the Engineer and Owner. The baseline shall not be altered for the duration of the project. Contractor shall submit an initial Baseline Progress Schedule for approval prior to the Notice to Proceed, and shall submit weekly updates of the Progress Schedule comparing progress to the baseline during the Work in accordance with Specifications Section 01330 – Submittal Procedures. The Project name and date of Submittal shall be written on each sheet.

1.03. CONSTRUCTION MILESTONES:

A. Specific requirements for phasing of the Work are set forth in Bid Form Schedule F, Construction Milestones. The initial Progress Schedule shall be based on progress and completion of the Work within the Construction Milestones and Contract Times listed in Bid Form Schedule F.

1.04. PROGRESS SCHEDULE:

A. The Progress Schedule shall be a bar graph (Gantt chart) showing the proposed order of Work, the expected beginning and completion times for the salient Work features, predecessor(s) for each item, and the duration of each item. The Progress Schedule shall show each activity and, as a minimum, each activity description shall contain:

1. Activity name and identifying number.

2. Predecessor(s).

3. Successor(s).

4. Activity duration (in calendar days).

5. Percent complete.

6. Float for each activity, where float is the amount of time that an activity can be delayed without delaying the start of the next activity.

B. The Contractor's Progress Schedule shall be developed using the critical path method (CPM) and Microsoft Project or equivalent software.

C. Activities:

1. The Progress Schedule shall identify all major construction activities.

2. The Progress Schedule shall show all significant design, testing, submittals, manufacturing, shipping, construction, installation, commissioning and training activities, milestones for start of Work, completion of construction phases, and completion of commissioning, beneficial occupancy, and punch list.

3. Any utility service interruptions necessary to perform the Work shall be identified.

4. A separate activity shall be provided for each occasion where Work is to be performed by others.

5. The Progress Schedule shall identify permits and approvals that are the responsibility of the Contractor.

6. The Progress Schedule shall identify all Contractor's Work.

7. The Progress Schedule shall identify Owner-furnished and Engineer-furnished items and any Work to be performed by the Owner or Engineer.

8. The Progress Schedule shall identify draft invoice and final invoice submittal dates in accordance with monthly closing dates established by the Engineer.

D. Contractor's Progress Schedule shall explain any additional information or coding used.

E. Contractor shall consider normal calendar year holidays, weather delays, long lead items, review times, and Project phasing, Project Site conditions and space availability in preparing the Progress Schedule.

F. The Contractor shall consider off-site disposal facility and trucking restrictions in preparing the Progress Schedule.

SECTION 01320
CONSTRUCTION PROGRESS DOCUMENTATION

G. The milestone completion dates required by the Specifications, listed in Bid Form Schedule F, Construction Milestones, shall be clearly identified on the Progress Schedule. The critical path shall be clearly indicated.

H. The Progress Schedule shall be updated and submitted weekly at the time of the Weekly Progress Meeting. The Progress Schedule shall be available to all meeting participants during the Weekly Progress Meeting.

1.05. DAILY CONSTRUCTION REPORT:

A. Contractor shall prepare a written Daily Construction Report in a format acceptable to the Engineer. The Daily Construction Report shall be prepared for each day Contractor is on the Project Site and submitted to the Engineer, electronically and in hard copy, no later than 10:00 A.M. the next Working day.

B. Daily Construction Reports shall include:

1. Number of Workers for each trade and the names of the Workers.

2. Names of Sub-Contractors and their on-site employees.

3. Hours of Work for each trade or type of equipment.

4. Equipment on the Project Site and materials furnished.

5. Major Work activities performed, and progress thereof, including estimated amounts of specialty Work, Soil Mix Wall Construction, stockpiling, loading, and backfilling Work completed.

6. Odor, Vapor, or Dust mitigation work activities performed.

7. Weather conditions and temperature.

8. Unforeseen subsurface conditions.

9. A list of Submittals transmitted to or received from the Engineer.

10. Meetings attended.

11. Accidents, safety, and security issues.

12. Tests and inspections performed and the results of tests and inspections.

13. Reasons for construction delays.

14. Units of T&M Work, subject to approval daily by the Engineer.

15. Daily Trucking Logs as specified in Specifications Section 02120 – Off-site Transportation and Disposal.

16. Vehicle Inspection Logs as specified in Specifications Section 02130 - Decontamination.

C. If multiple daily Work shifts are used, Contractor shall submit a Daily Construction Report for each shift.

D. The Daily Construction Reports may be used to substantiate any claim for delay, impact, or change, and shall contain sufficient information to document each potential impact.

E. The Daily Construction Report may be used as the basis for documentation of T&M Work. The units of T&M Work reported by the Contractor's Project Superintendent shall be reviewed daily by the Engineer and are subject to approval by the Engineer. Contractor's Project Superintendent shall promptly make any changes, as required by the Engineer, to the units of T&M Work recorded on the Daily Construction Report.

1.06. HEALTH AND SAFETY REPORTS:

A. Contractor's Daily Construction Report shall include a summary of daily Health and Safety meetings, conferences, issues, incidents, near misses, and actions taken to address and resolve Health and Safety issues.

B. Contractor shall immediately (within 30 minutes) verbally report to the Engineer the occurrence of any and all Health and Safety incidents, including, but not limited to, injuries, accidents, and unsafe conditions. An Incident Report form or Near-Miss Report form, which is included in Specifications Section 01415 – Health and Safety Requirements, shall be submitted to the Engineer within 24 hours of occurrence of the incident or near-miss. The Engineer will be the sole arbitrator of what is to be considered an incident or near miss.

C. Contractor shall provide to the Engineer periodic summary reports of Contractor's Health and Safety performance, including number of hours Worked in the period and a list of Health and Safety incidents with the date, names of any individuals involved, type of incident, current status of any medical treatment of individuals for the incident, and actions taken by Contractor to address the incident or unsafe condition.

SECTION 01320
CONSTRUCTION PROGRESS DOCUMENTATION

D. Contractor shall report to the Engineer the occurrence of any situations requiring a permit or checklist for confined space entry or hot work (welding or torch cutting), and maintain documentation as specified in Specifications Section 01415 – Health and Safety Requirements.

E. Additional reporting requirements are provided in Specifications Section 01415 – Health and Safety Requirements.

1.07. RECORD DOCUMENTS:

A. Contractor shall maintain in a safe place at the Project Site one copy of all Weigh Tickets, Drawings, Survey Data, Specifications, Addenda, Change Orders, Field Orders, Work Change Directives, Submittals, Laboratory Data, Photographs and written interpretations and clarifications, in good order and annotated to show all changes made during construction. These Record Documents shall be available to the Engineer, Owner, and NYSDEC representative upon request.

B. During the course of the Work, Contractor shall maintain the following records up-to-date at the Project Site at all times, and shall submit the following documents to the Engineer prior to final Application for Payment:

1. General Records:

a. Contractor's Daily Construction Reports.

b. Daily Safety Meeting minutes or notes.

c. Soil Tracking Logs.

d. Soil and debris disposal documentation (manifests, weight tickets, etc.).

e. Health and Safety Incident (Accident) Reports and Near-Miss Reports.

f. Hot Work Permits and Confined Space Entry Permits.

g. Minutes of all other Contractor meetings.

h. Progress Photographs and Videos.

2. Test and Laboratory Analytical Results: One copy of all test and analytical results.

3. Bills of Lading: One copy of all bills of lading for materials received.

4. Record Drawings: At the end of construction, the Contractor's surveyor shall prepare record Drawings showing horizontal and vertical Limits of the Soil Mix Wall; final grades and elevations; utilities including pipe invert elevations;

parking lot restoration including curb and pavement elevations; and other significant site features changed during construction. Record Drawings shall include Work plans, cross-sections, and profiles as necessary to accurately represent conditions.

C. At completion of the Project, the Contractor shall submit two bound copies of all Record Documents to the Engineer.

1.08. PROGRESS SCHEDULE REVIEWS, ACCEPTANCE, UPDATES, AND REVISIONS:

A. The initial Progress Schedule and all updates submitted by the Contractor shall be reviewed with the Engineer and shall be revised and resubmitted if they do not receive the Engineer's approval. The schedule shall be reviewed for:

1. Proper application of CPM methodology and logic.

2. A sequence of Work that satisfies the requirements of the Contract Documents and is reasonable and logical.

3. Activity durations, which are within an expected range, or can be justified by the Contractor to the satisfaction of the Engineer.

B. This review shall not be construed as an assignment of responsibility of performance to the Engineer.

C. Contractor shall make all necessary revisions to the initial Progress Schedule based on the Engineer's review and resubmit within 2 days of receipt of comments from the Engineer.

1. After the Engineer's review, Contractor shall use the Progress Schedule for planning, organizing, and directing the Work and reporting progress.

2. The Contractor shall bear sole responsibility for ensuring completion of the Work within the Contract Times.

3. The Engineer's acceptance of any Progress Schedule shall not transfer any of the Contractor's responsibilities to the Engineer. The Contractor alone shall remain responsible for adjusting forces, equipment, and schedules to ensure completion of the Work within the time(s) specified in the Contract Documents.

D. Updates:

SECTION 01320
CONSTRUCTION PROGRESS DOCUMENTATION

1. Contractor shall keep the Progress Schedule current during the Project so that it is an accurate indication of Project progress. Updates shall include any Field Orders, Work Change Directives, Change Orders, and delays.

2. All updates should show progress compared to the project baseline schedule and include actual start dates.

3. Contractor shall update the Progress Schedule weekly to document the construction progress. Contractor shall submit the weekly update on the day of the weekly Project meeting. Failure to submit a weekly updated Progress Schedule shall be cause for withholding of progress payments until the update is received and reviewed. Updates shall include a detailed 2-week look ahead, providing day by day, planned activities for the upcoming 2 week period.

4. Activity descriptions shall not be changed.

5. Any changes in the milestone dates must be approved, in writing, by the Engineer. Changes in milestone dates shall not cause an extension of the Project completion date without the execution of a Change Order.

E. Revisions:

1. In addition to weekly Progress Schedule Submittals, Contractor shall revise the Progress Schedule when additional Work, delays, or accumulations of causes indicate the Contract Times will be exceeded. Contractor shall submit a written statement describing the cause of the delay.

2. The Engineer shall require a revised Progress Schedule when it is apparent that the Contractor's schedule does not substantially match the actual progress and order of the Work as measured by:

a. Accumulated delays, which are more than 5 percent of the allotted Contract Times, or 15 calendar days, whichever is less.

b. Critical path activities (or activities restrained by critical path activities), which have been accomplished.

PART 2 – MATERIALS

Not used.

SECTION 01320
CONSTRUCTION PROGRESS DOCUMENTATION

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01330
SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01. SECTION INCLUDES:

A. Submittal Procedures
B. Requests for Information
C. Startup Submittals
D. Outline of Contractor's Technical Execution Plan

1.02. SUBMITTAL PROCEDURES:

A. Contractor shall prepare and transmit four copies of the following Submittals to the Engineer:

1. Contractor shall submit a Technical Execution Plan as discussed in this Section.

2. Contractor shall submit Contractor's Daily Construction Report electronically by 10:00 A.M. the next Working day as specified in Section 01320 – Construction Progress Documentation.

3. Contractor shall submit Applications for Payment as specified in Specifications Section 01290 – Payment procedures.

4. Contractor shall submit quality control reports and data as specified in other Sections of the Specifications.

5. Contractor shall submit weekly revisions and updates of Progress Schedule and Technical Execution Plan as required by the Engineer.

6. Contractor shall submit monthly Health and Safety reports, as specified in Specifications Section 01415 **-** – Health and Safety Requirements.

B. Contractor shall transmit each Submittal to the Engineer at the Project Site.

C. Contractor shall provide four copies of each submittal (except dailies) to the Engineer.

D. Contractor shall submit carbon copies (with all signatures affixed) of all waste manifests, weigh tickets, and other shipping documentation.

E. Contractor shall transmit each Submittal with a cover letter signed by Contractor's Project Superintendent. Contractor shall, by signing each Submittal, certify that Contractor has reviewed the Submittal, and that the submitted information conforms to the requirements of the Work and these Specifications.

F. Contractor shall sequentially number the transmittals (e.g., Submittal No. 001). Contractor shall number revised Submittals with original number and a sequential alphabetic suffix (e.g., Submittal No. 001a).

G. Each Submittal shall include Project title, Contractor, Subcontractor or Supplier, title of Submittal, Specifications Section number and, if applicable, Drawing number.

H. Submittals that do not conform to the requirements of the Specifications shall be returned with a notation of deficiencies. Contractor shall revise to correct noted deficiencies and resubmit. When revised for resubmission, Contractor shall identify all changes made since previous submission.

I. Submittals not required by the Specifications shall not be recognized or processed.

1.03. REQUESTS FOR INFORMATION:

A. Contractor shall submit all Requests for Information to the Engineer in writing. Requests for information shall be numbered sequentially and shall include the related Specifications Section number or Drawing number.

B. The Engineer will provide any revisions to the Specifications or Drawings in writing.

C. Contractor shall request written confirmation of any interpretations or clarifications provided verbally by the Engineer.

1.04. STARTUP SUBMITTALS:

A. This paragraph specifies Submittals that Contractor shall prepare and transmit prior to commencing the Work at the Project Site. Additional Submittals are specified in other Sections of these Specifications.

1. Contractor shall submit the initial Progress Schedule as specified in Specifications Section 01320 – Construction Progress Documentation.

2. Contractor shall submit the Contractor's HASP as specified in Specifications Section 01415 – Health and Safety Requirements, including documentation of worker's OSHA training and medical monitoring and the name and qualifications of the full-time Site Safety and Health Officer.

3. Certain parts of the Work are performance-based, requiring Contractor to provide detailed written information for review, comment, and approval by the Engineer, regarding the means and methods proposed by Contractor to execute the Work. Contractor shall submit a draft Technical Execution Plan, conforming to the outline specified in Paragraph 1.05, for the Engineer's review and comment. Contractor shall revise the draft Technical Execution Plan as requested by the Engineer and submit a final Technical Execution Plan, subject to the Engineer's review, approval, and acceptance, prior to commencing Work. Any material changes in the Work, process, staffing, major equipment or materials will require a TEP amendment and review and approval by the Engineer.

4. Contractor shall provide for Engineer's approval the name and qualifications for Subcontractors providing any laboratory, analyses, geotechnical, or surveying services as required in the Specifications and/or contract documents. Such approvals shall not be unreasonably withheld.

1.05. OUTLINE OF CONTRACTOR'S TECHNICAL EXECUTION PLAN:

A. Requirements of the Technical Execution Plan are described throughout the technical specifications, however it shall at a minimum include the following sections:

1. Section A: Project Coordination.

a. Resume of Project Superintendent(s).

b. Identification of key personnel.

c. Detailed Project staffing plan showing staffing levels for each task and phase of Work, along with any plans for shift Work.

d. Detailed list of proposed subcontractors, including truckers, disposal facilities, and soil mix wall.

e. List of major Equipment, Systems, and Material, other than listed in Bid Form Schedule E.

f. List of Permits and Approvals to be obtained by Contractor, including contact names, titles, and phone numbers.

2. Section B: Progress Schedule.

a. Contractor's initial Baseline Progress Schedule, based on the Construction Milestones listed in Bid Form Schedule F.

3. Section C: Construction Facilities and Temporary Controls.

a. Locations, sizes, and requirements for utility services.

b. Layout of Support Zone and other Work Zones, including Decontamination Zone.

c. Proposed design for Site Access Road.

d. Proposed design of Decontamination Stations.

e. Decontamination Methods and Equipment.

i. Procedures to prevent contamination of clean areas.

ii. Vehicle decontamination and inspection procedures.

iii. Procedures for collection, treatment, and disposal or discharge of decontamination residuals and used PPE.

4. Section D: Water Treatment Facility and Water Storage

a. Location, sizes, and capacities of the equipment.

b. Manufactures product information and operation manual.

c. Location of influent piping and effluent discharge.

d. Construction details of the dewatering well collection piping.

5. Section E: Dewatering

a. Provide a detailed description of System to be used.

b. Provide calculations to verify pumping capacity.

c. Provide a sketch of the system with components and tie-in locations.

d. Provide details of system capability with shoring design.

6. Section F: Soil Mix Wall Construction

a. Detailed description of equipment and procedures to be used to perform Soil Mix Wall as specified in Section 02196 – Soil Mix Wall.

7. Section G: Temporary Fabric Structure

a. Manufacturer, sizing and staging of temporary fabric structure and associated air handling system. Must include plans certified by a New York Registered Professional Engineer.

b. Detailed design of the foundation and structural support system for the temporary fabric structure, as described in Section 02150 as certified by a New York Registered Professional Engineer.

c. Details of noise abatement enclosures for air handling equipment.

8. Section H: Excavation and Backfill.

a. Detailed description of equipment and procedures to be used to excavate overburden soils and subsurface structures.

b. Detailed description of excavation and backfill sequencing to minimize dewatering flows to the construction water treatment systems.

c. Schedule for installation and operation of dewatering systems, including table showing coordination of dewatering systems with excavation.

d. Excavation production rates in the form of a table of excavation volumes per week for each week of the Project Schedule. In the same table, show the estimated quantities of off-site transportation and the quantities of materials in stockpile.

e. Figures showing locations of temporary on-site haul roads to support the progress of the excavation Work.

9. Section I: Stockpile Management and Loading.

a. Provide a Drawing showing the proposed layout of the stockpile area, including locations of stockpiles for Clean Material, Impacted Material, and Material to be tested. Show on-site truck routes, unloading areas for excavated soil, and loading areas for off-site transportation.

b. Methods and facilities for managing stormwater run-on, runoff from stockpile areas, and water drained from saturated Impacted Soils.

c. Truck loading areas, staging areas for incoming empty trucks.

d. Coordination of excavation, stockpiling, and loading.

10. Section J: Off-site Transportation.

a. Provide names and qualifications of proposed transporters and number of vehicles dedicated to the project.

b. Provide an estimate, by day, of the expected quantities of material to be shipped from the site. Describe the number of trucks to be used, the expected turn-around-times, and the expected number of trips per day.

c. Describe locations and procedures for staging and sequencing trucks to minimize disruption and obstruction of the area around the site.

d. Describe locations and equipment to be used to weigh haul trucks. Include frequency for obtaining true weight of trucks.

e. Provide a Traffic Control Plan showing how trucks will enter and exit the site, the location of flaggers and signs, truck driver orientation and acceptance forms that shall include truck driver responsibilities as specified in the Transportation Plan, designated haul route to and from the off-site disposal facilities with posted speed limits, warnings, etc., and incident reporting procedures for trucking related incidents.

f. Provide a plan for verifying the accuracy of weight scales.

11. Section K: Disposal Facilities

a. Detailed description of disposal facilities to be used and their daily capacities

b. Proposed facilities to be used for debris disposal.

12. Section L: Site Restoration.

a. Describe proposed procedures and equipment and materials to be used to restore disturbed areas. Provide a description of proposed method for the following:

i. Placing gravel backfill over the soil mix wall.

ii. Replacing asphalt parking.

iii. Replacing curb and sidewalk.

iv. Replacing asphalt roadway.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 01415
HEALTH AND SAFETY REQUIREMENTS

PART 1 – GENERAL

1.01 SECTION INCLUDES:

- **A.** Summary
- **B.** References
- **C.** Contractor's Responsibility for Health and Safety
- **D.** Submittals
- **E.** Notifications
- **F.** Equipment and Facilities
- **G.** Personal Protective Equipment
- **H.** Other Health and Safety Equipment
- **I.** Training
- **J.** Work Planning and Meetings
- **K.** Engineering Controls
- **L.** Monitoring
- **M.** Evaluation of Performance
- **N.** EHS Incident Report Form
- **O.** EHS Opportunity or Near Miss Report Form
- **P.** Hot Work Permit Form
- **Q.** ENSR Safety Task Analysis Review (STAR) Form
- **R.** Job Safety and Hazard Analysis Form
- **S.** ENSR Guidelines for BEST Observation and Feedback Process

1.02 SUMMARY:

A. This Section includes Specifications and requirements for Health and Safety during performance of Work, including identification of applicable regulations, submittals, notification requirements, and Health and Safety execution Specifications.

1.03 REFERENCES:

A. Applicable regulations and publications include, but are not limited to, the following:

1. OSHA, Title 29 CFR Part 1910, Occupational Safety and Health Standards, and Title 29 CFR Part 1926, Safety and Health Regulations for Construction Sites.

2. NFPA, Flammable and Combustible Liquids Code, NFPA 30, most recent revision.

3. USEPA, Standard Operating Safety Guidelines, November 1984.

4. DHHS, "Manual of Analytical Methods", 3rd edition Volumes I and II, DHHS (NIOSH) Publication 84-100.

5. ANSI, Practices for Respiratory Protection, Z88.2, most recent version.

6. ANSI, Emergency Eyewash and Shower Equipment, Z358.1, 1981.

7. ANSI, Protective Footwear, Z41.1, 1983.

8. ANSI, Respirator Use Physical Qualification for Personnel, Z88.6, 1984.

9. ANSI, Practice for Occupational and Educational Eye and Face Protection, Z87.1, 1979.

10. NIOSH/OSHA/USCG/USEPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, DHHS/PHS/CDC/NIOSH, October 1985.

11. NIOSH Pocket Guide to Chemical Hazards, DHHS/PHS/CDC/NIOSH, June, 2000 or most recent.

12. USEPA, Health and Safety Requirements for Personnel Engaged in Field Activities, USEPA Order No. 14402.

13. DOT Standards and Regulations, 49 CFR 171 and 49 CFR 172.

14. ACGIH, Threshold Limit Values and Biological Exposure Indices (most recent version).

15. Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, EPA/600/4-87-006, September 1986.

B. Where two or more regulations/documents conflict, the one(s) offering the greatest degree of protection shall apply.

1.04 CONTRACTOR'S RESPONSIBILITY FOR HEALTH AND SAFETY:

A. Contractor shall comply with any and all state, federal, and local ordinances and Regulations.

B. Contractor shall be responsible for the Health and Safety of Contractor's employees, its Subcontractors, suppliers, agents, inspectors, visitors, the general public, and any others associated with or interacting with Contractor who provides labor, goods, or other services on the Project Site.

C. Contractor shall be responsible for emergency response planning and notification, and for actual response to any and all emergencies that may occur during the course of the Work, including emergencies that may occur when Contractor is not present at the Project Site.

D. Contractor is responsible for communicating daily with the Engineer regarding Health and Safety issues for the Engineer's safe conduct of the Engineer's duties, but such communication shall not imply any duty or responsibility on the part of the Engineer with regard to Health and Safety of Contractor's employees, its Subcontractors, suppliers, the general public, or Others. The Engineer's responsibility and duty with regard to Health and Safety shall be limited to the Engineer's employees. Contractor shall have responsibility and duty to the Engineer to communicate Health and Safety issues accurately and in a timely manner to allow the Engineer to take appropriate actions to protect the Engineer's employees and the Owner's employees.

E. Contractor shall designate a dedicated Contractor's SSHO on the site during the Work who shall, at a minimum, have at least 1 year of experience as an SSHO on an uncontrolled hazardous waste site, and have 40-hour OSHA Hazardous Waste Operations training and 8-hour OSHA Supervisor training. Contractor's SSHO shall be solely dedicated to Health and Safety issues from the start of the site activities through completion.

F. The SSHO shall enforce the requirements of safety for all Contractor personnel on site at all times. The SSHO shall ensure that all Contractor personnel, Subcontractor personnel, and Contractor visitors, follow the HASP, including wearing the designated level of PPE. If the SSHO elects to require a higher level of protection than that specified in the HASP, the extra costs associated with such higher level shall be borne by Contractor, unless such extra costs are approved in advance in writing by the Engineer.

G. Prior to mobilization and continually through the duration of the Work, the SSHO shall inspect the Project Site and document area-specific and worker-specific protection requirements.

H. After mobilization, the SSHO shall monitor activities and shall document the need for additional worker protection as required, based on activities performed and Action Levels specified in the HASP.

I. The SSHO shall verify that all activities are performed in accordance with the HASP and all federal, state, local, and Health and Safety standards, regulations, and guidelines.

J. In the event of a health or safety risk, as determined by the SSHO or by other Contractor personnel or by the Engineer, Contractor shall not proceed with the Work until a method for handling the risk has been determined in consultation with the Engineer and implemented. Any health or safety risk resulting in a stoppage of Work shall be reported immediately to the Engineer.

K. Contractor shall be responsible for implementing a “Behavior Based Safety” process and providing site training, observation, and feedback for Contractor personnel employed at the site.

L. Contractor shall be responsible for stability of excavations and embankments caused by the Contractor’s Work. Contractor shall designate one competent person as defined in 29 CFR Part 1926, Subpart P, Excavations, to inspect and document excavation safety conditions daily, and to ensure excavation safety prior to any personnel entering an excavation.

M. Contractor shall designate one competent person (e.g., crane operator), certified in crane operations, to inspect and document safe crane operation daily, and to ensure safety of crane operation prior to start of SMW installation activities.

N. The Engineer shall provide the Contractor with a copy of the Engineer’s HASP as a reference.

1.05 SUBMITTALS:

A. Contractor shall prepare and submit a HASP to the Engineer as a part of the Technical Execution Plan. The Contractor shall follow all applicable local, state, and federal Health and Safety standards, regulations, and guidelines implemented through, but not limited to, the OSHA, NIOSH, ACGIH, and USEPA. Where these are in conflict, the most stringent requirement shall be followed. The following points shall be addressed in the Contractor’s HASP:

1. Names of key personnel and alternates responsible for Health and Safety, including a Contractor Health and Safety Representative and SSHO. The Engineer must approve the SSHO.

2. A Health and Safety risk or Job Safety and Hazard Analysis (JSHA) associated with each portion of the Work (i.e., list potential chemical and physical hazards), including JSHAs for excavation work around active utilities, excavation safety, crane operation safety, SMW work, and truck traffic into and out of the site.

3. Employee and Subcontractor training assignments to assure compliance with 29 CFR 1910.120.

4. A requirement that Contractor locate Underground Facilities by using "Safe Dig" procedures prior to the start of the Work.

5. Personal protective equipment (PPE) to be used for each of the site tasks and operations being conducted, as required by the PPE program in 29 CFR 1910.120 and 29 CFR 1926.

6. Medical surveillance requirements in accordance with the program in 29 CFR 1910.120.

7. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used by the Contractor, including methods of maintenance and calibration of monitoring and sampling equipment.

8. Corrective actions and upgrading of personnel protection based on monitoring of air, personnel, and environmental sampling, with specific Action Levels identified.

9. Site control measures in accordance with the control program required in 29 CFR 1910.120 and 29 CFR 1926.

10. Decontamination procedures in accordance with 29 CFR 1910.120 and Specifications Section 02130 - Decontamination.

11. An emergency response plan meeting federal, state, and local requirements for safe and effective responses to emergencies, including the necessary PPE and other equipment. Explanation of potential emergencies and contingency plan of action, including description of the route to the nearest appropriate hospital, hospital route map, and posting of emergency telephone numbers at the site.

12. If confined space entry is required, include confined space entry procedures in accordance with 29 CFR 1910.146, and a list of all anticipated confined space entries required by Contractor in the course of the Work.

13. A spill containment program meeting the requirements of all applicable local, state, and federal Health and Safety standards.

14. A list of Health and Safety and emergency equipment available on the site.

15. A description of engineering controls used to reduce the hazards of equipment operation and exposure to site hazardous chemicals.

16. An air monitoring plan describing the method, type, frequency, locations of air monitoring, laboratories, and type of analysis to be performed at the Work area for the purpose of employee safety.

17. Open trench excavation procedures in accordance with applicable OSHA Regulations.

18. Procedures for earthwork near buried utilities, where hand digging should be performed within 24 inches of known utility lines unless more stringent requirements are specified by law, Regulation, or the affected utility.

19. Training for emergency response procedures as outlined in Section 7.2 of the Engineer's HASP.

20. Heat stress program consistent with the references provided in Appendix G of the Engineer's HASP.

21. Cold stress program consistent with the references provided in Appendix F of the Engineer's HASP.

22. Lockout/Tagout where the operation of machinery and/or equipment in which the unexpected energization on start up or the release of stored energy could cause injury to personnel.

B. Contractor's Daily Construction Report, submitted in accordance with Specifications Section 01320 – Construction Progress Documentation, shall include a summary of daily safety issues and a summary of Contractor's Daily Safety Meeting.

C. Contractor shall submit monthly safety reports that include:

1. The names of all Contractor and Subcontractor personnel employed at the site at any time during the month, and the names and duties of key personnel including Contractor's Project Manager, Project Superintendent, SSHO, excavation-competent person, and crane operation-competent person.

2. A summary of all Health and Safety incidents describing any medical treatment that was provided during the month, the current Work status of any individuals affected the names of individuals who may have observed the incident, and actions taken by Contractor to address the unsafe act or unsafe condition.

3. A summary of all Health and Safety near-misses or observations providing an opportunity for shared learning and future hazard avoidance. For any Health or Safety incident or near-miss, list the date, the nature of the incident or near-miss, and the names of individuals involved. A near-miss form for use in submitting near-misses is attached to this Section.

4. The total number of labor hours worked at the site during that month.

5. Internal Health and Safety audits performed by the Contractor as part of the Contractor's HASP.

6. Results of Contractor behavioral observation and feedback evaluations as described in the Engineer's HASP.

D. Prior to initiating Work, Contractor shall provide the Engineer with documentation of employee and applicable Subcontractor training and medical certifications required by 20 CFR 1910.120 as described in 3.01A of this Section.

E. Contractor shall submit documentation of training and experience for the designated excavation-competent person and crane operation-competent person.

F. Contractor shall maintain all required and applicable training and medical monitoring records on-site including, but not limited to those specified in Part 3.01 (A) of this Section.

G. Contractor shall submit a Hot Work Permit, using the form attached to this Section, for any welding, torch cutting, or activities that generate sparks. Proximity to any ignitable or combustible liquids including MGP waste such as NAPL or tar shall be accounted for and precautions and set backs shall be provided for prior to issue of permit.

H. Contractor shall conduct a JSHA for significant activities and submit the documentation to ENSR for review prior to the start of the activities. Contractor's JSHA shall be submitted on the JSHA forms attached to this Section, or other form acceptable to the Engineer.

I. Contractor shall submit copies of all periodic crane and drill rig inspections completed.

1.06 NOTIFICATIONS:

A. Contractor shall immediately (within 30 minutes) verbally report to the Engineer the occurrence of any and all Health and Safety incidents. An Incident Report form or Near-Miss Report form as appropriate, which are attached to this Section, shall be submitted within 24 hours of occurrence of the incident or issue.

B. Contractor shall immediately and fully investigate any such incident or near miss and conduct a root cause analysis, and shall submit to the Engineer, the Contractor's written corrective action plan for such incident within one day after the incident occurs in accordance with Specifications Section 01330 – Submittal Procedures.

C. Contractor shall notify the Engineer in writing at least 5 days prior to bringing any hazardous material, equipment, or process to the site, or using the same on the site. Contractor shall provide the Engineer with a MSDS for all chemicals brought on to the site.

D. Contractor shall immediately notify the Engineer in writing of any hazard that Contractor discovers or observes on the site and corrective measures planned or taken to eliminate or minimize such hazard. Hazard reporting will be completed as a Near Miss Report as described in 1.05C.3 of this Section.

PART 2 – PRODUCTS

2.01. EQUIPMENT AND FACILITIES:

A. Contractor shall provide all equipment, temporary facilities, and personnel required to perform activities on site safely in accordance with all Regulations and standards, and with the Contractor's HASP.

2.02. PERSONAL PROTECTIVE EQUIPMENT:

A. The appropriate level of PPE shall be determined by the Contractor for specific tasks as described in the Contractor's HASP. If hazards are identified that require a level of protection greater than Level C, Work shall be suspended and the Engineer notified. The Contractor's SSHO, in consultation with the Engineer, shall determine what actions are required prior to restarting Work. Contractor shall determine and document the appropriateness of suggested minimum PPE requirements for Contractor's employees and others at the site.

B. Contractor shall furnish and maintain materials and equipment for the Health and Safety of Contractor employees, its Subcontractors, suppliers, and visitor personnel. Contractor shall provide all required Health and Safety equipment, first aid equipment, tools, monitoring equipment, PPE, and ancillary equipment and methods required to ensure workers' Health and Safety and to comply with the Contractor's HASP. The Engineer will furnish PPE and monitoring for Engineer's employees and Owner's employees.

C. Level D protection will be required at all times while on site by all personnel and visitors on the site, except in Support Zone areas. Level D PPE consists of:

1. Hard hat.

2. Steel-toed boots.

3. Safety glasses with permanent side shields.

4. Work clothes (long pants, shirts with sleeves).

5. Work gloves.

6. High visibility reflective safety vests.

7. Hearing protection (as needed to prevent exposure exceeding 85 dB level).

D. If additional protection consisting of Level C PPE is required during the Work, Level C PPE shall include protection from organic compounds and consist of Level D protection with the following additions:

1. Air purifying respirator, half-face or full-face (depending on required protection factor) with organic vapor/High Efficiency Particulate Air cartridges meeting NIOSH/Mine Safety and Health Administration Specifications.

2. Disposable poly-coated chemically protective coveralls.

3. Disposable chemically resistant outer gloves (nitrile).

4. Disposable chemically resistant inner gloves (nitrile).

5. Chemically resistant, steel-toed, and steel-shanked boots (PVC, neoprene, or nitrile), or outer booties.

E. In most cases, Level C will be the maximum allowed level of PPE. Level B may be allowed provided that personnel are properly trained and certified and exposure levels are below immediately dangerous to life and health (IDLH) conditions.

2.03. OTHER HEALTH AND SAFETY EQUIPMENT:

A. Contractor is required to have the following equipment available on the site for the Health and Safety of Contractor, Subcontractors, suppliers, and visitors:

1. First aid kits.

2. Fire suppression equipment (appropriate to location and type of flammable materials present).

3. OSHA-approved emergency eyewash facilities.

4. Personnel decontamination facilities and equipment.

5. Other equipment or supplies as determined to be necessary or prudent by Contractor or the Engineer.

6. Flammable liquids storage cabinet, if necessary.

7. Fall protection equipment.

8. Heavy Blankets.

PART 3 – EXECUTION

3.01 TRAINING:

A. Contractor shall provide the following training to each worker except those who will be restricted to the Support Zone:

1. Initial 40-hour (or 80-hour where appropriate) OSHA hazardous waste Health and Safety training and current annual 8-hour refresher training.

2. Eight-hour OSHA hazardous waste supervisory training (required for the Contractor's Superintendent and SSHO).

3. Enrollment in a medical monitoring program, with clearance within the previous 12 months from a licensed physician allowing the worker to participate in field activities and use respiratory protective equipment. Contractor shall not submit detailed medical information for employees.

4. Current respiratory fit testing certification.

5. Current cardiopulmonary resuscitation (CPR) and first aid certification for at least two workers assigned to Work on the site.

6. For one who is assigned the role of a "competent person," documentation of sufficient and relevant training and experience to perform the assigned duties and responsibilities of that role. As defined in 29 CFR 1926.31, the competent person shall be "one who is capable of identifying existing and predictable hazards, and who has authority to take prompt corrective measures to eliminate

them." Relevant training and experience shall be in the same type of Project activities included in the Work under this Contract.

B. Contractor shall designate one "competent person" as defined in 29 CFR Part 1926, Subpart P, Excavations, to inspect and document excavation safety conditions daily, and to ensure excavation safety prior to any personnel entering an excavation.

3.02 WORK PLANNING AND MEETINGS:

A. Contractor shall conduct a daily Health and Safety meeting, prior to beginning Work for that day, to address Health and Safety issues, changing site conditions, activities and personnel. All Contractor and Subcontractor employees working on the site on that day shall attend the meeting. All meetings shall be documented and attendees shall sign acknowledgement of their presence at the meeting. Daily meetings shall include a STAR evaluation of the Work to be conducted and to document meeting attendance and discussion points. The STAR evaluation and daily safety meeting shall be documented on STAR forms, which are attached to this Section.

B. Subcontractor personnel who are not in attendance for the daily Health and Safety meeting shall be briefed on the meeting notes upon arrival at the site and prior to commencing their Work activities. Employees shall sign acknowledgement of briefings prior to commencing Work.

C. Contractor shall hold and document additional safety meetings at the start of each major task and whenever site conditions affecting personnel safety change. Any major task undertaken shall require the completion of a JSHA as described in 1.05G of this Section.

3.03 ENGINEERING CONTROLS:

A. Contractor shall, at a minimum, provide the following engineering controls to reduce the hazards of equipment operation and exposure to site hazardous chemicals:

1. Roll-over cages for bulldozers, back hoes, loaders, and tractors.

2. Back-up alarms for all trucks and moving equipment.

3. Wetting of soil or other means to control dust during the Work.

4. Decontamination of personnel and equipment in accordance with Specifications Section 02130 - Decontamination.

5. Barricades for open trenches and excavations.

6. Sloping, benching, shoring, drainage systems, or other controls as necessary to ensure stability of excavations and embankments.

7. Providing a dedicated flag person to manage truck traffic along and into and out of the site.

8. Provide odor, vapor, and dust emission control as specified in the OVDCP and as directed by the Engineer.

9. Others as determined to be necessary or prudent by Contractor or as directed by the Engineer.

B. Contractor shall post ground level warning signs every 50-feet below all overhead utilities on site.

3.04 MONITORING:

A. Contractor shall perform heat exposure and cold exposure monitoring activities as required by weather conditions.

B. The Contractor shall perform all air monitoring activities described in the Contractor's HASP required to provide Health and Safety protection to the Contractor's and Subcontractor's personnel.

C. The Site Perimeter Community Air Monitoring shall be conducted by Others.

3.05 EVALUATION OF PERFORMANCE:

A. Contractor shall routinely conduct internal safety audits on Subcontract and Sub-subcontract Work sites in accordance with the Contractor's HASP. The focus of these routine audits will be on compliance with OSHA and local occupational safety regulations.

B. Contractor shall conduct routine behavioral observations and provide immediate feedback during Work activities to promote safe behavior of Contractor employees and Subcontractor employees. Contractor behavioral observation and feedback sampling will be conducted in accordance with the Engineer's BEST observation and feedback process which is attached at the end of this Section.

END OF SECTION

Health and Safety Forms Follow

SECTION 01415
HEALTH AND SAFETY REQUIREMENTS

First Report of Occupational Injury, Illness, or Exposure

Reported by:		**Incident Date/Time:**	
Date/Time Reported		**Client Name/Site:**	
Supervisor:		**ENSR Office:**	

Description:

Describe the operation in progress, body part affected, witness names, client notifications made, potential non-work related causes, and any contributing conditions. Use additional sheets as necessary.

Response and Care Provided:

☐ Taken to medical facility (provide facility name and phone):

☐ First aid provided(describe):

Incident Resulted from (check all that apply):

☐ Body mechanics/ergonomics	☐ Hand safety	☐ Road/vehicle
☐ Chemical exposure/release	☐ Mechanical	☐ Security Lapse
☐ Drowning/engulfment	☐ Noise	☐ Sharp/broken object
☐ Electrical	☐ Pinch point	☐ Slip/trip/fall
☐ Equipment/tools	☐ Plants/animals	☐ Weather
☐ Fire/explosion	☐ Pressure/heat	☐ Other:

Possible Causal Factors (as identified by employee):

1. Immediate Cause		**2. Root Cause**
☐ Engineering design – inadequate		☐ Behavior – rushing or frustration
☐ Inattentiveness/awareness – inadequate		☐ Behavior – fatigue or complacency
☐ Protective Systems/Equip. – inadequate		☐ Change in condition/scope of work
☐ Pre-planning – inadequate	**DUE TO:** →	☐ Procedure – inadequate or not present
☐ Procedure – not followed		☐ Staffing – insufficient number of staff
☐ Tool/Equipment– wrong for the job		☐ Staffing – inadequate physical state
☐ Tool/Equipment – inadequate insp./maint.		☐ Staffing – inadequate supervision
☐ Worksite layout or control – inadequate		☐ Training – inadequate
☐ Other:		☐ Other:

Corrective Action Taken and Lesson Learned:

Submit immediately to all of the following:

☐ Your supervisor ☐ Project Manager (if applicable) ☐ EHS Coordinator ☐ Corporate EHS

SECTION 01415
HEALTH AND SAFETY REQUIREMENTS

EHS Opportunity or Near Miss Report

Reported by: ______________________ Incident Date/Time: ______________________

Date Reported: ______________________ Site Location: ______________________

Report Type (please check one):

☐ EHS Opportunity (*suggestion for improvement, good EHS idea to share, or EHS observation*)
☐ EHS Near-Miss (*event that could have resulted in an incident under different circumstances)*

Description:

Describe key aspects such as the operation in progress, worker experience, potential outcome of event, and any contributing conditions. Use additional sheets as necessary.

Possible Outcome (check all that apply):

☐ Injury/illness ☐ Property damage ☐ Environmental release ☐ Regulatory Violation

Hazard Category (check all that apply):

☐ Body mechanics/ergonomics	☐ Hand safety	☐ Road/vehicle
☐ Chemical exposure/release	☐ Mechanical	☐ Security lapse
☐ Drowning/engulfment	☐ Noise	☐ Sharp/broken object
☐ Electrical	☐ Pinch point	☐ Slip/trip/fall
☐ Equipment/tools	☐ Plants/animals	☐ Weather
☐ Fire/explosion	☐ Pressure/heat	☐ Other:

Possible Causal Factors (as identified by employee):

1. Immediate Cause		2. Root Cause
☐ Engineering design – inadequate		☐ Behavior – rushing or frustration
☐ Inattentiveness/awareness – inadequate		☐ Behavior – fatigue or complacency
☐ Protective systems/equip. – inadequate		☐ Change in condition/scope of work
☐ Pre-planning – inadequate	DUE	☐ Procedure – inadequate or not present
☐ Procedure – not followed	TO:	☐ Staffing – insufficient number of staff
☐ Tool/Equipment– wrong for the job	→	☐ Staffing – inadequate physical state
☐ Tool/Equipment – inadequate insp./maint.		☐ Staffing – inadequate supervision
☐ Worksite layout or control – inadequate		☐ Training – inadequate
☐ Other:		☐ Other:

Corrective Action Taken and Lesson Learned:

Submit to: ☐ Your supervisor or PM (review for quality then send to:)
☐ EHS Coordinator (review, enter in monthly report, then send to:)
☐ Corporate EHS

SECTION 01415
HEALTH AND SAFETY REQUIREMENTS

Hot Work Permit

Permit Valid
For 1 Work Day

Site Name:______________________________ **Project Number**:________________________

EHS Officer:____________________________ **Client**:__________________________________

Hot Work Description:____

____

____

Workers/Welders Conducting Hot Work:____

Permits MUST be completed in its Entirety Before Hot Work Begins

	Yes	No
Has Project supervisor been notified of intended Hot Work?		
Does client representative need to be notified of the intended Hot Work?		
Will Hot Work impact the general public, clients, or operation employees?		
Will the intended Hot Work need to be coordinated with other contractors who may be working on the site to make them aware of any hazards and the scope of work to be performed?		
Have hazardous energy sources been identified, isolated, and locked out/tagged out before the start of the Project?		
Will Hot Work be conducted within a confined space?		
All testing equipment (i.e., CGI, oxygen meter, etc.) and firefighting equipment (i.e., extinguisher, etc.) have been checked to ensure proper operation and calibration before the start of this Project?		
Has a fire watch been designated and on station?		
Have coatings on metal surfaces been tested for ignitability and flame spread?		
Has the area been cleared of all flammable materials?		
Have all fuel sources been identified and protected?		
Has the area been restricted with proper barriers and signs?		
Has the area been tested to be certain that atmosphere is 0% LEL before starting Hot Work?		
Have flame sensitive areas and equipment (including cylinders and gas delivery lines) exposed to slag and sparks been protected by flame resistant blankets or removed from the area?		
Have all equipment and hoses been protected from falling metal structures and debris?		
Have escape routes been identified before starting work?		
Is ventilation equipment needed? Type needed:		

SECTION 01415
HEALTH AND SAFETY REQUIREMENTS

The Following Protective Equipment Will be Required:

	Yes	No		Yes	No
Welding Goggles/Shield Tint			Supplied Air Respirator		
Safety Boots			Head Protection		
Leather gloves			Safety Harness		
Hearing Protection			Welding Leathers – Top		
APR Cartridge			Welding Leathers - Bottom		

Permit Valid for 1 Work Day

The following procedures will be applicable prior to Hot Work on tanks or other types of enclosed structures. (Check all that apply and fill in appropriate information.)

☐ Ventilate to 0% LEL

☐ Confined Space Entry Permit

☐ Mechanical Ventilation Required

☐ Cold Cut Only Method Allowed:______________________________

☐ Hot Cutting Permitted Method Allowed:______________________________

Inert to <____________% Oxygen

Approvals:

____
Date

____
Client Representative

____
ENSR Site Safety Officer

____
Fire Watch

____
Performed Hot Work Employee

File Permit in Project Work File and Health and Safety Department

SECTION 01415
HEALTH AND SAFETY REQUIREMENTS

Job Hazard Analysis

JHA Type: ☐ **Investigation** ☐ **O&M** ☐**Office** ☐ **Construction**			☐ New ☐ Revised	Date:
Work Activity:				
Personal Protective Equipment (PPE):				
Development Team	**Position/Title**	**Reviewed By**	**Position/Title**	**Date**

❶ Job Steps [1]	❷ Potential Hazards [2]	❸ Critical Actions [3]
		1.
		2.
		3.
		4.
		5.
		6.
		7.
		8.
		9.
		10.
		11.
		12.

Notes

1 – Target number of job steps: six to ten
2 – Codes for Potential Hazards:

Caught Between (CBT)	Contacted By (CB)	Caught On (CO)	Fall To Below (FB)	Overexertion (O)	Struck Against (SA)
Caught In (CI)	Contact With (CW)	Exposure (E)	Fall - Same Level (FS)	Release To (R)	Struck By (SB)

3 – Types of Critical Actions: Administrative Controls, Engineering Controls, PPE, and/or Safe Work Practice / SOP
Form Version 4/3/06

SECTION 01415
HEALTH AND SAFETY REQUIREMENTS

Safety Task Analysis Review (STAR)

Task Description:

____

List Tasks:

____
____
____
____
____
____
____
____
____
____
____

Company: ____________________
Completed By: ________________
Date: _______________________
Job Location: ________________
____

List Additional Hazards (Hazards Not Shown with Check Box)

____
____
____
____
____
____
____
____
____
____
____

List Additional Controls (Controls Not Shown with Check Box)

____
____

Tailgate Meeting Topic

____
____

Signatures of Personnel on Task Analysis Review/Tailgate Meeting:

____
____

Mentor Assigned to Work

____
____
____

Lessons Learned (Based on changes in conditions, EHS Near- Incidents/ Observations, Potential Emergencies)
Is there a better/safer way to perform the work/task?

____
____

Supervisor Review (date/Time): ______
____

EHS Review (date/time): ____________
____

Comments: ______________________
____
____

SECTION 01415
HEALTH AND SAFETY REQUIREMENTS

Identify Potential Hazards

☐ Abrasions
☐ Biological Hazards (Plants, Animals, Insects)
☐ Cave-in (Trench/Excavation Work)
☐ Chemical/Thermal Burn
☐ Cuts
☐ Dermatitis
☐ Dropping Materials/Tools to Lower Level
☐ Drowning/Flowing Water
☐ Dust
☐ Electrical Shock
☐ Elevated/Overhead Work
☐ Energized Equipment
☐ Fire
☐ Flammability
☐ Foreign Body in Eye
☐ Hazardous Materials (Exposure or Release)
☐ Heat or Cold Stress
☐ Heavy Equipment Operation
☐ Heavy Lifting
☐ High Noise Levels
☐ Impact Noise
☐ Inability to Maintain Communication
☐ Inclement Weather
☐ Overhead Work
☐ Overhead Utilities
☐Underground Utilities
☐ Pinch Points
☐ Pressurized Lines
☐ Slips, Trips, Falls
☐ Sprains/Strains
☐ Traffic
☐ Underground Utilities
☐ Confined Space
☐ New or Rental Equipment
☐ Surface Water Run-On/Run-Off
☐ Odor/VOC Emissions
☐ Compressed Gas Cylinders
☐ Generated Wastes (Solids/Liquids)
☐ Known/Unknown Visitors
☐ Visibility
☐ New Personnel
☐ Hoists/Rigging/Slings/Wire Rope
☐ Special Operations/Instructions (Attach)
☐ Ergonomics

Identify Controls

☐ Air Monitoring
☐ Barricades/Fencing/Silt Fencing
☐ Buddy System
☐ Appropriate Clothing/Monitoring of Weather
☐ Confined Space Procedures
☐ Decontamination
☐ Drinking Water/Fluids
☐ Dust abatement Measures
☐ Equipment Inspection
☐ Exclusion Zones
☐ Exhaust Ventilation
☐ Fall Protection
☐ Fire Extinguisher/Fire Watch
☐ Flotation Devices/Lifelines
☐ Grounds on Equipment/Tanks
☐ Ground Fault Interrupter
☐ Ground Hydraulic Attachments
☐ Hand Signal Communication
☐ Hazardous/Flammable Material Storage
☐ Hazardous Plant/Animal Training
☐ Hearing Protection (Specify)
☐ Hoses, Access to Water
☐ Hot Work Procedures
☐ Insect Repellent or Precautions
☐ Isolation of Equipment or Process (LO/TO)
☐ Stormwater Control Procedures/Methods
☐ Machine/Equipment Guarding
☐ Manual Lifting Equipment (Chain Falls)
☐ Protective Equipment (Specify)
☐ Proper Lifting Techniques
☐ Proper Tool for Job
☐ Radio Communication
☐ Respirator, (Specify Type)
☐ Safety Harness/Lanyard/Scaffold
☐ Sloping, Shoring, Trench Box
☐ Vehicle Inspection
☐ Spill Prevention Measures/Spill Kits
☐ Equipment Manuals/Training
☐ Emergency Procedures/Incident Management Plan
☐ Appropriate Labels/Signage
☐ Derived Waste Management Plan
☐ Visitor Escort/Orientation/Security
☐ Window Cleaning/Defrost
☐ Proper Work Position/Tools

Pre-Task Review (Yes/No/NA)

1. Has Job Hazard Analysis been completed and reviewed? _____
2. Is Job Scope understood by all Personnel? ________
3. Proper Safety Equipment on job site? ____________
4. Permit Issued?
   What type?
   ☐ Hot Work ☐ Confined Space
   ☐ Excavation ☐ Other:__________________
5. Proper Tools for Job on site? _________________
6. Oxygen/Flammability checked? ________________
7. Reviewed MSDSs for any hazardous substance that might be present? _______________________
8. Proper training for all personnel? ______________
9. Are there any planned deviations from set procedures for equipment modifications? __ If so, contact supervisor to check applicability of MOC procedures.
10. Is there any work planned that could cause activation of emergency procedures? ______________
    If so, have these procedures been discussed and communicated?

Post-Task Review

1. Work area cleaned up?___________________
2. All locks and tags removed and signed off by individuals?_____________________________
3. Have Permits been turned in? ______________
4. STAR submitted to EHS Department? ___________
5. Were there any unplanned deviations from set procedures or equipment modifications? _________
   If so, contact supervisor to check applicability of MOC procedures.

SECTION 01500
MOBILIZATION AND TEMPORARY FACILITIES

PART 1 – GENERAL

1.01. SECTION INCLUDES:

A. Electric Service
B. Water Service
C. Temporary Sanitary Facilities
D. Traffic Control Signs
E. Work Zones
F. Enclosures and Fencing
G. Protection of the Work
H. Temporary Erosion and Sediment Controls
I. Haul Roads and Access Roads
J. Parking
K. Progress Cleaning and Waste Removal
L. Stockpile Areas
M. Field Offices and Sheds
N. Removal and Restoration of Utilities, Facilities, and Controls
O. Fuel Storage and Dispensing

1.02. ELECTRIC SERVICE:

A. A licensed electrician shall perform all electrical Work.

B. Contractor shall furnish and install electrical and telephone service to all Field Offices, including Engineer's field office, and any other location Contractor deems necessary to complete the Work. A 600a, 3 phase, 480V temporary electrical service is existing at the site. Contractor shall furnish and install electrical connections from main service disconnect to Contractor's facilities, equipment and to the office trailers. In addition, GFCI outlets shall be installed every 50 linear feet along the perimeter fence to power the perimeter air monitoring stations. Contractor shall be responsible for any electric power requirements for the water treatment system. At a minimum the contractor will be required to coordinate and pay for power for the temporary facilities, air handling systems, perimeter air monitoring stations and other construction activities. The temporary service shall remain in place at the end of the project at which time the service shall be transferred to the owner. No large portable generator shall be utilized on site.

C. All electrical connections shall meet appropriate NEMA ratings consistent with the intended service.

D. Contractor shall coordinate with local electric utility and obtain any necessary inspections and permits.

SECTION 01500
MOBILIZATION AND TEMPORARY FACILITIES

1.03. WATER SERVICE:

A. Contractor shall provide, maintain, and pay for suitable quantity and quality of water service for dust control and decontamination..

B. Contractor shall provide water conveyance from the water service terminus to any locations on the Project Site where water is used.

C. Contractor shall provide, maintain, and pay for a suitable quantity of potable drinking water for all on-site employees. Contractor shall furnish drinking water in Contractor's field office trailer and, if necessary at other locations near the Work being conducted

1.04. TEMPORARY SANITARY FACILITIES:

A. Contractor shall provide a sufficient number of portable toilets for Contractor and Subcontractor Work crews, the Engineer, Owner, and visitors in accordance with usage ratings, or as otherwise directed by the Engineer. The facilities shall be provided at time of project mobilization and maintained in clean and sanitary condition until Substantial Completion.

B. Contractor shall provide and maintain in clean, good working order, a water hand washing facility for personnel decontamination.

C. Contractor shall provide and maintain in clean, good working order an emergency decontamination and eye wash station.

D. Contractor shall provide and maintain, in clean, good working order other personnel decontamination facilities required by the Contract Documents or the HASP.

1.05. TRAFFIC CONTROL SIGNS:

A. Contractor shall furnish, install, and maintain traffic control signs in accordance with requirements of the Village of Sag Harbor, Transportation Plan, the Contractor's traffic plan, and as otherwise deemed necessary by the Engineer for the safety of the public.

1.06. WORK ZONES:

A. Contractor shall establish a Secured Zone, Support Zone, Exclusion Zone, and Decontamination Zone, as defined herein.

1. Contractor shall lay out the Work Zones and establish boundaries, barriers, facilities, and controls to ensure that all personnel and equipment exiting the

Exclusion Zone shall pass through the Decontamination Zone before entering the Support Zone and before exiting the Project Site.

2. Contractor shall furnish, install, and maintain in good condition, orange plastic mesh fencing secured to metal posts to delineate the boundaries between Work Zones, including the Exclusion Zone, Decontamination Zone, and Support Zone and around the lined stockpile area.

B. Secured Zone. Contractor shall establish a general Secured Zone that excludes unauthorized personnel from entering the Project Site.

1. Access to Secured Zone shall be controlled by steel chain link fence and locking gates provided by Others as shown on the Drawings.

2. Contractor shall furnish locks for Secured Zone gates and provide duplicate keys to Engineer and Owner.

3. Contractor and Engineer shall control access to the Secured Zone. The Engineer and Owner shall be allowed free access to the Secured Zone 24 hours per day, subject to appropriate safety precautions.

4. Contractor shall maintain a log sheet on which all Contractor personnel and visitors must sign in and out upon entering or leaving the Secured Zone.

5. Contractor shall be responsible for the security and safety of equipment, facilities, personnel, and materials within the Secured Zone.

C. Support Zone. Contractor shall establish a Support Zone for field offices, storage, sanitary facilities, hand washing facilities, and non-construction vehicle parking.

1. The Support Zone shall be an area free of physical and chemical hazards.

2. Contractor shall maintain the Support Zone in a safe, clean, orderly, and sanitary manner at all times.

D. Exclusion Zone. Contractor shall establish an Exclusion Zone within the Secured Zone using the following criteria and other criteria deemed necessary by the Engineer:

1. Open excavation areas shall be included in the Exclusion Zone.

2. Impacted Material stockpile area shall be designated an Exclusion Zone.

3. Consideration of meteorological conditions and the potential for contaminants or other materials to be blown or washed from the area.

4. OSHA Regulations and other applicable Laws and Regulations.

E. Temporary Activity Zones within Exclusion Zone. Contractor shall establish Temporary Activity Zones within the Exclusion Zone using high-visibility warning tape fastened to metal posts or weighted barrels to delineate areas where specific Work tasks will take place. Temporary Activity Zones shall be revised as necessary and as the Work progresses. Temporary Activity Zones shall be established to include the following tasks:

1. Excavation: Excavation areas shall be marked with yellow or orange caution tape at all times.

2. Stockpiling: Stockpile areas (i.e., unimpacted stockpiles, import material stockpiles) shall be established as Temporary Activity Zones and signs installed to indicate the type of material stockpiled in each stockpile area. Signs may consist of high visibility spray paint on the plastic membrane stockpile cover.

3. Storage: Storage areas for materials or equipment shall be established and maintained as Temporary Activity Zones.

4. Decontamination: Any temporary decontamination areas shall be marked as Temporary Activity Zones.

F. Decontamination Zone. Contractor shall establish a Decontamination Zone between the Support Zone and the Exclusion Zone.

1. Contractor shall provide suitable facilities for personnel decontamination in the Decontamination Zone, including emergency eyewash, hand washing, and shower facilities.

2. Contractor shall construct a vehicle and equipment decontamination facility, if necessary, which shall allow for containment and collection of liquid and solid residuals from decontamination of construction vehicles and trucks bound for landfill disposal.

3. Contractor shall inspect and document inspection of each truck bound for disposal of Impacted Soil and debris. Contractor shall inspect all vehicles and equipment that have been in the Exclusion Zone prior to exiting the Exclusion Zone. Contractor shall remove loose mud and debris from all vehicles that have been in the Exclusion Zone prior to movement of equipment between the Exclusion Zone and Non-Exclusion Zone areas of the Secured Zone.

4. Contractor shall provide splash protection around the vehicle decontamination facility. Splash protection shall minimize potential contamination from splatter and mist during the vehicle and equipment decontamination process. Splash protection shall be temporary, but stable, and capable of being dismantled in the event of high winds.

5. Contractor shall provide a drainage and collection system for wastewater generated during decontamination procedures.

6. Contractor shall place the Decontamination Zone near the entrance and exit as specified in the Drawings.

1.07. ENCLOSURES AND FENCING:

A. Existing fencing around the site is shown on the Drawings. The Contractor shall protect this security fencing from damage and shall repair and replace fencing damaged by Contractor's activities. Contractor shall furnish, install, and maintain all other proposed temporary fencing, gates and barriers around impacted areas as required by the Contract Documents and to complete the Work.

B. Contractor shall furnish and post signs at every entrance and gate and at least every 50 feet along the fence warning the general public that the Project Site contains physical and chemical hazards and that access is forbidden to unauthorized persons.

C. Contractor shall furnish and post a professionally lettered sign, minimum size 4 feet by 4 feet, at each entrance, or gate to the site with the following text, or other similar text approved by the Engineer.

> "All Personnel and Visitors Beyond This Point Must Wear Hard Hat, Safety Glasses, High-Visibility Vest, and Steel Toe Boots."

1.08. PROTECTION OF THE WORK:

A. Contractor shall protect installed Work and provide special protection with regard to preventing the spread of residuals to areas outside the Exclusion Zone.

B. Contractor shall protect the existing buildings, trees, shrubs, sidewalks, driveways, streets, catch basins, manholes, subsurface facilities, curbs, and gutters by such means as determined by Contractor to be adequate for such protection, unless such facilities are designated on the Drawings for removal. Contractor shall repair or replace any existing buildings, trees, shrubs, sidewalks, driveways, streets, catch basins, manholes, subsurface facilities, curbs, or gutters that are cracked, broken, or otherwise damaged by Contractor, to its original condition, or better, in accordance with Village of Sag Harbor requirements.

1.09. TEMPORARY EROSION AND SEDIMENT CONTROLS:

A. Contractor shall remove all soil, mud, and residuals from vehicle wheels, fenders, and tailgates before exiting to public streets.

B. The Contractor shall provide, install, and maintain all required sediment and erosion controls as specified in section 01570 – Erosion and Sediment Controls.

1.10. HAUL ROADS AND ACCESS ROADS:

A. Contractor shall furnish, construct, and maintain on-site haul and access roads as designated on the Drawings, or as necessary to complete the work with Engineer's approval.

1.11. PARKING:

A. Engineer shall designate a parking area to accommodate personal vehicles of Contractor employees, the Engineer, Owner, and visitors. Construction vehicles shall not be allowed in the areas designated for parking personal vehicles.

B. Contractor shall designate an area of the Secured Zone to be used for parking and maintenance of construction vehicles and equipment.

1.12. PROGRESS CLEANING AND WASTE REMOVAL:

A. Contractor shall maintain all Work areas free of waste materials, debris, and rubbish, maintain the Work site in a clean and orderly condition, and collect and remove waste materials, debris, and rubbish from the Work site weekly and dispose off site.

1.13. STOCKPILE AREAS:

A. The Stockpile and Laydown Area will be constructed by the Contractor. The Contractor shall maintain these facilities during the course of the Work, modify them as required to implement the Work, and remove them when the Work is complete.

B. Contractor shall establish individual stockpiles within the stockpile area as necessary for coordination of excavation with off-site transportation for disposal of Impacted Soil and debris, subject to approval by the Engineer.

SECTION 01500
MOBILIZATION AND TEMPORARY FACILITIES

1.14. FIELD OFFICES AND SHEDS:

A. General requirements for all sheds and offices shall be as follows:

1. Structurally sound, weather tight, with floors raised above ground, with hurricane tie-down straps.

2. Thermal insulation compatible with occupancy and storage requirements.

B. The Engineer shall furnish and maintain a field office for the use of the Owner and the Engineer at the Project Site, at a location to be coordinated with the Contractor, during the entire period of Work. The Contractor shall cooperate with the Engineer to locate the field office.

C. Contractor shall furnish and maintain a field office for the use of Contractor and a field office for use of the Owner's Air Monitoring Contractor and NYSDEC at the Project Site, at a location coordinated with the Engineer, during the entire period of Work.

1. Field offices shall be located in the Support Zone.

2. Field offices shall be of a size, construction, and outfitted in a manner customary to such facilities at similar construction sites. The Air Monitoring/ NYSDEC field office may be of half-trailer size.

3. Field offices (other than the Engineer's) shall be furnished with appropriate fire extinguishers, first aid supplies, and office supplies.

4. Contractor's field office and Air Monitoring field offices shall each be separate structures and be separate structures from the Engineer's field office.

5. Engineer's field office will require (1) phone, (1) fax, and (1) high speed data (hard line) connections. The air monitoring subcontractor's/ NYSDEC field office will require (2) phones and (2) data connections.

1.15. REMOVAL AND RESTORATION OF UTILITIES, FACILITIES, AND CONTROLS:

A. Contractor shall remove temporary utilities, equipment, and construction facilities, prior to submitting final Application for Payment, including those provided or installed by Others unless specifically identified for removal by Others.

B. Contractor shall remove from the Work site all materials, equipment, vehicles, construction facilities, temporary controls, rubbish, debris, and wastes.

C. Contractor shall dismantle and remove from the Project Site, as directed by the Engineer, any temporary fencing installed by the Contractor.

1.16. FUEL STORAGE AND DISPENSING:

A. Contractor shall store fuel on site only in approved containers that meet all relevant fire codes.

B. Contractor shall provide secondary containment and spill protection devices at all onsite fueling facilities.

C. Extreme care shall be taken to prevent fuel spills. Contractor's representative shall be present at all time when equipment is being fueled. Subcontractor shall notify the Engineer, the local Fire Department and other authorities as required in the event of a spill. Contractor shall be prepared and shall provide personal equipment and materials to immediately respond to fuel spills, and is responsible for all costs of containing, removing and disposing of materials contaminated by fuel spills.

D. Contractor shall provide and maintain absorbent materials, shovels, containers and other appropriate materials for spill response and cleanup. Cleanup materials shall be appropriate for the type of fuels, oils and other materials used.

E. Contractor shall not commingle waste materials caused by fueling or vehicle maintenance activities with excavated contaminated soil or with impacted water generated by the Work.

F. Contractor shall dispose of waste materials caused by fueling at no expense to the Owner.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 01570
EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.01. SECTION INCLUDES:

A. Performance Requirements
B. Products
C. Surface Water Run-on/Run-off Control
D. Inspection and Maintenance

1.02. PERFORMANCE REQUIREMENTS:

A. Permits and Approvals: The Engineer will obtain any necessary permits and approvals for erosion and sediment control.

B. Compliance: Contractor shall be responsible for compliance with requirements of any and all permits and approvals, and the Stormwater Pollution Prevention Plan.

C. Implementation: Contractor shall employ the following general procedures, and other procedures as required by all regulations:

1. Run-on Controls: Contractor shall use ditches, berms, pumps, and other methods necessary to divert and drain surface water away from excavations and other Work areas.

2. Sediment Controls:

a. The sediment and erosion control structures shown on the Drawings shall be installed by the Contractor. The Contractor shall inspect and maintain these facilities in accordance with the Contract Documents.

b. Contractor shall take necessary precautions and implement best management practices to prevent sediment from entering roadways, storm sewers, catch basins, or surface water.

D. Stockpile Management. Contractor shall manage stockpiles in accordance with Specifications Section 01500 – Mobilization and Temporary Facilities.

E. Street Cleanliness:

1. Where construction vehicle access routes intersect public roads, Contractor shall make provisions to mitigate the transport of mud, spoils, soil, or dust onto the public road. Contractor shall construct haul roads with necessary controls to prevent soil transport to public streets. If soil, spoils, mud, or dust is transported onto a road surface, Contractor shall clean the road thoroughly immediately.

Contractor shall remove soil from the roads by shoveling or sweeping and sweepings shall be transported to an on-site soil stockpile area. Street washing with water shall be allowed only after soil is removed to the extent practical by sweeping.

F. Control of Pollutants Other than Soil/Mud/Dust/Sediment:

1. All pollutants that occur on the Project Site during construction shall be handled and disposed in a manner that does not impact stormwater runoff.

2. Fueling of Contractor's equipment shall be performed away from storm drain inlets and catch basins.

PART 2 – PRODUCTS

2.01. SILT FENCE

A. Silt fence shall be as detailed in the Drawings, or equivalent.

2.02. HAY BALES

A. Hay bales shall be installed by the Contractor at the Engineer's discretion, as detailed in the Drawings.

PART 3 – EXECUTION

3.01. SURFACE WATER RUN-ON/RUN-OFF CONTROL:

A. Contractor shall intercept surface water and divert it away from excavations and Work areas through use of dikes, ditches, curb walls, pipes, sumps, or other Engineer-approved means. The requirement includes temporary measures as required to protect adjoining properties from surface drainage caused by construction operations.

B. Contractor shall prevent surface water run-on/run-off from transporting sediment or other contaminants off site. Any stormwater coming into contact with contaminants shall be stored on-site and shipped off-site for disposal. Should, in the opinion of the Engineer, the Contractor fail to provide adequate run-on controls, all costs related to the collection, storage and disposal of the resulting impacted storm water shall be the responsibility of the Contractor.

SECTION 01570
EROSION AND SEDIMENT CONTROL

3.02. INSPECTION AND MAINTENANCE:

A. Contractor shall inspect and repair or replace damaged components of temporary erosion and sediment controls weekly including those installed by Others. Inspection and repairs shall be conducted immediately after rain or flooding events, and inspection and repairs shall be conducted at least once each day during prolonged rain events.

B. Contractor shall remove sediment deposits and place them in designated spoil areas. Sediment shall not be allowed to migrate off site. If sediment has been in contact with contaminated materials, it shall be incorporated into material to be disposed or further characterized to determine appropriate disposition.

C. Contractor’s equipment and vehicles are prohibited from maneuvering on areas outside of dedicated rights-of-way and easements for construction.

D. Damage to erosion and sediment control systems shall be repaired immediately.

END OF SECTION

SECTION 01720
SURVEYING

PART 1 – GENERAL

1.01. SECTION INCLUDES:

A. Submittals
B. Examination
C. Survey Reference Points
D. Survey Requirements

1.02. SUBMITTALS:

A. Contractor will provide a Land Surveyor licensed in the State of New York.

B. Contractor will submit all field notes, computations, data logger information, and other survey records for the purposes of layout of the Work, or payment quantity estimation, or for final documentation of the Work to the Engineer on a daily basis.

C. Contractor will maintain and submit all survey data and survey Drawings as Record Documents.

1.03. EXAMINATION:

A. Contractor shall verify locations of survey benchmarks shown on the Drawings prior to starting Work.

B. Contractor shall promptly notify the Engineer of any discrepancies discovered.

1.04. SURVEY REFERENCE POINTS:

A. Contractor's surveyor will establish temporary benchmark(s) and horizontal control for the Work.

B. Contractor shall locate and protect survey control and reference points during construction.

PART 2 – PRODUCTS

Not Used.

SECTION 01720
SURVEYING

PART 3 – EXECUTION

3.01. SURVEY REQUIREMENTS:

A. The Contractor's Land Surveyor will conduct an initial survey of boundaries for limits of the soil mix wall as shown on the Drawings. This survey shall utilize recognized engineering survey practices appropriate for obtaining the information specified. The Contractor shall conduct additional layout survey during the Work as needed to ensure that the Soil Mix Wall is constructed to the limits shown of the Drawings.

B. The Contractor's Land Surveyor shall conduct a final as-built survey of the Soil Mix Wall limits.

C. Surveying personnel shall be in full compliance with all requirements of CFR.1910.120 before entering the Exclusion Zone.

D. Contractor shall preserve the survey stakes, including replacement by a Registered Land Surveyor, at Contractor's expense, if destroyed or moved.

E. During the course of the Work, the Contractor will record final locations and elevations of all excavation work when complete in each area. Contractor will record location and elevation of the Soil Mix Wall. Contractor personnel, properly trained in Total Station may perform this work in lieu of a RLS.

F. During the course of the backfilling and site restoration Work, the Contractor will record elevations and locations in completed working areas for each restoration material used.

G. Contractor shall promptly report to the Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Contractor shall make no changes without prior written notice to the Engineer.

H. The Work shall be executed in conformance with the lines and grades shown on the Drawings, unless otherwise approved by the Engineer.

I. If the Engineer believes that Contractor constructed the Soil Mix Wall outside the limits shown on the Drawings in certain areas, Work in that area shall be temporarily discontinued upon notification to Contractor. The Contractor may then employ a Registered Land Surveyor to determine actual elevations and locations of excavation.

J. At the end of construction, the Contractor's surveyor shall prepare Record Drawings as required by Engineer.

END OF SECTION

SECTION 01770
CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.01. SECTION INCLUDES

- **A.** Submittals
- **B.** Final Cleanup
- **C.** Contract Closeout Procedures

1.02. SUBMITTALS

A. Contractor shall submit the following in accordance with the Specifications Section 01330 – Submittal Procedures:

1. Contractor shall submit a written statement that the Work has progressed to Substantial Completion.

2. Contractor shall submit a written request for a final inspection after Contractor has determined that the Work is complete in all respects.

3. Contractor shall submit Project Record Documents as described in Specifications Section 01320 – Construction Progress Documentation.

4. Contractor shall submit a final Application for Payment.

5. Contractor shall submit a closeout report.

6. Contractor shall submit an Application for Payment of retainage accompanied by Contractor's affidavit of release of liens and Contractor affidavit of payment of debts and claims.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01. FINAL CLEANUP

A. Upon completion of the Work and before final inspection, Contractor shall clean the entire Work premises occupied or used in connection with the Work of all rubbish, surplus, and discarded materials, temporary facilities and controls, equipment, and debris. The entire Work premises shall be left in a clean, neat, and presentable condition.

SECTION 01770
CLOSEOUT PROCEDURES

3.02. CONTRACT CLOSEOUT PROCEDURES

A. Contract closeout procedures shall take place in the following order:

1. The Engineer will perform the final inspection.

2. If necessary, the Engineer shall prepare a punch list of Work items to be completed and transmit a copy of the punch list to Contractor.

3. Contractor shall complete all punch list items expeditiously to the satisfaction of the Engineer.

4. Contractor shall submit final Application for Payment to the Engineer identifying total adjusted Contract Price, previous payments, and amount remaining to be paid.

5. Contractor shall submit Application for Payment for retainage with required affidavits.

6. Contractor shall submit a Project closeout report that shall include:

a. Description of remediation activities, including total work quantities.

b. Variations from the Drawings, Plans and Specifications.

c. Discussion of major problems encountered and the resolutions.

d. Accident Injury Report summary.

e. Complete list of all Contractor personnel on the Site during completion of the work.

f. As-Built Record Drawings from a surveyor licensed in the State of New York.

END OF SECTION

SECTION 02120
OFF-SITE TRANSPORTATION AND DISPOSAL

PART 1 – GENERAL

1.01 SECTION INCLUDES:

- **A.** Summary
- **B.** Submittals
- **C.** Coordination with Waste Management Facilities
- **D.** Designated Haul Routes
- **E.** Shipping Documentation
- **F.** Waste Characterization
- **G.** Truck Bed Liners
- **H.** Preparation for Transport
- **I.** Transportation to Waste Management Facility
- **J.** Manifests
- **K.** Transportation
- **L.** Permits

1.02 SUMMARY:

A. This Section includes transportation of excavated materials and soil mix wall spoils and debris to specified disposal facilities. Contractor is responsible for the cost of all material transportation and disposal. The Contractor shall only utilize routes designated by the Engineer as outlined in the Transportation Plan. All truck traffic will enter Site from Route 79 (Main Street), to Spring Street, to Bridge Street. All truck traffic will leave the site south on Long Island Avenue, to Glover Street, to Route 79 (Main Street). The Village of Sag Harbor has many historic structures and congested roads and intersections. It is the responsibility of the Contractor to utilize equipment and personnel capable of navigating the local traffic patterns while maintaining minimum daily production required to meet the project milestones. The Contractor shall be responsible for all delays caused as a result of trucks not following approved traffic routes, due to inadequate scheduling of trucks causing traffic delays or from utilizing equipment that can not safely navigate the local roadways.

B. The Contractor shall provide tracking documentation for each load correlating with the pre-characterization data. Each load shall have tracking documentation identifying the pre-characterization data provided by the Engineer.

C. Contractor shall be solely responsible for proper vehicles loading. The Contractor shall ensure the vehicle contents are properly contained and secured in the vehicle including proper lining and covering of loads. The Contractor shall abide by all load limits and weight limits for all vehicles leaving the Project Site, and is responsible for any fines, taxes, penalties, or judgments resulting from overweight or improperly loaded vehicles

SECTION 02120
OFF-SITE TRANSPORTATION AND DISPOSAL

D. Contractor will employ dedicated flaggers to stop and direct all traffic at the location where trucks will exit from the site at all time during soil transportation activities and as needed along the trucking route.

E. Trucks shall only enter and exit the site at locations shown on the Drawings unless approved by the Engineer

F. The requirements specified in the Engineer’s Transportation Plan and the Contractor's Traffic Plan shall be implemented including but not limited to:

1. All truck drivers shall undergo an orientation detailing at a minimum the Work, requirements of the Transportation Plan and Traffic Plan, Village of Sag Harbor traffic rules and regulations, driver conduct, approved haul routes, approved staging areas, and prohibition to stage or park trucks within the Village of Sag Harbor except in pre-designated areas.

2. All truck drivers shall be required to sign the orientation form.

3. All truck drivers shall be provided with hard copies of the orientation package including the Transportation Plan and the Traffic Plan.

4. A hand-out detailing the haul routes, speed limits, warnings, designated staging areas, etc, will be provided to each truck driver.

5. All truck drivers will be required to follow incident reporting requirements detailed in the Traffic Plan.

1.03 SUBMITTALS:

A. Contractor shall provide a list of proposed waste haulers for approval by Engineer. Contractor shall submit copies of all necessary permits and certifications of listed waste haulers to Engineer before commencing the Work.

B. The Contractor shall submit written certification of proper transport of Impacted Materials to Engineer within one working day after receipt of the documentation. Contractor shall submit carbon copies (with all signatures affixed) of all waste manifests, weigh tickets, waste tracking logs and other shipping documentation.

C. Daily Construction Report shall include detailed documentation of all loading and transport activities as specified in Specifications Section 01320 – Construction Progress Documentation.

D. Contractor shall provide truck driver orientation signature sheets for al truck drivers.

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OFF-SITE TRANSPORTATION AND DISPOSAL

E. Contractor shall verbally inform the Engineer of any trucking related incident within an hour of the incident and provide any trucking related incident reporting forms to the Engineer within 4-hrs of the incident.

1.04 WASTE CHARACTERIZATION:

A. The Engineer has pre-characterized a majority of the soil at the Site for disposal at the facilities listed in Part 1.05. Further characterization will be performed during mobilization as the remaining locations become accessible, including areas of Bridge Street, and locations within the footprint of the Schiavoni Building. Additional characterization by the Engineer may be required by the disposal facilities based on actual soil and ISS spoils volumes. The data from precharacterization will be provided to the Contractor to obtain final approval from the Owner approved facilities. The Contractor will coordinate with all of the selected facilities and schedule transportation to insure uninterrupted soil removal from the Project Site.

1.05 COORDINATION WITH WASTE MANAGEMENT FACILITIES:

A. The Contractor shall be solely responsible for coordinating waste shipments with the waste management facilities. The Contractor shall utilize one of the following pre-approved facilities for all soil disposal:

1. CleanEarth of New Castle, Inc., located at Pyles Lane, New Castle, DE, 19720
2. CleanEarth of Philadelphia, Inc., located at 3201 South 61st Street, Philadelphia, PA, 19153
3. CleanEarth of Southeast Pennsylvania, Inc., located at 7 Steel Road East, Morrisville , PA, 1906
4. Environmental Soil Management, Inc., located at 304 Tow Path Road, Fort Edward, NY, 12828.
5. Environmental Soil Management, Inc., located 75 Crows Mill Rd. Keasbey, NJ,08832
6. Mid-Atlantic Recycling Technologies/Casie Protank, located at 3209 North Mill Road, Vineland, NJ, 08360.

B. The Contractor shall prioritize shipping to the lowest cost facility first. Additional approved facilities will then be used based on availability and cost, should the lowest cost facility limit acceptance. The Engineer shall be notified on a daily basis of the anticipated shipping volume and the destination facility.

C. The Bidder's proposal shall identify the names and locations of the debris disposal facilities they plan to use. The Contractor shall list their planned debris disposal facilities in their TEP and in Schedule C.

1.06 DESIGNATED HAUL ROUTES:

A. Contractor shall follow the designated haul routes. All truck traffic will enter Project Site from Route 79 (Main Street), to Spring Street, to Bridge Street. All truck traffic will leave the site south on Long Island Avenue, to Glover Street, to Route 79 (Main Street).

1.07 SHIPPING DOCUMENTATION:

A. Shipping documentation shall be performed consistent with federal, state, and local waste management and transportation requirements and the requirements of off-site disposal facilities.

B. The Contractor shall prepare necessary paperwork for transportation and disposal of all materials to the appropriate waste management facilities.

C. A non-hazardous/ hazardous waste manifest or other tracking document shall be provided by the Contractor for each individual load depending on material classification. Each manifest shall be signed by designated authorized agent of the Owner, the truck driver as a transporter, and by the disposal facility operator.

D. The Contractor shall not be paid for shipments with unsigned shipping documentation.

E. Daily Trucking Log:

1. The Contractor shall provide a Daily Trucking Log to the Engineer for approval providing information on each off-site shipment from the site, including trucking company, truck and trailer registration number, date, pre-characterization source ID, destination facility, estimated quantity, verification of decontamination, verification of 364 permit and Contractor personnel's initials.

2. The Contractor shall fill in the Daily Trucking Log for each shipment at the time it leaves the site.

3. The Contractor shall submit the completed Daily Trucking Log to the Engineer electronically as specified in Specifications Sections 01320 – Construction Progress Documentation and 01330 – Submittal Procedures.

4. The Contractor shall not be paid for any shipment if there are discrepancies between Daily Trucking Logs and facility weigh tickets until the discrepancy is resolved, as determined by the Engineer.

SECTION 02120
OFF-SITE TRANSPORTATION AND DISPOSAL

PART 2 – PRODUCTS

2.01 TRUCK BED LINERS:

A. Truck bed liners shall be 6-mil (minimum thickness) polyethylene sheets. Polyethylene sheets shall be of sufficient length and width to cover the interior bed of the haul truck with no seams and have sufficient material to completely cover over the load with overlap.

B. Contractor shall provide staging so that workers can place liners in the truck bed safely. Drivers will not be allowed to place liners or cover loads.

PART 3 – EXECUTION

3.01 PREPARATION FOR TRANSPORT:

A. Contractor shall coordinate transportation Work with excavation, SMW, and stockpile management Work to maintain excavation and SMW production rates for completion of the Work in accordance with the Contractor's submitted work schedule and the Construction Milestones. Slowing or stopping of Work by Contractor due to lack of transportation, availability of trucks or shipping containers or availability of disposal facility capacity does not release the Contractor for obligations to achieve the documented construction milestones.

B. Due to tight site conditions truck staging will be limited to (5) trucks prior to loading if space is available on-site. Additionally, trucks will not be allowed to stand on streets adjacent to the site awaiting entrance into the loading area. Trucks staged on-site shall not be allowed to idle longer than 5 minutes in duration and shall be in compliance with 6 NYCRR subparts 217-3.

C. The Contractor is responsible for identifying an off-site truck staging area outside the Village as approved by the Owner. The Contractor is responsible for coordinating, via radio or telephone, careful arrival of truck to avoid congestion in the Village of Sag Harbor.

D. No loading of soil shall take place in areas outside of the temporary fabric structure while the structure is in place.

E. Tarps shall be placed over loads after liner has been overlapped.

F. Loading operations and hours shall be coordinated with the operating hours of the disposal facilities or other designated off-site KeySpan facilities. KeySpan will make alternate overnight staging facilities available, however trucks cannot be staged at other off-site facilities not belonging to KeySpan overnight. Loading shall be limited to the hours of 8:00 a.m. to 5:00 p.m., Monday through Friday, or as otherwise specified or approved by the Engineer.

3.02 TRANSPORTATION TO WASTE MANAGEMENT FACILITY:

A. Contractor shall furnish and operate all vehicles and containers for transportation of all waste materials and backfill soils to and from the Project Site.

B. Drivers hauling Impacted Material shall drive directly to disposal facility or approved staging area and shall not stop except in the event of an emergency.

C. Transportation of all Impacted Material shall be in compliance with all pertinent Regulations.

D. Contractor shall visually inspect each truck and fill out a Daily Trucking Log before the truck leaves the site to ensure that the tailgate and tarp are secure. Contractor shall decontaminate vehicles as specified in Specifications Section 02130- Decontamination.

E. Haul trucks shall be lined with polyethylene sheeting or decontaminated on site prior to re-use for hauling anything other than material from the site. Contractor shall provide appropriate staging so that workers can safely line the truck bed. Drivers will not be allowed to place liners or cover loads. Truck beds shall be included in the decontamination.

F. In the event that a loaded truck is involved in an incident that results in an off-site release of the transported materials the Contractor shall immediately notify the Engineer who will notify the NYSDEC. The Contractor is responsible for following all NYSDEC spill response guidelines. The Contractor shall be responsible for cleanup and shall following all local and State Department of Transportation spill response procedures.

G. Contractor shall promptly clean up any spills on haul routes, if they occur, with suitable equipment at no cost to the Engineer or the Owner.

H. Contractor shall keep all haul routes and public rights-of-way free of any Project Site materials due to the Contractor's operations. To this end, all Contractor trucks shall be covered to prevent any material from leaving the truck, and all vehicles shall be carefully loaded to prevent site materials from coming in contact with the exterior truck surfaces.

I. The load weight shall be documented by the disposal facility scale Weigh Ticket. Contractor shall submit copies of all disposal facility scale Weigh Tickets to the Engineer. Unsigned scale Weigh Tickets will be rejected and the Contractor will not be paid based on these weights.

J. Contractor shall prevent any tracking of Project Site materials onto public rights-of-way.

K. Trucks hauling Impacted Materials shall not be allowed to haul any other materials until the truck has been decontaminated by the Contractor at the Project Site. Truck owner/operator shall not haul other materials during evenings, weekends, holidays, or any other non-working period unless the truck has been thoroughly decontaminated at the Project Site and documentation of decontamination has been provided in writing to the Engineer.

L. Loaded trucks shall not leave the Project Site unless they shall arrive at the designated waste management facility or KeySpan staging facility before it closes. Loaded trucks shall discharge their loads at the designated waste management facility the same day they are loaded unless they are staged overnight at an approved KeySpan operating facility provided.

M. Truck drivers shall be required to remain inside the truck cab with the windows and doors closed during loading. Drivers shall be instructed to proceed after loading through a decontamination area to a designated area outside the temporary fabric structure where they will be permitted to exit the truck cab to inspect the load.

N. The Contractor shall address vehicular accidents and the possible release of transported materials in their HASP and Traffic Plan.

3.03 MANIFESTS:

A. Contractor will prepare manifests, and prepare necessary paperwork for transportation and disposal of impacted materials and debris.

B. A non-hazardous/ hazardous waste manifest or other tracking document shall be provided by the Contractor for each individual load depending on material classification. Each manifest shall be signed by designated authorized agent of KeySpan, the truck driver as a transporter, and by the disposal facility operator.

C. The Contractor will not be paid for shipments with unsigned manifests.

3.04 TRANSPORTATION:

A. Contractor shall obtain all required transportation permits for shipment of Impacted Materials and debris.

B. Transportation of Impacted Materials and debris shall be in accordance with applicable State, RCRA, USDOT, local, and other applicable Regulations, including: 40 CFR 261, 262, 263 and 49 CFR 171 through 179; NYCRR Part 364 and Parts 370 to 373;

C. Truck drivers using routes other than the routes allowed in the Transportation Plan or found upon investigation to be at fault of causing an accident associated with this Project shall be barred from working on the Project Site.

D. Truck drivers not following the requirements detailed during the orientation, in the Transportation Plan, or in the Traffic Plan shall be barred from working on the Project Site.

E. No backhauling (hauling of material during trip back from the management facility) shall be allowed without prior approval by the Engineer.

F. No trucks that have hauled Impacted Material shall haul different material without first being decontaminated at the Project Site. No hauling after hours, or during the weekend or during any other non-working periods without prior decontamination shall be allowed.

3.05 PERMITS:

A. Contractor shall obtain all required transportation permits for shipment of Impacted Materials and debris including NYCRR Part 364 permits. Contractor shall maintain a current copy of all transportation permits for all approved waster haulers on-site in the Contractor's trailer.

B. Contractor shall examine and verify individual truck NYCRR Part 364 Permits or in the case that multiple trucks are under one waste hauler's permit each individual truck's identification shall be verified as included under the permit. Truck permits shall be examined and verified upon arrival at the Site prior to loading. Documentation of valid permit should be noted on the Daily Trucking Log maintained by the Contractor

END OF SECTION

SECTION 02130
DECONTAMINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Summary
B. Submittals
C. Decontamination Facilities
D. Decontamination of Vehicles and Equipment
E. Personnel Decontamination
F. Truck and Equipment Decontamination Methods
G. Management of Decontamination Residues

1.02 SUMMARY:

A. This section covers the decontamination of personnel and equipment as they move from the Exclusion or Work Zones into the support Zones of the site.

1.03 SUBMITTALS

A. Prior to mobilization, Contractor shall submit personnel decontamination procedures as part of the Contractor's HASP specified in Section 01415 – Health and Safety Requirements. Contractor shall provide the following information:

1. Number and location of decontamination and wheel wash stations.

2. Decontamination methods and equipment that will be used in accordance with NYSDEC requirements.

3. Procedures to prevent contamination of clean areas including procedures for decontamination of all trucks and equipment.

4. Methods and procedures to minimize worker contact with contaminants during removal of personal protective equipment (PPE).

5. Procedures for inspection and decontamination of vehicles leaving the Site.

6. Procedures for disposal of personal PPE.

7. Procedures for the collection, and off-site treatment and disposal of all decontamination water and residuals.

8. Procedures for minimizing generation of wastewater.

SECTION 02130
DECONTAMINATION

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 DECONTAMINATION FACILITIES

A. Construct and maintain decontamination facilities and wheel wash stations in accordance with these specifications or as otherwise proposed by Contractor and approved by the Engineer.

3.02 DECONTAMINATION OF VEHICLES AND EQUIPMENT

A. Contractor shall inspect and decontaminate all vehicles and equipment that have entered the Exclusion Zones upon exiting the Exclusion Zone. All decontamination shall take place in the Decontamination Zone as specified in Specification Section 01500 – Mobilization and Temporary Facilities.

B. Decontamination shall include removal of soil and residues from the chassis (which includes undercarriage, suspension, and tire tracks) and other parts of the vehicle known to have been contaminated or visually appearing to be contaminated.

C. Contractor shall take care while decontaminating vehicles to avoid contaminating personnel, other parts of the vehicle or equipment, or the surroundings. Personnel involved in vehicle and equipment decontamination shall be dressed in the appropriate level of PPE as determined by the HASP. All personnel shall follow all applicable safety procedures described in Specifications Section 01415 – Health and Safety Requirements.

D. Contractor shall decontaminate haul trucks after loading and before the haul trucks exit onto public streets. Contractor shall ensure that all haul trucks exit through the Decontamination Zone and receive proper decontamination and inspection.

E. Contractor shall document decontamination of vehicles and equipment on the Daily Trucking Log as described in Specifications Section 02120 – Off-site Transportation and Disposal.

SECTION 02130
DECONTAMINATION

3.03 PERSONNEL DECONTAMINATION

A. Contractor shall ensure that personnel who have entered the Exclusion Zone perform decontamination as required in the HASP as specified in Specifications Section 01415 prior to exiting the Decontamination Zone.

3.04 TRUCK AND HEAVY EQUIPMENT DECONTAMINATION METHODS:

A. Physical removal techniques used to decontaminate materials and wastes shall include, but are not limited to, brushing and spraying with heated-water pressure washer until all visible contamination and debris is removed.

B. Brushing shall consist of removal of loose materials with the use of a broom and/or brushes.

C. A heated water pressure washer shall be used to provide application of water of sufficient temperature, pressure, residence time, and agitation to remove soil and contaminated residuals from surfaces.

D. Surfactants and detergents must be approved by the Engineer prior to use in decontamination operations.

E. All equipment decontamination procedures shall be performed in a decontamination facility.

F. Overspray barriers shall be provided on each side of the decontamination area to prevent re-contamination of adjacent areas.

G. Contractor shall manage decontamination residuals, including water, soil, residues, used PPE, and other materials removed during decontamination as specified in paragraph 3.05.

3.05 MANAGEMENT OF DECONTAMINATION RESIDUALS

A. Contractor shall collect and settle decontamination liquid to remove solids prior to transfer and treatment at the on-site water treatment system.

B. Contractor shall dewater and collect decontamination solids. Dewatered decontamination solids shall be managed as Impacted Material, as specified in Specifications Section 02120 – Off-site Transportation and Disposal.

END OF SECTION

SECTION 02150
ODOR AND VAPOR CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES:

- **A.** Summary
- **B.** References
- **C.** Submittals
- **D.** Quality Control
- **E.** Temporary Fabric Structures
- **F.** Air Handling Equipment
- **G.** Lighting
- **H.** Air Treatment System
- **I.** Odor Suppressing Foam
- **J.** Air Monitoring Equipment
- **K.** Operation and Maintenance
- **L.** Performance
- **M.** Monitoring

1.02 SUMMARY:

A. The Contractor shall provide all materials, equipment, and labor to provide odor and vapor control at the site during but not limited to all excavation, Soil Mix Wall installation, backfilling, stockpiling, loading of impacted soil, or MGP waste handling and transport.

B. Related Sections:

1. Section 01570 – Temporary Erosion and Sediment Control.
2. Section 02260 – Excavation.
3. Section 02196 – Soil Mix Wall.
4. Section 02300 – Backfilling and Grading.
5. Section 01500 – Temporary Facilities and Controls.
6. Section 01415 – Health and Safety Requirements.
7. ENSR Site Specific Health and Safety Plan (HASP).

SECTION 02150
ODOR AND VAPOR CONTROL

1.03 REFERENCES:

A. Not used.

1.04 SUBMITTALS:

A. The Contractor shall provide in the Technical Execution Plan (TEP) detailed descriptions and drawings with the means and methods proposed for controlling and monitoring odors and vapors inside the Temporary Fabric Structure and the exhaust from the Temporary Fabric Structure during the work. The TEP shall describe the method to be used for monitoring the extent of adsorption on the air treatment units so that the units can be changed prior to contaminant breakthrough. The TEP shall include design calculations, shop drawings, installation instructions, maintenance instructions and vendor information for all temporary fabric structures, foundations, lighting, air handling equipment (including air exchanges per hour), and air treatment systems.

B. Contractor shall submit written documentation showing conformance of the materials and constructed work with the specifications

C. All odor and vapor control equipment and materials shall be approved by the Engineer prior to use.

D. The Contractor may propose alternative means and methods for controlling dust, odors, and vapors from site operations, particularly for activities conducted outside the temporary fabric structure such as excavation, and soil mix wall installation. Equipment or material substitutions for odor and vapor control will be evaluated by the Engineer prior to use on-site on a case-by-case basis. Alternative means and methods of controlling odors and vapors cannot be used until approval by the Engineer is received in writing.

E. The Contractor shall provide all Work Zone and air treatment system effluent monitoring data in the daily report on a form acceptable to the Engineer.

1.05 QUALITY CONTROL:

A. Contractor shall monitor the air inside the structure and outside the structure in accordance with this specification and the site specific Health and Safety Plan to confirm that the levels established for odors and vapors are maintained.

SECTION 02150
ODOR AND VAPOR CONTROL

PART 2 – PRODUCTS

2.01 TEMPORARY FABRIC STRUCTURES:

A. Excavation, stockpiling, and loading operations for soil and debris located within the designated limits shown on the Drawings shall take place under a temporary fabric structure to the extent practicable.

B. If excavation, stockpiling, and loading is not be possible in some locations under a temporary fabric structure as shown on the Drawings, then extreme care and diligence in using other methods to reduce odors and vapors shall be employed. Other methods must be approved in advance by the Engineer.

C. Soil Mix Wall installation activities are not required to be performed under a temporary fabric structure.

D. The Drawings show a preliminary concept for temporary structure layout and sequencing during excavation. The Contractor shall design and construct temporary foundations for the temporary fabric structure(s) based on their selected building vendor's specifications. Design Shop Drawings and calculations for all foundations shall be provided with the Contractor's TEP, as described in Section 01330.

E. The structures must be a Stressed Membrane Structure

F. No exterior guy ropes or cables shall be used for anchoring the structure.

G. There shall be no exterior horizontal purlins.

H. The structure shall be completely clear-span with no interior supports of any description.

I. All personnel doors and windows must be installed in such a way that the vertical and horizontal tension on the architectural membrane is maintained, at all times.

J. All personnel doors, especially fire exits, must come complete with a protective all weather hood system to shed snow and rain away from front of doors.

K. The completed structure shall be designed to withstand a wind loadings based on the local Building Code.

L. The stressed membrane structure must be designed to shed snow before the design load is exceeded, or alternatively provide structure capacity to meet or exceed required roof snow load requirements of Sag Harbor, New York.

SECTION 02150
ODOR AND VAPOR CONTROL

M. The architectural membrane, when assembled and tensioned, shall be absolutely wrinkle free, and shall remain so indefinitely in hot and cold temperatures.

N. In order to provide the introduction of natural light for daytime use, a continuous section of highly translucent white architectural membrane (skylight) shall be incorporated into the membrane along the peak of the structure.

O. Structure Supplier must be a proven, established manufacturer and have a minimum of ten years experience in the design, fabrication and delivery of structures with the same specifications (same size not required) as outlined above together with at least fifty installations in North America.

P. Structure Supplier must supply a Technical Consultant on site for the full duration of the erection and relocation of the structures to provide information about structure assembly and erection. All costs for the Consultant's time, travel, meals and accommodation are to be the responsibility of the Contractor.

Q. Upon award of this contract, Structure Supplier is to supply detailed drawings and supporting calculations for the structure, including Shop Drawings showing the location, dimensions, and load bearing capacities of the structural members, and a description of the methods of installation. The Shop Drawings and design description of the temporary fabric structure shall be stamped and signed by a Professional Civil/Structural Engineer licensed in the State of New York.

R. The building shall be properly cleaned and decontaminated at the completion of the project.

2.02 AIR HANDLING EQUIPMENT:

A. The air handling Equipment shall be of adequate size and capacity to achieve the performance standards in this specification.

B. The air handling equipment shall be a complete unit equipped with but not limited to: duct work, blowers, motor starters, electric power and controls, particulate filters, and activated carbon filters.

C. The air handling equipment shall have an air flow capable of maintaining negative pressure within the temporary fabric structure every hour, 24 hours per day, 7 days per week and as required to meet the requirements of 3.02.

D. Contractor shall construct an enclosure around the blower unit(s) and connection(s) to the carbon vessel. The carbon vessel itself will not require an enclosure. Material specifications and construction details are listed below; any variation in materials shall be approved in advance by the ENGINEER.

1. The enclosure siding shall be constructed of 1 layer of ½ inch Hardie Cement Fiber Backer Board or equivalent.

2. Sufficient 2 x 4 inch framing to local building codes shall be constructed to stabilize the enclosure and shall be concealed on the inside of the cement fiber backer board.

3. The interior of the framing shall be covered with 2 inch thick Owens Corning 703 un-faced semi rigid panels or equivalent. The panels shall be attached to the 2 x 4 inch framing and not the cement fiber panels to allow for a 3 ½ inch dead air space. The acoustic insulation shall be affixed using appropriate length wood screws and 1 inch washers.

4. The roof of the enclosure shall be treated in the same fashion as mentioned above.

5. In addition to typical nailing, liquid nails or equivalent construction adhesive shall be used at each edge of the cement backer board that is attached to a stud or joist. Backer board corners and seams must be butted together to achieve a tight seal, and sealed with liquid nails.

6. All walls and ceiling must be no closer than 18 inches from the blower unit.

7. At the seam where the blower and transition enclosure connects to the carbon vessel, the enclosure must be caulked to the vessel with silicon caulk. For cracks larger than ¼ inch, use a foam backer rod before caulking.

8. At the hose(s) opening the hose shall be lined with ½ inch thick sponge rubber, 6 inches wide, in exactly once circle around the hose(s). Ensure a tight fit around the rubber with the backer board.

9. The base of the enclosure shall maintain ground contact. The soil surrounding the enclosure shall be lapped over the exterior siding as necessary to ensure ground contact.

10. All necessary access doors shall be constructed of screwed on backer board panels overlapping the outer layer of backer board siding by 4 inches in each direction as shown in the access panel detail drawing. The door shall be located on the side of the enclosure furthest from receptors where practicable.

11. Where the wiring penetrates the enclosure shall be sealed with silicon caulk.

12. If ventilation is required for heat buildup, build the air intake and discharge chimney as shown on the attached drawings. Ventilation sizing requirements will be determined by the Contractor's manufacturer or mechanical engineer. The length of the air intake and the height of the discharge chimney 1.5 times the largest dimension of their respective open area. The inside of these ducts shall be lined with the above specified insulation. Mount a small metal lip or flashing over the exposed edge of the chimney insulation to prevent it from getting direct precipitation.

2.03 LIGHTING:

A. The Contractor shall provide adequate electric lighting to allow sufficient light within the structure for 10 hours of work per day during the winter season.

2.04 AIR TREATMENT SYSTEM:

A. The Contractor shall provide an air treatment system with the air handling equipment that will remove air-borne chemical constituents generated during the work. The chemical constituents of concern include but are not limited to volatile organic compounds from MGP wastes.

B. The air treatment system shall be adequately sized to capture and/or treat the constituents of concern generated inside the temporary fabric structure and meet the performance standards outside the temporary fabric structure.

2.05 ODOR SUPPRESSING FOAM:

A. The contractor shall provide odor-suppressing foam or cellulose material to contain odors and vapors generated from excavation, stockpiling, loading, and solidifying impacted soil and MGP waste on the site.

B. The odor-suppressing foam shall be a spray on foam that provides a direct contact impermeable barrier to impacted soil or MGP wastes.

C. Odor suppressant shall be provided by Rusmar, or approved equivalent, and shall have been successfully used on previous MGP remediation projects.

D. Odor suppressant foam application unit shall have minimum coverage rate of 270 square feet per minute at a depth of 3-inches. Unit shall have self contained storage to allow premixing and be equipped with freeze protection for operation throughout the winter months.

SECTION 02150
ODOR AND VAPOR CONTROL

2.06 AIR MONITORING EQUIPMENT:

A. The Contractor shall provide air monitoring equipment to monitor the air inside and outside the temporary fabric structures. All air monitoring equipment shall be approved by the Engineer prior to use. The Contractor shall provide adequate backup air monitoring equipment to allow uninterrupted site operations. The equipment shall be calibrated according to the equipment manufacturer's specifications. The equipment shall be calibrated at a minimum once per day or after any repair.

B. The Contractor shall provide a photo-ionization detector (PID) capable of providing results on a real-time basis with a 10.2 eV bulb to monitor organic vapors.

C. The Contractor shall provide a particulate air monitor capable of providing results on a real-time basis with a minimum detection limit of 0.05 mg/cubic meter.

D. The Contractor shall provide carbon monoxide detectors capable of providing results on a real-time basis with a minimum detection limit of 1 ppm.

E. The Contractor shall provide detection equipment and materials to detect benzene on a near real-time basis.

F. The Contractor shall provide Nitrogen Dioxide detectors capable of providing results on a real time basis.

PART 3 – EXECUTION

3.01 OPERATION AND MAINTENANCE:

A. The Contractor shall operate the air handling System and air treatment system 24 hours per day, 7 days per week throughout the entire project.

B. The Contractor shall maintain the temporary fabric structure, the air handling system and the air treatment system in working condition throughout the project and shall repair or replace any equipment that fails and shall replace filters, activated carbon, and other expendable air treatment media as necessary.

3.02 PERFORMANCE:

A. The air treatment system must remove air-borne chemical constituents and meet the performance standards below:

1. Total particulates shall be below 150 ug/cubic meter in the exhaust air outside the temporary fabric structure at all times.

2. Total organic vapors shall be below 5 ppm in the exhaust air outside the temporary fabric structure.

3. Total benzene concentrations shall be below 1 ppm in the exhaust air outside the temporary fabric structure.

4. There shall be no detectable MGP odors at the site perimeter.

5. Shall allow the personnel working inside of the structure to maintain personal protective equipment of Level C or lower.

B. The Contractor shall cease all operations if any of the performance standards are exceeded. Work cannot proceed until approval by the Engineer is received.

C. The Contractor shall monitor the workspace in the temporary fabric structure to ensure action levels specified in the Contractor's HASP are observed and that the proper level of personnel protective equipment is utilized.

D. The Contractor shall apply odor-suppressing foam to the soil stockpiles, excavation outside of the temporary fabric structure, loading operations, or ISS operation as directed by the Engineer.

E. The Contractor shall provide labor, equipment, and material required to apply odor and vapor suppressant foam to all exposed soil areas including stockpiles within 5 minutes when directed by the Owner or the Engineer. No separate payment shall be made for supplying and operation of vapor/odor control equipment. Payment for vapor/odor suppression materials will be per the bid unit price. Failure to apply vapor/odor suppression materials within the specified time shall result in all Contractor operations being suspended until such time as the Engineer feels the request for controls has been fully satisfied by the Contractor and no additional payment for such downtime shall be due to the Contractor.

F. The Contractor shall provide sufficient material to apply foam as directed during the entire period when soil disturbance occurs.

G. All exposed areas and stockpiles left untouched for greater than 2 hours shall be covered with a secured polyethylene tarp. All stockpiles left overnight shall be similarly covered. Vapor suppression foam shall be utilized to cover stockpiles during stockpiling and loading of any soil containing tar like materials or NAPL. Foam application must begin within 10 minutes of creation of the stockpile or the beginning of loading activities and continue until stockpile activities are completed, at which time the pile shall be covered with polyethylene sheeting and secured.

H. The Contractor will be notified when real time monitoring being performed at the site perimeter indicates levels have reached 10% of the action levels specified in the CAMP for a 10 minute period. Upon notification, the Contractor shall begin to implement odor/vapor reduction controls as necessary.

3.03 MONITORING:

A. The Contractor shall monitor the air inside the temporary fabric structure and at the air treatment system exhaust(s) to confirm that the performance standards are met.

B. The Contractor shall monitor the air within the temporary structure with the air monitoring equipment at least once every hour during work activities. The Contractor shall monitor for all of the applicable performance standards and document the results.

C. The Contractor shall monitor the air at the air treatment system exhaust with the air monitoring equipment at least once every hour during work activities. The Contractor shall monitor the exhaust for the applicable performance standards and document the results.

D. The Contractor shall monitor the extent of adsorption of the air treatment units to enable units to be changed prior to contaminant breakthrough.

E. The Contractor shall notify the Engineer if any of the performance standards are exceeded and stop work immediately.

F. The Engineer will notify the Contractor when work can resume.

END OF SECTION

SECTION 02196
SOIL MIX WALL

PART 1 – GENERAL

1.01 INCLUDED IN THIS SECTION

A. Summary
B. References
C. Definitions
D. Qualifications
E. Submittals
F. Mix Design
G. Performance Standards
H. Soil Mix Wall Equipment
I. Reagents
J. Reagent Preparation
K. Coordination of Work
L. Solidification
M. Spoils Management
N. Quality Control
O. Reprocessing

1.02 SUMMARY:

A. The Contractor shall provide all designs, submittals, equipment, material, and manpower to complete the Soil Mix Wall (SMW) as specified in this section and on the Drawings. The SMW is designed to provide excavation support during impacted soil removal and to inhibit lateral flow of groundwater into the excavation.

1.03 REFERENCES:

A. The most recent version of the following publications are incorporated in this specification

1. ASTM C150 Standard Specification for Portland Cement

2. American Petroleum Institute (API) API RP 13-B1 for Viscosity and Density

3. ASTM D 5084-00 Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

4. ASTM D 1633-00 Standard Test Method for Compressive Strength of Molded Soil-Cement Cylinders

SECTION 02196
SOIL MIX WALL

1.04 DEFINITIONS:

A. The following definitions are used in this section:

1. **Homogeneous Mixture** – The column of prepared reagent and soils that have been thoroughly mixed together to create a solidified material that meets the performance specified in this section.

2. **SMW Design Elevations**

   a. Top Elevation for SMW– the elevation of the top of SMW as shown on the Drawings.

   b. Bottom Elevation for SMW– the elevation of the bottom of SMW as shown on the Drawings.

3. **SMW Working Platform** – the leveled surface of stable soil on which the SMW mixing equipment shall be placed while operating.

4. **Mixing Pass** – operation of the mixing equipment from the top elevation for SMW treatment to the bottom elevation for SMW treatment and back to the top.

5. **Obstruction –** Subsurface manmade or natural object that impede auger advancement.

6. **Overlap Ratio** – the ratio between the overlap distance between adjacent mixing passes and the width of the mixing pass.

7. **Pre-SMW Excavation** – the removal of soil to the top of SMW elevation as shown in the Drawings.

8. **Reagent –** Solidification material that includes Type I Portland Cement, bentonite, or other material approved of by the Engineer for solidifying impacted soils.

9. **Refusal** – an Obstruction for which no further action on the part of the Contractor is required, as determined by the Engineer.

10. **Spoils** – the excess material resulting from adding reagent to the *in situ* soils, typically a mixture of soil and reagent

1.05 QUALIFICATIONS:

A. The Contractor or SMW Subcontractor shall have completed at least 3 SMW projects of similar size and scope.

B. The Contractor's or SMW Subcontractor's Project Superintendent shall have a minimum of 5 years of experience with SMW projects, with a minimum of 2 of those years in the role of project superintendent.

C. The Contractor's other Key Personnel shall have a minimum of 2 years of experience with SMW projects of similar scope. Other Key Personnel include equipment operators, batch plant operator, SMW rig operator, supervisory engineering staff, and technical staff involved with the SMW system operation.

1.06 SUBMITTALS:

A. All submittals shall be completed and submitted in accordance with Section 01330, Submittal Procedures.

B. Contractor shall submit a description of the SMW construction in the Technical Execution Plan with their bid as specified in Specification 01330 – Submittal Procedures. The Technical Execution Plan shall include:

1. Description and specifications of SMW system, equipment, equipment maintenance schedules, and processes.

2. SMW design mix and reagents.

3. Site map showing the proposed layout and pattern, including overlap ratio between adjacent SMW passes or columns.

4. Methods for determining and verifying the coordinates, elevations and depths of the SMW.

5. A description of the vapor control and mitigation methods used to control vapor, odor and dust, to be included in the SMW system.

6. Methods of controlling exhaust and smoke emissions and noise levels generated from the SMW equipment.

7. Methods to control dust/particulate emissions when handling dry reagent materials.

8. Proposed methods to prepare and measure reagents to verify proper proportions.

9. Total estimated quantity of water and solidification reagents required for the work.

10. Solidification procedures and sequencing.

11. Method to manage obstruction (debris and concrete) that limit down time.

12. Associated water procedures.

13. Estimated production rate for solidification.

14. Methods for handling generated spoils and estimated quantity.

15. Estimated schedule for completion.

16. Any proposed deviations to the Specifications and Drawings.

17. Spill control measures.

18. Sampling methods, personnel, and equipment.

19. Resumes for key personnel assigned to conduct the Work, including Project Superintendent, equipment operators, reagent plant operators, supervisory engineering staff and other technical staff.

20. Equipment manufacturer's specifications and description.

C. Contractor shall identify in the Technical Execution Plan and maintain sufficient reserve or backup equipment to minimize delays attributable to equipment failures. The Contractor shall include a failure modes and effects analysis and determine systems or components that are likely to fail or require routine maintenance in the course of normal operation for this project. This analysis should determine credible failure modes or maintenance activities, which, if occurred, would result in the inability to measure parameters critical to the performance of the work, or result in significant delays in the work.

D. Provide daily reports including daily totals and running totals for volume of soil mixed and reagents used (electronically on a form acceptable to Engineer) during the work and summarizing the following information:

1. Amount of soil solidified

2. Reagent quantities consumed.

3. Solidification equipment used.

4. Any unforeseen Project Site conditions or equipment problems that affected solidification efforts.

5. Any modifications or deviations from the Specifications and Drawings or the Technical Execution Plan.

6. Obstructions encountered.

7. Number of columns completed.

E. Provide detailed records of each column solidified. SMW Column Logs shall be submitted to the Engineer no later than 10:00 AM the following day. SMW Column Logs shall, at a minimum, contain the following information:

1. Unique Column or sub-area ID.

2. Date.

3. Top elevation of SMW treatment.

4. Bottom elevation of SMW treatment.

5. Column or sub-area volume (cy).

6. Calculation of reagents used (lbs).

7. Start and finish time.

8. Number of mixing passes.

9. Overlap ratio and configuration.

10. Any unforeseen Project Site conditions or equipment problems that affected solidification efforts.

11. Any modifications or deviations from the Contract Documentation.

12. Notes on the visual appearance of the mixed material.

F. Provide a Final SMW Job Summary containing, at a minimum, the following information:

1. Quantities of reagents delivered to the Project Site and used during each week with backup in the form of weight receipts, bills of lading, flow meter records, or equivalent.

2. Any modifications to the project schedule.

3. Spoils disposal/handling methods and quantities managed.

4. Any unforeseen Project Site conditions or equipment problems that affected solidification efforts.

5. Any modifications or deviations from the Contract Documents.

G. Submit a Mix Design in accordance with the requirements of this specification.

1.07 MIX DESIGN:

A. The Contractor shall provide a mix design that specifies the proportions and quantities of reagent and water.

1. The Engineer conducted a treatability study with impacted site soils, and varying percentages of Type I Portland Cement. The results of the treatability study are attached. The treatability study results are provided for information purposes only. The Contractor shall determine the appropriate mix design independent of the Engineer's treatability study results.

2. The Contractor shall bear all costs associated with changes in the mix design or construction means and methods needed to achieve the performance standards.

B. The water to dry grout ratio shall be 1:1 by weight.

C. Based on the results of performance testing of the solidified soil, the Contractor with the Engineers' approval may modify the solidification mixture proportions.

D. Contractor shall provide sufficient quantities of reagent based on the Contractor's mix design and the quantity of soil that will be solidified.

E. Contractor shall calculate (on a form acceptable to the Engineer) the minimum reagent proportions as follows:

1. Calculate the volume of soil being treated based on the total depth of the impacted soil, less the volume of soil already treated.

2. Calculate the weight of soil being treated based on the previously calculated volume, using the appropriate unit density for the soil being solidified.

3. Water and reagent addition shall be in accordance with the mix design.

4. Based on the results of performance testing of the solidified soil, the Contractor with the Engineers' approval may modify the solidification reagent mixture proportions.

5. Contractor shall not modify the reagent mix proportions without prior written approval from the Engineer.

1.08 PERFORMANCE STANDARDS:

A. The solidified soil shall have an Unconfined Compressive Strength (UCS) greater than 50 lb/in^2 but less than 500 lb/in^2 after 28 days as determined by ASTM D 1633-00 Standard Test Method for Compressive Strength of Molded Soil-Cement Cylinders.

B. The hydrated solidification reagent shall be less than or equal to 50% water by weight. Reagent slurries shall be no more than 1:1 dry reagent to water by weight.

C. The Contractor shall, under the Engineer's direction, recover samples of mixed soil within one hour of mixing. The Engineer will produce and test Quality Control (QC) cylinders to confirm that the performance standards are met.

D. Passes or columns shall be laid out in a manner to solidify the entire area and provide an overlap between adjacent passes or columns, so that no soil is untreated.

E. The Top Elevation for SMW and Bottom Elevation for SMW are shown on the Drawings. Contractor shall not deviate from the elevations shown by greater than 0.5 feet without written authorization by the Engineer.

F. Contractor shall ensure that the reagent is mixed or injected evenly through the pass or column and that the reagent and soil at each pass or column is a homogeneous mixture meeting the requirements listed in this section.

G. Samples will be visually inspected by the Engineer to verify that a homogeneous mixture has been created, based on the following criteria:

1. Reagent and soil are thoroughly mixed in the pass or column.

2. Consistent color for samples collected from different depth intervals and locations.

3. There are no unmixed soil clumps greater than 6 inches.

4. Columns that do not meet these criteria will be immediately remixed by the Contractor.

H. Contractor shall minimize the amount of spoils produced by the solidification processes while still meeting the performance standard.

1.09 SMW EQUIPMENT:

A. The SMW equipment will be of sufficient size and capacity to solidify the soil to the depths required on the drawings with a homogenous mixture of reagent and impacted soil within the proposed SMW schedule. An excavator capable of reaching to the total depth of solidification shall be available at all times for obstruction removal during SMW activities. The equipment used shall be specified in the Technical Execution Plan and approved by the Engineer.

PART 2 – MATERIALS

2.01 REAGENTS:

A. The Contractor will provide Type I Portland Cement, or other solidifying reagent approved by the Engineer for the solidification work.

B. The Contractor shall control all dust during offloading, storage, transportation, and use of reagents.

C. Reagents

1. Portland Cement – Type I Portland Cement Meeting the requirements of ASTM C150.

2. Contractor may elect to have powder reagents delivered to the site in a hydrated condition.

D. Contractor shall coordinate the delivery of all reagents to the site.

E. Contractor shall, at all times, maintain an adequate quantity of solidification reagents so that the work is completed without delay.

F. Containers or storage locations for reagent storage shall be protected from precipitation, moisture, and other potential deleterious events.

G. Containers for reagent storage shall be properly labeled per the supplier's requirements and Contractor shall maintain material safety data sheets for the reagents.

H. The Contractor shall measure reagent quantities within a tolerance of ±2% by weight.

SECTION 02196
SOIL MIX WALL

PART 3 – EXECUTION

3.01 REAGENT PREPARATION:

A. Contractor shall provide all equipment, materials, and personnel needed to properly prepare the reagent in accordance with these specifications.

B. Contractor shall complete a form to calculate the needed quantities of water and reagents for each pass or column. Contractor shall record the following, at a minimum:

1. Amount of each reagent added.

2. Reagent density.

3. SMW pass or column number.

4. Extent of pass or column overlap and reduction in volume due to overlap.

C. Contractor shall add the calculated quantities determined by the mix design.

D. Contractor shall thoroughly mix the water and reagent mixture until it is a consistent and homogenous mixture.

E. Contractor shall pump or deliver the reagent mixture from the reagent mixing plant to the SMW equipment at an adequate pressure and flow rate for the solidification process.

F. Contractor shall verify that the reagent volume and density meets the Performance Standards in this Specification.

G. Processed reagent held for greater than 2 hours prior to using shall be discarded at the Contractor's expense.

H. The Engineer will periodically visually inspect each batch of mixed reagent to ensure that the reagent has been sufficiently mixed. Contractor shall continue to mix reagent until it is thoroughly mixed to the satisfaction of the Engineer's site representative.

3.02 COORDINATION OF WORK:

A. Contractor shall coordinate SMW activities and other Work as necessary.

3.03 SOLIDIFICATION:

A. Contractor shall provide all personnel, equipment, and materials required to conduct the Work identified in these specifications.

B. Solidification shall be conducted to the extents, depths and elevations shown in the Drawings.

C. The Contractor shall perform surveying to confirm the Top Elevation for SMW Treatment and Bottom Elevation for SMW Treatment.

D. The Contractor shall note any variance for Top Elevation for SMW Treatment and adjust reagent mix accordingly.

E. The excavation to the top of SMW elevation shall be conducted on a limited basis, only to the extent necessary to execute the pending SMW work without delaying the SMW production rates and overall Project Schedule.

F. All obstructions encountered will be removed by the contractor to the extent practicable with an excavator. The Engineer shall be notified immediately if an obstruction is encountered. If the obstruction can not be removed within 15 minutes of Engineer notification the Engineer shall either call the SMW column complete or direct the Contractor to continue to attempt to remove the obstruction. The first 15 minute of obstruction removal shall be considered incidental and included in the SMW unit rates. The Contractor shall inspect the available borings and test pit data to fully understand the subsurface conditions in the SMW area. No standby time will be paid if the Engineer is not notified of an obstruction.

G. In the event that the excavator or auger tool meets an obstruction, the Contractor shall notify the Engineer who will evaluate the following potential actions to be taken:

1. Engineer may direct Contractor to excavate overlying soil in an attempt to remove the Obstruction.

2. The Obstruction may be deemed unmovable and no further action is required; the column is complete at that depth.

3. The Engineer alone will make the determination when refusal is reached and a pass or column can be considered complete.

H. Dewatering shall be conducted only to the extent necessary to complete the Work.

I. Reagent addition shall be at the prescribed proportions in the Contractor's Approved TEP and calculated on the Contractor's forms.

J. Contractor shall mix reagent with impacted soil until it is a homogeneous mixture of soil and reagent from the Top Elevation for SMW Treatment to the Bottom Elevation for SMW Treatment shown on the Drawings.

K. Contractor shall complete a minimum of three mixing passes throughout the SMW area.

3.04 SPOILS MANAGEMENT:

A. The Contractor shall remove spoils as necessary.

1. The Contractor shall manage spoils so that it does not accumulate in the working area and above columns yet to be mixed. The Contractor shall prevent spoils from previously mixed columns from being incorporated into subsequently mixed columns.

2. The Contractor shall place spoils in a temporary stockpile for removal and disposal.

3.05 QUALITY CONTROL:

A. The Contractor shall periodically collect a sample of the mixed reagent for density verification testing according to API Method RP 13-B1.

B. The Contractor shall collect for the Engineer one *in situ* bulk sample of newly solidified soil for every 250 cubic yards SMW for the first 1,000 cubic yards of treated soil and one per every 500 cubic yards of SMW thereafter.

1. Sampling Timing. Sampling of the treated soil will occur within 1 hours of solidification completion, while it is still wet.

2. Sampling Tool. Contractor will provide and collect samples with the sampling tools required by the applicable test method. The sampler shall be capable of obtaining a discrete sample of mixed material at depths up to the total depth of the SMW.

3. Quality Assurance Control Testing. The Engineer shall test each sample for the performance standards and the testing procedures in Performance Standard part 1.08 A of this specification.

C. The Engineer will determine whether the Contractor's SMW operations meet specified Performance Standards. The Engineer will collect and test Quality Assurance (QA) samples at his discretion.

D. The Engineer may require additional sampling based on the QC and QA test results.

SECTION 02196
SOIL MIX WALL

3.06 REPROCESSING:

A. The Contractor shall reprocess the column(s) at the direction of the Engineer if the QC or QA samples do not meet the requirements of the performance standards.

B. If the sample fails the visual inspection by the Engineer's representative due to insufficient mixing, the Contractor shall reprocess the pass or column from which such sample was collected. Reprocessing shall be completed within one working day of the rejected sample at the Contractor's expense.

END OF SECTION

SECTION 02220
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Summary
B. Submittals
C. Quality Control
D. Project Conditions
E. Coordination and Scheduling
F. Excavation Stability
G. Preparation
H. Removal
I. Materials Handling and Disposal

1.02 SUMMARY

A. The Section includes demolition and removal of surface and subsurface structures as shown in the Drawings.

B. Related Specifications Sections:

1. Section 01415- Health and Safety Requirements
2. Section 01500– Temporary Facilities and Controls
3. Section 01570 –Temporary Erosion and Sediment Control
4. Section 02120 – Off-site Transportation and Disposal
5. Section 02240- Dewatering.
6. Section 02260- Excavation.

1.03 SUBMITTALS

A. The Contractor shall identify disposal facilities for off-site management of materials generated during site demolition activities for the Engineer’s approval, as specified in Specifications Section 02120 – Off-site Transportation and Disposal.

B. As part of the Technical Execution Plan, Contractor shall describe the sequence for the removal of the surface and subsurface structures, equipment and procedures for breaking and cutting debris, and the specific disposal facilities proposed for the debris.

C. Contractor shall also keep and submit Daily Trucking Logs. Trucking Logs shall include pay item type for each load shipped from the site. It is the Contractor's responsibility to properly log the correct pay item type. Ask for pay item type or unclear pay item type designation shall result in the Contractor being reimbursed at the lowest unit rate.

1.04 QUALITY CONTROL

A. Contractor shall conform to the HASP, including adherence to all applicable local, state, and federal health and safety standards and guidelines as specified in Specifications Section 01415- Health and Safety.

1.05 PROJECT CONDITIONS

A. The approximate locations and dimensions of structures to be removed are indicated on the Drawings. The Contractor may encounter former MGP holders, foundations and associated process piping, utilities, wooden or other piling, surface slabs, and other debris during excavation. If the Contractor encounters a structure not on shown on the Drawings, the Contractor shall notify the Engineer immediately.

B. Contractor is responsible for maintaining stability of excavation slopes. Work shall comply with applicable OSHA regulations. The Contractor shall complete excavation, demolition of surface and subsurface structures, and backfilling in accordance with the sequence shown on the Drawings and described in these Specifications.

C. Surface and subsurface structure removal Work shall be performed in a manner that does not disturb or damage existing utilities, monitoring wells, or other facilities not indicated to be removed.

1.06 COORDINATION AND SCHEDULING:

A. Structure removal Work shall be coordinated with the excavation and dewatering activities.

1.07 EXCAVATION STABILITY:

A. The Contractor shall be responsible for maintaining the stability of adjacent sidewalks and streets during excavation and demolition operations

B. Contractor shall maintain the excavation slopes as necessary to ensure their continued stable condition, including prevention of excessive erosion.

SECTION 02220
DEMOLITION

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 PREPARATION

A. Contractor shall comply with all applicable regulations for demolition work, including 29 CFR 1910 and 29 CFR 1926 Subpart T- Demolition.

B. Contractor shall demolish and remove surface and subsurface structures as shown in the Drawings.

C. Contractor shall erect and maintain barriers around structures and provide other necessary safety measures required by regulations as specified in Specifications Section 02260 - Excavation.

D. Contractor shall locate and protect nearby utilities, monitoring wells, fences and all other items that are not designated to be demolished, as shown on the Drawings.

E. To the extent possible, the Contractor shall remove water and pumpable free product from intact subsurface structures before demolition.

F. Contractor shall dewater excavations for removal of subsurface structures and foundations as specified in Specifications Section 02240 - Dewatering.

3.02 REMOVAL

A. Contractor shall demolish and remove the walls and foundations of each structure shown to be removed on the Drawings or as otherwise directed by the Engineer.

B. Contractor shall break up or cut all debris into pieces suitable for disposal. For subsurface structures the Contractor shall segregate all debris greater than the acceptable to the thermal treatment facility for disposal at the approved debris landfill. All debris of a size acceptable to the thermal treatment facility or smaller shall be excavated with the soil for transportation to the approved soil disposal facility. The Contractor shall be responsible for any delays or charges from the soil disposal facilities due to oversized debris.

C. The Subcontractor will demolish the Buildings and other structures as follows:

1. Thoroughly wet structures prior to and during demolition activities to avoid the generation of dust and/or debris emissions.

2. Breakup walls, foundation elements, piping, fixtures, large pieces of demolition debris into manageable pieces.

3. All salvageable material (i.e., equipment and fixtures) are property of Subcontractor for use, resale, or disposal.

4. Load sized debris into trucks for off site transportation or temporary stockpile.

5. Subcontractor shall excavate or demolish any foundations below grade.

3.03 MATERIALS HANDLING AND DISPOSAL

A. Transportation and disposal of removed solid materials shall be in accordance with Specifications Section 02120 - Off-site Transportation and Disposal.

B. If stockpiling is required prior to disposal, demolition materials shall be temporarily stockpiled on site by the Contractor within areas approved by Engineer as specified in Specifications Section 02260 - Excavation.

C. The Contractor shall dispose of materials generated during site demolition activities at a facility approved by the engineer.

D. Liquid Wastes

1. To the extent possible, water and free product from intact subsurface structures will be collected in the on-site groundwater storage system in accordance with Specifications Sections 02240 – Dewatering and 02245 – Construction Water Treatment. Free product shall not be pumped directly to the Construction Water Treatment System.

2. With the Engineer's approval, the Contractor may ship water and free product removed from intact subsurface structures to an approved off-site water management facility.

END OF SECTION

SECTION 02240
DEWATERING

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Summary
B. Submittals
C. Dewatering Equipment
D. Dewatering-General
E. Quality Control
F. Sampling and Analysis

1.02 SUMMARY

A. This Specification covers Work required to control and collect surface water, stormwater, and groundwater in disturbed areas and from excavated soil. The goal of the dewatering activities in the excavation area is to dewater the excavation, or to maintain a workable dry excavation. The collected water shall be treated using the on-site water treatment plant to be provided and operated by the Contractor as part of this Project. Contractor shall select a dewatering design and operation within the water treatment capacity constraints. Once excavation dewatering begins, it is to continue for 24 hours per day for the full duration of the excavation activities.

B. Related Sections

1. Section 01450 – Quality Control

2. Section 01570 – Temporary Erosion and Sediment Controls

3. Section 02130 – Decontamination

4. Section 02260 – Excavation

1.03 PROJECT CONDITIONS

A. Pumping tests were conducted to determine the aquifer characteristics and estimate the aquifer response to pumping. This data is attached to the Bid Package.

B. The Contractor shall be required to design, furnish, install, operate and remove a dewatering system to allow excavation to the depths shown on the Drawings. The system should be designed to keep groundwater levels at least 2 feet below active excavation activities, but should be designed to minimize the amount of water discharged.

SECTION 02240
DEWATERING

C. The water to be controlled is groundwater and surface water generated by dewatering of the active excavation area. 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 pretreatment system prior to discharge in accordance with the SPDES Permit. The design of the system shall be provided in the Contractor's Technical Execution Plan (TEP).

D. The average daily discharge of treated water to Sag Harbor shall be less than 1.0 million gallons per day. The maximum discharge of treated water to Sag Harbor shall be less than 1.5 million gallons per day.

E. Due to this in remediation work being performed under a Consent Order a Groundwater Removal Permit is not required.

1.04 SUBMITTALS

A. Contractor shall submit information in the Dewatering section of the TEP that details the principle components of the system and should contain narratives dealing with the installation, operation and maintenance and removal of the dewatering system. The TEP should detail excavation, backfill, and dewatering sequence that achieves the required draw downs without exceeding the volumetric discharge limits on the Construction Water Treatment System (average daily discharge less than 1.0 million gallon and maximum daily discharge less than 1.5 million gallons). The design should contain drawings of the proposed dewatering system. The design should include a monitoring program so as to demonstrate compliance with these specifications. The TEP should also include the resume of the dedicated Dewatering Superintendent and a description of his duties.

B. The Contractor is to visit the site, be aware of its restrictions, review the sub-surface and geotechnical information, and pump test data. The Contractor shall submit a detailed dewatering design to the Engineer at least 2 weeks prior to the start of excavation.

C. The Contractor shall submit daily progress reports to the Engineer containing piezometer readings, pumping quantities, vacuum gauge readings and a narrative detailing any problems which may develop 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 each excavation area.

1.05 SEQUENCING AND SCHEDULING

A. Dewater in conjunction with water treatment, excavation, and restoration work 24 hours per day 7 days per week until completion of excavation and backfill work.

B. Coordinate and schedule the dewatering work in a manner that minimizes the quantity of water pumped while not affecting the excavation and restoration schedule.

1.06 QUALITY CONTROL

A. Establish, maintain, and document quality control, in a form acceptable to the Engineer, for all groundwater and surface water control systems, including monitoring equipment. Quality control documentation by the Contractor is required to assure compliance with regulatory requirements. Detailed records of quality control shall be kept by the Contractor for all dewatering operations.

B. Dewatering performance shall meet the following requirements:

1. Dewatering area shall be minimized to the extent necessary to conduct the excavation and backfilling work.

2. Groundwater levels shall be monitored and recorded on a regular basis.

3. Dewater excavations to the extent practical to remove soils and pass the paint filter test and complete backfilling and compaction.

4. All tar, oils, or other by-product like material shall be pumped and temporarily stored in on-site tanks. The material should be solidified, managed, and properly disposed.

5. All water collected shall be treated in accordance with Specification Section 02245 - Construction Water Treatment.

PART 2 – PRODUCTS

2.01 DEWATERING EQUIPMENT

SECTION 02240
DEWATERING

A. The Contractor shall furnish, install and operate pumping equipment of sufficient capacities to meet the requirements for the removal of groundwater and surface water from work areas as necessary to complete the excavation and backfilling work.

B. Contractor shall keep on hand, 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. Contractor shall provide sufficient suction and discharge hose or piping for transferring pumped liquids without causing erosion, sedimentation, or other adverse consequences.

D. Contractor shall 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.

E. Equipment for dewatering may be new or used, but shall be suitable for the Work and be maintained in good condition.

F. Contractor shall 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. Contractor shall keep on hand, or have immediate access to, spare components to provide reasonably for any breakdown. Contractor shall maintain on site spare dewatering pumps during the dewatering work.

H. All dewatering equipment shall remain the property of Subcontractor and shall be decontaminated in accordance with Specification Section 02130 - Decontamination and removed from the Project site at the completion of the Work.

I. Contractor shall provide wells, well points, sumps, pumps, or other equipment subject to approval by the Engineer, as necessary to allow Work to be performed in the dry.

PART 3 - EXECUTION

3.01 DEWATERING-GENERAL

A. Contractor shall furnish, at a minimum, all labor, materials, and equipment, and perform all operations required to design furnish, 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 remediation work can be conducted under controlled conditions. Contractor shall demobilize and decontaminate all dewatering equipment and materials after completing the excavation and backfill work.

B. The Contractor shall provide a dedicated Dewatering Superintendent whose sole responsibility is to oversee all dewatering activities and coordinate dewatering activities with excavation, backfill, and water treatment operations. The Dewatering Superintendent shall be on the Project Site when dewatering is taking place. The Dewatering Superintendent shall have a minimum of ten years experience managing dewatering projects.

C. It is the intent of these specifications that the ground water levels at this site be lowered to a point at least 2 ft. below the bottom of the excavation as it is conducted by means of a dewatering. The dewatering system design will be prepared by a person or firm experienced in work of this nature. The dewatering system may consist of multiple stages of wellpoints, closely spaced deep wells, ejector wellpoints or combinations of these systems.

D. Dewatering, excavation, and backfill shall be coordinated so that the volumes of water generated during dewatering can be treated and discharged without exceeding the treatment system discharge limits.

E. 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 failure of the entire system.

F. Components of the excavation dewatering system such as the individual wells and wellpoints should be tested immediately after their installation so as to verify design assumptions and demonstrate yields without suspended solids.

G. Conduct localized dewatering in work areas as necessary to perform excavation and restoration work

H. 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 soil inspection and excavation progress. Prevent stormwater from leaving the Project Site.

I. 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. Divert surface water away from stockpiles, excavations, and all other impacted materials.

J. 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.

K. Install, operate, and remove the dewatering systems in accordance with applicable federal, state, county, and local Laws and Regulations, Permits and generally accepted industry practices.

L. Safety of personnel, and protection of off-site facilities and designated on-site facilities during dewatering Work, shall be solely the Contractor's responsibility.

M. Weather and site conditions shall be monitored 24 hours per day and seven days per week and dewatering conducted at any time to prevent impacted water runoff from the site.

3.02 QUALITY CONTROL

A. Dewatering performance shall meet the following requirements:

1. Dewatering area shall be minimized to the extent necessary for the Work being conducted.

2. Excavations shall be dewatered to maintain a dry work area during the entire period when the excavation remains open.

3. All water shall be pumped to the treatment system or to an on-site temporary storage tank.

4. Contractor shall make reasonable efforts to not pump tar, oils, or other by-product like materials directly to the water treatment system.

3.03 SAMPLING AND ANALYSES

A. Water sampling and analysis will be performed by the Engineer in accordance with Specifications Section 02245 – Construction Water Treatment.

END OF SECTION

SECTION 02245
CONSTRUCTION WATER TREATMENT

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Summary
B. Submittals
C. Project Conditions
D. Primary Water Treatment Equipment
E. Water Treatment System Controls
F. Water Treatment – General
G. Sequencing and Scheduling
H. Disposal of Other Residuals
I. Sampling and Chemical Analysis
J. Discharge Limits

1.02 SUMMARY:

A. This section includes treatment and discharge of impacted water collected during dewatering, decontamination, and other operations.

B. The Contractor shall provide a water treatment system capable of treating water generated during construction dewatering (described in Specification Section 02240-Dewatering) to the treatment standards required by SPDES Discharge Permit Equivalent.

C. The Contractors water treatment system should at a minimum include the treatment components shown in the Drawings.

D. Related Sections:

1. Section 01330 – Submittal Procedures

2. Section 02240 – Dewatering

3. Section 02120 – Off-Site Transportation and Disposal

1.03 SUBMITTALS:

A. Contractor shall submit a Technical Execution Plan with their bid. The Technical Execution Plan shall include:

1. Description of water treatment system, equipment (including size and capacity), processes and monitoring.

SECTION 02245
CONSTRUCTION WATER TREATMENT

2. Contractor shall submit an Operation & Maintenance plan with their design of the WWTP to include regular maintenance, daily operating procedures and recording of performance parameters, logs, and record keeping.

3. Calculation and support documentation for treatment system design, component selection and sizing.

4. Description of the coordination with the excavation dewatering system.

5. Any proposed alterations from the minimum required system shown in the Drawings

1.04 PROJECT CONDITIONS:

A. Excavation dewatering, described in Specification Section 02240 – Dewatering, will generate water impacted with MGP constituents.

B. Contractor shall provide and maintain a water treatment system that is capable of treating and discharging water to the harbor in accordance with the SPDES Discharge Permit Equivalent and the Specifications.

C. The maximum average discharge from the water treatment system to Sag Harbor shall be less than 1.0 million gallons per day. The maximum discharge shall be 1.5 million gallons per day.

D. Contractor shall prepare and submit a Technical Execution Plan in accordance with the procedures set forth in Specifications Section 01330 – Submittal Procedures. Contractor shall follow the approved water treatment plan, and be responsible for meeting the requirements of the discharge permit volume and constituent concentration limitations.

E. Contractor shall maintain Daily Discharge Volume Logs obtained 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 shall include the results of daily system inspections.

F. Contractor is responsible for all fines and penalties associated with non-conformance of the system in meeting the discharge permit.

G. Minimum requirements for a wastewater system have been provided in the Drawings. The Contractor is responsible for the final Design and performance of the WWTP.

SECTION 02245
CONSTRUCTION WATER TREATMENT

PART 2 – PRODUCTS

2.01 PRIMARY WATER TREATMENT EQUIPMENT:

A. Contractor shall 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. Contractor shall choose the type and size of equipment and components needed to accomplish the functions designated.

C. The water treatment system shall be designed to handle the maximum flow rate of 1.5 million gallons per day.

D. Contractor shall connect to the marine discharge pipeline at bulkhead near West Water Street. Contractor shall provide all materials, labor, traffic control, permits, and all other work for connecting the pipeline to the water treatment system as shown on the Drawings.

E. Contractor shall furnish a discharge pump with sufficient flows and pressures to achieve the maximum discharge rate of 1.5 million gallons per day. The discharge pump shall be capable of pumping the treated effluent under pressure from the water treatment system to the final offshore discharge point in Sag Harbor Bay approximately 3500 linear feet from the water treatment system.

F. Contractor shall 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 minor interruption in the event of a power outage.

G. Contractor shall 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.

H. 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.

SECTION 02245
CONSTRUCTION WATER TREATMENT

I. Contractor shall keep on hand, or have immediate access to, spare components to provide reasonably for any breakdown.

J. All water treatment and storage equipment shall remain the property of the Contractor and shall be properly decontaminated prior to removal from the site at the completion of the Work as specified in specification section 02130.

K. Contractor shall provide and maintain at all times a flow meter to record water discharged to the discharge system. The flow meter shall record instantaneous and totalized flow.

L. Contractor shall provide sampling ports for collecting samples in accordance with the discharge permit.

M. Contractor shall provide adequate freeze protection for the operations and protection of all water treatment equipment.

N. Contractor shall provide all necessary safety equipment and personnel protective equipment for safe handling of contaminated water and water treatment chemicals.

2.02 WATER TREATMENT SYSTEM CONTROLS:

A. Contractor shall provide adequate system controls to permit unattended operation with occasional operator checks for monitoring and adjustments.

B. The Contractor shall 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. Contractor shall 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, Contractor shall immediately suspend operation and notify the Engineer.

E. The water treatment system shall not be operated without onsite supervision.

SECTION 02245
CONSTRUCTION WATER TREATMENT

PART 3 – EXECUTION

3.01 WATER TREATMENT – GENERAL:

A. Contractor shall 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. The discharge from the Contractor’s water treatment system shall enter discharge system installed by others, at a location as shown on the Drawings.

C. Contractor shall place equipment at the location designated on the Drawings. In as much as possible, equipment should be located in a permanent location for the entire duration of the project.

D. Contractor shall arrange components and provide means to contain any spills or overflows from the treatment process within the site.

E. Contractor shall provide spill containment for any water treatment chemicals used on the site.

F. Contractor shall establish, maintain and document quality control, as required in Specifications Section 01330 – Submittal Procedures.

G. The Engineer may specify and require additional records from the Contractor as needed to satisfy permit and project requirements.

3.02 SEQUENCING AND SCHEDULING:

A. Contractor shall conduct water treatment activities in conjunction and coordination with decontamination, excavation, dewatering and backfilling Work. Contractor shall be responsible for coordinating water treatment with all other site activities.

B. The Contractor shall provide a water treatment system with the treatment and storage capacity to manage water from dewatering operations without causing construction delays.

SECTION 02245
CONSTRUCTION WATER TREATMENT

3.03 DISPOSAL OF OTHER RESIDUALS:

A. Contractor shall manage settled solids, collected NAPL, and spent filtration and GAC adsorption media in accordance with all transportation laws and regulations and the receiving facility requirements.

3.04 SAMPLING AND CHEMICAL ANALYSIS:

A. Sampling and laboratory analyses as required by the discharge permit will be performed by the Engineer.

B. Results of the laboratory analysis will be forwarded to the Contractor by the Engineer upon receipt.

END OF SECTION

SECTION 02260
EXCAVATION

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Summary
B. References
C. Quality Control
D. Project Conditions
E. Submittals
F. Excavation Requirements
G. Sequencing and Scheduling
H. Materials
I. Preparation
J. Excavation
K. Sloping and Benching

1.02 SUMMARY:

A. Section includes excavation and handling of materials being removed, as shown on the Drawings.

B. The excavation area has been laid out and sampled as shown on the pre-characterization plan for purposes of pre-approval by the selected disposal facilities.

C. A sequenced excavation is depicted on the Drawings. To the extent possible, excavation, stockpiling and loading of soil and debris, for a portion of the Work designated on the Drawings, shall take place inside of a temporary fabric structure. The proposed sequence requires some areas to be excavated, stockpiled and loaded outside of the temporary structure, but with vapor and odor controls performed in accordance with Section 02150.

D. This Section specifies Work to provide temporary excavation supports and engineering controls in support of the excavation activities.

E. Related Sections:

1. 01330 – Submittal Procedures.

2. 01500 – Temporary Facilities and Controls.

3. 01720 – Surveying.

4. 02120 – Off-site Transportation and Disposal.

5. 02150 – Odor & Vapor Control.

6. 02300 – Backfill and Grading.

7. 02240 – Dewatering.

1.03 REFERENCES:

A. OSHA 29 CFR 1926 Subpart P – Excavations.

1.04 QUALITY CONTROL:

A. Contractor's Land Surveyor shall stake excavation boundaries indicated on the Drawings and perform initial survey as specified in Specifications Section 01720.

B. Contractor shall perform surveying to record elevations during the course of the excavation Work. During performance of the Work, Contractor shall employ all equipment necessary for control of excavation depths, lines, and grades within required tolerances.

C. Verification of final excavation horizontal limits and depths shall be accomplished by survey provided by Contractor's Land Surveyor and in a manner that is mutually acceptable to the Contractor and the Engineer. During the progress of Work, the Contractor shall provide survey data as the excavation progresses that consist of the following:

1. Horizontal limits of completed excavation in sufficient detail to determine limits of the material removed.

2. Vertical limits of excavation consisting of top of final grade or excavation limit in sufficient detail to verify quadrant elevations and to establish the progress of the completed Work.

D. Contractor personnel and equipment shall meet the training standards and requirements of OSHA 29 CFR 1926: Subpart P-Excavations.

1.05 PROJECT CONDITIONS:

A. Excavation will occur in a commercial residential neighborhood. Odors, noise, dust, and vapors must be controlled accordingly and as described in the Contract Documents.

B. Excavation of areas identified in the Drawings must take place beneath a temporary fabric structure to the extent practicable to prevent migration of vapor, odors, and dust.

C. Debris, concrete foundations, cable, and abandoned pipe will be encountered in the excavation area.

D. Excavation will be in granular soils and groundwater will be encountered during excavation.

E. Contractor shall provide materials, and install all necessary controls required for stability of the excavation and to protect adjacent roadways and structures.

1.06 SUBMITTALS:

A. Contractor shall prepare and submit a Technical Execution Plan in accordance with the procedures set forth in Specifications Section 01330. The Engineer has designed an open cut excavation system as shown on the Drawings. Contractor's Technical Execution Plan shall include a detailed proposal for investigation, design and construction of the open cut and trench box conceptual sequencing depicted on the Drawings. Any sheeting or shoring must be designed by a New York State Professional Engineer and plans must be approved by the Engineer

B. The Technical Execution Plan will document the Contractor's proposed procedures for managing the excavation dewatering, staging, tracking, and stockpiling the excavated soil, both beneath and outside of the temporary fabric structure.

1.07 EXCAVATION REQUIREMENTS:

A. The Drawings show the limits and elevations of the excavation areas for this Work.

B. The Contractor shall lay out the Work and excavate soil to the horizontal and vertical limits of excavation with allowances for stable slopes or use of excavation support.

C. Contractor shall erect and maintain barriers as specified in Specifications Section 01500 and deemed necessary by the Engineer around open excavations to provide any other necessary safety precautions to safely secure the site both during and after Work hours.

D. The Contractor is responsible for excavation slope stability. Excavation Work shall be in compliance with applicable OSHA Regulations. The Engineer shall have the authority to address concerns or stop Work regarding excavation slope stability. The Contractor shall immediately notify the Engineer if slope sidewall instability is noticed.

E. Work shall be performed in a manner that does not disturb or damage existing structures, utilities, monitoring wells, or other facilities not indicated to be removed, unless the removal of such items is shown on the Drawings. Damaged facilities shall be repaired or replaced at the Contractor's expense as determined by the Engineer.

F. Contractor shall maintain a written record of daily progress of the excavation, including all survey observations and data, and submit a copy to the Engineer at the Weekly Progress Meetings, or as otherwise requested by the Engineer.

G. The Contractor shall comply with Occupational Safety and Health Act Regulations (29 CFR 1926.651):

1. These regulations include but are not limited to specific excavation requirements including the following:

a. Removal of surface encumbrances.

b. Determination of underground installations.

c. Providing access and egress.

d. Protection of nearby structures.

e. Preventing exposure to vehicular traffic.

f. Preventing exposure to falling loads.

g. Providing a warning system for mobile equipment.

h. Preventing exposures to hazardous atmospheres.

i. Preventing hazards associated with water accumulation.

j. Protection of employees from loose rock or soil.

k. Inspections.

2. The Contractor shall be responsible for meeting requirements for excavation protection in OSHA 29 CFR 1926.652, including providing a "competent person" to classify soils and verify that the excavation slopes shown on the Drawings are protective of worker safety.

H. Contractor shall control dust emissions and odors during excavation activities in accordance with the requirements of Specifications including Section 01350.

SECTION 02260
EXCAVATION

I. Contractor shall protect all existing structures outside the limits of excavation areas. If Contractor damages any structures, Contractor shall repair or replace the damaged structure to the original construction standards at Contractor's own expense without reimbursement.

J. Contractor shall notify all utility companies and locate all underground utilities prior to starting excavation Work. Contractor shall be responsible for protection of utilities. If Contractor damages any utilities, Contractor shall repair or replace the damaged utility to the original construction standards at Contractor's own expense without reimbursement.

K. The Contractor shall sequence and stage excavation operations as specified in the Technical Execution Plan submitted in accordance with Specifications Section 01330 to meet the following requirements:

1. Minimize the amount of water generated by excavation dewatering described in Specifications Section 02240.

2. Balance the rate of excavation with the rates of on-site material management and off-site transportation operations described in Specifications Sections 02120 to ensure sufficient capacity for stockpiling and transportation.

1.08. SEQUENCING AND SCHEDULING:

A. Contractor shall conduct excavation in accordance with the milestones set forth in Bid Form Schedule F, Construction Milestones.

B. Contractor shall sequence temporary fabric structure installation, relocation and removal in accordance with the excavation work.

C. Contractor shall conduct excavation support installation and removal activities in coordination with Backfill and Grading Work specified in Specifications Section 02300.

D. Contractor shall locate excavation support and controls in accordance with the limits of excavation shown on the Drawings.

E. Contractor shall coordinate the installation of excavation supports and controls with the installation and operation of excavation dewatering systems described in Specifications Section 02240.

F. Contractor shall complete excavation, demolition of subsurface structures and backfilling in accordance with the sequence shown on the Drawings and described in these Specifications.

SECTION 02260
EXCAVATION

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Material and equipment are not specified herein, but shall be furnished as deemed necessary by Contractor. Contractor shall furnish and install all materials necessary for excavation support and controls. The materials and equipment used for excavation support and controls may be new or used but must be suitable for the Work and be maintained in good condition.

B. All temporary excavation support and controls shall remain the property of the Contractor. All temporary excavation support and controls materials shall be decontaminated and removed from the project site at the completion of the Work.

PART 3 – EXECUTION

3.01 PREPARATION:

A. The Contractor shall comply with the requirements of the utility owners for protection of underground utilities.

B. The Contractor shall erect and maintain structure and barriers around excavations and provide other necessary site controls and safety measures as specified in Specifications Sections 02150, 01500, and 01350.

3.02 EXCAVATION:

A. Excavation:

1. The Contractor shall excavate soil and other material from the existing grade elevations and extents shown on the Drawings.

2. The Contractor shall excavate using the equipment and procedures described in the Technical Execution Plan submitted as specified in Specifications Section 01330.

3. Excavated material shall be loaded directly into trucks, or placed directly in the Excavated Material Stockpile Area within the temporary fabric structure. No soil excavated from within the temporary structure may be stockpiled outside of the temporary structure.

4. The Engineer may take confirmation samples at the limits of excavation. Additional excavation may be required based on the results of the confirmation samples. The Engineer and Contractor shall work together to perform additional excavation to the extent practicable based on excavation stability and temporary fabric structure limitations. Additional excavation in the southern and western portions of Bridge Street may be expanded based on confirmation sampling where feasible to continue. Additional excavation costs above the unit rate for excavation provided in Schedule A will be determined based on the extent of the additional excavation required.

3.03 TRENCH BOX UTILIZATION:

A. The conceptual design shown on the Drawings indicates the use of a trench box system in proximity to the edge of the temporary fabric structure in areas of structure overlap.

B. Trench boxes may be new or used but shall be in good and safe working condition and appropriately sized for the work.

C. Trench boxes shall be sized as to be safely handled by the equipment on site and within the overhead clearances of the temporary fabric structure.

D. Trench boxes shall be decontaminated when transitioning between excavation and backfill activities and prior to utilizing adjacent to clean fill areas.

E. Proper selection, use, and handling of trench boxes shall be the responsibility of the Contractor and shall comply with OSHA requirements at all times.

3.04 SLOPING AND BENCHING:

A. Excavation slopes and benches shall conform to OSHA requirements at all times.

B. Sloping or benching for excavations greater than four feet deep shall be in accordance with the Drawings, unless alternative slopes are deemed appropriate due to site conditions as determined by the Contractor's Competent Person and the Engineer.

C. Contractor shall provide written documentation in Contractor's Daily Report for sloping and benching, including acceptable grades and dimensions, soil types, and soil conditions.

D. Contractor shall inspect excavations daily to verify stability of slopes, benches, and temporary sheet piling.

SECTION 02260
EXCAVATION

END OF SECTION

SECTION 02300
BACKFILLING AND GRADING

PART 1 – GENERAL

1.01 SECTION INCLUDES:

A. Summary
B. References
C. Submittals
D. Quality Control
E. Project Conditions
F. Gravel Backfill
G. Road Base
H. Surveying
I. Preparation
J. Placement of Backfill
K. Site Grading and Restoration
L. Maintenance

1.02 SUMMARY:

A. The Contractor shall provide all materials, equipment, and labor to place and compact backfill and grade to the final elevations in accordance with this section and the Drawings.

1.03 REFERENCES:

A. American Society for Testing and Materials (ASTM):

1. ASTM D 1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (Modified Proctor).

2. ASTM D 2487, Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

3. ASTM D 2922, Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods.

4. ASTM D 3017, Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

B. New York State Department of Environmental Conservation (NYSDEC):

1. NYSDEC Title 6 of the New York Codes, Rules, and Regulation (NYCRR) Part 375, Environmental Remediation Programs.

SECTION 02300
BACKFILLING AND GRADING

1.04 SUBMITTALS:

A. Contractor shall submit written documentation showing conformance of the materials and constructed work with the Specifications within five days after test results are obtained.

B. For backfill, Contractor shall submit written certification, signed by the material supplier, stating that the material meets or exceeds the specified requirements. Information shall be submitted to Engineer for review and approval no less than fourteen calendar days prior to scheduled delivery of specified material to the Project Site.

C. Contractor shall submit samples of imported common backfill material to Engineer for chemical analyses. At least one sample shall be submitted for each borrow source at least three weeks prior to being needed on Project Site.

D. Contractor shall identify primary and backup backfill burrow sources in the TEP.

1.05 QUALITY CONTROL:

A. Contractor shall retain the services of a New York State Department of Transportation (DOT) approved soils testing laboratory to document conformance of material type and compaction of backfill and paving materials with the Specifications.

1.06 PROJECT CONDITIONS:

A. Work shall be performed in a manner that does not disturb existing utilities, structures, or other facilities not indicated to be removed within the project limits.

B. Work shall be coordinated with SMW Construction.

PART 2 – PRODUCTS

2.01 COMMON FILL:

A. Common Backfill (bank run gravel or equivalent) shall be hard, durable sand and gravel, and shall be free from ice and snow, roots, sod, rubbish, and any other deleterious or organic matter. It shall be chemically clean, in accordance with NYSDEC 6 NYCRR Part 375 Subpart 6.7 (d) (375.6.7 (d)) values, as sampled and analyzed by the Engineer. It shall conform to the following gradation requirements:

Sieve Size	Percent Passing
3-inch	100
2-inch	90-100
1-inch	70-90
No.4	80-30
No. 200	0-15

2.02 GRAVEL BACKFILL:

A. Gravel Backfill (NYSDOT #Type 2) shall be hard, durable sand and gravel, and shall be free from ice and snow, roots, sod, rubbish, and any other deleterious or organic matter. It shall be chemically clean, in accordance with NYSDEC 6 NYCRR Part 375 Subpart 6.7 (d) (375.6.7 (d)) values, as sampled and analyzed by the Engineer. It shall be supplied from a NYSDOT approved facility and conform to the following gradation requirements:

Sieve Size	Percent Passing
2-inch	100
No. 4	25 - 60
No. 40	5 - 40
No. 200	0 – 10

2.03 ROAD BASE, PARKING BASE MATERIAL:

A. Road base material for temporary haul roads and parking areas shall be NYDOT Type A (Section 667) and be well graded sand gravel or stone, and shall be free from ice and snow, roots, sod, rubbish, and any other deleterious or organic matter. It shall be chemically clean, in accordance with the NYSDEC 6 NYCRR Part 375 Subpart 6.7 (d) (375.6.7 (d)) values, as sampled and analyzed by the Engineer. It shall be supplied from a NYSDOT approved facility and conform to the following gradation requirements:

Sieve Size	Percent Passing
1-inch	100
3/4-inch	85-100
1/4-inch	50-75
No.40	15-35
No. 200	8-15

SECTION 02300
BACKFILLING AND GRADING

PART 3 – EXECUTION

3.01 SURVEYING:

A. The Contractor shall survey the final surface elevation of each layer of completed backfill with a New York State Registered Land Surveyor for payment quantity and as-built purposes. Final thickness of placed backfill shall vary no more than 10% from the specified thickness.

3.02 PREPARATION:

A. Backfilling shall not proceed until Engineer has approved the completion of excavation or SMW in each area of the Project Site and documented bottom conditions including sampling as required and as-built survey.

B. Backfilling shall not be done when the ground or backfill is frozen or too wet to compact. The Contractor shall dewater the excavations as necessary to allow backfilling to proceed.

3.03 PLACEMENT OF BACKFILL:

A. Backfill shall be placed in uniform layers not exceeding eight inches loose lift thickness.

B. Backfill shall be compacted to a minimum of 90 percent of the material's maximum dry density, and within 3% of optimum moisture as determined by the Modified Proctor.

C. Contractor shall provide field compaction tests for each lift and at a minimum of one per every 1,000 square feet.

D. Contractor shall place and compact Gravel and Topsoil in the excavations up to the final grade as indicated on the Drawings.

3.04 SITE GRADING AND RESTORATION:

A. Contractor shall grade unpaved areas to the contours indicated on the Drawings. The soil surface shall be shaped to provide a smooth transition to existing grade at the limits of the disturbed areas.

B. Contractor shall shape and compact fill with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.

C. Contractor shall smooth the finished surfaces for general site grading within tolerance of two inches above or below the required elevation.

D. Contractor shall grade areas adjacent to structures to achieve drainage away from the structures and to prevent ponding.

3.05 MAINTENANCE:

A. Contractor shall protect newly graded areas from traffic and erosion. The Work shall be sequenced to minimize disturbance of completed areas.

B. Where completed areas are disturbed by subsequent project operations or adverse weather, fill and reshape eroded areas until acceptance of the Work.

END OF SECTION

SECTION 02740
FLEXIBLE PAVEMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- **A.** Summary
- **B.** References
- **C.** Submittals
- **D.** Quality Control
- **E.** Source Quality Control
- **F.** Subbase, Binder, and Finish coarse
- **G.** Field Quality Control
- **H.** Preparation
- **I.** Maintenance and Protection

1.02 SUMMARY:

A. The Contractor shall provide all necessary equipment, materials and labor to construct the asphaltic concrete pavement in this specification and on the drawings.

1.03 REFERENCES:

A. New York State Department of Transportation "Comprehensive Pavement Design Manual" originally issued in June 2001 (dated June 2000)", (New York DOT Standard Specifications, January 2002).

B. American Association of State Highway and Transportation Officials (AASHTO):

1. AASHTO T 209, Maximum Specific Gravity of Bituminous Paving Mixtures

2. AASHTO T 238, Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

3. AASHTO T 245, Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus

C. American Society for Testing and Materials (ASTM):

1. ASTM D 2041, Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures

SECTION 02740
FLEXIBLE PAVEMENT

1.04 SUBMITTALS:

A. The Contractor shall submit the following information to Engineer, for review and approval, no later than fourteen calendar days prior to scheduled delivery of specified materials to the Project Site:

1. Material list for items proposed to be provided under this Section.

2. Job-mix formula for asphaltic concrete surface course.

3. Certificates, signed by the material producer, stating that the materials meet or exceed the specified requirements.

B. Progress Submittals

1. The Contractor shall submit, within seven days after the date of placement, results of field quality control testing.

1.05 QUALITY CONTROL:

A. Contractor shall retain the services of an approved Quality Control Firm to determine conformance of the materials and constructed work with the specifications.

PART 2 - PRODUCTS

2.01 SOURCE QUALITY CONTROL:

A. Proposed materials shall be subject to approval by Engineer as specified prior to delivery and use of the materials in the construction.

2.02 SUBBASE, BINDER, AND FINISH COARSE

A. Asphalt layers and aggregate sub-base shall conform to the New York State Department of Transportation's Standard Specifications (January, 2002)

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL:

A. Tests specified in the following paragraphs shall be performed by the Quality Control Firm during construction of the asphaltic concrete pavement.

B. Density Testing (during the Compaction Process):

SECTION 02740
FLEXIBLE PAVEMENT

1. Acceptance of each day's placement of asphaltic concrete courses shall be determined by using a nuclear densometer. The density shall be determined by a licensed nuclear gage operator conducted in presence of Engineer, using the procedure described in AASHTO T 238. A minimum of three tests shall be conducted for every 3000 square yards or 300 tons of material placed and a minimum of three tests per lot.

2. Pavement areas where the density falls below the specified range shall be re-compacted until the required density is obtained. Density requirements are specified in New York State DOT Specifications.

C. Surface Tolerance: Contractor shall test the finished surface of asphaltic concrete with a straightedge while being rolled. Deviations shall be corrected using methods approved by Engineer.

D. Tests for Depth

1. The depth of pavement surface course shall be carefully controlled, with periodic measurements of the loose and compacted depths.

3.02 PREPARATION:

A. Contractor shall verify that aggregate base course has been constructed to the correct thickness and grades, and provide report to Engineer.

B. Contractor shall prepare the surface of the base course as specified in the New York State DOT Specifications.

3.03 MAINTENANCE AND PROTECTION:

A. The completed pavement surface shall be protected from damage until acceptance of the Work.

B. Damaged areas shall be repaired using methods approved by Engineer.

END OF SECTION

SECTION 02900
PLANTING

PART 1 – GENERAL

1.01 SECTION INCLUDES:

- **A.** Summary
- **B.** Submittals
- **C.** Quality Control
- **D.** Delivery, Storage, and Handling
- **E.** Project Conditions
- **F.** Fertilizer
- **G.** Lime
- **H.** Seed
- **I.** Water
- **J.** Mulch
- **K.** Erosion Control Mat
- **L.** Application of Temporary Grass Seed
- **M.** Application of Seed and Protective Cover
- **N.** Establishment of Grass

1.02 SUMMARY:

A. This section includes establishing a stand of grass on all disturbed work areas not to be paved or graveled.

1.03 SUBMITTALS:

A. Contractor shall submit manufacturer's certification that seed, lime, fertilizer, and mulch binder meet specification requirements. Seed submittal shall include a listing of all seed types and proportions in seed mixtures.

B. Contractor shall submit seed bag tags, receipts, truck weight tickets, and other information necessary to confirm application rates and types for all seed, fertilizer, lime and mulch, as applicable.

C. Contractor shall submit actual proposed types and rates of application of lime, fertilizer and seed based on local conditions and planting season.

1.04 QUALITY CONTROL:

A. Contractor shall contact the local agricultural extension office to establish the optimal seed and fertilizer mixes, including any recommended soil testing.

B. Seeding shall be accomplished according to standard local practice and in compliance with requirements of applicable state and federal regulations.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Contractor shall deliver packaged materials in containers showing weight, analysis and name of manufacturer.

B. Contractor shall protect materials from deterioration during delivery, and while stored at the site.

1.06 PROJECT CONDITIONS:

A. Contractor shall perform seedbed preparation and seeding as soon as possible after completion of remediation, backfilling and grading in disturbed areas.

B. Contractor shall proceed with planting only when existing and forecasted weather conditions permit.

PART 2 – PRODUCTS

2.01 FERTILIZER:

A. Fertilizer requirements shall be specified in the Contractor's Technical Execution Plan (TEP).

2.02 LIME:

A. Lime requirements shall be specified in the Contractor's TEP.

2.03 SEED:

A. Seed mixes for permanent vegetation shall be a blend of Red Fescue, Rye, and Kentucky Blue, applied at a rate of 75 lbs./acre, or approved equivalent for the site location.

B. The variety and blends of seed may be added, deleted or substituted as appropriate to take advantage of proven varieties and mixtures and to account for changes of season and weather. Proposed changes to the seed mix shall be submitted to Engineer for approval prior to use.

C. Seed that has become wet, moldy or otherwise damaged will not be acceptable.

SECTION 02900
PLANTING

2.04 TREES AND SHRUBS:

A. Trees and other plantings shall be transplanted, protected and replanted as shown on the Drawings.

B. Trees and other plantings that cannot be preserved shall be restored with existing species, sizes and locations as directed by the Engineer.

2.05 WATER:

A. Water shall be clean and potable.

2.06 MULCH:

A. Mulch shall be clean long-fibered hay or straw, consisting of stalks of oats, wheat, barley, rye, or excelsior wood fibers, reasonably free of noxious weed seeds. Application rate is 1 ½-2 tons/acre.

2.07 EROSION CONTROL MAT:

A. Erosion control mat shall consist of biodegradable mats made from woven jute, or suitable alternate approved by the Engineer. Erosion control mats shall be utilized wherever planting is required on slopes greater than 5%.

PART 3 – EXECUTION

3.01 APPLICATION OF TEMPORARY GRASS SEED:

A. Temporary seeding shall be applied to areas lacking vegetation if no construction activities will be performed in the area for more than 30 days.

B. Contractor shall uniformly apply seed during optimum planting season and rates indicated on the Drawings, unless otherwise approved by Engineer.

3.02 APPLICATION OF SEED AND PROTECTIVE COVER:

A. For permanent seeding, apply seed and mulch as specified in the following paragraphs.

B. Contractor shall apply lime at a rate determined based on soil test results and as approved by Engineer.

SECTION 02900
PLANTING

C. Contractor shall uniformly apply fertilizer at the rates indicated in the TEP or as otherwise determined based on soil test results and approved by Engineer. Fertilizer shall be applied as not to run-off into local storm sewer system.

D. Fertilizer, seed and mulch may be placed using hydroseeding, or other suitable mechanical methods that will not damage the completed Work.

E. Seeding for permanent vegetation shall be performed during the first optimum planting season following completion of the work in an area.

F. Immediately after seeding, in areas designated for mulch, the Contractor shall spread mulch uniformly over the seeded area

G. Erosion control mat shall be utilized where planted slopes exceed 5%.

3.03 ESTABLISHMENT OF GRASS:

A. Contractor shall begin maintenance of seeded areas immediately after seed placement. Contractor shall water; repair washed or eroded areas, and otherwise protect and maintain the seeded areas until a final satisfactory stand of grass is obtained.

B. Engineer will periodically inspect the seeded areas to verify that a satisfactory stand of grass is obtained in all areas seeded. A satisfactory stand of grass is defined as a cover of living plants, after true leaves are formed, of the seed species applied, in which gaps larger than one square foot do not occur. Bare spots shall be reseeded, and the total bare areas shall not comprise more than one percent of the total seeded area. Contractor shall re-seed bare and eroded areas as determined necessary by Engineer.

C. Contractor shall mow the property twice once a satisfactory stand of grass has been established.

D. Contractor shall warranty planting for 90 days following establishment of a satisfactory stand of grass.

END OF SECTION

SECTION 32310
CHAIN LINK FENCES AND GATES

PART 1 – GENERAL

1.01. SECTION INCLUDES:

- **A.** Summary
- **B.** References
- **C.** Submittals
- **D.** Fabric
- **E.** Posts
- **F.** Top Rails and Brace Rails
- **G.** Fence Fittings
- **H.** Gates
- **I.** Barbed Wire
- **J.** Concrete for Post Footings
- **K.** Preparation
- **L.** Fence Installation

1.02. SUMMARY:

A. Contractor shall provide all necessary labor, materials, and equipment for maintenance and relocation of temporary and permanent chain link fencing, and gates as needed to complete the Scope of Work shown on the Drawings and specified in the Specifications.

B. Contractor shall provide all necessary labor, materials and equipment for installation of privacy fabric.

1.03. REFERENCES:

A. American Society for Testing and Materials (ASTM):

1. ASTM A 121, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire

2. ASTM C 33, Standard Specification for Concrete Aggregates

3. ASTM C 150, Standard Specification for Portland Cement

4. ASTM F 567, Standard Practice for Installation of Chain-Link Fence

5. ASTM F 626, Standard Specifications for Fence Fittings

6. ASTM F 900, Standard Specification for Industrial and Commercial Swing Gates

SECTION 32310
CHAIN LINK FENCES AND GATES

1.04. SUBMITTALS:

A. Contractor shall submit product data and shop drawings showing materials, finishes and dimensions for fencing and gates seven (7) days prior to relocation of fences and gates.

PART 2 – PRODUCTS

2.01. FABRIC:

A. Height of fence fabric shall be eight feet minimum.

B. A woven geotextile made of 100% slit film yarns (US 2000 or equivalent) shall be used as a privacy fabric to the existing and new link fencing on the site.

2.02. POSTS:

A. Posts shall conform to the existing chain link fence posts.

2.03. TOP RAILS AND BRACE RAILS:

A. Rails shall conform to the existing chain link fence.

B. Furnish rails in manufacturer's longest lengths, with expansion type couplings, approximately six inches long, for each joint. Provide means for attaching the top rail and bottom rail securely to each gate, corner, pull, and end post.

2.04. FENCE FITTINGS:

A. Fence fittings shall conform to the existing chain link fence.

2.05. GATES

A. Contractor shall use same fabric as for fence, unless otherwise indicated. Gates shall be as shown on the Drawings, and shall be complete with latches, stops, keepers, and hinges. Swing gates shall conform to ASTM F 900.

2.06. BARBED WIRE:

A. Barbed wire shall be zinc-coated double strand 12-1/2 gauge twisted wire with 14 gauge, four-point round aluminum barbs spaced on approximately five-inch centers. Conform to ASTM A 121, chain-link fence grade.

2.07. CONCRETE FOR POST FOOTINGS:

A. Concrete shall consist of Type I Portland cement complying with ASTM C 150, aggregates complying with ASTM C 33, and clean water. Concrete mix shall be proportioned such that the 28-day compressive strength of moist-cured laboratory samples achieves not less than 3,000 pounds per square inch (psi).

PART 3 – EXECUTION

3.01. PREPARATION:

A. Contractor shall establish required locations for fencing and gates.

B. The ground surface along the alignment of the fencing shall be graded as necessary to provide a relatively even surface for fence construction.

C. Contractor shall place aggregate base to fill minor depressions, and riprap or other free draining stone for larger depressions and drainage channels, so that fence fabric will be in contact with the ground surface for its entire length.

3.02. FENCE INSTALLATION:

A. Contractor shall construct fencing in accordance with ASTM F 567, except as modified in this subsection, and in accordance with the fence manufacturer's recommendations.

B. Contractor shall provide all necessary hardware for a complete installation.

C. Contractor shall install new fencing as shown on the Drawings or where directed by the Engineer, unless otherwise directed by Engineer. Contractor shall install posts at spacing not greater than ten feet.

D. Contractor shall not install fence fabric until concrete has cured for a minimum of two days.

E. Visual barrier fabric to be removed at the end of the project.

END OF SECTION

BID FORM SCHEDULE A
SCHEDULE OF QUANTITIES AND PRICES
FORMER MANUFACTURED GAS PLANT REMEDIATION
SAG HARBOR, NEW YORK

Bid prices listed in this Schedule are based on performance of the Work described in the Specifications and Drawings. Bid prices shall include all overhead, profit, handling and all other related charges. The estimated quantities in this Schedule A are based on available information and may vary from actual site conditions. No adjustment of Bid prices will be allowed by ENSR for any Bid Item due to any change in quantities.

Bid Item		Unit	Estimated Quantity	Unit Price	Total Amount
1	Mobilization and Demobilization	LS	1		
2	Temporary Facilities and Controls	LS	1		
3	Structure Demolition	LS	1		
4	Temporary Fabric Structures and Controls Mobilization	LS	1		
5	Temporary Fabric Structures and Controls	LS	1		
6	Soil Mix Wall Mobilization	LS	1		
7	Construct Soil Mix Wall	LS	1		
8	Excavation Stockpiling and Loading	CY	16,450		
9	Landside Effluent Discharge Pipe	LS	1		
10	Construction Water Management	LS	1		
11	Construction Water Treatment, Set up, and Removal	LS	1		
12	Construction Water Treatment Operation	Day	180		
13	Transportation and Disposal: Debris	Ton	3,475		
14	Transportation and Disposal [Note 1]	Ton	28,720		
15	Restoration: Gravel Backfill	CY	500		
16	Restoration: Common Backfill	CY	18,870		
17	Restoration: Topsoil	CY	830		
18	Restoration: Asphalt Paving	SY	5,000		
19	Restoration: Sidewalk and Curb	LF	120		
20	Miscellaneous Site Restoration	LS	1		

Subtotal ________

100% Performance and Payment Bond ________

Sales taxes and other taxes on the Work ________

Total Price ________

Note 1: Provide unit costs for Bid Items 5A,B,C,D,E,F beolow. Only total the lowest unit cost from the six facilities in Bid Item 14.

LS - Lump Sum
CY- In-Place Cubic Yard
LF - Linear Foot

BID FORM SCHEDULE A
SCHEDULE OF QUANTITIES AND PRICES
FORMER MANUFACTURED GAS PLANT REMEDIATION
SAG HARBOR, NEW YORK

ALTERNATE UNIT PRICES

	Item	Unit	Estimated Quantity	Unit Price
UP1	Odor Control Foam System Expendables	Gallon	1	
UP2	Soil Mix Wall Standby Hourly	Hour	1	
UP3	Soil Mix Wall Standby Day	Day	1	
UP4	Excavation Standby Hourly	Hour	1	
UP5	Excavation Standby Day	Day	1	
UP6	Soil Amendment	Ton	1	

ALTERNATE TRANSPORTATION AND DISPOSAL COSTS

	Item	Unit	Estimated Quantity	Unit Price
		Ton	1	
		Ton	1	
		Ton	1	
		Ton	1	
		Ton	1	

SCHEDULE B
LIST OF ADDENDA

List all Addenda received.

NO.	TITLE	DATE

SCHEDULE C
SCHEDULE OF MATERIALS - (VARIATIONS AND SOURCES)

VARIATIONS (Bidder shall list any proposed variations from the specified materials, subject to approval by Engineer):

MATERIALS SOURCES (Bidder shall list sources of the following specified materials)

SCHEDULE D
LIST OF SUB-CONTRACTORS

Provide the name of each Sub-Contractor proposed for the Work, together with the amount payable to each Sub-Contractor. Work that will be carried out partly or entirely by Bidder's own forces shall be indicated by "Own Forces". Should Bidder wish to separate the Work into two parts or more to be awarded to two or more Sub-Contractors, without conflicting with the requirements of the Specifications, such separation shall be indicated below. Bidder shall not be allowed to change any Sub-Contractor except with the prior consent of the Engineer.

TYPE OF WORK	NAME AND ADDRESS	APPROXIMATE VALUE

SCHEDULE E
LIST OF EQUIPMENT

On this form list all equipment that will be used in the performance of the Work. Such list shall show for each unit, the description of the unit, capacity, condition, age, present location, the name of the owner of the equipment, and all-inclusive hourly rates excluding operator. Such equipment shall be subject to inspection by the Engineer to verify the stated information. The equipment rates provided on this schedule may be used as the basis for payment of any Time and Materials Work that is deemed necessary by the Engineer for completion of the Work. Hourly rates will include all operating costs including fuel. Operator costs should not be included. During the course of the project if additional equipment is required this list will be revised and resubmitted to the Engineer.

DESCRIPTION	*CAPACITY*	*CONDITION*	*AGE*	*LOCATION*	*OWNER*	*HOURLY RATE*

SCHEDULE F
CONSTRUCTION MILESTONES

Bidder shall prepare an initial Progress Schedule, as described in the Specifications, showing all activities and dependent operations such as plant and equipment mobilization and taking into account the Milestones listed below. The Bidder's initial Progress Schedule shall be provided in Bidder's Technical Execution Plan with the Bid proposal.

Date	Milestone
7/18/2008	Submit Bid and Draft Technical Execution Plan
8/4/2008	Award of Contract / Issuance of Work Order
8/18/2008	Submit Revised Technical Execution Plan and all other Submittals
9/22/2008	Mobilization
11/14/2008	Soil Mix Wall Installation Completion
5/8/2009	Excavation Completion
5/22/2009	Substantial Completion
5/26/2009	Final Completion including all punch list items

SCHEDULE G
LIST OF PERSONNEL

List the names of the principal personnel who will be assigned to the Work, including the superintendent, their experience, and their hourly billing rate (not pay rate). List all categories of personnel and hourly rates for non-principal personnel. This information shall be for the use of the Engineer, and such personnel shall be subject to the approval of the Engineer and Owner. The labor rates provided may be used as the basis for payment of any Time and Materials Work that is deemed necessary by the Engineer for completion of the Work.

NAME	POSITION	EXPERIENCE	HOURLY RATE

REMEDIATION DESIGN
FORMER MANUFACTURED GAS PLANT
SAG HARBOR, NEW YORK

PREPARED FOR
KEYSPAN CORPORATION

01765-066-003

PREPARED BY:

ENSR | AECOM

ISSUED FOR BID

SHEET	SHEET TITLE	
T-01	COVER SHEET	REV. 0
T-02	LEGEND	REV. 0
C-01	EXISTING CONDITIONS	REV. 0
C-02	SITE PREPARATION AND SEDIMENT AND EROSION CONTROL	REV. 0
C-03	LONG ISLAND AVENUE SITE PREPARATION AND	
	SEDIMENT AND EROSION CONTROL	REV. 0
C-04	DEMOLITION PLAN	REV. 0
C-05	SOIL MIX WALL AND EXCAVATION PLAN	REV. 0
C-06	PRE-CHARACTERIZATION PLAN	REV. 0
C-07	CONCEPTUAL TEMPORARY FABRIC STRUCTURE PLAN	REV. 0
C-08	RESTORATION PLAN	REV. 0
C-09	SITE PREPARATION AND SEDIMENT AND EROSION CONTROL DETAILS	REV. 0
C-10	SOIL MIX WALL DETAILS	REV. 0
C-11	RESTORATION DETAILS	REV. 0
P-01	PROCESS AND INSTRUMENTATION LEGEND	REV. 0
P-02	WATER TREATMENT SYSTEM P&ID (SHEET 1 OF 2)	REV. 0
P-03	WATER TREATMENT SYSTEM P&ID (SHEET 2 OF 2)	REV. 0
		REV. 0

SHEET	SHEET TITLE

SHEET	SHEET TITLE

CURRENT DATE	05/09/08	T-01

LEGEND

Symbol	Description
	EXISTING BUILDING
	HISTORIC STRUCTURE (APPROXIMATE)
	PROPERTY LINE
	EXISTING CHAINLINK FENCE
	EDGE OF PAVEMENT
	RAILROAD TIE CURB
G	GAS LINE
EOH	ELECTRIC OVERHEAD UTILITY
TUG	TELEPHONE UNDERGROUND UTILITY
SD	STORM DRAIN LINE
S	SANITARY SEWER LINE
W	WATER LINE
	CURB/SIDEWALK
	WOODEN BULKHEAD
3	EXISTING GROUND SURFACE ELEVATION CONTOUR 1' INTERVAL
5	EXISTING GROUND SURFACE ELEVATION CONTOUR 5' INTERVAL
DI	DRAIN INLET
CIC	SEPTIC SYSTEM MANHOLE
SS	SANITARY SEWER MANHOLE
WMT	WATER UTILITY ROAD BOX
WV	WATER UTILITY VALVE
SHMW-08I	MONITORING WELL
SHMW-08S*	MONITORING WELL (APPROXIMATE LOCATION)
GV	GAS UTILITY ROAD BOX
UL 2A W/ GUY WIRE	ELECTRIC UTILITY POLE & GUIDE WIRE
	LIGHT POLE
	FIRE HYDRANT
	STREET/TRAFFIC SIGN
CB CB	CATCH BASIN
	TREE/SHRUBS (SURVEYED)
	TREE/SHRUBS (APPROXIMATE BASED ON AERIAL PHOTO)
	SOIL MIX WALL LIMIT
	BRIDGE STREET EXCAVATION LIMIT
	WORK LIMIT
	ASPHALT DEMOLISHED DURING EXCAVATION
	CONCRETE SIDEWALK DEMOLISHED DURING EXCAVATION
	OUTER SOIL MIX WALL (EXTENDS TO −17 FEET MSL)
	INNER SOIL MIX WALL (EXTENDS TO −6 FEET MSL)
	INNER SOIL MIX WALL (EXTENDS TO −9 FEET MSL)
	TEMPORARY ENTRANCE TO CONDMINIMUM PARKING
	TEMPORARY CONSTRUCTION FENCE WITH EROSION CONTROLS
ACCESS RAMP	TEMPORARY CONSTRUCTION FENCE WITH GATE AROUND ACCESS RAMP
	TEMPORARY CONSTRUCTION ENTRANCE
	NEW PERMANENT FENCE
	RESTORED ASPHALT
	RESTORED CONCRETE SIDEWALK
	RESTORED GRASS AREAS
3	EXCAVATION CONTOUR 1' INTERVAL
5	EXCAVATION CONTOUR 5' INTERVAL
3	RESTORATION CONTOUR 1' INTERVAL
5	RESTORATION CONTOUR 5' INTERVAL
	ABOVE GROUND CONSTRUCTION AREA DISCHARGE LINE
	BELOW GROUND CONSTRUCTION AREA DISCHARGE LINE
	PRE-CHARACTERIZATION SAMPLE COLLECTED APRIL 2007
	PRE-CHARACTERIZATION SAMPLE COLLECTED MAY 2008

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NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE
0	BcV	05/09/08	ISSUED FOR BID				

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SAG HARBOR FORMER MGP SITE
SAG HARBOR, NEW YORK

PROJ. NUMBER: 01765-066-003

DATE: 05/09/08

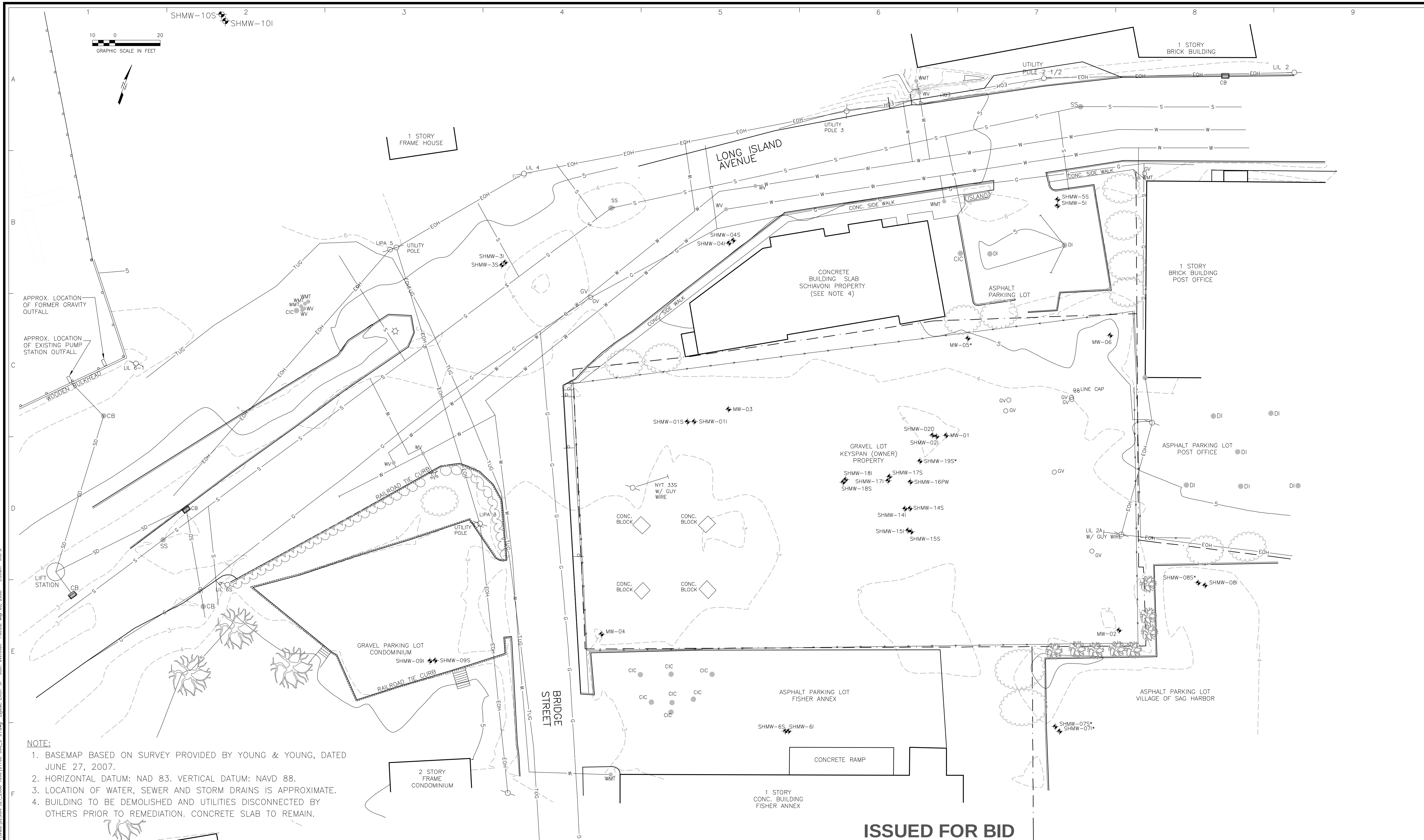
LEGEND

REMEDIATION DESIGN

DRAWING NUMBER: T-02

SHEET NUMBER:

REVISION 0



NOTE:

1. BASEMAP BASED ON SURVEY PROVIDED BY YOUNG & YOUNG, DATED JUNE 27, 2007.
2. HORIZONTAL DATUM: NAD 83. VERTICAL DATUM: NAVD 88.
3. LOCATION OF WATER, SEWER AND STORM DRAINS IS APPROXIMATE.
4. BUILDING TO BE DEMOLISHED AND UTILITIES DISCONNECTED BY OTHERS PRIOR TO REMEDIATION. CONCRETE SLAB TO REMAIN.

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0	BcV	05/09/08	ISSUED FOR BID				

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PROJ. NUMBER: 01765-066-003
DATE: 05/09/08

EXISTING CONDITIONS

REMEDIATION DESIGN

DRAWING NUMBER: C-01
SHEET NUMBER:
REVISION: 0

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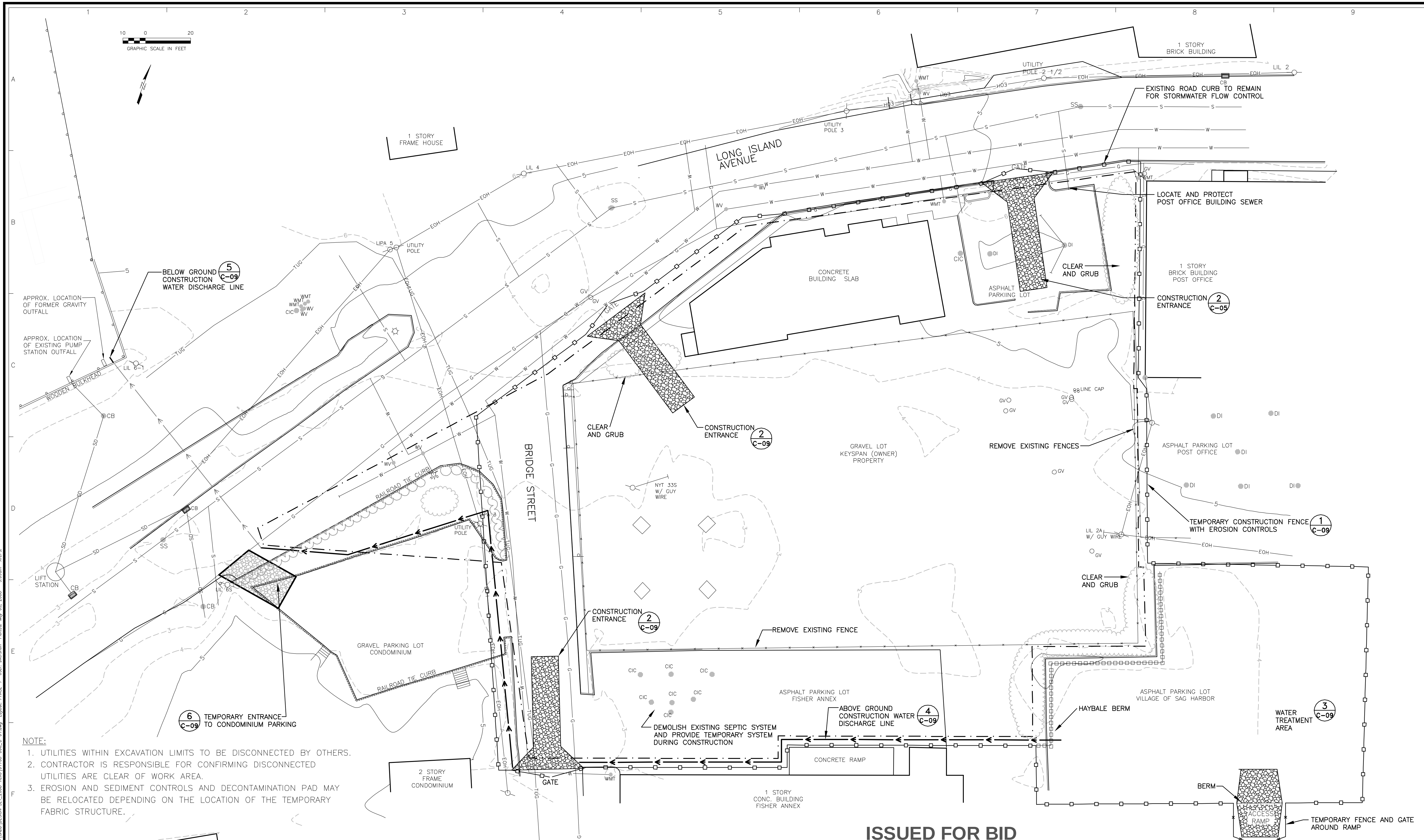

NOTE:

1. UTILITIES WITHIN EXCAVATION LIMITS TO BE DISCONNECTED BY OTHERS.
2. CONTRACTOR IS RESPONSIBLE FOR CONFIRMING DISCONNECTED UTILITIES ARE CLEAR OF WORK AREA.
3. EROSION AND SEDIMENT CONTROLS AND DECONTAMINATION PAD MAY BE RELOCATED DEPENDING ON THE LOCATION OF THE TEMPORARY FABRIC STRUCTURE.

ISSUED FOR BID

NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE
0	BcV	05/09/08	ISSUED FOR BID				

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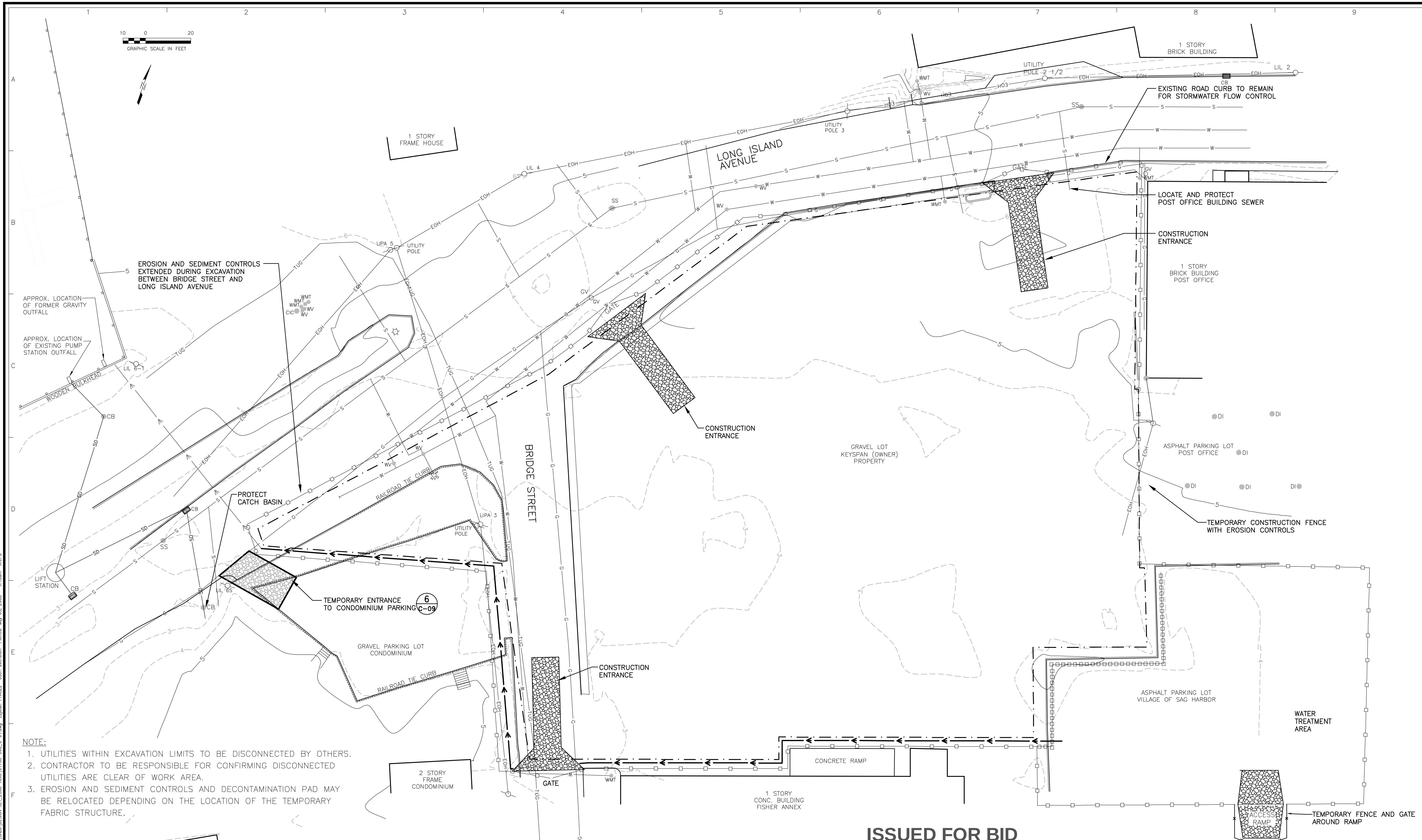
PROJ. NUMBER: 01765-066-003 DATE: 05/09/08

SITE PREPARATION AND EROSION AND SEDIMENT CONTROL

REMEDIATION DESIGN

DRAWING NUMBER: C-02
SHEET NUMBER:
REVISION: 0



NOTE:

1. UTILITIES WITHIN EXCAVATION LIMITS TO BE DISCONNECTED BY OTHERS.
2. CONTRACTOR TO BE RESPONSIBLE FOR CONFIRMING DISCONNECTED UTILITIES ARE CLEAR OF WORK AREA.
3. EROSION AND SEDIMENT CONTROLS AND DECONTAMINATION PAD MAY BE RELOCATED DEPENDING ON THE LOCATION OF THE TEMPORARY FABRIC STRUCTURE.

ISSUED FOR BID

NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE
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PROJ. NUMBER: 01765-066-003 DATE: 05/09/08

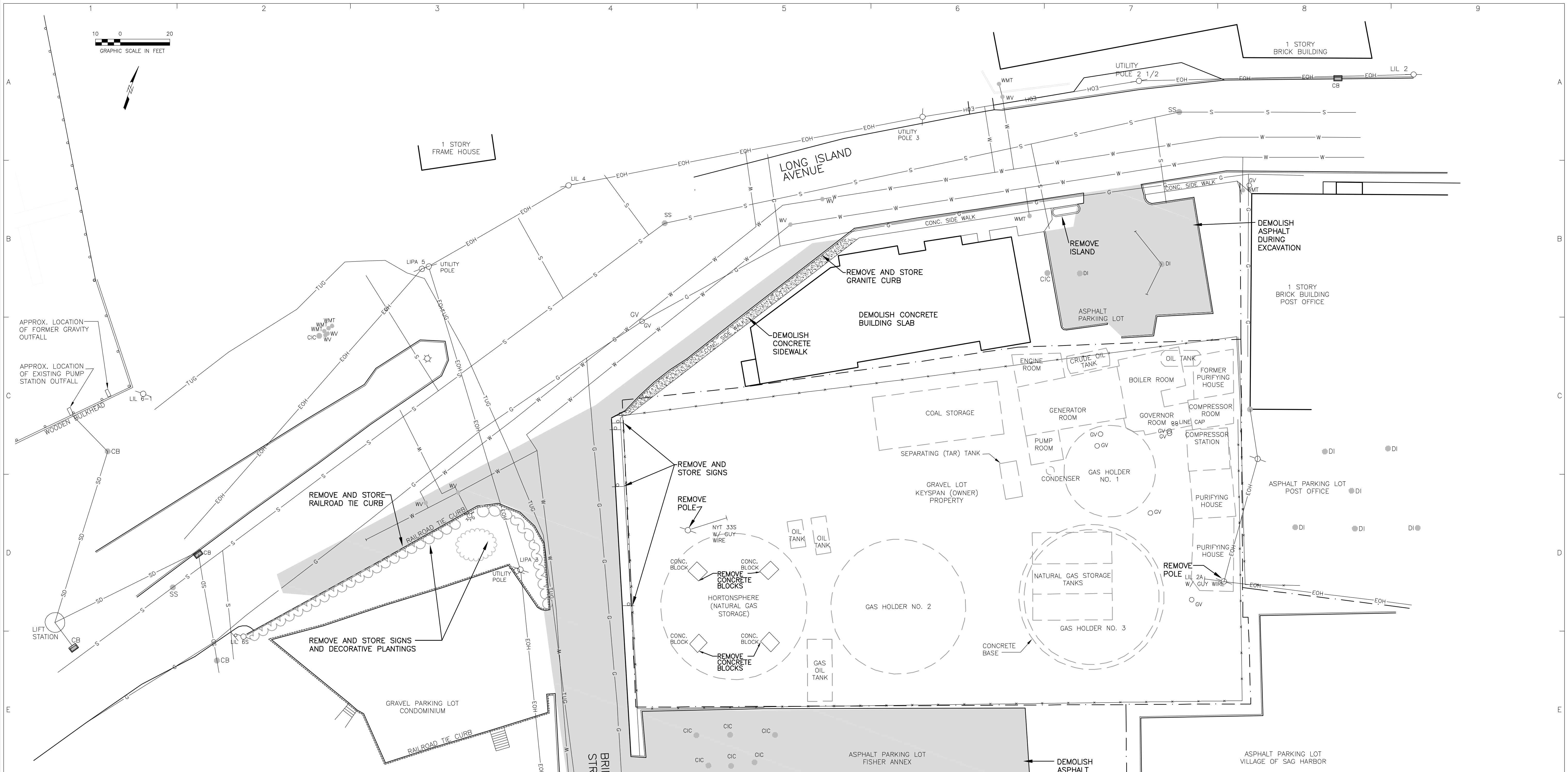
LONG ISLAND AVENUE SITE PREPARATION AND EROSION AND SEDIMENT CONTROL

REMEDIATION DESIGN

DRAWING NUMBER C-03

SHEET NUMBER

REVISION 0



NOTE:

1. BUILDING DEMOLISHED AND UTILITIES DISCONNECTED BY OTHERS PRIOR TO REMEDIATION. CONCRETE SLAB TO REMAIN.
2. UTILITIES IN BRIDGE STREET TO BE RELOCATED BY OTHERS.
3. THE INFORMATION PROVIDED ON HISTORIC STRUCTURES IS FOR REFERENCE ONLY. EXACT LOCATIONS AND REMAINING SUBSURFACE FEATURES ARE TO BE DETERMINED BY THE CONTRACTOR. CHANGES MAY HAVE OCCURED SINCE THE REFERENCE DRAWINGS WERE PUBLISHED.

REFERENCES:

1. 57'-6" HORTONSPHERE PIPING BY E.L. PHILLIPS & COMPANY, NEW YORK.
2. PLOT PLAN OF GAS PLANT PROPERTY BY LONG ISLAND LIGHTING COMPANY, ENGINEERING DEPARTMENT DATED 9/22/1941, F-10460-4.
3. 57'-6" DIAMETER HORTONSPHERE FOUNDATION BY LONG ISLAND LIGHTING COMPANY DATED 1/26/1931, F-841 32018.
4. 57'-6" DIAMETER HORTONSPHERE LOCATION OF TEST HOLES BY LONG ISLAND LIGHTING COMPANY DATED 12/18/1930, 41257 D-31683-1.

NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE
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PROJ. NUMBER: 01765-066-003 DATE: 05/09/08

DEMOLITION PLAN

REMEDIATION DESIGN

DRAWING NUMBER: C-04
SHEET NUMBER:
REVISION: 0

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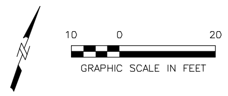


SOIL MIX WALL DEPTH LEGEND

OUTER SOIL MIX WALL (EXTENDS TO –17 FEET MSL)

INNER SOIL MIX WALL (EXTENDS TO –6 FEET MSL)

INNER SOIL MIX WALL (EXTENDS TO –9 FEET MSL)

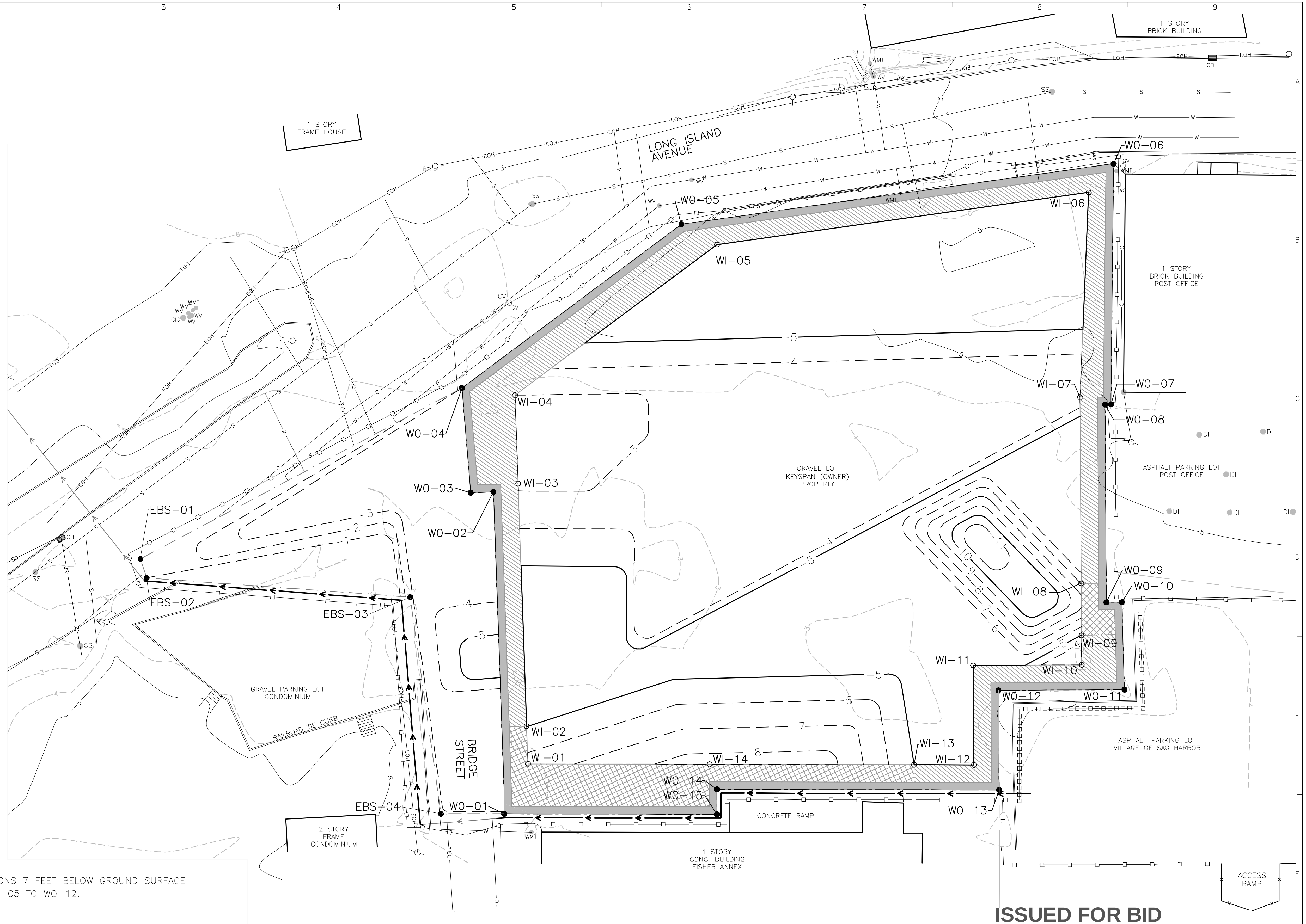
SOIL MIX WALL OUTER COORDINATES		
POINT-ID	Easting	Northing
W0-01	1454142.82	308525.59
W0-02	1454094.78	308645.03
W0-03	1454086.34	308641.62
W0-04	1454068.76	308679.76
W0-05	1454128.75	308771.23
W0-06	1454282.74	308853.05
W0-07	1454314.68	308762.30
W0-08	1454312.48	308761.46
W0-09	1454340.00	308687.36
W0-10	1454345.80	308689.52
W0-11	1454358.74	308657.00
W0-12	1454311.49	308639.52
W0-13	1454325.38	308602.19
W0-14	1454219.39	308563.89
W0-15	1454222.79	308554.48

SOIL MIX WALL INNER COORDINATES		
POINT-ID	Easting	Northing
WI-01	1454144.97	308547.63
WI-02	1454139.22	308561.58
WI-03	1454102.92	308651.57
WI-04	1454089.68	308684.31
WI-05	1454144.88	308768.48
WI-06	1454277.34	308838.85
WI-07	1454302.06	308760.79
WI-08	1454327.97	308691.02
WI-09	1454335.19	308671.56
WI-10	1454339.31	308660.48
WI-11	1454298.62	308645.43
WI-12	1454312.49	308608.16
WI-13	1454290.00	308600.04
WI-14	1454213.17	308572.27

LONG ISLAND AVENUE EXCAVATION COORDINATES		
POINT-ID	Easting	Northing
EBS-01	1453971.40	308571.64
EBS-02	1453976.36	308565.37
EBS-03	1454077.92	308594.15
EBS-04	1454119.08	308516.95

NOTE:

1. CONTRACTOR SHALL PRE–EXCAVATE OBSTRUCTIONS 7 FEET BELOW GROUND SURFACE AND RETURN SPOILS TO EXCAVATION FROM WO–05 TO WO–12.



ISSUED FOR BID

NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE
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PROJ. NUMBER: 01765-066-003 DATE: 05/09/08

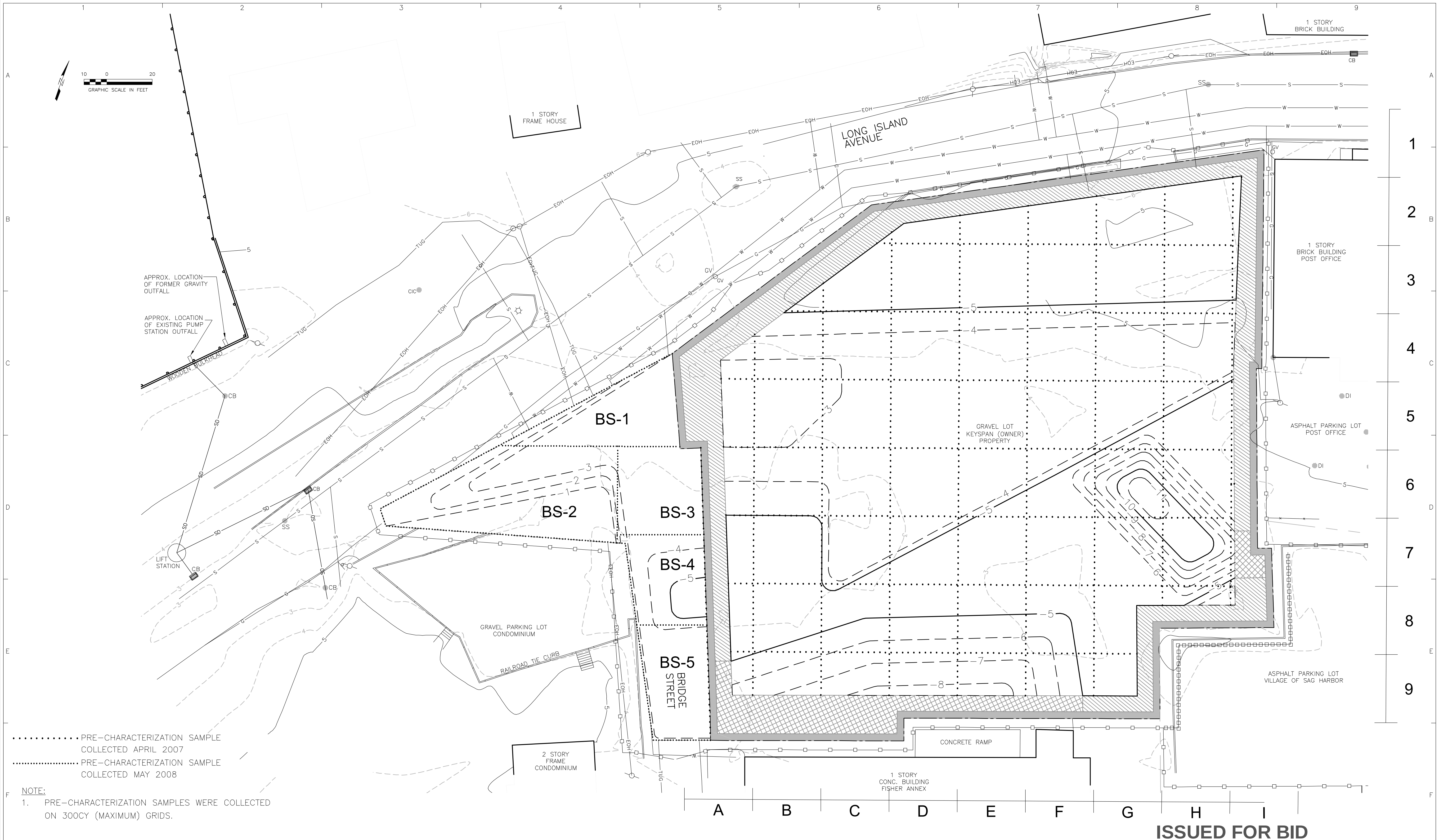
SOIL MIX WALL AND EXCAVATION PLAN

REMEDIATION DESIGN

DRAWING NUMBER: C-05

SHEET NUMBER:

REVISION 0



NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE
0	BcV	05/09/08	ISSUED FOR BID				

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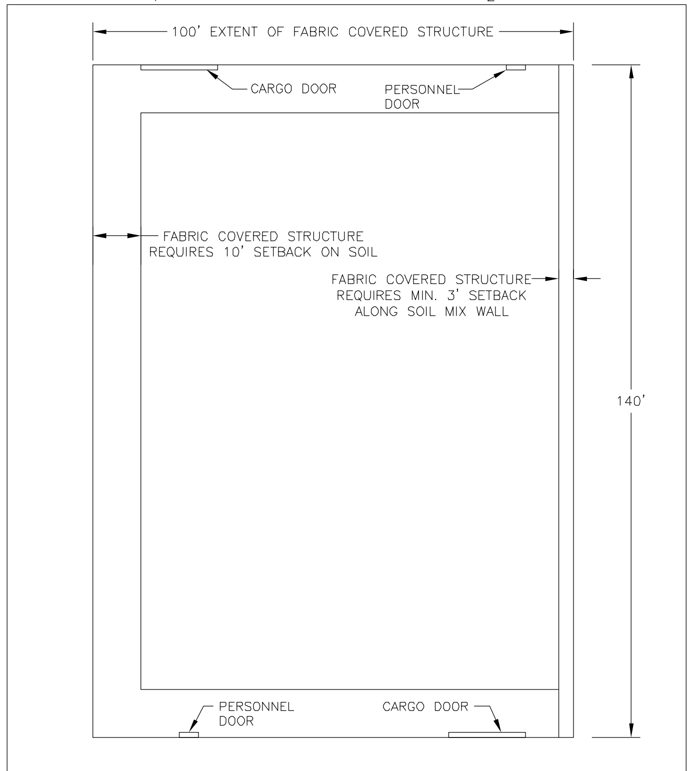
PROJ. NUMBER: 01765-066-003
DATE: 05/09/08

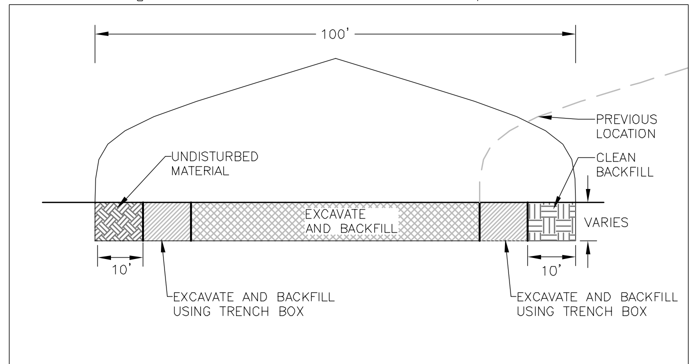
PRE-CHARACTERIZATION PLAN

REMEDIATION DESIGN

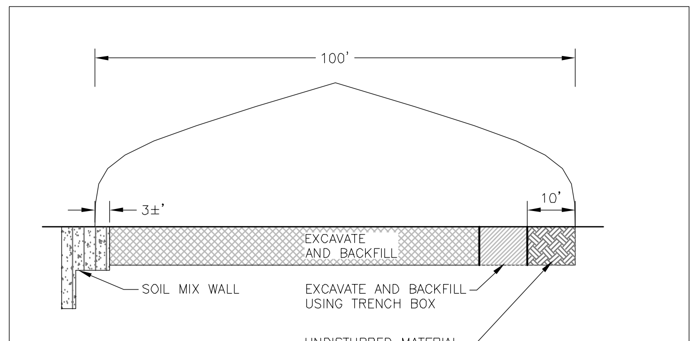
DRAWING NUMBER: C-06
SHEET NUMBER:
REVISION: 0



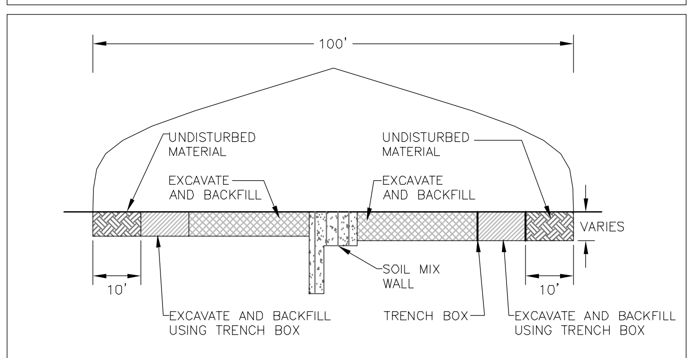
1 C-07 TEMPORARY FABRIC STRUCTURE PLAN VIEW SCALE: NOT TO SCALE



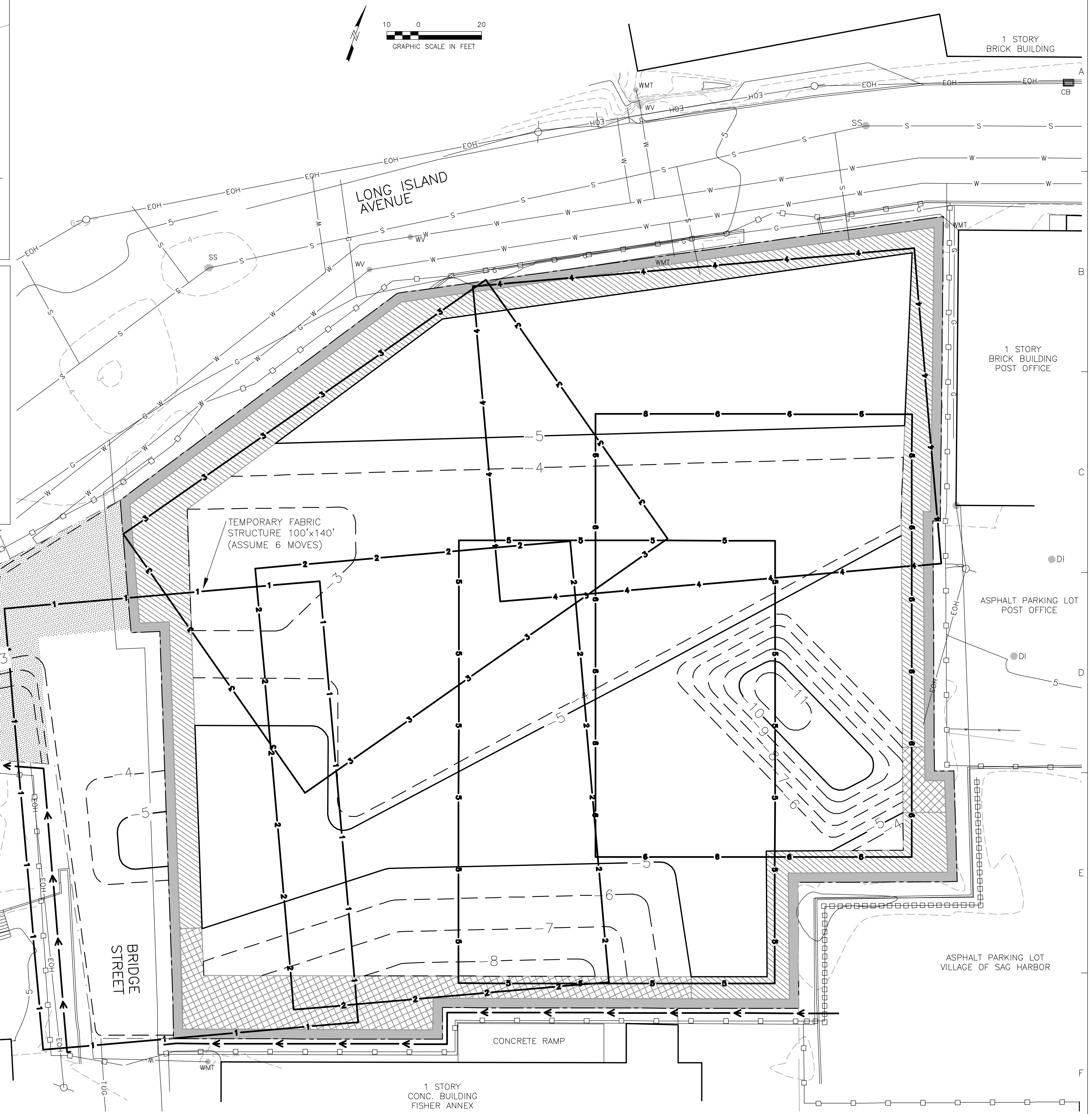
3 C-07 TEMPORARY FABRIC STRUCTURE SECONDARY/OVERLAPPED LOCATION PROFILE SCALE: NOT TO SCALE



4 C-07 TEMPORARY FABRIC STRUCTURE SOIL MIX WALL LOCATION PROFILE SCALE: NOT TO SCALE



2 C-07 TEMPORARY FABRIC STRUCTURE INITIAL LOCATION PROFILE SCALE: NOT TO SCALE



NOTES:

1. NUMBERED LINES REPRESENT SEQUENCE OF ——1——1—— TEMPORARY FABRIC STRUCTURE RELOCATION.
2. ALL SET BACKS FROM STRUCTURE ARE CONCEPTUAL. ACTUAL SET BACKS SHALL BE BASED ON VENDOR REQUIREMENTS AND NYS PE DESIGN.
3. STRUCTURAL CONFIGURATION (INCLUDING OVERHEAD AND PERSONNEL DOORS) DETERMINED BY CONTRACTOR OPERATIONS.
4. DO NOT EXCAVATE ON BOTH SIDES OF THE SOIL MIX WALL SIMULTANEOUSLY.

ISSUED FOR BID

NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE
0	BcV	05/09/08	ISSUED FOR BID				

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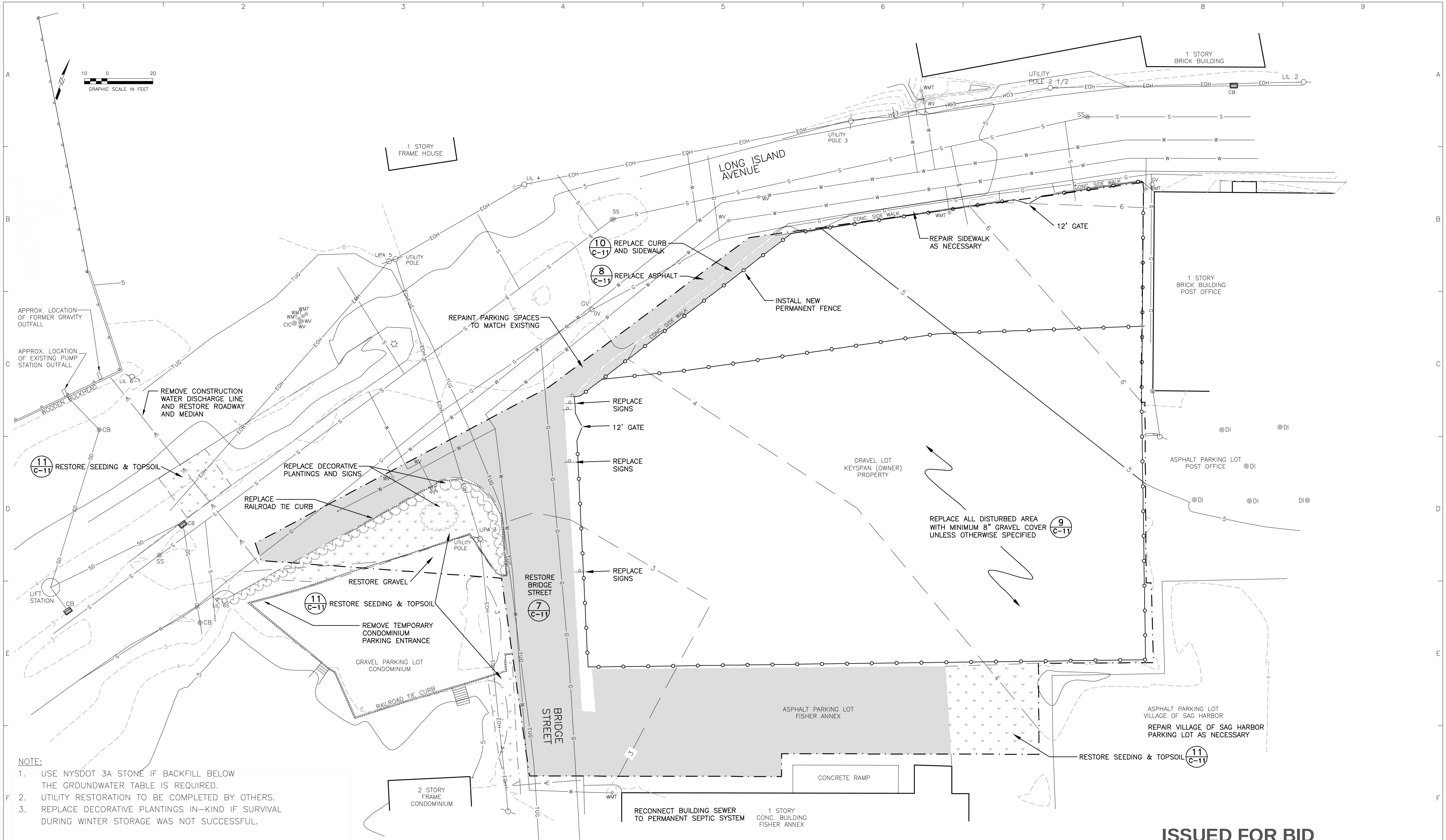
SAG HARBOR, NEW YORK

PROJ. NUMBER: 01765-066-003
DATE: 05/09/08

CONCEPTUAL TEMPORARY FABRIC STRUCTURE PLAN

REMEDIATION DESIGN

DRAWING NUMBER: C-07
SHEET NUMBER:
REVISION: 0



NOTE:

1. USE NYSDOT 3A STONE IF BACKFILL BELOW THE GROUNDWATER TABLE IS REQUIRED.
2. UTILITY RESTORATION TO BE COMPLETED BY OTHERS.
3. REPLACE DECORATIVE PLANTINGS IN-KIND IF SURVIVAL DURING WINTER STORAGE WAS NOT SUCCESSFUL.

ISSUED FOR BID

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0	BcV	05/09/08	ISSUED FOR BID				

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PROJ. NUMBER: 01765-066-003 DATE: 05/09/08

RESTORATION PLAN

REMEDIATION DESIGN

DRAWING NUMBER: C-08

SHEET NUMBER:

REVISION: 0

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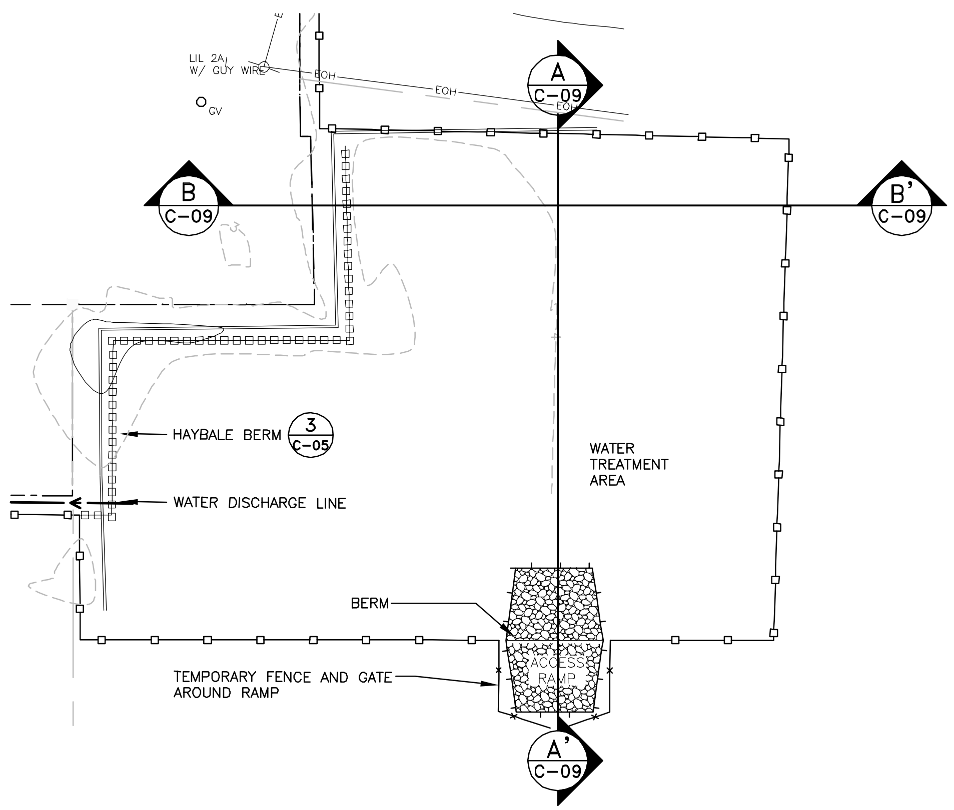
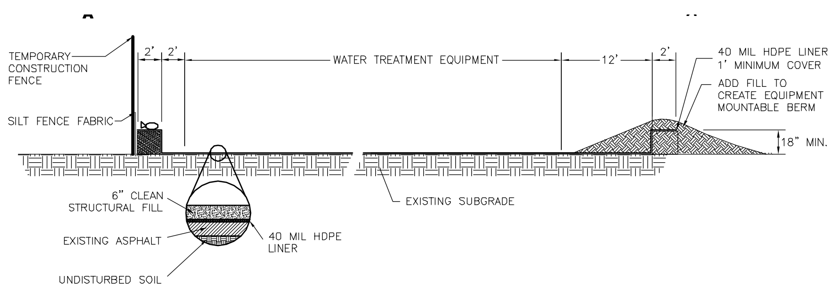
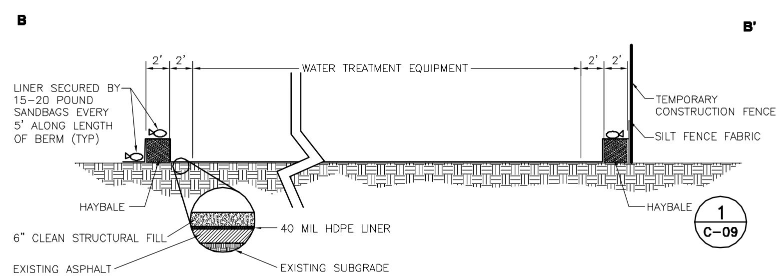






NOTES:

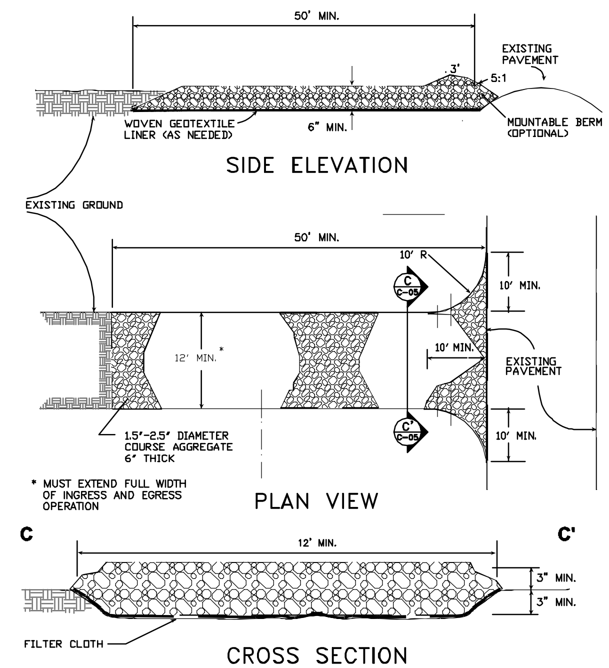
1. DAILY INSPECTION AND MAINTENANCE OF THE CONTAINMENT BERMS IS REQUIRED FOR THE DURATION OF THE PROJECT.

5. ANY DAMAGE TO THE WATER TREATMENT AREA MUST BE REPORTED TO THE SITE ENGINEER IMMEDIATELY.

6. LINER SHALL BE 40 MIL HDPE ONE SOLID SHEET OR SEAMS SHALL BE WELDED PER MANUFACTURER'S RECOMMENDATIONS. NO OVERLAP IS ALLOWED.

3 (C-02) WATER TREATMENT AREA

SCALE: NOT TO SCALE



NOTES:

1. SITE PREPARATION: REMOVE ALL UNSUITABLE MATERIAL FROM THE FOUNDATION AREA, GRADE AND CROWN FOR POSITIVE DRAINAGE.

2. GRADING: IF SLOPE TOWARDS THE ROAD EXCEEDS 2 HIGH RIDGE WITH 3:1 SLOPES ACROSS THE FOUNDATION APPROXIMATELY 15 FEET FROM THE ENTRANCE TO DIVERT RUNOFF AWAY FROM THE PAVED ROAD.

3. INSTALL PIPE UNDER THE PAD IF NEEDED TO MAINTAIN DRAINAGE DITCHES ALONG ROADS.

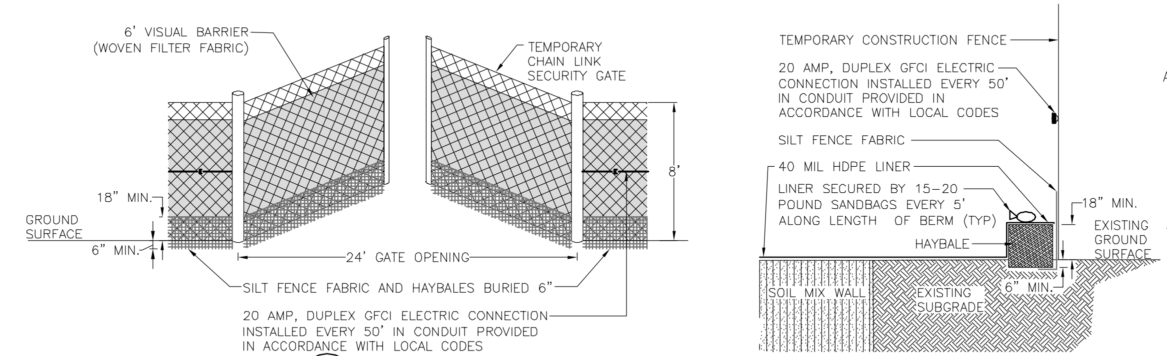
4. PLACE STONE TO DIMENSIONS AND GRADES AS SHOWN ON PLANS. LEAVE SURFACE SMOOTH AND SLOPED FOR DRAINAGE.

5. PLACE WOVEN GEOTEXTILE LINER ON THE GRADED FOUNDATION TO IMPROVE STABILITY.

6. MAINTENANCE: REAPPLY STONE AS NEEDED TO MAINTAIN INTEGRITY OF ENTRANCE.

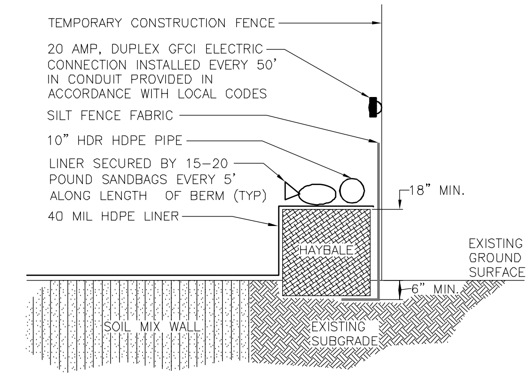
2 (C-02) CONSTRUCTION ENTRANCE

SCALE: NOT TO SCALE



1 (C-02) TEMPORARY CONSTRUCTION FENCE WITH EROSION CONTROLS

SCALE: NOT TO SCALE



4 (C-02) ABOVE GROUND CONSTRUCTION WATER DISCHARGE LINE

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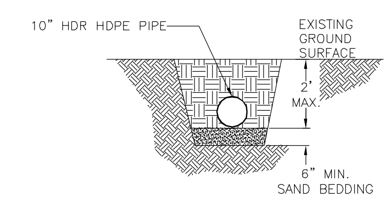

5 (C-02) BELOW GROUND CONSTRUCTION WATER DISCHARGE LINE

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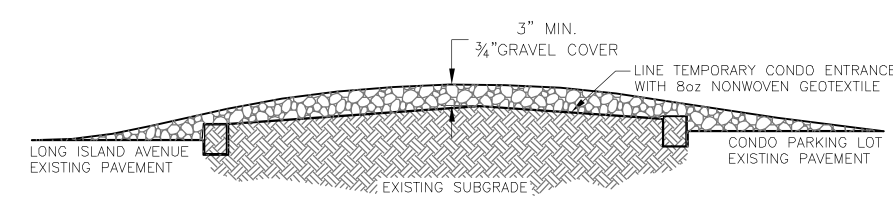

6 (C-02) TEMPORARY CONDOMINIUM PARKING ENTRANCE

SCALE: NOT TO SCALE

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PROJ. NUMBER: 01765-066-003 DATE: 05/09/08

SITE PREPARATION AND SEDIMENT AND EROSION CONTROL DETAILS

REMEDIATION DESIGN

DRAWING NUMBER: C-09

SHEET NUMBER:

REVISION 0

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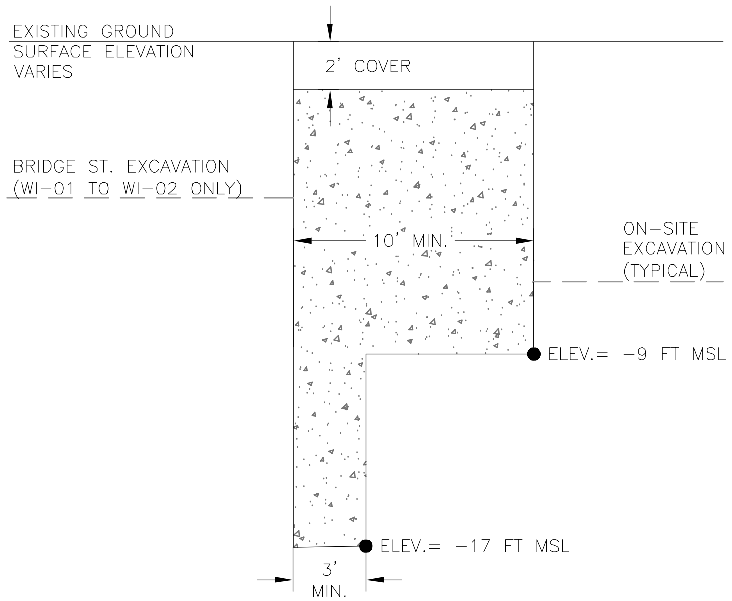
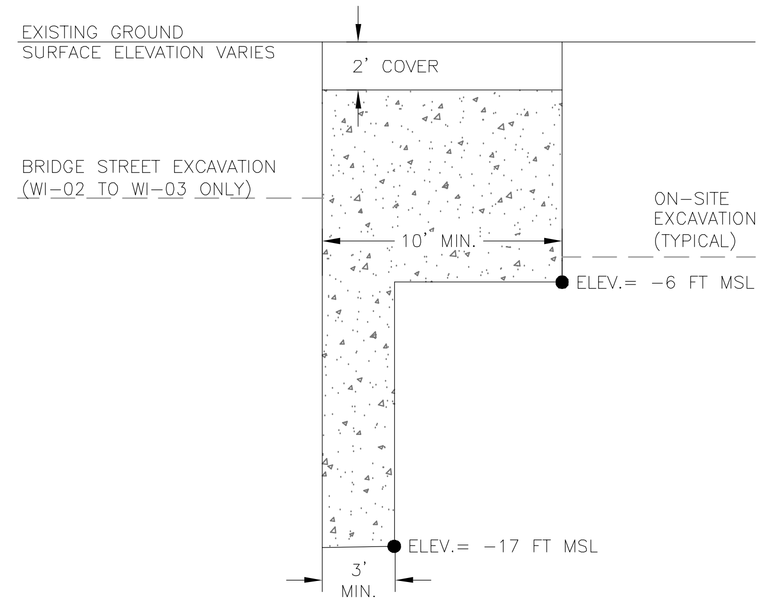


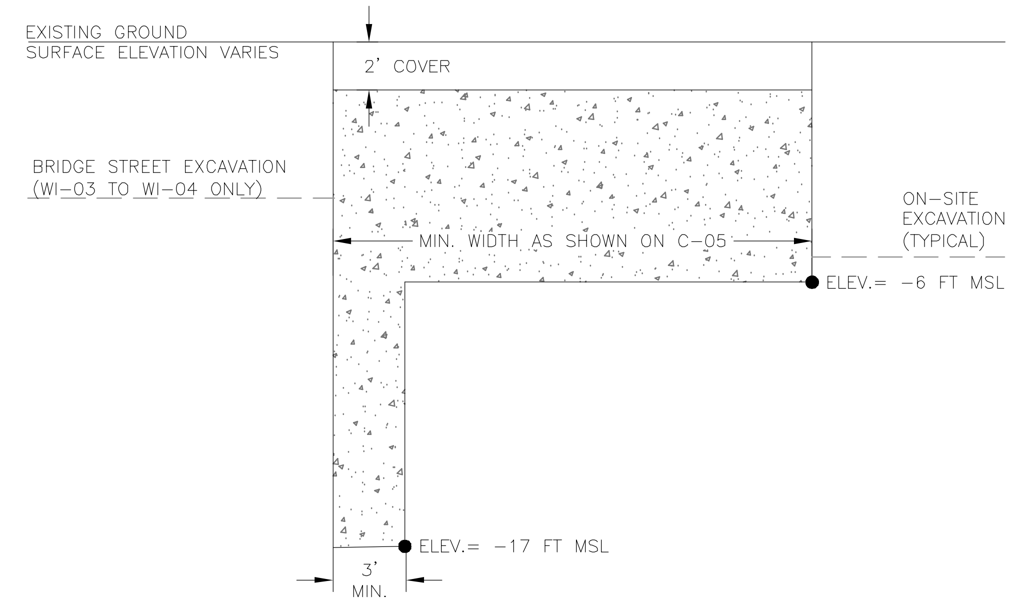
SOIL MIX WALL TYPICAL CROSS SECTION

WI-01 TO WI-02
WI-13 TO WI-14



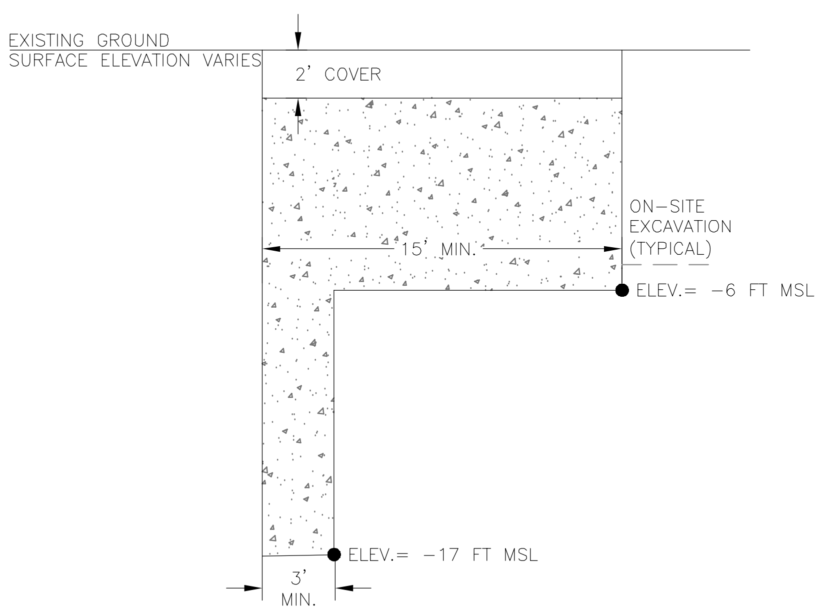
SOIL MIX WALL TYPICAL CROSS SECTION

WI-02 TO WI-03
WI-05 TO WI-06
WI-10 TO WI-13



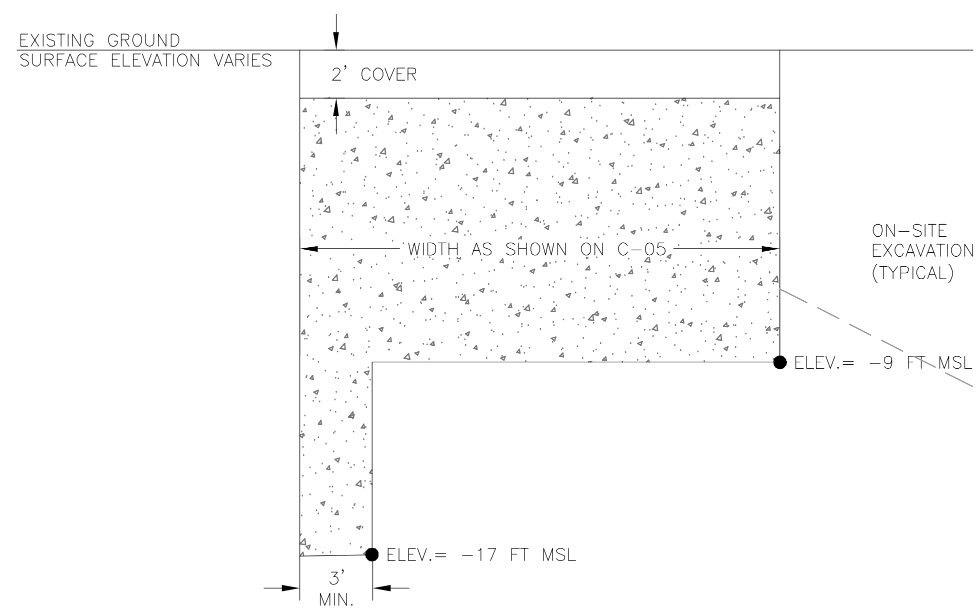
SOIL MIX WALL TYPICAL CROSS SECTION

WI-03 TO WI-04
WI-06 TO WI-08
WI-09 TO WI-10



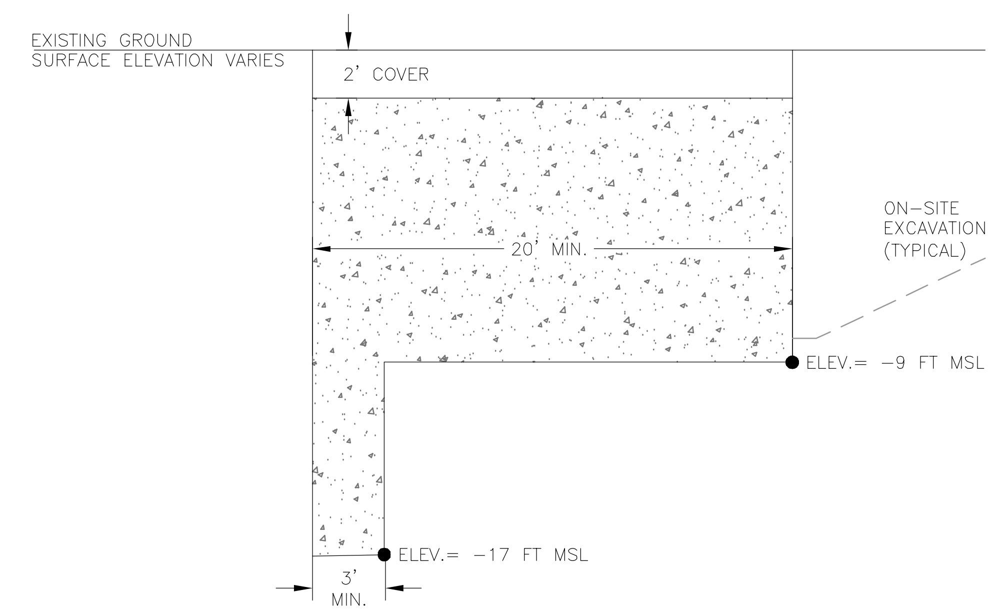
SOIL MIX WALL TYPICAL CROSS SECTION

WI-04 TO WI-05



SOIL MIX WALL TYPICAL CROSS SECTION

WI-08 TO WI-09



SOIL MIX WALL TYPICAL CROSS SECTION

WI-14 TO WI-1

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DATE: 05/09/08

SOIL MIX WALL DETAILS

REMEDIATION DESIGN

DRAWING NUMBER: C-10

SHEET NUMBER:

REVISION 0

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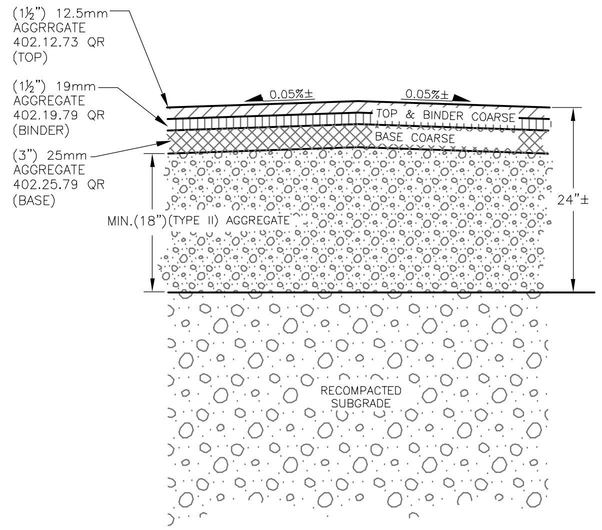

7 C-08 BRIDGE STREET RESTORATION
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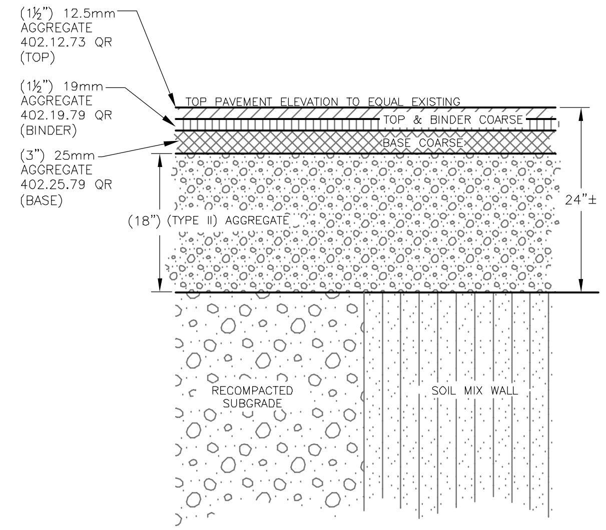

8 C-08 ASPHALT RESTORATION
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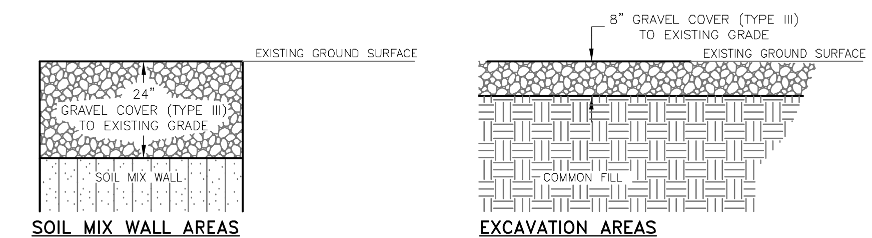

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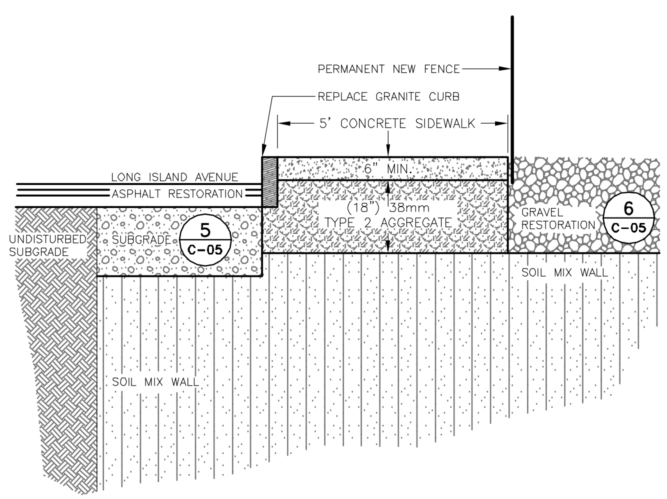

10 C-08 CURB AND SIDEWALK RESTORATION
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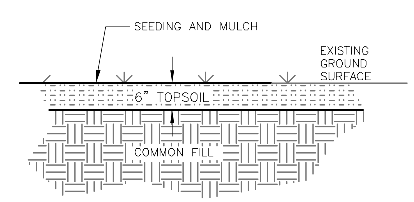

11 C-08 SEEDING AND TOP SOIL RESTORATION
SCALE: NOT TO SCALE

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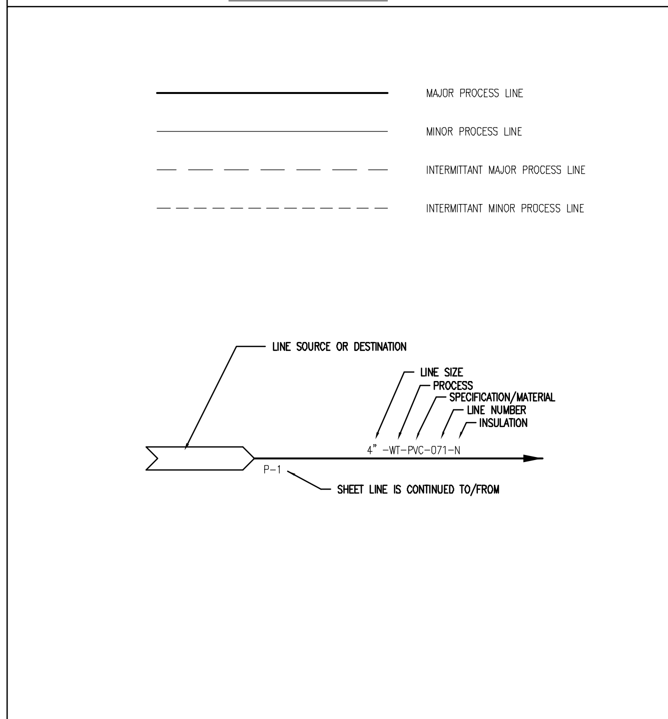
PROJ. NUMBER: 01765-066-003
DATE: 05/09/08

RESTORATION DETAILS

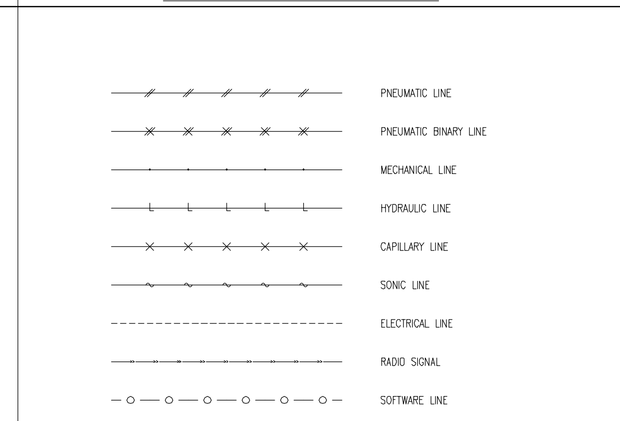
REMEDIATION DESIGN

DRAWING NUMBER: C-11
SHEET NUMBER:
REVISION 0

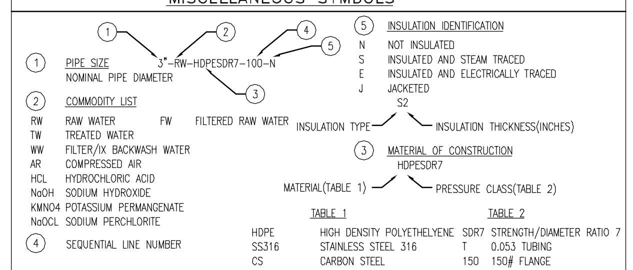
LINE DESIGNATION



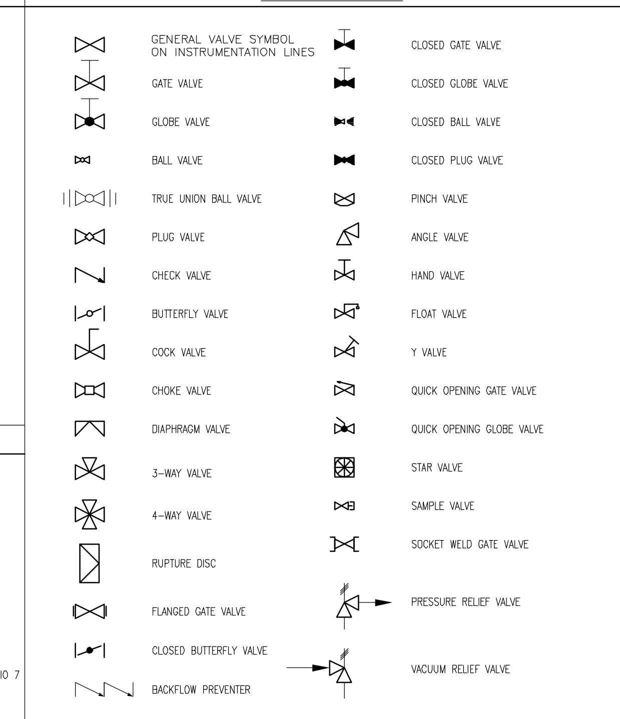
INSTRUMENT LINE DESIGNATION



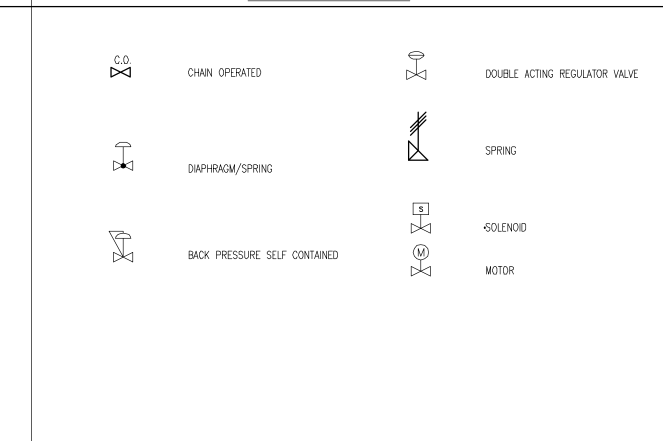
MISCELLANEOUS SYMBOLS



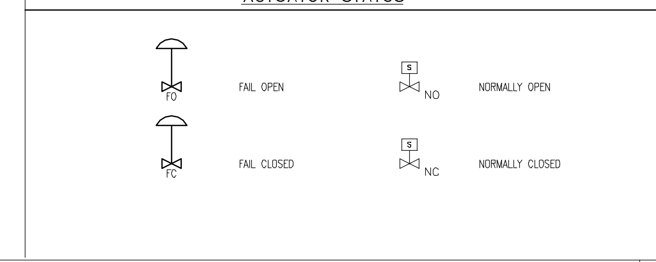
VALVE SYMBOLS



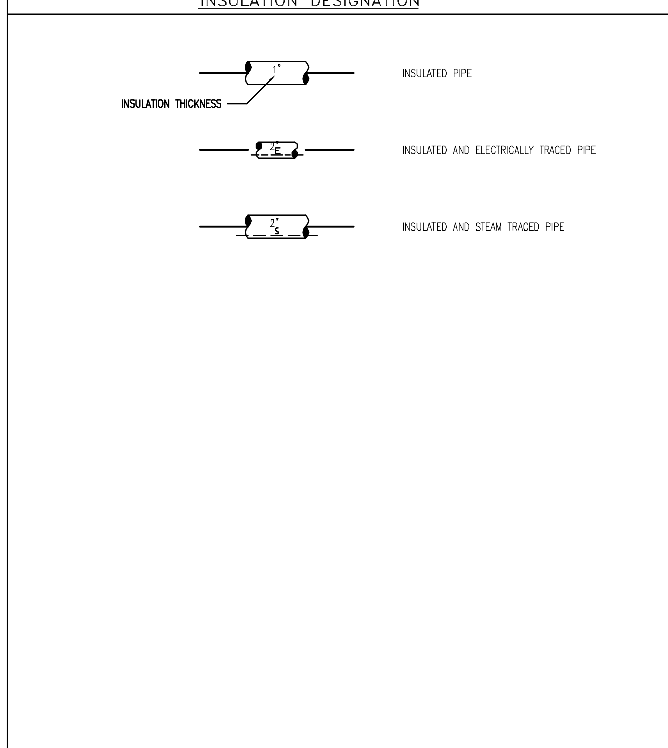
VALVE ACTUATORS



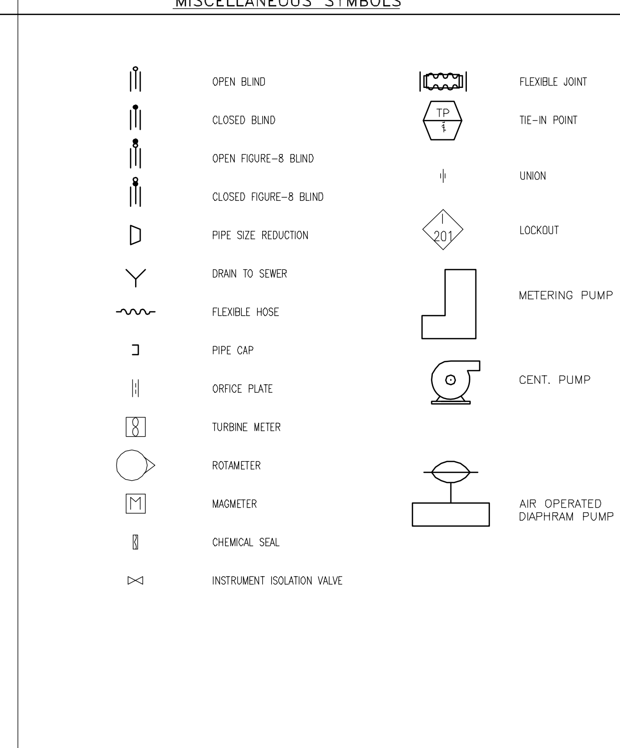
ACTUATOR STATUS



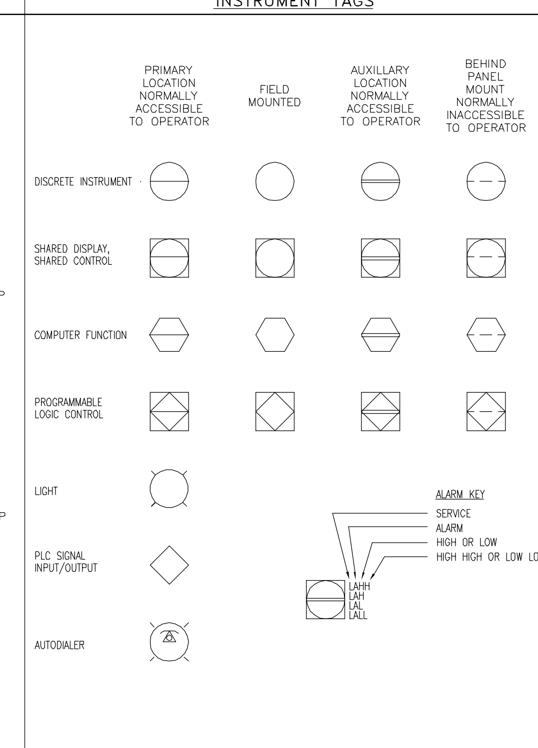
INSULATION DESIGNATION



MISCELLANEOUS SYMBOLS



INSTRUMENT TAGS



INSTRUMENT TAG LETTER IDENTIFICATION

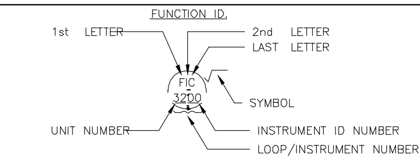
	1st LETTER	2nd LETTER	3rd LETTER	4th LETTER	LAST LETTER
A	ANALYZER	ALARM	ALARM	ALARM	ALARM
B	BURNER (FLAME)				
C	CONTROL (LOOP)	CONTROLLER	CONTROLLER	CONTROLLER	CONTROLLER
D	DENSITY	DIFFERENTIAL *	DEVIATION		DRIVE, OPERATOR
E	VOLTAGE	ELEMENT			ELEMENT
F	FLOW	RATIO *	FLOW	FLOW	
G	GAUGE				GLASS
H	HAND (MANUAL)		HIGH	HIGH	HIGH
I	AMPERES	INDICATOR			INDICATOR
J	POWER				MTR PB & LGT
K	TIME (COUNT)				
L	LEVEL	LEVEL	LOW	LOW	LOW
M	MOISTURE				METER
N					
O	OPERATIONAL				
P	PRESSURE	PRESSURE	PRESSURE		PNEUMATIC
Q	SPECIAL	INTEGRATE	INTEGRATE	INTEGRATE	INTEGRATE
R	RELIEF	RECORDER	RECORDER	RECORDER	RECORDER
S	SPEED, SOLENOID	SAFETY *, SELECTOR, SWITCH	SWITCH	SWITCH	SWITCH
T	TEMPERATURE	TEMPERATURE	TOTALIZER		TRANSMITTER
U	MULTIVARIABLE	MULTIVARIABLE			MULTIVARIABLE
V	VIBRATION	VALVE	VALVE	VALVE	VALVE
W	WEIGHT				WELL
X					
Y	USERS CHOICE				TRANSDUCER
Z	POSITION				COMPUTER

SYMBOLS SUCH AS CO_2, O_2, BTU, $\sqrt{\ }$, Σ, , ETC SHOULD BE SHOWN NEXT TO INSTRUMENT TAG.

FUNCTION IDENTIFICATION

FIRST LETTER = MEASURED OR INDICATING VARIABLE
* = MODIFIES MEASURED OR INDICATING VARIABLE
SUCCEEDING LETTERS = READOUT AND/OR FUNCTIONS

FUNCTION ID.



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PROJ. NUMBER: 01765-066-003 DATE: 05/09/08

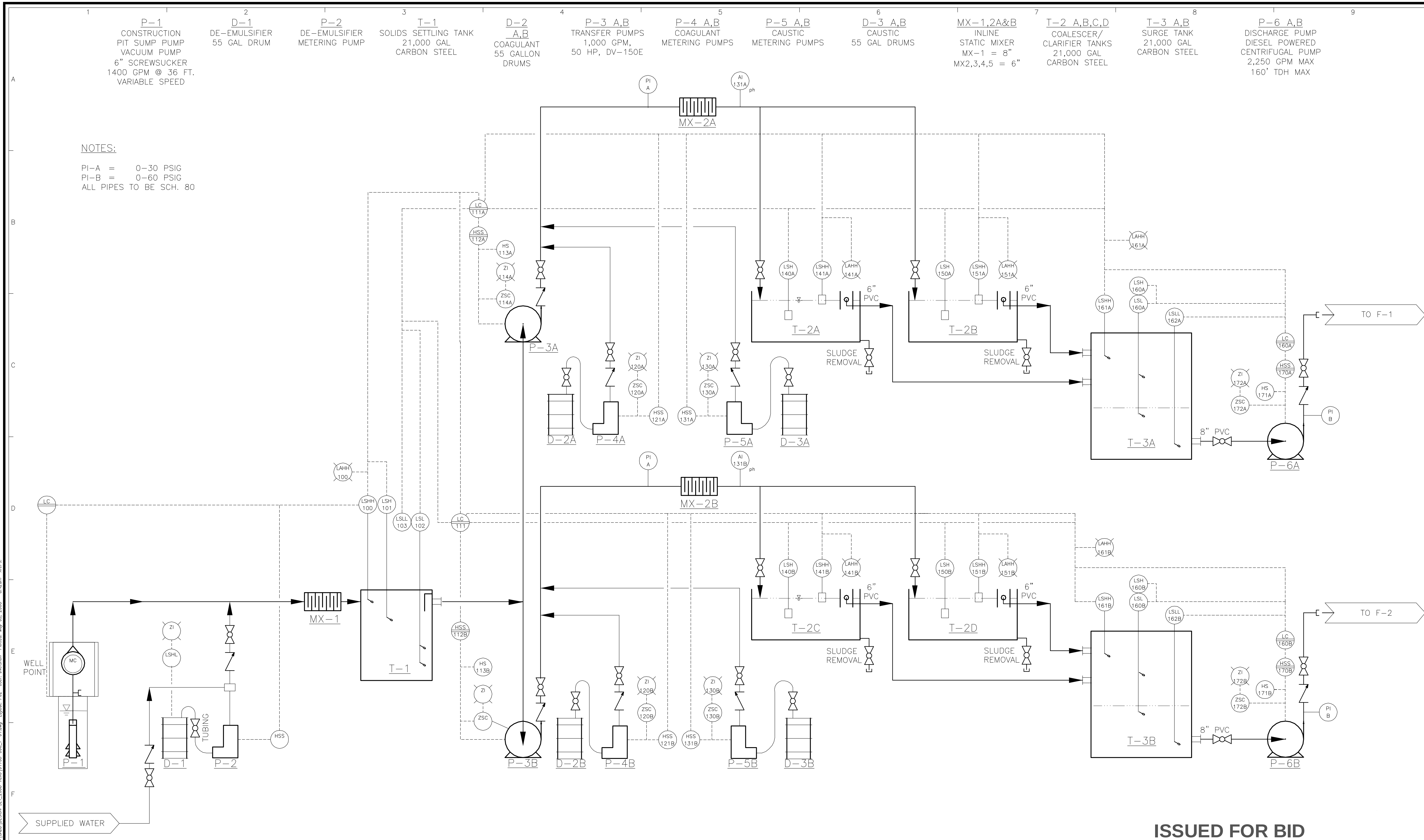
LEGEND
PIPING & INSTRUMENTATION DIAGRAM

REMEDIATION DESIGN

DRAWING NUMBER: P-01

SHEET NUMBER:

REVISION 0



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0	BcV	05/09/08	ISSUED FOR BID				

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PROJ. NUMBER: 01765-066-003
DATE: 05/09/08

WATER TREATMENT SYSTEM PIPING & INSTRUMENTATION DIAGRAM

REMEDIATION DESIGN

DRAWING NUMBER: P-02
SHEET NUMBER: SHEET 1 OF 2
REVISION 0

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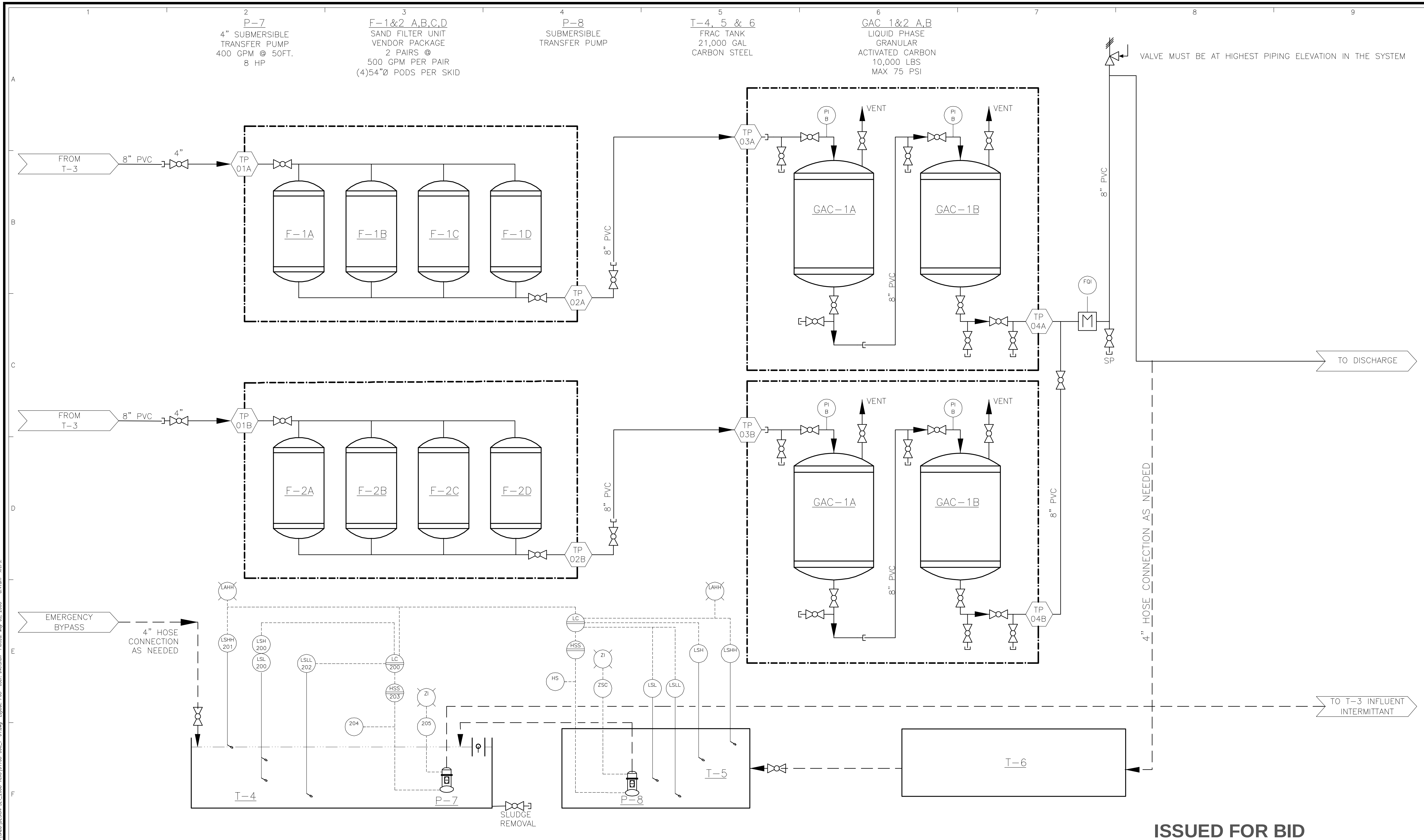

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NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE
0	BcV	05/09/08	ISSUED FOR BID				

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PROJ. NUMBER: 01765-066-003
DATE: 05/09/08

WATER TREATMENT SYSTEM PIPING & INSTRUMENTATION DIAGRAM

REMEDIATION DESIGN

DRAWING NUMBER: P-03
SHEET NUMBER: SHEET 2 OF 2
REVISION 0

Appendix B

Record of Decision (CD Format)

Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Sag Harbor Manufactured Gas Plant Site

Suffolk County, **New York**

Site Number 1-52-159

March 2006

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor*   DENISE M. SHEEHAN, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Sag Harbor Manufactured Gas Plant Inactive Hazardous Waste Disposal Site
Suffolk County, New York
Site No. 1-52-159

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Sag Harbor Manufactured Gas Plant site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Sag Harbor Manufactured Gas Plant inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and/or the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the Sag Harbor Manufactured Gas Plant site and the criteria identified for evaluation of alternatives, the NYSDEC has selected excavation of on-site and off-site source material to a depth of tefeet, NAPL recovery, institutional controls and a site management plan. The components of the remedy are as follows:

- A remedial design program to provide the details necessary to implement the remedial program.

- Installation of an excavation support system; removal of the commercial building to the north of the property; excavation and off-site disposal of the top ten feet of contaminated soil; and backfilling of the excavated area with clean fill from an off-site source which has been approved by NYSDEC.

- Covering all vegetated areas with clean soil and all non-vegetated areas with either buildings or a paving system.

- Installation of passive NAPL recovery wells.

- Development of a site management plan to address residual contamination, evaluate buildings for soil vapor impacts, address any use restrictions, and provide for the operation, maintenance, and monitoring of components of the remedy.

- Imposition of an institutional control in the form of an environmental easement.

- Periodic certification of the institutional and engineering controls.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

MAR 31 2006
Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

TABLE OF CONTENTS

RECORD OF DECISION

Sag Harbor Manufactured Gas Plant Site
Suffolk County, New York
Site No. 1-52-159
March 2006

SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the Sag Harbor Manufactured Gas Plant. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, the use of the site as a manufactured gas plant has resulted in the disposal of hazardous wastes, including benzene, toluene, ethylbenzene, and xylene (BTEX) and polycylic aromatic hydrocarbons (PAHs). These wastes have contaminated the surface soil, subsurface soil, soil vapor and groundwater at the site, and have resulted in:

- a significant threat to human health associated with potential exposure to surface soil, subsurface soil, soil vapor and groundwater.

- a significant environmental threat associated with the impacts of contaminants to surface soil, subsurface soil, and groundwater.

To eliminate or mitigate these threats, the NYSDEC has selected the following remedy:

- A remedial design program to provide the details necessary to implement the remedial program.

- Installation of an excavation support system; removal of the commercial building to the north of the property; excavation and off-site disposal of the top ten feet of contaminated soil; and backfilling of the excavated area with clean fill from an off-site source which has been approved by NYSDEC.

- Covering all vegetated areas with clean soil and all non-vegetated areas with either concrete or a paving system.

- Installation of several passive NAPL recovery wells.

- Development of a site management plan to address residual contamination, evaluate buildings for soil vapor impacts, address any use restrictions, and provide for the operation, maintenance, and monitoring of components of the remedy.

- Imposition of an institutional control in the form of an environmental easement.

- Periodic certification of the institutional and engineering controls.

The selected remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

SECTION 2: SITE LOCATION AND DESCRIPTION

The site occupies roughly 0.76 acres in the downtown section of the Village of Sag Harbor in Suffolk County. The site is adjacent to the intersection of Bridge Street and Long Island Avenue and is roughly 200 feet to the south of Sag Harbor Cove. The site's location is noted on Figure 1.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

From 1859 to 1930 the site was operated as a manufactured gas plant. The plant originally produced gas from coal or wood rosin and was switched to a water gas process in 1892. The by-products of gas production that either spilled, leaked, or were disposed on the site are the source of the contamination.

3.2: Remedial History

In 1997 a preliminary site assessment was performed on the MGP site and, as a result, the NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York in 1998. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required. Following that listing, an Interim Remedial Measure (IRM) was performed to remove and cap historic piping that was present at the site to prevent migration of MGP by-products through these pipes.

Originally the site was part of the Sag Harbor Bridge Street Site (Site Number 1-52-126) which was listed as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York in 1987. This occurred after an incident when Suffolk County Water Authority workers were exposed to tar during an excavation on Bridge Street. It was then delisted in 1995 because investigations had failed to find hazardous wastes on the Bridge Street Site as defined by the contemporary edition of 6 NYCRR Part 375.

SECTION 4: <u>ENFORCEMENT STATUS</u>

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The NYSDEC and KeySpan Corporation entered into a Consent Order on March 31, 1999. The Order obligates the responsible parties to implement a full remedial program.

SECTION 5: <u>SITE CONTAMINATION</u>

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: <u>Summary of the Remedial Investigation</u>

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between April 2000 and May 2004. The field activities and findings of the investigation are described in the RI report.

The following activities were conducted during the RI:

- Research of historical information;
- A survey of public and private water supply wells in the area around the site;
- Installation of 46 soil borings and 30 monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions;
- Multiple rounds of sampling of 32 new and existing monitoring wells;
- Collection of 29 surface soil samples for chemical analysis;
- Collection of 134 discrete groundwater samples using a direct push technique;
- Collection of 16 surface water samples;
- Collection of 18 aquatic sediment samples;
- Collection of 8 sediment pore water samples;
- Collection of 3 tap water samples;
- Collection of 4 storm water runoff samples;
- Collection of 13 soil vapor samples, 45 indoor air samples, and 27 outdoor air samples.

To determine whether the soil, groundwater, surface water, soil vapor, air and sediment contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

- Soil SCGs are based on the NYSDEC "Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels".

- Sediment SCGs are based on the NYSDEC "Technical Guidance for Screening Contaminated Sediments."

- Indoor air SCGs are based on the New York State Department of Health Database summary of indoor and outdoor air sample results in control homes collected and analyzed by NYSDOH from 1989 through 1996.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized below. More complete information can be found in the RI report.

5.1.1: <u>Site Geology and Hydrogeology</u>

The site is located in an area that was a marine wetland before being filled in the 1800s. Today, the ground surface stands a few feet above sea level, with the uppermost soil layer made up of material (sandy soils, brick fragments, ash, etc.) used to fill the original wetland. The peat, silt and clay deposits which formed the original wetland bottom are still present at depths of 8 to 12 feet below the ground surface. Below these lie several hundred feet of unconsolidated sands.

The peat, silt, and clay layers are important because they are far less permeable than the predominantly sandy soils above and below. Groundwater and other liquids do not readily move through the peat, sand, and clay. In most areas, this has had the effect of limiting the degree to which MGP tar can move downward through the subsurface. However, these deposits are absent in some portions of the site, and MGP tar has moved downward into the underlying sands in these areas.

The water table at the site is very shallow. The depth to groundwater varies from about 6 inches to about 18 inches below grade. This high groundwater level leads to localized ponding during heavy rains. The groundwater is tidally influenced, but consistently flows in a northerly or northwesterly direction. The groundwater is brackish and discharges to Sag Harbor Cove.

5.1.2: Nature of Contamination

As described in the RI report, many soil, groundwater, ambient and indoor air, and sediment samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).

The principal human health and environmental risks posed by this site relate to the widespread distribution of MGP (coal) tar throughout the site and surrounding area. Understanding the physical and chemical behavior of coal tar is essential to proper characterization and clean up. The tar at this site does not have the sticky, viscous consistency of other materials commonly labeled as “tar.” Instead, the coal tar found at this site has the consistency of motor oil, and is consequently able to move about as a liquid through the subsurface.

MGP tar belongs to a group of organic contaminants known as dense non-aqueous phase liquids, commonly abbreviated as DNAPLs. DNAPLs do not readily dissolve in water and tend to sink to the bottom of water bodies and aquifers. When released into the subsurface, these liquids can spread out in complex directions that may or may not be the same direction as groundwater flow. MGP tar is an unusual DNAPL, in that its density is only slightly greater than water. Although MGP tar does tend to sink, the relatively slight difference in density between tar and water makes this sinking effect somewhat unpredictable.
Two classes of chemical compounds contained in the tar are of concern:

Benzene, toluene, ethylbenzene, and xylenes (collectively known as the BTEX compounds) are volatile organic compounds, which are also commonly found in unleaded gasoline, paint thinners and other solvents. They are somewhat soluble in water; consequently, groundwater which comes into contact with MGP tar often becomes contaminated with these compounds. This contaminated groundwater is then free to move away from the site along with the ordinary groundwater flow through the subsurface.

The second class of compounds are known as polycyclic aromatic hydrocarbons, commonly abbreviated as PAH. This is a large group of semi-volatile organic compounds, with several hundred different individuals known to exist. They are far less soluble than the BTEX compounds, and consequently are far less likely to cause groundwater contamination. They are also far less likely to be digested by soil bacteria, and thus are very persistent in the environment. The United States Environmental Protection Agency has identified 17 of the PAHs as hazardous materials, and these are the ones used to define the extent of PAH contamination at this site.

An inorganic contaminant of concern is cyanide. Cyanide, bound to iron to form ferric-ferro-cyanide, is a component of some MGP tars. While it is not dangerous in its bound form, certain conditions can release free cyanide, causing an exposure risk both for humans and the environment.

5.1.3: <u>Extent of Contamination</u>

This section describes the findings of the investigation for all environmental media that were investigated.

Chemical concentrations are reported in parts per billion (ppb) for water, parts per million (ppm) for waste, soil, and sediment, and micrograms per cubic meter ($\mu g/m^3$) for air samples. For comparison purposes, where applicable, SCGs are provided for each medium.

Table 1 summarizes the degree of contamination for the contaminants of concern in surface soil, subsurface soil, groundwater, indoor air, surface water, soil vapor, and sediment and compares the data with the SCGs for the site. The locations of all the samples are noted on Figure 2. The following are the media which were investigated and a summary of the findings of the investigation.

Waste Materials

The waste material associated with this site is coal tar. Coal tar has migrated to a depth of roughly 8-10 feet below the ground surface. At this level, it encountered a layer of peat, silt and clay which it could not readily penetrate, and spread laterally on top of this layer beneath the MGP site. It has also spread beyond the site boundaries, roughly 50 feet to the south and 80 feet to the north, where it is now found beneath a row of retail stores.

Near the center of the MGP site, the peat, silt and clay layer is absent, and the MGP tar has spread downward much further, to a total depth of roughly 90 feet. No deep penetration of tar has been found beyond the limits of the MGP site.

The tar now appears to be in a steady state, in which the overall limits of the tar migration should not change unless site conditions change significantly. However, within the area of tar contamination, some pockets of pooled, mobile tar may exist. This pooled tar can enter wells which are drilled nearby and could enter future excavations as well. The extent of the MGP tar contamination is shown on Figures 3 and 4. This material requires remediation, as it acts as a source for soil and groundwater contamination.

Surface Soil

Surface soil samples were collected from the upper 0-2 or 0-6 inches across the site, as well as off-site. All samples were analyzed for SVOCs, metals and cyanide. The off-site samples were also analyzed for VOCs.

Contaminated surface soil represents a potential exposure route through ingestion, dermal contact, or the breathing of dust or vapors coming from the surface soil. Although BTEX was detected in the off-site samples, all of the detections were below the New York State Recommended Soil Cleanup Objectives from Technical Administrative Guidance Memorandum 4046 (TAGM 4046).

PAHs were found in the majority of the surface soil samples across the site and in some off-site areas. The maximum detections of PAHs were, in the majority of samples, above the individual SCGs. The highest total PAHs in surface soil was 950 ppm and was found in the historic location of the southeastern gas holder.

Cyanide was identified in both on-site and off-site samples, with the maximum concentration found onsite in the location of the former gas holders. The cyanide is not above guidance levels and is, most likely, a constituent of the coal tar.

Subsurface Soil

PAH and BTEX contamination of subsurface soils was detected in several areas, with the highest contaminant concentrations found in areas where visible tar contamination was present. Thus, the highest levels of soil contamination are found in the shallow subsurface soils (generally less than 8 feet below the ground surface) in the eastern portion of the MGP site. Outside of the zones of tar contamination, PAH and BTEX concentrations decrease rapidly. Individual BTEX concentrations ranged from not detectable to 500 ppm, and PAH concentrations ranged from not detectable to 1,700 ppm.

Cyanide was detected in only a few subsurface samples, at low levels. The highest value, 4.8 ppm, was found in an area of shallow visible tar contamination, which also contained high levels of PAH and BTEX.

The contaminants in the subsurface are an environmental concern as they are a potential source of groundwater contamination.

Groundwater

Both PAH and BTEX compounds are found in on-site and off-site groundwater, with the highest contaminant levels found at shallow depths, in close proximity to the MGP tar. Groundwater flow direction is north toward Sag Harbor Cove.

BTEX compounds were found in the majority of the groundwater samples, both on site and off site. Benzene was the individual compound detected most frequently, and at the highest concentration, with values ranging from non detect to 8,700 ppb.
PAH compounds are less soluble than BTEX, but due to the extensive distribution of MGP tar, they were detected in most groundwater samples as well. Naphthalene is the PAH compound detected most frequently, and at the highest concentration, with values ranging from non-detect to 79,000 ppb.

The extent of groundwater contamination is shown on Figure 5.

Surface Water

Surface water and groundwater seep samples were collected. The only site-related contaminant detected was xylene at a concentration of 1 ppb in one of the 31 surface water samples, which is far below the SCG for xylene of 19 ppb.

Sediments

The sediments in Sag Harbor Cove were sampled for BTEX and PAHs. None of the samples indicate an impact from the MGP. The low levels of BTEX and PAH which were detected were distributed randomly across the survey area, which suggests that they represent general background conditions in the area and are not the result of MGP contamination.

Soil Vapor

Soil vapor samples were collected and analyzed for BTEX compounds and naphthalene. Naphthalene and other PAHs were not detected in any of the samples. BTEX was detected in samples collected above areas of MGP tars.

Indoor and Ambient Air

Indoor and ambient air samples were collected during two rounds of sampling from buildings surrounding the site. The samples were analyzed for VOCs, which included BTEX and naphthalene. Although some VOCs were detected in several samples, the NYSDOH has determined that these detections do not appear to be related to the MGP site. Further monitoring of soil vapor and air samples will be required to monitor for potential indoor air exposures.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS. There were no IRMs performed at this site during the RI/FS.

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Appendix G and E of the June 2002 and December 2003 RI reports, respectively.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.
The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The

exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

Potential exposure pathways at the Sag Harbor MGP site include the following:

- Direct contact with, incidental ingestion or inhalation of contaminated soil
- Direct contact with, or inhalation of vapors from contaminated groundwater
- Direct contact with or incidental ingestion of NAPL
- Inhalation of vapors in indoor air related to subsurface vapor intrusion

None of these pathways has been found to be complete at this site. The contamination (contaminated soil, groundwater, and NAPL) is below the ground surface, which minimizes the likelihood of incidental exposure. Two private water supply wells were identified in the area surrounding the site. Both were sampled, and neither contained site-related contamination. The rest of the area uses a public water supply, which is routinely tested to ensure that it meets drinking water standards for many chemicals, including the contaminants found at the Sag Harbor MGP site. KeySpan collected two rounds of indoor air samples from many of the buildings immediately surrounding the site, and the NYSDOH has determined that contamination from the site was not affecting the indoor air quality in the buildings.

5.4: <u>Summary of Environmental Impacts</u>

This section summarizes the existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

The Fish and Wildlife Impact Analysis, which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors. The following environmental exposure pathways and ecological risks have been identified: Site contamination has impacted the groundwater resource in the upper glacial aquifer.

At this time, sediment sampling has not indicated any impacts to Sag Harbor Cove. However, contamination from the migration of DNAPL and groundwater from the site could potentially enter Sag Harbor Cove.

Sag Harbor Cove is an environmentally sensitive area which includes many species of flora and fauna. It is also a valuable recreational resource to the surrounding community. The potential for future contamination of the cove with MGP by-products could lead to a decrease in the cove's ability to support wildlife and could potentially lead to its devaluation as a recreational asset.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to VOCs, SVOCs, and cyanide in surface soil, subsurface soil, groundwater and soil vapor;

- environmental exposures of flora or fauna to VOCs, SVOCs, and cyanide in surface soil, subsurface soil, and groundwater;

- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and

- the release of contaminants from surface soil, subsurface soil, groundwater, sediment, and soil vapor into ambient air, indoor air, sediment, and surface water through desorption, storm water erosion, vaporization, wind borne dust and dissolution.

Further, the remediation goals for the site include attaining to the extent practicable:

- ambient groundwater quality standards and

- recommended soil cleanup values for surface soils.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Sag Harbor Manufactured Gas Plant Site were identified, screened and evaluated in the FS report which is available at the document repositories identified in Section 1.

A summary of the remedial alternatives that were considered for this site are discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated surface soil, subsurface soil, groundwater, and soil vapor at the site.

Alternative 1: No Action

Present Worth: *$2,000,000*
Capital Cost: *$0*
Annual OM&M: *$180,000*

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2A: Off-site excavation to a 10 foot depth, NAPL recovery, Engineered cap, On-site containment cells, Institutional controls, Groundwater and indoor air monitoring

Present Worth: *$6,100,000*
Capital Cost: *$3,200,000*
Annual OM&M: *$120,000*

This alternative would involve containment of the tar which remains on the MGP site, combined with limited excavation of neighboring properties where tar has spread. The overall approach would be to remove the tar which has already left the MGP site, and to immobilize the tar which remains on the Keyspan property (MGP site). The remedy is illustrated in Figure 6.

Subsurface barrier walls would be installed around the perimeter of the MGP site to prevent contaminant migration off-site. An impermeable engineered cap would be installed within the limits of the subsurface barrier walls to prevent rainwater infiltration through the contaminated soil and to prevent any direct exposures to contaminants. The barrier wall would extend downward far enough to reach the peat, silt, and clay unit beneath the site, thus reducing the impact of the tar as a groundwater contamination source. It should also be noted that some tar has been found below the peat, silt, and clay unit (which is absent in the central portion of the MGP site), and that the containment wall would not isolate this deeper contamination.

There would be two areas of off site excavation in the parking lots to the north and the south of the site. Excavation would proceed to a depth of approximately 10 feet, which should effectively remove all tar-impacted soil in these areas. The contamination underneath the retail stores adjacent to the north site boundary would not be addressed by this alternative.

NAPL collection wells would be installed in at least three locations within the limits of the barrier wall. The objective would be to reduce the volume of tar in the soil and to reduce the mobility of the tar that remains. These wells will collect tar passively (without pumping); however, provisions would be made to pump some or all of the wells at low flow rates if it appears that this would improve tar removal. The number of wells could be increased, if collection from the initial wells proves successful.

An institutional control, in the form of an environmental easement on the MGP property, would be established to protect the integrity of the containment system. Groundwater and indoor air quality would be monitored.

Construction of the remedy would require approximately 1 season (October through April). These time restrictions reflect a long-standing agreement between Keyspan and the Village of Sag Harbor.

Alternative 2B: Off-site stabilization to a 10 foot depth, NAPL recovery, Engineered cap, On-site containment cells, Institutional controls, Sub-slab depressurization system, Groundwater and indoor air monitoring

Present Worth: *$7,500,000*
Capital Cost: *$5,500,000*
Annual OM&M: *$180,000*

This alternative would include the features of Alternative 2A, with the off-site excavation in the northern parking lot replaced by in-situ stabilization. Stabilization is a form of containment which involves the in-situ mixing of contaminants with a stabilizing agent such as cement. The overall approach is to make a large, solid mass of low-strength concrete whose low permeability would reduce contact with groundwater and thus reduce the amount of groundwater contamination being generated.

In addition, a sub-slab depressurization system would be installed beneath the block of retail stores to the north of the site, to provide an increased level of protection against potential vapor intrusion. This alternative is also illustrated on Figure 6.

Construction of the remedy would require approximately 1 season.

Alternative 3A: Excavation of on-site and off-site source material to a 10 foot depth, NAPL recovery, Institutional controls, Groundwater and indoor air monitoring

Present Worth: *$10,700,000*
Capital Cost: *$9,100,000*
Annual OM&M: *$100,000*

This alternative would include the excavation of tar-impacted soil up to a depth of 10 feet over the entire site as well as on the parcels to the north and south of the site. This would require the removal of the existing commercial buildings on the north parcel. As shown on Figure 7, the excavation limits would reach to Long Island Avenue on the north, into Bridge street on the west, east to the Post Office, and into the parking area for the commercial building to the south

This alternative would remove the majority of tar in the subsurface both on-site and off. The area of deep tar penetration in the center of the MGP site would be the only appreciable location of contamination to remain.

The NAPL recovery, institutional controls, groundwater monitoring, and indoor air monitoring would be similar to alternative 2A.

Construction of this remedy would require from1 to 2 seasons.

Alternative 3B: On-site and off-site excavation to a 10 foot depth, On-site and off-site stabilization to a 36 foot depth), NAPL recovery, Sub-slab depressurization system, Institutional controls, Groundwater and indoor air monitoring

Present Worth: $12,300,000
Capital Cost: $10,400,000
Annual OM&M: $160,000

The excavation proposed in this remedy would include most of the site as well as the parking lot area to the south to a depth of ten feet. The stabilization would occur in three areas both on and off-site, to a depth of 36 feet, to contain the remaining deeper DNAPL in these areas. This alternative, including the areas selected for excavation and deeper stabilization, is illustrated in Figure 6.

The sub-slab depressurization system would be installed beneath the retail building north of the site. The institutional controls and groundwater and indoor air monitoring aspects of the remedy would be similar to remedy 2A. The construction of the remedy would require from1 to 2 seasons.

Alternative 4: Excavation of on-site and off-site source material to a 10 foot depth, On-site stabilization to a 60 foot depth, Institutional controls, Sub-slab depressurization, Groundwater monitoring

Present Worth: $33,300,000
Capital Cost: $31,600,000
Annual OM&M: $160,000

This remedy would entail excavation of contaminants from the top ten feet of soil both on the site and off the site in the parking lot to the north and in the parking area for the commercial building south of the site. Following this, stabilization would be performed on the remaining contamination on-site to a depth of sixty feet below grade. The remedy is illustrated in Figure 6.

The sub-slab depressurization system would be installed beneath the retail store building north of the site. The institutional controls and groundwater and indoor air monitoring aspects of the remedy would be similar to remedy 2A.

Construction would require from 1 to 2 seasons.

Alternative 5: Excavation of the site to unrestricted levels

Present Worth: *$69,000,000*
Capital Cost: *$69,000,000*
Annual OM&M: *$0*

This alternative would excavate the entire mass of contaminated soil, regardless of depth, to provide the maximum extent of groundwater protection and direct exposure protection. Due to the great depth to which tars have penetrated in areas where the peat, silt, and clay layer is absent, the excavation would be quite deep and very expensive. With all contaminated soil removed, there would be no need for ongoing operation, monitoring, and maintenance.

Construction will require from 3 to 8 seasons.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York State. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the NYSDEC has determined to be applicable on a case-specific basis.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectivness. Capital costs and operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

This final criterion is considered a “modifying criterion” and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the NYSDEC addressed the concerns raised. In general, the public comments received were supportive of the selected remedy. Several comments were received, however, pertaining mainly to the dewatering plan and short-term impacts related to the construction. Many of these comments will be addressed during the design phase.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the NYSDEC has selected Alternative 3A: Excavation of on-site and off-site source material to a depth of 10 feet, NAPL recovery, Institutional controls, Sub-slab depressurization system, and groundwater and indoor air monitoring as the remedy for this site. The elements of this remedy are described at the end of this section and are shown on Figure 7.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS.

Alternative 3A was selected because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It will achieve the remediation goals for the site by removing soils at or near the surface which are the most likely to expose human and wildlife receptors to PAHs, BTEX, and cyanide. This removal will also prevent the contamination of shallow groundwater and production of contaminated soil gas.

The proposed alternative is not expected to fully achieve groundwater SCGs on site. Tar has penetrated to depths beyond the limits that this Alternative will reach. This deeper tar will continue to remain in contact with groundwater moving beneath the site, and will continue to act as a source of groundwater contamination. However, with all of the shallow soil contamination removed, the shallow groundwater contaminant levels are expected to decline significantly. Transfer of volatile contaminants into soil gas is also expected to diminish greatly as the contaminant concentrations decline.

Alternative 1 was rejected because it did not meet either of the threshold criteria. Remedial Alternatives 2A, 2B, 3A, 3B, 4, and 5 all would meet the two threshold criteria, so the choice between these alternatives rests upon the remaining five balancing criteria.

Alternative 2B would require the least construction, with the shortest construction time, and would therefore have the fewest short-term impacts. Alternative 5, with its extended schedule and massive scale of construction, would present the most short term impacts, which would include increased noise and truck traffic for the entire duration of the construction. Alternatives 2A, 3A, 3B, and 4 would all have similar short-term impacts, since they involve similar shallow excavation and installation of similar remedial components. Of these, Alternatives 3A, 3B, and 4 would have the longest construction schedules at one to two years. These are still significantly less than the time required for Alternative 5.

Alternative 5 would have the greatest long-term effectiveness, since it would permanently remove all or nearly all of the source material. The long-term effectiveness of Alternatives 2A and 2B would rely heavily on institutional controls, which could be less certain in the long term. Alternatives 3A and 3B would offer proven long-term effectiveness due to the extent of the source removal and NAPL collection. Only routine ongoing maintenance procedures would be required. The containment remedies do not reduce the volume of waste, so their long-term effectiveness would depend on maintaining the integrity of the barrier wall and cap through institutional controls. Although the cap would divert rainwater away from the contamination, this does not prevent the tar from contacting the groundwater passing underneath the site. Thus, the tar would continue to act as a source of groundwater contamination.

Evaluating the long-term effectiveness of in-situ stabilization, called for in alternatives 2B, 3B, and 4 would require treatability testing during the remedial design phase of the project. The behavior of the stabilized cement/soil mixture when exposed to seasonal freeze/thaw cycles near the ground surface has not yet been established.

Alternative 5 would offer the greatest reduction of toxicity, mobility or volume, although the actual increased protection offered over the proposed Alternative is not significant. Alternative 2B would offer minimal reduction in mobility and no reduction in toxicity or volume. Alternatives 2A and 3B would provide more reduction in volume, with some reduction in mobility. The remaining active Alternatives (3A and 4) would have similar levels of reduction due to the source removal and NAPL collection. However, of those six alternatives, 3A would represent the most feasible and implementable overall reduction in mobility and volume due to the extent of the source removal combined with NAPL collection.

Alternative 2B would be the most easily implemented, since the limited off-site work would present few access issues. Alternatives 2A, 3A, 3B, and 4 would have comparable implementability, as the excavation in those options extends to the same level. However, Alternatives 3B and 4 both call for extensive in-situ stabilization, which would have more implementation issues to resolve than 2A and 3A. Alternative 5 would be extraordinarily difficult to implement, due to the depth of the required excavation. Extensive excavation support would be required to excavate to 90 or more feet. Moreover, the highly permeable subsurface soils would make dewatering of the excavation extremely difficult. Sea water would be expected to flow in from the adjacent Sag Harbor Cove at a very high rate.

Cost-effectiveness would vary greatly between the alternatives. Alternative 5 would be more than twice as costly than the next highest alternative, while not providing any appreciable increase in the level of protection from exposures. Alternative 2A would be the least costly, but would also provide the lowest level of protection from exposure. Alternatives 2B, 3B, and 4 would provide less protection, and with greater uncertainty in long-term effectiveness than 3A, at similar or greater cost. Alternative 3A, through source removal, NAPL collection, institutional controls, and long-term monitoring would address all of the readily accessible source material at this site and would be in the middle of the cost range.

The estimated present worth cost to implement the remedy is $10,700,000. The cost to construct the remedy is estimated to be $9,100,000 and the estimated average annual operation, maintenance, and monitoring costs for 30 years is $100,000.

The elements of the selected remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.

2. An excavation support system to allow for shallow subsurface soil removal will be installed. The commercial building to the north will be removed. The top ten feet of contaminated soil will then be excavated. Soils will be dewatered and transported off-site for proper treatment and disposal. The excavated areas will be backfilled with clean soil materials from an off-site location. Demolished building materials determined to be free of contamination may be used to backfill the lower portion of the excavated areas.

3. All vegetated areas will be covered with one foot of clean soil and all non-vegetated areas with either concrete or a paving system.

4. Several passive NAPL recovery wells will be installed to collect NAPL remaining in the subsurface. The wells will collect tar passively (without pumping) at first. Additional wells will be installed if additional areas of mobile tar are identified. Low-flow pumping may be implemented if early results indicate that this will increase tar recovery.

5. A site management plan will be developed to: (a) address remaining contaminated soils that may be excavated during future redevelopment. The plan will note that soils beneath the remaining peat layer are considered contaminated; and will require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; (b) evaluate the potential for vapor intrusion for any buildings on or adjacent to the site, including provision for mitigation of any impacts identified; (c) identify any use restrictions; and (d) provide for the operation and maintenance of the components of the remedy.

6. Imposition of an institutional control in the form of an environmental easement that will (a) require compliance with the approved site management plan; (b) limit the use and development of the property to commercial uses only unless authorized by NYSDEC and NYSDOH; (c) restrict the use of groundwater as a source of potable water, without necessary water quality treatment as determined by NYSDOH; and (d) require the property owner to complete and submit to the NYSDEC a periodic certification.

7. The property owner will provide a periodic certification, prepared and submitted by a professional engineer or such other expert acceptable to the NYSDEC, until the NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal will contain certification that the institutional controls and engineering controls, are still in place, allow the NYSDEC access to the site, and that nothing has occurred that will impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- Repositories for documents pertaining to the site were established.

- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.

- A meeting was held with Village and Town officials on November 21 to present and receive comment on possible remedies.

- A fact sheet was sent to the public contact list once the PRAP was released.

- A public availability session was held on January 25, 2006 to present and receive comment on the PRAP.

- A public meeting was held on February 6, 2006 to present and receive comment on the PRAP.

- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.

TABLE 1
Nature and Extent of Contamination
{April, 2000-May, 2004}

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Total BTEX	ND[d] to 0.012	10	0 of 15
Semivolatile Organic Compounds (SVOCs)	Total PAHs	ND-950	500	2 of 29

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Total BTEX	ND-1390	10	25 of 129
Semivolatile Organic Compounds (SVOCs)	Total PAHs	ND-6222	500	24 of 129

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Total BTEX	ND-0.027	NA	NA
			NA	NA
Semivolatile Organic Compounds (SVOCs)	Total PAHs	ND-46.8	ER-L[c]= 4	7 of 18
			ER-M[c]=45	1 of 18

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Total BTEX	ND-23900	NA	NA
	Benzene	ND-8700	1	109 of 240
	Toluene	ND-7900	5	41 of 240
	Ethylbenzene	ND-6900	5	84 of 240

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
	Xylene	ND-4600	5	92 of 240
Semivolatile Organic Compounds (SVOCs)	Total PAHs	ND-580200	NA	NA

SURFACE WATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Total BTEX	ND-1	NA	NA
	Benzene	ND	10	0 of 16
	Toluene	ND	6000	0 of 16
	Ethylbenzene	ND	4.5	0 of 16
	Xylene	ND-1	19	0 of 16
Semivolatile Organic Compounds (SVOCs)	Total PAHs	ND	NA	NA

SOIL GAS	Contaminants of Concern	Concentration Range Detected (:g/m^3)[a]	SCG[b] (:g/m^3)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Benzene	ND-52	NA	NA
	Toluene	3.8-349	NA	NA
	Ethylbenzene	ND-39	NA	NA
	Xylene	ND-172	NA	NA
Semivolatile Organic Compounds (SVOCs)	Naphthalene	ND	NA	NA

INDOOR AND AMBIENT AIR	Contaminants of Concern	Concentration Range Detected (:g/m^3)[a]	SCG[b] (:g/m^3)[a]	Frequency of Detection
Volatile Organic Compounds (VOCs)	Benzene	ND-11.4	NA	8 of 63
	Toluene	ND-400	NA	39 of 63

INDOOR AND AMBIENT AIR	Contaminants of Concern	Concentration Range Detected (:g/m^3)[a]	SCG[b] (:g/m^3)[a]	Frequency of Detection
	Ethylbenzene	ND-14	NA	8 of 63
	Xylene	ND-122	NA	25 of 63
Semivolatile Organic Compounds (SVOCs)	Naphthalene	ND	NA	NA

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m^3 = micrograms per cubic meter

[b] SCG = standards, criteria, and guidance values; {list SCGs for each medium}

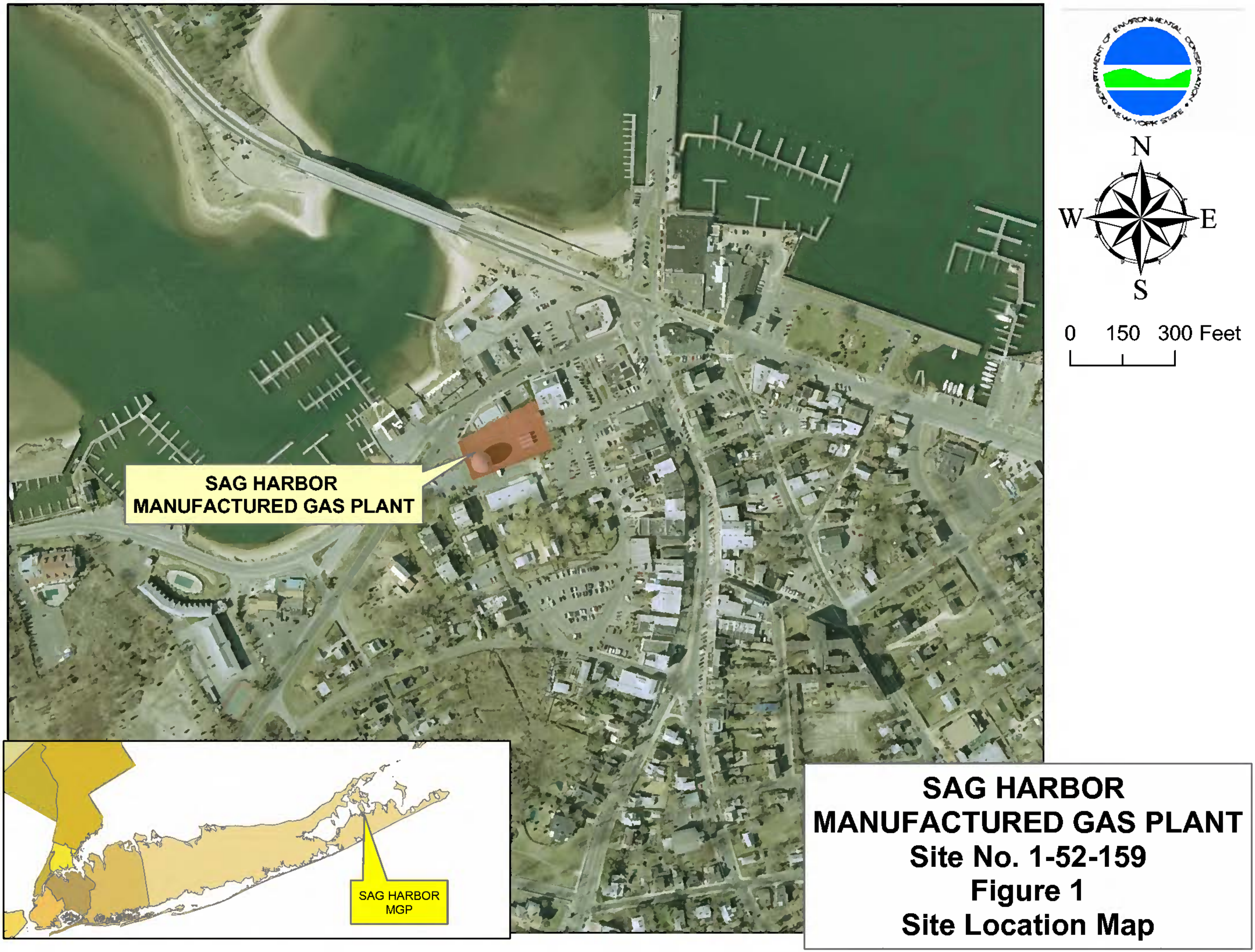
[c] ER-L = EffectRange - Low and ER-M = Effect Range - Moderate. A sediment is considered to be contaminated if either of these criteria is exceeded. If both criteria are exceeded, the sediment is severely impacted. If only the ER-L is exceeded, the impact is considered to be moderate.

[d]ND = Not Detected

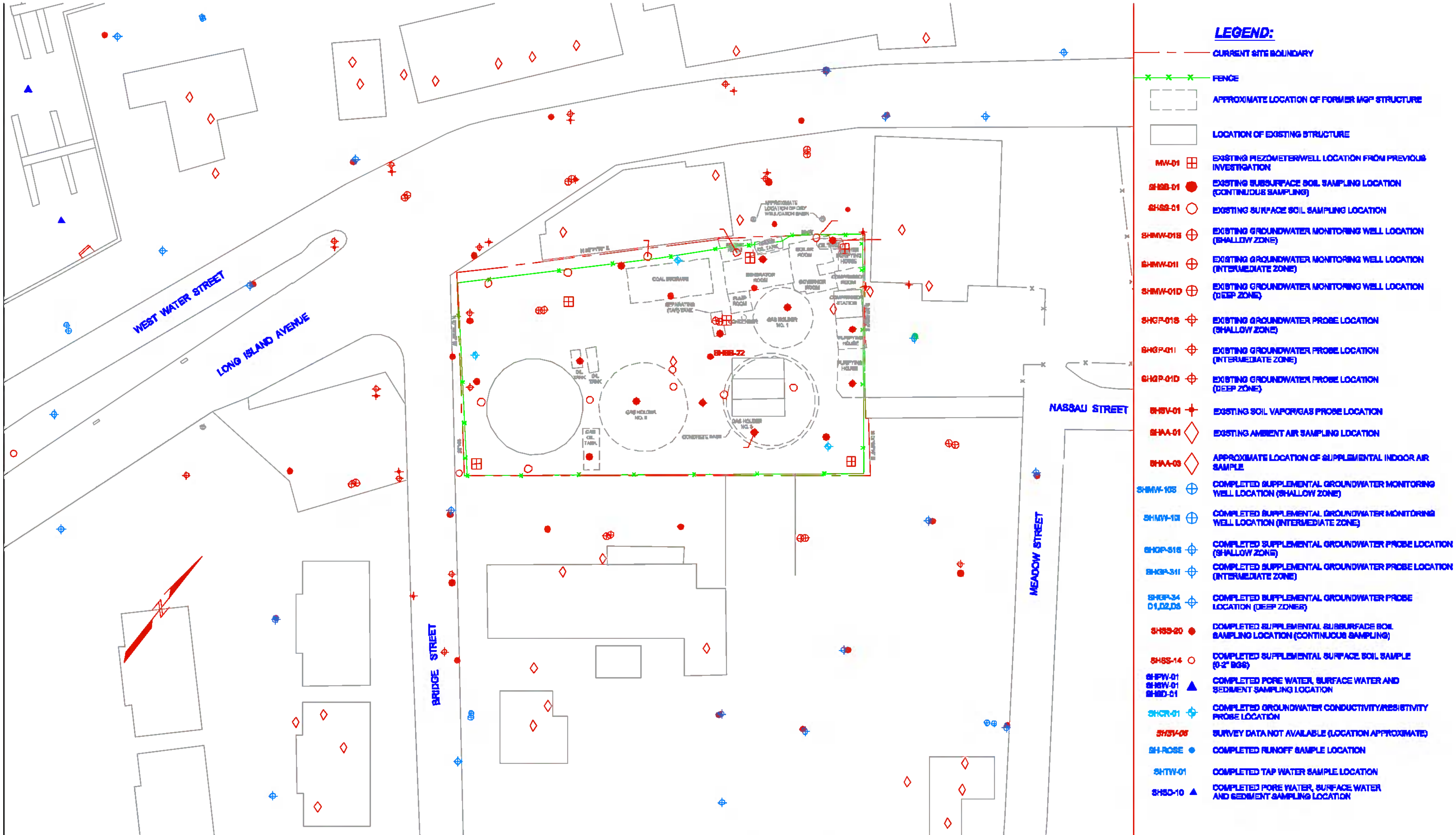
[e]NA = Not applicable

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
Alternative 1: No Action	$0	$180,000	$2,000,000
Alternative 2A: Off-site excavation (10'), NAPL recovery, Engineered cap, On-site containment cells, Institutional controls, Groundwater and indoor air monitoring	$3,200,000	120,000	$6,100,000
Alternative 2B: Off-site stabilization (10'), NAPL recovery, Engineered cap, On-site containment cells, Institutional controls, Sub-slab depressurization system, Groundwater and indoor air monitoring	$5,500,000	$180,000	$7,500,000
Alternative 3A: Excavation of on-site and off-site source material (10'), NAPL recovery, Institutional controls, Groundwater and indoor air monitoring	$9,100,000	$100,000	$10,700,000
Alternative 3B: On-site and off-site excavation (10'), On-site and off-site stabilization (36'), NAPL recovery, Sub-slab depressurization system, Institutional controls, Groundwater and indoor air monitoring	$10,400,000	$160,000	$12,300,000
Alternative 4: Excavation of off-site source material (10'), On-site stabilization (60'), Institutional controls, Sub-slab depressurization, Groundwater monitoring	$31,600,000	$160,000	$33,300,000
Alternative 5: Restoration of the site to pre-release conditions	$69,000,000	$0	$69,000,000



SAG HARBOR MANUFACTURED GAS PLANT
Site No. 1-52-159
Figure 1
Site Location Map

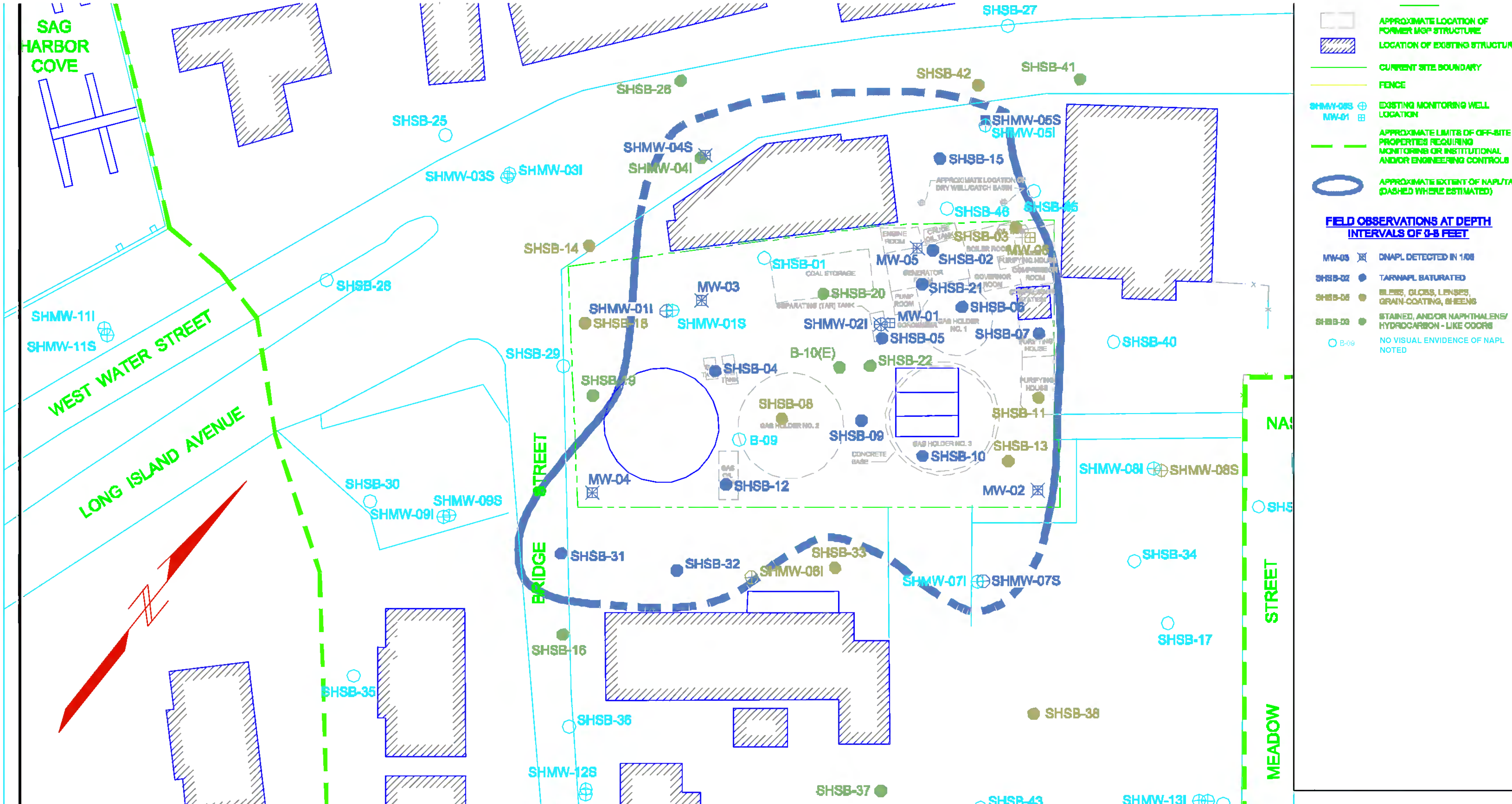


Not to Scale

SAG HARBOR MANUFACTURED GAS PLANT
SAG HARBOR (V), SUFFOLK COUNTY, NEW YORK

SAMPLE LOCATIONS

FIGURE 2

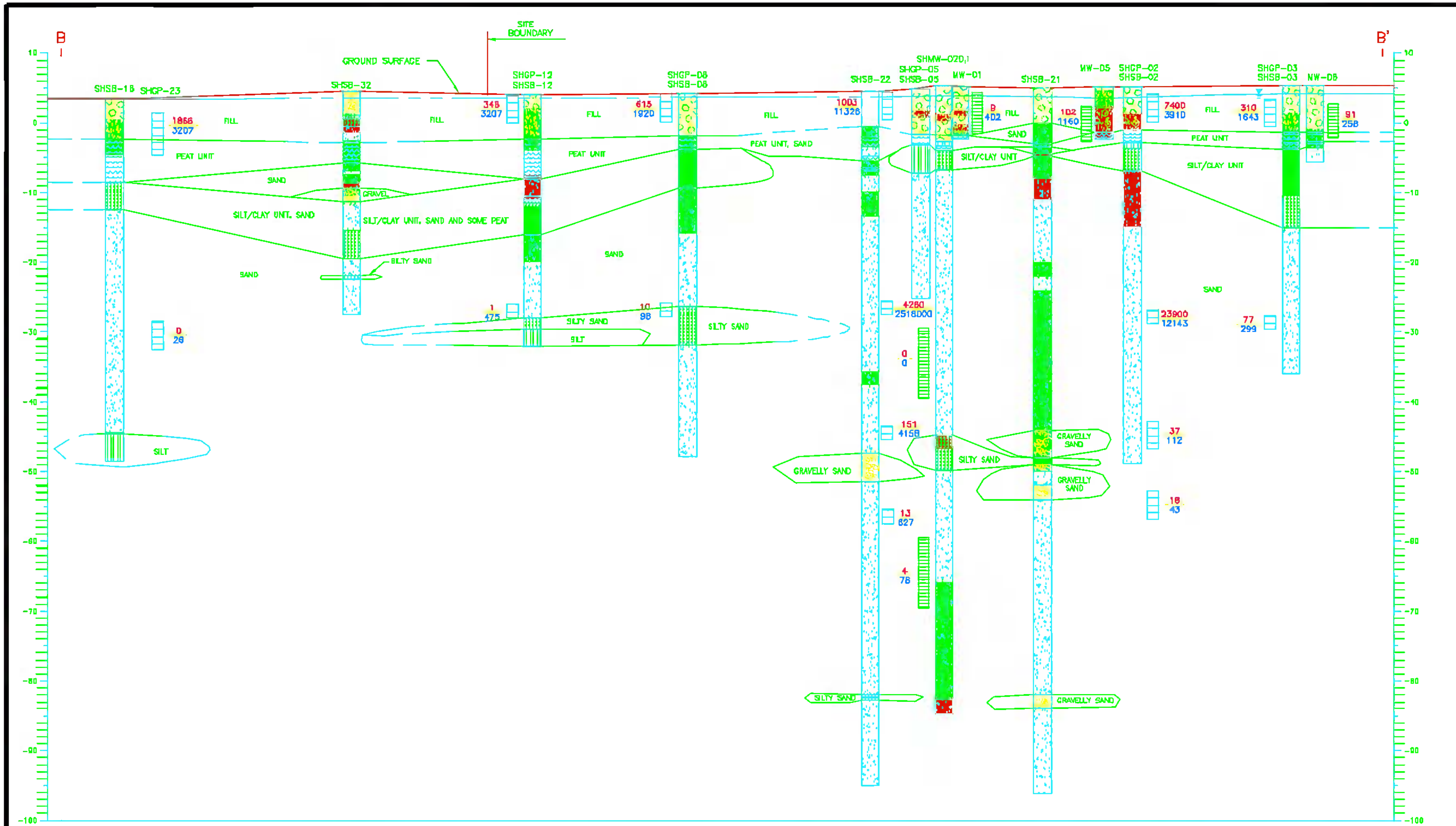


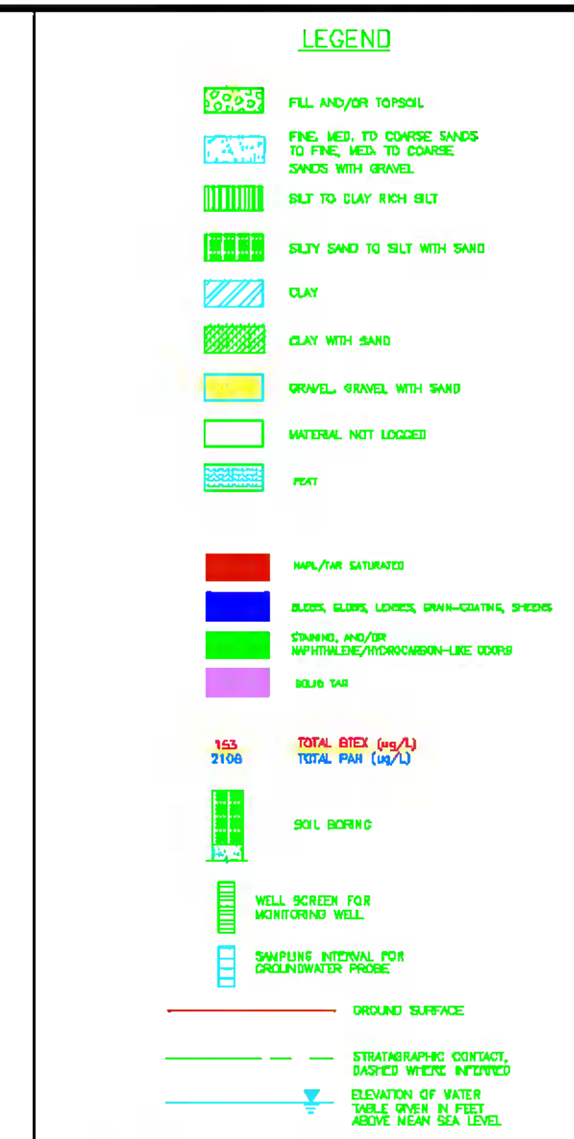
Not to Scale

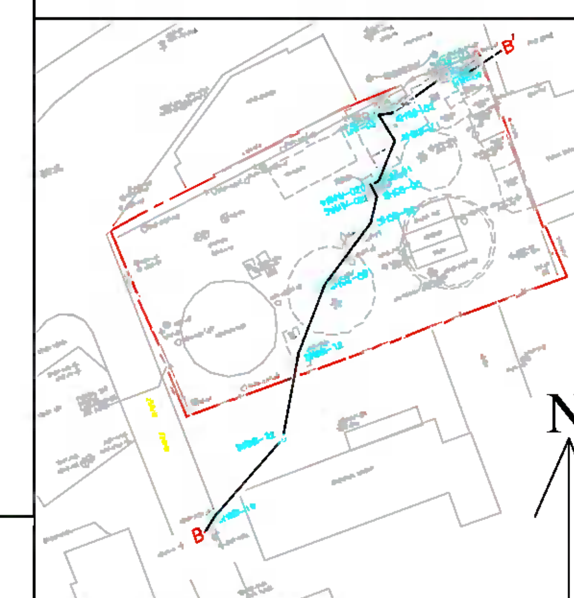
SAG HARBOR MANUFACTURED GAS PLANT
SAG HARBOR (V), SUFFOLK COUNTY, NEW YORK

NAPL EXTENT

FIGURE 3





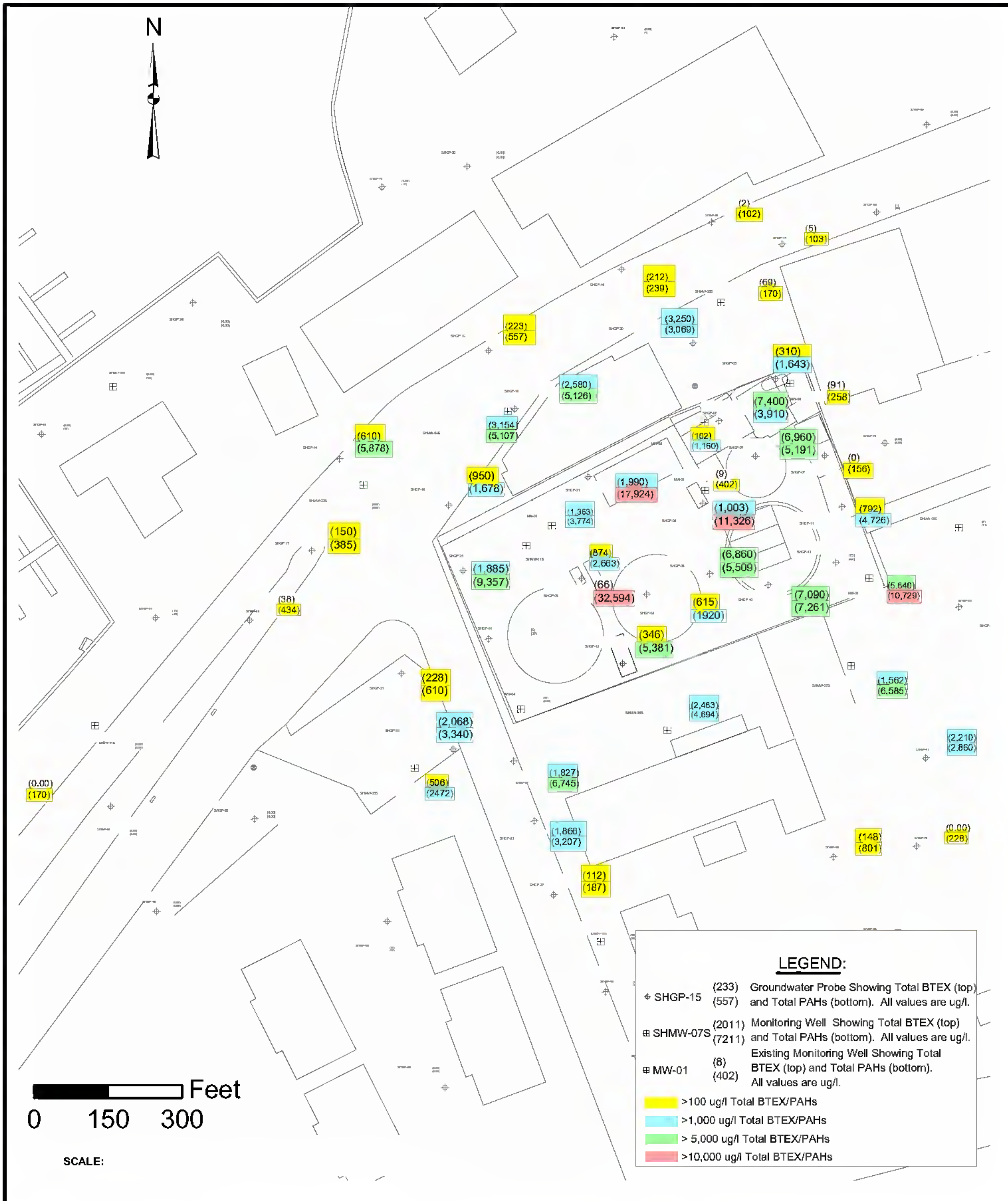


Not to Scale.

SAG HARBOR MANUFACTURED GAS PLANT
SAG HARBOR (V), SUFFOLK COUNTY, NEW YORK

CROSS-SECTION OF THE EXTENT OF NAPL CONTAMINATION

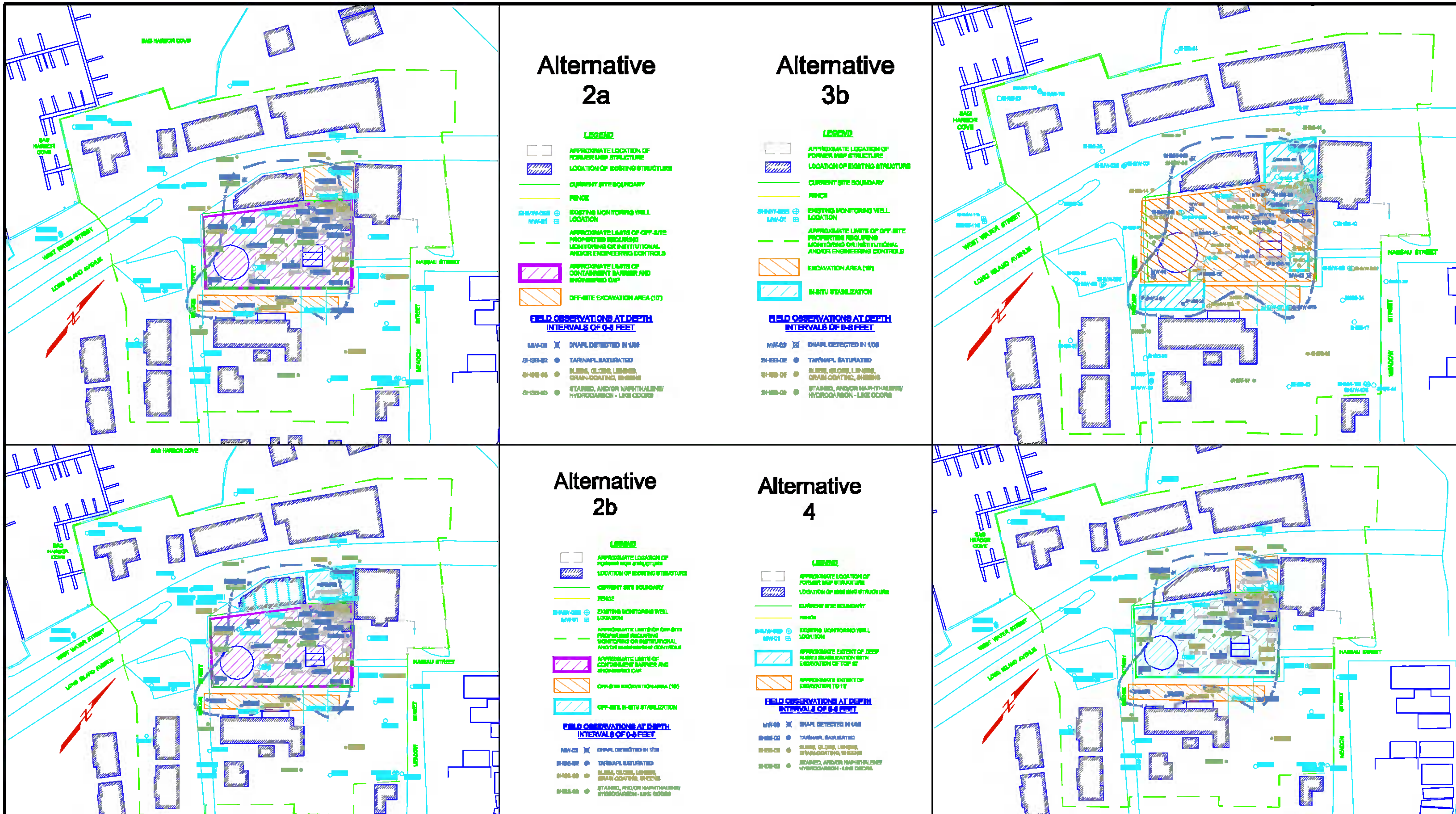
FIGURE 4



SAG HARBOR MANUFACTURED GAS PLANT
SAG HARBOR (V), SUFFOLK COUNTY NEW YORK

FIGURE 5

CONTAMINANT IMPACTS IN SHALLOW GROUNDWATER (0 TO 10 FEET)

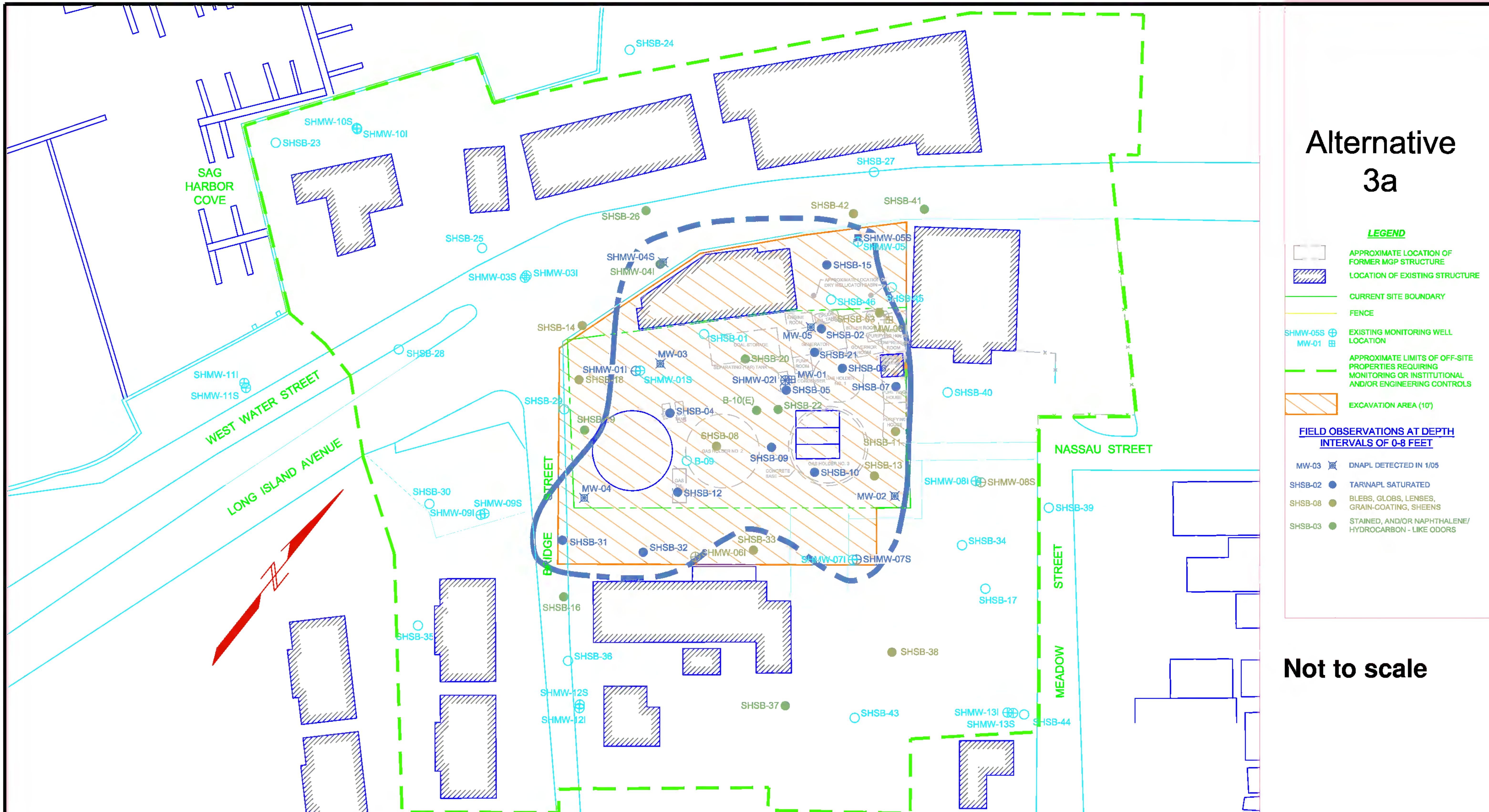


Not to scale

SAG HARBOR MANUFACTURED GAS PLANT
SAG HARBOR (V), SUFFOLK COUNTY, NEW YORK

REMEDIAL ALTERNATIVES

FIGURE 6



Sag Harbor Manufactured gas Plant
Sag Harbor (V), suffolk County, New York

Selected Remedy

FIGURE 7

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Sag Harbor Manufactured Gas Plant Site
Suffolk County, New York
Site No. 1-52-159

The Proposed Remedial Action Plan (PRAP) for the **Sag Harbor Manufactured Gas Plant Site** site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on January 13, 2006. The PRAP outlined the remedial measure proposed for the contaminated soil, groundwater, and soil vapor at the **Sag Harbor Manufactured Gas Plant Site** site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on February 6, 2006, which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period was to have ended on February 17, however it was extended to March 10, at the request of the public.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the NYSDEC's responses:

The following comments were received during the public meeting on February 6, 2006:

COMMENT 1: Will the comment period be extended?

RESPONSE 1: The comment period was extended to March 10, 2006.

COMMENT 2: The village is concerned about short-term impacts (e.g. noise, dust, odor, truck traffic, etc.) and the impact that de-watering discharge will have in the cove.

RESPONSE 2: The short-term impacts will be minimized during design using mitigation systems and engineering controls. These plans will be made available for review by the Village and public during the design.

COMMENT 3: If only the top 10 feet is removed and deeper material remains, won't that mean the remaining material will re-contaminate the upper material and continue to contaminate the groundwater?

RESPONSE 3: By removing the top 10 feet, the majority of source material is being removed. The groundwater will become cleaner and the material in the deeper zone is a Dense NAPL (heavier than water)and is not expected to significantly re-contaminate the zone above it.

COMMENT 4: Was any radioactive material stored at this site?

RESPONSE 4: No.

COMMENT 5: Not even in the 1970's?

RESPONSE 5: No.

COMMENT 6: Have you looked at in-situ chemical oxidation for this site?

RESPONSE 6: It was examined as an alternative but was not found viable as it has not been found to be effective at treating large concentrations of NAPL such as are present at this site.

COMMENT 7: How is the plan to discharge treated water from this site different from the EPA's plan to discharge water from the Rowe Industries site?

RESPONSE 7: The plan to dewater the site and discharge that water into the cove is different in several aspects:

- The location of the water removed is much closer to the cove. This means this water was destined for the cove and was going to be naturally discharged much sooner than the water from the Rowe Industries site.

- The plan of the dewatering is much shorter than the proposed pump-and-treat system at Rowe Industries. This system would be running 16 months total in 2 eight month cycles, as opposed to continuously for many years at the Rowe Industries site.

- The contaminants in the groundwater under the Rowe Industries site are different in their nature and concentrations than those under this site.

- The discharge point selected for the Rowe Industries site was different than the one for this site. The Rowe Industries discharge would have been in a small creek in the back of the cove where minimal mixing took place. This discharge would be by the mouth of the cove where the mixing during tidal fluctuations is at a maximum.

- The Rowe Industries site had the necessary area available for a recharge basin. This site does not.

COMMENT 8: How will the discharge water be treated?

RESPONSE 8: The treatment system will be designed in detail during the design phase. It is likely to be a combination of systems (air stripping, GAC, and/or settling basins). The discharge requirements are those found in the Division of Water Technical and Operational Guidance Series (1.1.1). The monitoring requirements during discharge will be determined in consultation with the Division of Water, but will follow requirements established for State Pollutant Discharge Elimination System (SPDES) permits.

COMMENT 9: What will the change in salinity be during dewatering?

RESPONSE 9: While a more complete analysis of the impacts of the discharge on the salinity of the cove will be performed during the design phase, a preliminary analysis shows a conservative estimate of 350 million gallons of water moved out of the cove each ebb (i.e. outgoing) tide (based on a tidal fluctuation of less than 2 feet and a total area of the cove of 575 acres). Assuming a worst case scenario that the million gallons of discharge is released into the bay as the tide is coming in and the discharge has a salinity of 0, the drop in salinity would be roughly .1%. Assuming a starting salinity 30 parts per thousand (ppt), this would mean a new salinity of approximately 29.97 ppt.

COMMENT 10: Is there an option of discharging the water outside the bay or onto a land-based facility like Cilli farms?

RESPONSE 10: The options for discharge will be more closely evaluated during the design phase.

COMMENT 11: How will the discharge affect the local marine life?

RESPONSE 11: The discharge should have no noticeable effects on the local marine life.

COMMENT 12: How will you be installing the steel sheets and how long will it take?

RESPONSE 12: The sheets will be vibrated into place. It is estimated to take about three weeks.

COMMENT 13: It appears the contamination is conveniently located close to the property lines.

RESPONSE 13: The contamination is not located within the limits of the property. It extends quite a bit to the north and to the south. The investigation moved outward from the center until multiple borings with no contamination demonstrated the limits of the contamination.

COMMENT 14: Why limit your excavation to ten feet?

RESPONSE 14: There is a peat/silt layer in the 8 to 12 foot zone beneath most of the site. This layer acts as a semi-permeable barrier which inhibits upward groundwater flow and thus limits how much water the dewatering system must remove. To increase the depth of the excavation below this layer would greatly increase dewatering flow rates. The additional time, labor, and cost is not justified by the small increase in material that would be removed.

COMMENT 15: Shouldn’t the local community be involved with the remedial decision?

RESPONSE 15: The release of the Proposed Remedial Action Plan and the following comment period are the opportunity for the local community to be involved with the remedial decision.

COMMENT 16: Why can't you just pave over it or encapsulate it in some way or choose a No Further Action remedy?

RESPONSE 16: No further action is not protective of human health or the environment. The contamination still has the potential for migrating further off-site and could become a more significant exposure hazard at some time in the future. Further, it limits the potential future uses of the site and neighboring properties. Some excavation and dewatering would be necessary, even for a simple paving remedy. Finally, encapsulation at this site is contrary to the Superfund goal of achieving source removal to the extent practicable and the Superfund law's preference for remedies that permanently remove and/or destroy contaminants.

COMMENT 17: Won't driving the steel sheets move the tar further beyond it's current limits?

RESPONSE 17: Given the geology of the soils beneath the site, NYSDEC anticipates that the sheeting will be rapidly advanced into the ground. While driving the sheets may mobilize some tar it is not expected to be a significant migration and will likely be slow enough that the sheeting will be in place prior to any migration of material beyond the sheeting limit.

COMMENT 18: One of the contaminants is cyanide. Won't that corrode the steel sheets?

RESPONSE 18: The levels of cyanide are not sufficient at this site to corrode the sheets during the time they are to be in place for the remedial work.

COMMENT 19: Have neighborhood homes been tested for contamination due to the high water table?

RESPONSE 19: Yes, most of the adjacent residences have had air testing performed and a basement survey was performed to determine which homes had basements, and which ones had slabs or crawl spaces. Groundwater directly underneath the homes was not sampled, but groundwater in the area adjacent to the homes was sampled.

COMMENT 20: Will ratepayers be responsible for the cost of the cleanup?

RESPONSE 20: The question is beyond the scope of this ROD and should be posed to Keyspan.

COMMENT 21: Will excavated material have an odor?

RESPONSE 21: Yes, but the odor will be controlled using several different means, including the use of a tent to contain the odors and foam odor suppressants.

COMMENT 22: Will the full trucks be waiting on or offsite?

RESPONSE 22: The trucks will be leaving the site immediately after being loaded to travel to the disposal facility.

COMMENT 23: Will the empty trucks smell? Where will they park while waiting to load and will they be idling for a long time?

RESPONSE 23: The empty trucks should not have an odor. They will be decontaminated at the disposal facility. The waiting area for the empty trucks and acceptable idling times will be determined during design, in consultation with the village.

COMMENT 24: I am concerned that the water discharged into the bay will cause flooding and impact local wildlife.

RESPONSE 24: The discharged water will flow out of the cove and into the ocean and should not impact local wildlife.

COMMENT 25: What is going to happen to the Hortonsphere?

RESPONSE 25: The Hortonsphere is going to be dismantled and removed by Keyspan, most likely in the spring of 2006.

COMMENT 26: Who prepared the data and the reports? Under whose supervision were they?

RESPONSE 26: The data and reports were prepared by licensed private engineering firms on behalf of KeySpan under the review and oversight of NYSDEC and pursuant to NYSDEC-approved work plans.

COMMENT 27: Over a period of 30 days, how many days would you say that a DEC agent was observing the testing, the removal, disposal?

RESPONSE 27: On average about 20 days out of 30, we had onsite staff present observing testing, removal, and disposal.

COMMENT 28: Please be sure to consult with local community groups during design.

RESPONSE 28: The local community will be involved during the design phase.

COMMENT 29: Please try to prevent waiting trucks from idling on the street.

RESPONSE 29: NYSDEC will ensure the design includes appropriate controls on trucks idling while waiting to be loaded.

COMMENT 30: Can you tell us that absolutely the discharge will not affect the environment?

RESPONSE 30: The discharge will be monitored to ensure it does not affect the environment. Further modeling of the discharge effects in the cove will occur during the design phase.

COMMENT 31: Have you looked into local marine biologists other than your own staff? I think local marine biologists should be consulted.

RESPONSE 31: At this time, NYSDEC's Marine Resources Bureau on Long Island have been consulted. During design, other experts may be consulted, as needed.

COMMENT 32: I am concerned the investigation area is not big enough.

RESPONSE 32: The investigation started at the source area and moved out until the limits of contamination were defined.

COMMENT 33: Have you coordinated with clean-ups at the Mobil site, the old Mobil site?

RESPONSE 33: No. The groundwater contamination from the Mobil Site is not impacting the same area that the contamination from this site is impacting.

COMMENT 34: Will the building on the north side of Water Street need to be removed?

RESPONSE 34: No, only the Schiavoni building is proposed to be removed.

COMMENT 35: Please examine the affect truck traffic will have on the historic buildings around the town.

RESPONSE 35: That will be considered during the design phase.

COMMENT 36: If, during design, a major flaw is found in the selected remedial action is it too late to change it?

RESPONSE 36: No, the Record of Decision can be amended during the design process if changed conditions are encountered.

COMMENT 37: Is a bond put in place for road repair or remediation of somebody's basement?

RESPONSE 37: This could be raised by the Village with Keyspan during the design phase.

COMMENT 38: I take it you're going to monitor the discharge water and then monitor the effects on the cove?

RESPONSE 38: Yes. Regular monitoring will be part of the discharge plan.

COMMENT 39: I think another concern that everyone has is, you guys don't know with exact certainty what's going to happen to the water in the cove; that you should have an alternative plan should you guys be surprised and it ends up severely degrading the water quality. That you have a Plan B instead of A. Obviously, if that happens you're going to have to shut down the process, shut down the discharge. I don't think the public wants a situation where you're stuck and you don't know where to go from there.

RESPONSE 39: NYSDEC is confident the selected remedy is implementable. Should changed conditions be encountered another remedy could be considered. Also see Response 36.

COMMENT 40: Then also, how does the SEQRA process work? Wouldn't there be an EIS on the remediation plan that would have to be done?

RESPONSE 40: No. The plan is exempted from the SEQRA process under NYSDEC's enforcement authority.

COMMENT 41: Could you do an Environmental Impact Statement (EIS)? An EIS would be subject to an independent review.

RESPONSE 41: The work performed during the remedial investigation and feasibility study phase is much more detailed than an EIS. This PRAP was subject to multiple layers of review within NYSDEC and the NYSDOH, and is now open to public review. Also, see Response 40.

COMMENT 42: After the public comment period is over there's a chance that you will not have been able to respond to a lot of the questions that were raised tonight. Is there another mechanism by which the public will be able to review your responses before the close of public comment? In the past, Rowe Industries, when Rowe Industries happened, it was actually a governmental public committee that was set up to work with the State DEC, Department of Health, and at the time Nabisco, to negotiate the remediation plan. Is something like that possible with this? If in fact it gets that far.

RESPONSE 42: NYSDEC will address every comment received during the public meeting, as well as the comments received in writing. The responses to all the comments are found in the appendix of the Record of Decision (ROD). At this time, there is no plan to form a governmental/public committee.

COMMENT 43: The public will not have another opportunity to respond to your answers before the Record of Decision?

RESPONSE 43:. Correct. However, prior to the start of construction, there will be additional opportunity for the public to comment on the remediation, specifically a pre-construction meeting. Also, during design, NYSDEC and Keyspan will be consulting with the Village.

COMMENT 44: Did you take soil samples below the peat/silt layer?

RESPONSE 44: Yes. While some of those samples, on the site and just outside of the site boundary showed contamination, the majority of samples did not detect any contamination. Those that did have contamination were at levels much lower than those found above the peat/silt layer.

COMMENT 45: Isn't there a conflict of interest with you, the state, negotiating a voluntary cleanup agreement with Keyspan for sites owned by the Long Island Power Authority, also a state agency?

RESPONSE 45: No. The negotiations are strictly with Keyspan, a private entity. LIPA is a completely independent entity from NYSDEC and Keyspan.

COMMENT 46: I lived there, I was raised on this site all my life. I lived about a hundred yards from it. I was raised there. This was my playground and we gotta get it clean.

RESPONSE 46: Comment noted.

COMMENT 47: Would it be possible for Keyspan or the Department to fund an independent engineer to review the plan?

RESPONSE 47: The village has already retained an engineer to review the PRAP. However, qualifying community groups would be eligible for a technical assistant grant (TAG) from NYSDEC to to obtain technical assistance in interpreting information with regard to the nature of the hazard, to hire health and safety experts to advise affected residents on any health assessments, and for the training and education of interested affected community members. More information on the TAG program can be found in the new Draft NYCRR Part 375 regulations (375-2.10(g)) which can be found at http://www.dec.state.ny.us/website/der/superfund/375draft.pdf

COMMENT 48: Are there any sites similar to this one that you have already performed work on?

RESPONSE 48: There have been several sites, e.g. Rockaway Park, Hudson, and Haverstraw, which all have characteristics similar to the Sag Harbor site. The Records of Decision for many of these sites and other MGPs can be found on our website, http://www.dec.state.ny.us/website/der/mgp/mgp_rods.html.

COMMENT 49: Do you know how long it will take the discharge to mix with the water of the cove, to be assimilated into the cove?

RESPONSE 49: That is part of the modeling that will be undertaken during the design.

Brian Halweil submitted an email, dated February 7, 2006, with the following comment:

COMMENT 50: " Regarding alternative modes of discharge, I wanted to comment on a brief suggestion that a neighbor made about using the Cilli Farm as a possible recharge basin. I live on Glover St, and my home borders the Cilli Farm. Our property is several feet below the grade of the Cilli Farm and our property floods well before the farm floods. (During the October rains that several people mentioned, we had nearly 1 foot of water in our first floor--that is, our kitchen, bedroom and living room.)"

"We are currently in the process of raising our house to the recommended FEMA level, but we would have a concern about discharging large amounts of water onto the farm if there was any possibility of it moving onto our property before it moves to the bay. Again, I'm not sure the Cilli Farm idea is something that would even be considered as an alternative, but I plan to share my concerns with the Harbor Committee as well."

RESPONSE 50: At this time there is no plan to utilize the Cilli property. Your comment has been noted.

The Village Harbor Committee submitted a letter, dated February 16, 2006, which included the following comment:

COMMENT 51: " The committee feels that Key Span's proposal to pump a million gallons of water into the Sag Harbor Cove is inconsistent with Policy 3, Policy 4, and Policy 5 of the Local Water Revitalization Program (LWRP) of the Village of Sag Harbor."

RESPONSE 51: After review of the noted policies, NYSDEC does not agree that the dewatering program is inconsistent with these policies. The water will be treated, therefore it will not have an adverse impact on the marine resources in Sag Harbor (Policy 3). The system will not be in use during significant storm events and will not use any existing storm water outfalls. Therefore, it will not contribute to flooding or erosion (Policy 4). Finally, the plan will remove contaminated groundwater and treat it, removing a significant source of groundwater contamination, thereby actually protecting and improving the water quality in the waters of the Village of Sag Harbor (Policy 5).

The Suffolk County Department of Health Services submitted a letter, dated February 28, 2006, which included the following comments:

COMMENT 52: "Recent findings detailed in the SCDHS supplemental data report on the Sag Harbor MGP site indicate that a significant level of DNAPL (coal tar) has migrated off site upgradient along Bridge Street. As proposed at our meeting on Feb 6th, establishing an additional operative unit (OU2) to address this offsite contamination is warranted. This would allow the onsite remediation process to proceed without any additional delay. A timely investigation of the offsite contamination (OU2) along Bridge Street is critical. However, if OU1 proceeds without knowing the extent of offsite contamination then a strong possibility exists that the activities associated with the onsite remediation will further spread the off site DNAPL. The close proximity of the offsite DNAPL to offices and residences is already a concern and this additional influence may make matters worse. The OU2 study and a remediation proposal should be in place before actual operation of OU1 remediation."

RESPONSE 52: NYSDEC does not consider it necessary to create a second operable unit to address the possible contamination along Bridge Street at this time. During the design phase a supplemental investigation will determine the extent of this material. However, the data from the Remedial Investigations does not indicate a significant source area long Bridge Street and there is no reason to believe that the proposed remediation would cause a significant release or migration of the DNAPL not removed during the excavation, since if present this could be removed at the time of the ROD remediation.

COMMENT 53: "Since significant offsite contamination exists and the depth to groundwater is less than 2 feet, a program of routine indoor air sampling should be initiated as soon as possible. The indoor air sampling should be conducted seasonally and routinely as part of the required monitoring program in the PRAP. Samples should be split with SCDHS; analysis should include PAHs, BTEX and degradates associated with MGP contamination."

RESPONSE 53: Indoor air sampling will be routinely conducted as part of the monitoring program. However, most PAHs are not included in a standard air analysis and are not expected to be impacting indoor air due to their semi-volatile nature. Naphthalene is included in the analysis and is an excellent indicator of a potential indoor air impact from MGP contamination.

COMMENT 54: “The proposed remediation calls for extensive dewatering of the aquifer in order to excavate the contamination. Several private wells are located within 300 ft of the site and the proposed dewatering volume of 1 million gallons per day will impact the local groundwater flow regime. The source area for these wells may potentially shift and impact the water quality of these shallow private wells. In order to assure that no detrimental impact will occur and to avoid extensive monitoring and impact modeling on these wells we recommend that the nearby public water service mains be extended to these two properties along Springs Street. contamination.”

RESPONSE 54: NYSDEC has only located two wells, both of which are located roughly 450 feet from the site. An analysis of the dewatering’s effect on local groundwater flow will be conducted during the design. NYSDEC will assure the water supply to these properties is maintained during the remediation.

COMMENT 55: “The borings indicate that the contamination has reached depths up to 90 feet below grade but the proposed remedy 3A only calls for the removal of the top ten feet of contaminated soils. We realize that it may not be feasible to remove contamination to these depths but we are concerned that the removal of the upper ten feet may not be adequate. Soil bores SHSB-02, SHSB-2, SHSB-06 and SHSB-21, all have significant contamination greater than the ten ft level but not much deeper than 15ft. Since significant effort will be made to sheet pile, encapsulate and dewater the area it would appear logical to extend the excavation an additional 5 to ten ft to remove these significant tar saturated areas.”

RESPONSE 55: See Response 14.

COMMENT 56: “The installation of these passive collection wells should be in place before construction of the sheet pile wall in order to head off migration of the DNAPL further offsite. The location of these wells should be positioned to collect source material (DNAPL) in areas not included in the current excavation area, specifically the village parking area and Bridge street.”

RESPONSE 56: The purpose of the passive collection wells is to collect material which remains behind after the excavation is complete. This includes material both beyond and beneath the identified excavation area. NYSDEC will consider the installation of at least some of the perimeter collection wells prior to the start of excavation. Some of these wells may be located in areas scheduled for excavation (to collect tar at depths beyond the excavation limits); such wells must wait for excavation to be finished, since they would be destroyed during excavation.

COMMENT 57: “The proposal calls for dewatering rates of approximately 1 million gallons of water per day to be discharged into Sag Harbor cove. The effect of the discharge on Sag Harbor cove is not well understood at this point and more detail is needed to assure the community that the proposed discharge will not impact the cove. The water quality and quantity of the discharge will vary during the operation, with significantly higher levels of contaminated water discharging during startup. The treatment of the discharge water should be designed with this in mind and routine and timely monitoring of the discharge should be in place to assure proper treatment.”

RESPONSE 57: Those items will be considered during the design process.

COMMENT 58: "The possibility for an offshore groundwater discharge exists. Little is presently known about the offshore groundwater discharge zone in the cove. The contamination at the site has impacted groundwater at several depths and all groundwater will eventually discharge to the surface waters. It may be that natural attenuation or the lack of mobility of the plume may minimize the offshore effect but not enough sampling has been done to determine this presently. Additionally offshore migration and disposal of coal tar waste is not uncommon at MGP sites and a further look at this is needed. The county will take a preliminary look at these issues in the spring and if evidence of a significant discharge exists then additional investigation and remediation may be warranted."

RESPONSE 58: No such discharge as hypothesized by this comment has been identified by the investigations to date. NYSDEC however will consider any new data which may be obtained..

The Village of Sag Harbor submitted a letter, dated March 1, 2006, which included the following comments:

COMMENT 59: "The Village of Sag Harbor has had our consultant P.W. Grosser Consulting review the documentation provided by you relative to the Sag Harbor Former MGP Site. This documentation includes the "Sag Harbor June 2002 RI", the "Sag Harbor December 2003 RI", the "Sag Harbor FS" and the "Sag Harbor Supplemental Report". In general, we concur with the findings of the RI and Supplemental reports that there is significant soil and groundwater contamination by BTEX and PAHs in and around the Keyspan Former MGP site. We believe that it is in everyone's interest to treat and/or remove these contaminants from the area."

RESPONSE 59: Comment noted. NYSDEC appreciates the Village's support of the remedy.

COMMENT 60: "Based upon the information provided, we cannot accept the conclusion that, "Sag Harbor Cove is not currently impacted by site related constituents". The data shows that there are elevated levels of PAHs in the sediments of Sag Harbor Cove in the area where contaminated groundwater discharges to the cove. Background sediments samples show the presence of PAHs at only one tenth the concentrations of sediments in the contaminated groundwater discharge area. This information is significant in that these contaminated sediments can impact shellfish (particularly clams and scallops) that are an economically important harvest in the area. There has been no significant analysis of this potential impact in the RI, FS or Supplemental Report. We request that additional investigation be performed as an exposure assessment of contaminated sediments on shellfish in Sag Harbor Cove."

RESPONSE 60: While SHSD-01 and SHSD-08 have elevated PAH levels, they do not however represent a trend of higher levels in that area of the cove, as the other 6 sample locations along the area of the suspected groundwater discharge are in line with the background samples. Also, if these "hot spots" were attributable to groundwater discharge from the site, it would be expected that the deeper sediments at these locations would contain higher levels of PAHs, however these deeper samples exhibit levels in line with or below the remaining samples. This indicates the contaminants are likely settling from above, not being pushed from below.
Also, these PAHs can be attributed to other sources known to exist in the area, notably storm water runoff from the developed area and gasoline and diesel engines in use in water craft using the cove.

COMMENT 61: "Generally we need more description of the selected alternative to determine if impacts to the Village are acceptable or not."

RESPONSE 61: Further detail on these aspects of the execution of the remedy will be provided during the design phase.

COMMENT 62: "Trucking routes, truck weights and expected number of trucks each day during peak remediation periods should be provided, so that the Village can ascertain the suitability of the roads over which the trucks will pass."

RESPONSE 62: These transportation details will be developed, in consultation with the Village, during the design.

COMMENT 63: "Was the use of barges to remove the excavated material from the Village and transport it to Philadelphia considered? This would reduce the length of haul for truck traffic and the number of tractors required. The material could be placed in roll offs that would then be placed on a barge."

RESPONSE 63: The use of barges was initially considered and was not specifically included during the development of the remedy due to many uncertainties and logistical unknowns. However, the use of water transport will be evaluated during the design.

COMMENT 64: "What will be done if during excavation significant quantities of product are encountered right up to the sheet piling?"

RESPONSE 64: Prior to the start of construction, a pre-design round of sampling will take place to more accurately determine the best path for the sheet piling. This work should identify the condition you note. Should significant contamination exist at the sheeting limits, the possibility of moving beyond the sheeting line will be evaluated at that time. The decision would consider each of the following: either the contamination would be removed at that time; it would be removed later; or it could be left in place. The factors that will affect the decision will include the location of the contamination on the site; its depth; its proximity to municipal infrastructure; the amount of contamination at the sheeting; and the project's progress at that time.

COMMENT 65: "We recommend that soil vapor sampling be performed underneath the slabs of the Post Office and the L.I. Fisherman buildings to determine the potential for vapor intrusion into these buildings and if a control system is necessary."

RESPONSE 65: Soil vapor sampling will be considered. However, the high groundwater table makes the collection of sub-slab soil vapor samples problematic. Indoor air samples have already been collected at both locations and no impacts to indoor air have been identified.

COMMENT 66: "What type of treatment will be placed on the water to be discharged to Sag Harbor Cove and what will be the discharge requirements for that water? We have heard several conflicting descriptions of the treatment system including various combinations of air stripping, GAC and settling basins."

RESPONSE 66: See Response 8.

COMMENT 67: "There is no discussion of the impacts on the salinity of Sag Harbor Cove from the discharge of fresh water from the dewatering system. The Cove has a tidal range of only 2 feet with a maximum of 2.5 feet during spring tides."

RESPONSE 67: See Response 9.

COMMENT 68: "There is no discussion of the procedures to be used to remove soil and product from the source area, such as type of equipment, control of odors, etc."

RESPONSE 68: The exact equipment and procedures will be determined during the design phase. However, a general procedure would be as follows:

1. Prepare the site by leveling it off, preparing equipment pads, staging working areas, and staging support facilities.
2. Drive the steel sheeting using a crane with a vibratory hammer.
3. Erect an enclosure over the first area to be excavated.
4. Install dewatering wells pumping and the treatment system.
5. Begin dewatering. Once dewatering has sufficiently lowered the water level, excavation begins. During excavation, air is withdrawn through a treatment system in the enclosure to create a negative pressure environment and prevent vapors from leaving the enclosure. Material is removed using excavators and staged, if necessary, within the enclosure until being loaded into outbound trucks. Odor is controlled with the use of the enclosure and with odor suppressing foams and sprays when necessary.
6. The outbound trucks are decontaminated and covered prior to leaving the enclosure.
7. Once the first area is completely excavated to specifications, confirmatory samples are taken.
8. The area is backfilled with clean material.
9. The dewatering wells and the enclosure are moved to the next excavation area and the process repeats steps 3 through 8.
10. When the entire site is excavated and backfilled, the sheets are removed, again using a crane with a vibratory hammer.
11. The DNAPL collection wells are installed and the site is regraded and prepared for its future use.

Assemblyman Fred W. Thiele Jr. submitted a letter, dated March 7, 2006, with the following comments:

COMMENT 69: "I understand the geographical constraints facing the DEC in its attempt to resolve this matter in an environmentally sound manner however; I remain troubled over the fact that the treated water will be potentially pumped back into the cove."

RESPONSE 69: NYSDEC appreciates your concerns and will be designing the dewatering systems to minimize its impact to all local surface water bodies.

COMMENT 70: "In addition to the above, I am also concerned about the possible effects truck traffic will have on the community. Although I understand the exact number of trucks being utilized and their routes will be determined during the design phase, I feel particular attention should be paid to this matter. The Sag Harbor community should in no way suffer adverse impacts to their quality of life while the remediation project is ongoing. Further, it is my hope that local road infrastructure does not suffer any impacts due to substantially increased traffic. I would urge the DEC to carefully consider any alternative means to transport such materials or create a mutually acceptable transport schedule for all parties involved."

RESPONSE 70: NYSDEC will work with the Village to minimize the short-term impacts of the remediation work, especially the truck traffic, on the surrounding community.

COMMENT 71: "Coinciding with these concerns, are those relating to noise while remediation work is being performed. It is my understanding that most of the noise will occur when the steel sheets are vibrated into the ground and that after this is completed, noise will be mitigated onsite under a tent. The DEC must ensure there are suitable noise controls in place throughout the project's duration."

RESPONSE 71: NYSDEC will review the design and will ensure the noise mitigation is in place to minimize the short-term impact on the surrounding community.

The Group for the South Fork submitted a letter, dated March 9, 2006, with the following comments:

COMMENT 72: "We suggest that the DEC take a "hard look" at an alternative to discharging processed water into the Cove. The risk is simply too great to chance, especially if there exists an alternative method of hauling out processed water and disposing of it in a catch basin a safe distance from any surface waters. In the event that the DEC determines that the risk to the health of the Cove is negligible, the DEC must use a water quality standard that takes into account all of the factors that could effect the biological integrity of the immediate and surrounding water bodies. It is important to distinguish between drinking water standards and marine habitat safety standards. Factors such as salinity and temperature may not affect a drinking water quality standard; yet have significant adverse impacts on the health of a marine habitat. We suggest that the latter be the principal consideration when measuring the discharge against a standard that would ensure a "no impact" result on the surrounding environment."

RESPONSE 72:. Salinity and temperature will be monitored if discharge does occur. Also see Responses 8, 9, 30, 38, and 57.

COMMENT 73: "We would also like to see an independent third party assessment of all relevant scientific conclusions by DEC and for the entire remedial plan to receive an "endorsement" from that entity."

RESPONSE 73: NYSDEC has subjected the plan to multiple levels of review in the Division of Environmental Remediation and the Bureau of Marine Resources, as well as NYSDOH. There is no need for further third party review of the plan.

COMMENT 74: "The DEC should also maintain a website that is regularly updated regarding the progress of the remedial plan and the latest water quality test results."

RESPONSE 74: Comment noted. Keyspan has used similar web sites at other sites.

APPENDIX B

Administrative Record

Administrative Record

Sag Harbor Manufactured Gas Plant Site
Site No. 1-52-159

1.Proposed Remedial Action Plan for the Sag Harbor Manufactured Gas Plant Site, dated January 2006, prepared by the NYSDEC.

2.Order on Consent, Index No. D1-0002-98-11, between NYSDEC and KeySpan Gas East Corporation, executed on March 31, 1999.

3.“Sag Harbor Former Manufactured Gas Plant Site Remedial Investigation Report”, June 2002, prepared by Dvirka and Bartilucci Consulting Engineers

4.“Sag Harbor Former Manufactured Gas Plant Site, Site ID 1-52-159, Final Remedial Investigation Report”, December 2003, prepared by Dvirka and Bartilucci Consulting Engineers

5.“Supplemental Field Program Report”, February 2005, prepared by GEI Consultants, Inc.

6.“Feasibility Study”, September 2005, prepared by GEI Consultants, Inc.

7.Fact sheet, January 2006

8.Transcript of public meeting on February 6, 2006

9.Letter, dated February 16, 2006 from the Village Harbor Committee

10.Letter, dated February 28, 2006 from Suffolk County Department of Health Services

11.Letter, dated March 1, 2006, from the Village of Sag Harbor

12.Letter, dated March 7, 2006, from Assemblyman Fred W. Thiele Jr.

13.Letter, dated March 9, 2006, from The Group for the South Fork

Appendix C

PDI Boring Logs (CD Format)

ENSR | AECOM

Merged with ENSR in 2007 RETEC

78 Main Street, Suite 3
Nyack, New York, 10960

Boring Log Legend

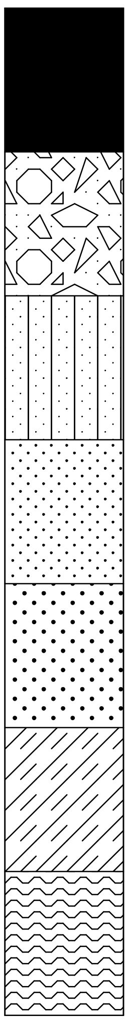
Project Name: Sag Harbor Former MGP

Location: Sag Harbor, New York

Project Number: 01765-066

Client: KeySpan Energy Delivery

Lithology



Asphalt

Fill

(SM) Silty sand

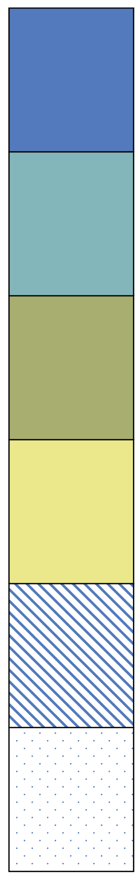
(SW) Well graded sand

(SP) Poorly graded sand

(OH) Silty clay

(PT) Peat

Visual Impacts



Tar saturation

Tar staining, sheen, and tar/naphthalene-like odors

Tar coating, blebs, globs, and lenses

Tar/naphthalene-like odors

Petroleum-like odors, sheen, and staining

Petroleum-like odors

Abbreviations

ft bgs:	Feet below ground surface
H2S:	Hydrogen sulfide
NA:	Not applicable
NLO:	Naphthalene-like odor
SAA:	Same as above

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Merged with ENSR in 2007 RETEC

78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB200

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: April 24, 2007

Boring Location: Northwest Excavation Wall

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 14.0 ft bgs

Logged By: Kevin Kachel/ Nic Vrey

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0		7.1						ASPHALT
		1.9				Fill		POORLY GRADED SAND (Fill); fine-medium sand, <5% subangular gravel, moist. WELL GRADED SAND (Fill); medium-coarse sand, ~30-40% cinders and ash, <5% gravel, moderately dense, faint NLO.
-2	NA	0.3				SP		POORLY GRADED SAND (SP); fine-medium sand, subangular sand, dark brown to gray, moderately dense to loose, wet. POORLY GRADED SAND (SP); medium sand, wet.
-4		1.3						
-6	3.8	73.0						Tar coating from 6.0-7.5 ft bgs.
								Tar saturated from 7.5-8.0 ft bgs.
-8		21.0						Sheen from 8.0-9.0 ft bgs.
-10		10.0				SM		SILTY SAND (SM); fine sand, dark brown, wet.
	3.8	4.0						
-12								Slight sheen and NLO from 12.0-13.0 ft bgs.
		5.7						~20-30% gravel from 13.5-14.0 ft bgs.
-14								

Comments: Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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Merged with ENSR in 2007 RETEC

78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB201

Project Name:	Sag Harbor Former MGP	**Drilling Method:**	Hollow Stem Auger
Project Number:	01765066	**Sampling Method:**	2 ft Split Spoon
Date Started/Completed:	April 24, 2007	**Ground Elevation (ft/msl):**	NA
Boring Location:	Northwest Excavation Wall	**Total Depth:**	30.0 ft bgs
Drilling Company:	Fenley & Nicol Environmental, Inc.	**Logged By:**	Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval
0 to -4	NA		3.3, 1.9, 3.6, 4.7		
-4 to -6	1.6	22, 10, 12, 10	18.0		
-6 to -8	1.4	9, 6, 8, 14	23.2, 139		
-8 to -10	1.5	4, 5, 5, 4	374, 98.6		
-10 to -12	1.4	12, 4, 4, 3	29.6, 193		
-12 to -14	1.5	3, 3, 8, 12	330, 190, .045		
-14 to -16	1.9	4, 7, 12, 14	29.1, 192	SB201 (14-18)	14-18

USCS	Geologic Description
	Asphalt
SP	POORLY GRADED SAND (SP); fine-medium subangular sand, 30-40% fine rounded gravel; dark brown, moist. POORLY GRADED SAND (SP); fine subangular sand, <5% fine rounded gravel, tan, medium dense, moist.
	POORLY GRADED SAND (SP); fine-medium subangular sand, dark brown-gray, loose-medium dense, wet. POORLY GRADED SAND (SP); fine-medium subangular sand, <5% fine rounded gravel, dark brown-gray, loose-medium dense, wet, slight petroleum-like odor from 4.0-5.3 ft bgs.
SW	WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel; light gray, loose, wet, tar saturated with sheen and NLO from 6.0-9.5 ft bgs.
SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, trace rootlets, light brown, medium dense, wet, H2S-like odor from 9.5-10.0 ft bgs.
	Dark brown, low viscosity tar coating and moderate NLO from 11.9-12.0 ft bgs. POORLY GRADED SAND (SP); fine-medium subrounded sand, light brown, medium dense, wet, tar coating with NLO from 12.0-13.5 ft bgs.
	Dark brown saturation with moderate NLO from 13.5-14.0 ft bgs.
	Tar coating with sheen and faint NLO and petroleum-like odor from 14.0-15.4 ft bgs.
	Low viscosity tar saturation with moderate NLO from 15.4-15.6 ft bgs.

Comments: Soil samples SB201(14-18) and SB201(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.33 ft bgs on April 17, 2007.

ENSR | AECOM
Merged with ENSR in 2007 RETEC
78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB201

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 24, 2007
Boring Location: Northwest Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	USCS	Geologic Description
-16 to -18	2.0	7 9 14 17	55.4 27.8 8.2			Some tar coating with sheen and NLO from 16.0-18.0 ft bgs.
-18 to -20	1.0	6 5 10 12	4.3 6.8			Moderate H2S-like odor from 18.0-20.0 ft bgs.
-20 to -22	2.0	4 7 9 11	5.8 4.1 4.5		SW	WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% coarse sand, light brown, medium dense, wet, H2S-like odor
-22 to -24	2.0	8 6 8 12	10.5 3.7		SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, light brown, medium dense, wet, H2S-like odor, tar coating from 23.9-24.0 ft bgs.
-24 to -26	1.6	5 4 4 7	4.0 3.6 6.3 5.6			Light staining from 25.7-26.0 ft bgs.
-26 to -28	1.6	5 8 8 6	4.1 3.0 0.7	SB201 (26-30)		POORLY GRADED SAND (SP); fine sand, brown, medium dense, wet, faint H2S-like odor. POORLY GRADED SAND (SP); fine-medium sand, ~30 - 40% fine rounded gravel from 28.3-28.9 ft bgs, brown, medium dense, wet, faint H2S-like odor.
-28 to -30	2.0	5 7 6 5	0.8 0.6 0.5			

Comments: Soil samples SB201(14-18) and SB201(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.33 ft bgs on April 17, 2007.

ENSR | AECOM

Merged with ENSR in 2007 RETEC

78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB202

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: April 24, 2007

Boring Location: Northwest Excavation Wall

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 14.0 ft bgs

Logged By: Nic Vrey

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0						Fill		POORLY GRADED SAND (Fill); medium-coarse sand, ~20-30% gravel, moist.
-2	NA	0.0						
								Wet from 3.0 ft bgs.
-4		49.1				SP		POORLY GRADED SAND (SP); medium sand, ~10% subrounded gravel, wet. Tar coating from 4.0-6.0, 7.3-7.5, and 7.8-8.1 ft bgs. Strong NLO from 4.0-9.0 ft bgs.
-6	3.6	18.0						
-8		16.5						POORLY GRADED SAND (SP); medium-coarse sand, ~20% gravel, tan to dark brown, NLO from 9.0-14.0 ft bgs. Tar coating from 9.0-12.5 ft bgs.
-10		172						
	3.8	22.2						
-12		14.7						Trace sheen from 12.5-13.0 ft bgs.
-14								

Comments: Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

ENSR | AECOM

Merged with ENSR in 2007 RETEC

78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB203

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: April 25, 2007

Boring Location: Northwest Excavation Wall

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger

Sampling Method: 2 ft Split Spoon

Ground Elevation (ft/msl): NA

Total Depth: 30.0 ft bgs

Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	USCS	Geologic Description
0 to -2	NA		0.0 0.0			SW SM	ASPHALT WELL GRADED SAND (SW); medium sand, ~30% coarse rounded gravel, brown, moist.
-2 to -4			32.4 190			SP	SILTY SAND (SM); medium sand, <5% rounded gravel and brick fragments, brown, moist. SILTY SAND (SM); coarse-medium sand, <5% fine angular gravel, brown, moist, faint NLO.
-4 to -6	1.8	8 8 15 15	10.8 240 412				POORLY GRADED SAND (SP); medium sand, ~15-25% medium rounded gravel, black, tar saturated with strong NLO. POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, <5% fine rounded gravel, dark gray to brown, loose, wet, tar coated with NLO.
-6 to -8	1.8	3 2 3 10	181 93.9 23.7				Brown with tar saturation and moderate NLO from 6.0-7.0 ft bgs. Gray with tar coating and faint NLO from 7.0-8.0 ft bgs.
-8 to -10	1.2	5 6 6 12	166 12.4				Brown with tar saturation and NLO from 8.0-9.5 ft bgs.
-10 to -12	2.0	6 7 10 10	49.0 27.0 14.1				Petroleum-like odor from 10.0-11.0 ft bgs. POORLY GRADED SAND (SP); fine subrounded sand, <5% silt, brown, medium dense, H2S-like odor.
-12 to -14	1.6	5 6 7 11	11.9 5.8 2.9	SB203 (12-16)	12-16		POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, <5% fine rounded gravel, brown, medium dense, H2S-like odor.
-14 to -16	1.5	4 6 9 12	5.0 0.6				

Comments: Soil samples SB203(12-16) and SB203(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

ENSR | AECOM
Merged with ENSR in 2007 RETEC
78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB203

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 25, 2007
Boring Location: Northwest Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16 to -18	1.7	5 10 14 18	0.6 0.3 0.3						
-18 to -20	2.0	6 11 12 15	0.0 1.8						
-20 to -22	2.0	8 9 14 17	1.8 2.9 4.5						
-22 to -24	2.0	6 8 9 14	7.4 7.4 4.4						~30-40% fine rounded gravel layer and faint NLO from 22.6-23.0 ft bgs.
-24 to -26	1.7	5 6 6 11	0.0 0.0 0.6				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% silt, <5% fine rounded gravel, brown, medium dense. ~40-50% fine rounded gravel from 26.1-26.4 ft bgs.
-26 to -28	1.6	5 7 11 20	0.0 0.0 0.2	SB203 (26-30)					
-28 to -30	2.0	6 7 9 12	0.0 0.0 0.0				SP		POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, <5% fine rounded gravel, light brown, medium dense.

Comments: Soil samples SB203(12-16) and SB203(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

ENSR | AECOM
Merged with ENSR in 2007 RETEC
78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB204

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 26, 2007
Boring Location: Northeast Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	USCS	Visual Impacts	Geologic Description
0 to -4	NA		0.0 0.0 0.0		SP SM SP		ASPHALT POORLY GRADED SAND (SP); coarse sand, ~30-40% fine rounded gravel, brown, dry. SILTY SAND (SM); medium sand, <5% fine rounded gravel, black, dry.
-4 to -6	1.5	10 14 17 6	0.1 0.0	SB204 (4-10)			POORLY GRADED SAND (SP); coarse sand,~ 25-30% fine rounded gravel, brown, moist. POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine rounded gravel, light brown, medium dense, moist.
-6 to -8	1.8	6 8 10 14	0.0 0.0 0.0		SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine subrounded gravel, light brown-tan, loose, wet.
-8 to -10	2.0	9 5 7 12	0.0 0.0				Faint H2S-like odor from 10.7-11.2 ft bgs.
-10 to -12	2.0	3 3 4 8	0.0 0.4 0.8		SP		POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, <5% rootlets from 11.2-12.0 ft bgs, medium dense, wet, moderate H2S-like odor.
-12 to -14	1.0	7 9 10 12	1.4	SB204 (12-16)			
-14 to -16	1.5	4 6 9 14	3.8 3.5				

Comments: Soil samples SB204(12-16) and SB204(26-30) submitted for particle size analysis ASTM D 422-63.
Soil samples SB204(4-10) and SB204(16-18) submitted for BNA, metals, and cyanide analysis.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB204

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 26, 2007
Boring Location: Northeast Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16 to -18	2.0	5 8 12 22	6.5 6.5 3.6	SB204 (16-18)					<5% fine subrounded gravel from 18.0-24.0 ft bgs.
-18 to -20	2.0	6 10 14 20							
-20 to -22	2.0	10 14 14 18	0.7				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, medium dense, wet, faint H2S-like odor.
-22 to -24	2.0	8 12 17 24	0.5 0.8 0.1						
-24 to -26	1.5	9 12 14 18	0.0 0.4						Dense from 26.0-30.0 ft bgs.
-26 to -28	2.0	6 12 19 26	0.0 0.0 0.1	SB204 (26-30)					
-28 to -30	2.0	7 10 14 18	0.0 0.3 0.0						

Comments: Soil samples SB204(12-16) and SB204(26-30) submitted for particle size analysis ASTM D 422-63.
Soil samples SB204(4-10) and SB204(16-18) submitted for BNA, metals, and cyanide analysis.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB205

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 25, 2007
Boring Location: Northeast Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push
Sampling Method: 5 ft Macrocore
Ground Elevation (ft/msl): NA
Total Depth: 13.5 ft bgs
Logged By: Nic Vrey

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0						Fill		POORLY GRADED SAND (Fill); medium-coarse sand, ~20% gravel, ~10% brick fragments, ~10% cinders, moist.
-2	NA	1.2						Wet from 3.0 ft bgs.
-4		1.2						
-6	3.6	141				SP		POORLY GRADED SAND (SP); medium sand, black, wet, tar saturated, strong petroleum-like odor.
								POORLY GRADED SAND (SP); medium sand, wet, faint petroleum-like odor.
-8		23.3						
-10						PT		PEAT (PT); brown, wet.
	3.2	38.1				SP		POORLY GRADED SAND (SP); fine sand, wet. Tar saturated lense at 11.6 ft bgs.
-12								
								Tar blebs at 13.0 ft bgs.

Comments: Boring location hand cleared to 4.0 ft bgs on April 25, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB206

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: April 26, 2007 to April 27, 2007

Boring Location: Northeast Excavation Wall

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger

Sampling Method: 2 ft Split Spoon

Ground Elevation (ft/msl): NA

Total Depth: 30.0 ft bgs

Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID
0 to -2	NA			
-2 to -4	0.6	4 5 8 2	0.1	SB206 (2-8)
-4 to -6	1.2	10 28 14 12	0.7 2.3	
-6 to -8	1.7	3 1 1 2	27.1 9.7	
-8 to -10	2.0	1 2 2 2	9.3 73.3 85.9	
-10 to -12	2.0	2 5 14 18	27.4 60.1 81.1	
-12 to -14	1.4	12 17 15 17	66.2 131	
-14 to -16	2.0	8 20 27 32	81.2 56.4 34.1	SB206 (14-18)

Sample Interval | Lithology | Visual Impacts

USCS	Geologic Description
SW	WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, <5% brick fragments, dark brown, medium dense, wet. WELL GRADED SAND (SW); fine-coarse subangular sand, <5% fine angular gravel, dark brown, loose, wet. WELL GRADED SAND (SW); fine-coarse subangular sand, ~30-40% brick fragments, light gray and tan, wet.
SP	POORLY GRADED SAND (SP); fine-medium subangular sand, dark gray, loose, wet, faint NLO.
SM	SILTY SAND (SM); fine-medium subangular sand, abundant rootlets, gray, loose, wet, faint NLO.
PT	PEAT (PT); <5% fine sand, brown, soft, moderate H2S-like odor and petroleum-like odor from 7.3-9.1 ft bgs. Dark brown with strong H2S-like odor and petroleum-like odor from 9.1-10.7 ft bgs.
SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, light brown grading to dark brown, medium dense, wet, moderate H2S-like odor and faint NLO. Same as above but dark brown grading to light brown, faint H2S-like odor and no NLO. Same as above but brown and dense.

Comments: Soil samples SB206(14-18) and SB206(26-30) submitted for particle size analysis ASTM D 422-63.

Soil samples SB206(2-8)-042707 submitted for BNA, metals, and cyanide analysis.

Boring location hand cleared to 2.0 ft bgs on April 26, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB206

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: April 26, 2007 to April 27, 2007

Boring Location: Northeast Excavation Wall

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger

Sampling Method: 2 ft Split Spoon

Ground Elevation (ft/msl): NA

Total Depth: 30.0 ft bgs

Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16 – -18	2.0	12 15 15 25	72.6 60.0 13.7						POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, <5% fine rounded gravel, light brown, medium dense, wet, faint H2S-like odor.
-18 – -20	1.8	10 15 20 25	9.0 6.0 1.2						Same as above but loose-medium dense with no odor.
-20 – -22	2.0	5 8 12 16	2.8 1.0 0.6						
-22 – -24	2.0	10 12 16 16	0.7 0.4 0.4				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% silt, <5% fine rounded gravel, light brown from 22.0-23.0 ft bgs and light brown to tan from 23.0-24.0 ft bgs, loose-medium dense, wet.
-24 – -26	1.7	8 8 10 16	0.0 0.0 0.1						Same as above but light brown to tan.
-26 – -28	1.7	9 8 8 16	0.1 0.1 0.2	SB206 (26-30)					
-28 – -30	1.8	5 12 20 26	0.1 0.0 0.0						

Comments: Soil samples SB206(14-18) and SB206(26-30) submitted for particle size analysis ASTM D 422-63.
Soil samples SB206(2-8)-042707 submitted for BNA, metals, and cyanide analysis.
Boring location hand cleared to 2.0 ft bgs on April 26, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB207

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: April 25, 2007

Boring Location: Northeast Excavation Wall

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 14.0 ft bgs

Logged By: Nic Vrey

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0						Fill		WELL GRADED SAND (Fill); fine-coarse sand, <10% gravel and silt, moist.
-2	NA	2.5						Wet from 3.0 ft bgs.
-4		308				SP		POORLY GRADED SAND (SP); medium sand, ~30% gravel, wet, strong NLO. Tar coating from 4.5-6.5 ft bgs.
-6	3.6	490						Tar saturated from 6.5-7.2 ft bgs.
-8		740				PT		PEAT (PT); brown, wet, some tar blebs, strong NLO.
-10		281						NLO from 9.0-14.0 ft bgs.
-12	3.8	107				SP		POORLY GRADED SAND (SP); medium-coarse sand, ~20% gravel, tan to dark brown.
-14		156						

Comments: Boring location hand cleared to 4.0 ft bgs on April 25, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB208

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: April 24, 2007

Boring Location: Northeast Excavation Wall

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger

Sampling Method: 2 ft Split Spoon

Ground Elevation (ft/msl): NA

Total Depth: 30.0 ft bgs

Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts
0 to -4	NA		1.7 168 605 850				SW	
-4 to -6	1.3	8 2 2 5	675 350 875					
-6 to -8	1.8	3 2 2 3	167 53.0				OH	
-8 to -10	2.2	5 2 2 3	78.8 100				PT	
-10 to -12	1.9	4 5 5 4	57.0 53.0 29.0				SP	
-12 to -14	1.9	5 7 10 8	25.7 15.6	SB208 (12-16)				
-14 to -16	1.7	4 8 12 18	7.8 9.5 18.7					

Geologic Description

WELL GRADED SAND (SW); fine-coarse sand, <5% fine subangular gravel, dark brown, wet. Tar coated with sheen and moderate NLO from 1.0-2.0 ft bgs.

WELL GRADED SAND (SW); fine-coarse sand, <5% fine subangular gravel, brown, wet. Tar coated with sheen and strong NLO from 2.0-4.0 ft bgs.

Same as above but tar saturated with sheen and NLO from 4.0-5.0 ft bgs.

WELL GRADED SAND (SW); fine-coarse sand, <5% fine subrounded gravel, <5% rootlets from 6.6-7.1 ft bgs, gray, loose, wet, tar saturated with sheen and NLO and petroleum-like odor from 5.0-6.6 ft bgs.
Faint petroleum-like odor and NLO from 6.6-7.1 ft bgs.

SILTY CLAY (OH); silty clay, <5% fine sand, <5% rootlets, dark gray, soft, strong H2S-like odor.

PEAT (PT); soft, dark brown, strong H2S-like odor.

POORLY GRADED SAND (SP); fine-medium subrounded sand, dark brown, medium dense, wet, moderate H2S-like odor and petroleum-like odor.
Trace tar coating with sheen and NLO at 11.0 ft bgs.
POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine rounded gravel from 13.6-14.0 ft bgs, dark brown, medium dense, wet, moderate H2S-like odor.

Same as above but brown.

Comments: Soil samples SB208(12-16) and SB208(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 5.0 ft bgs on April 20, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB208

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 24, 2007
Boring Location: Northeast Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16 to -18	2.0	6 11 12 18	2.4 0.7 0.3				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, brown, medium dense, wet, moderate H2S-like odor. Same as above but light brown.
-18 to -20	1.8	5 8 12 17	1.1 0.3 0.3						
-20 to -22	0.6	12 12 14 18	1.2						Same as above but light brown-tan with <5% fine rounded gravel from 22.8-23.4 ft bgs.
-22 to -24	1.7	10 12 14 18	1.2 0.3 0.1						
-24 to -26	2.0	6 7 10 14	0.4 0.0 0.3						Same as above but with <5% fine rounded gravel.
-26 to -28	2.0	12 20 20 20	0.9 0.1 0.4	SB208 (26-30)					
-28 to -30	1.7	18 18 15 18	1.4 0.8 0.5						

Comments: Soil samples SB208(12-16) and SB208(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 5.0 ft bgs on April 20, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB209

Project Name: Sag Harbor Former MGP	**Drilling Method:** Direct Push
Project Number: 01765066	**Sampling Method:** 5 ft Macrocore
Date Started/Completed: April 26, 2007	**Ground Elevation (ft/msl):** NA
Boring Location: Southwest Excavation Wall	**Total Depth:** 14.0 ft bgs
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Nic Vrey

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0 to -4	NA	1.0 1.9 1.0 1.0				Fill		POORLY GRADED SAND (Fill); loamy sand, ~15-30% silt and gravel, dark brown, moist. Wet from 2.0 ft bgs.
-4 to -8	4.8	0.4 71.2 36.7				SP		POORLY GRADED SAND (SP); sand, <5% gravel, wet, moderate NLO. Tar coating from 5.6-7.2 ft bgs.
-8 to -12	3.1	30.7 39.3				PT		PEAT (PT); abundant roots, brown, wet, organic odor.
-12 to -14		18.1				SP		POORLY GRADED SAND (SP); fine grained sand, ~15-30% silt, <5% gravel, brown, wet, faint NLO.

Depth scale: 0, -2, -4, -6, -8, -10, -12, -14

Comments: Boring location hand cleared to 4.0 ft bgs on April 26, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB210

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: May 1, 2007

Boring Location: Southeast Excavation Wall

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger

Sampling Method: 2 ft Split Spoon

Ground Elevation (ft/msl): NA

Total Depth: 37.0 ft bgs

Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval
0 – -4	NA		0.5 0.3 0.9 1.0		
-4 – -6		9 6 5 6	130 16.9		
-6 – -8	1.0	13 2 2 3	12.6 8.1		
-8 – -10	2.0	1 1 2 1	98.0 318 187		
-10 – -12	0.3	1 2 1 4	37.1		
-12 – -14	2.0	5 6 9 11	64.0 72.1 47.0		
-14 – -16	2.0	3 8 15 22	44.0 51.0	SB210 (14-18)	14-18
-16 – -18	1.3	5 12 14 18	11.6 10.1		
-18 – -20	1.4	5 12 5 22	2.6 0.7		

USCS	Geologic Description
SM	SILTY SAND (SM); fine-medium subrounded sand, <5% fine rounded gravel, <5% rootlets, grayish brown, medium dense, moist.
SW	WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, <5% rootlets, grayish brown, loose, moist. Same as above but dark brown. Tar saturated with sheen and NLO from 4.0-5.5 ft bgs.
SM	SILTY SAND (SM); fine subrounded sand, brown, loose, moist. POORLY GRADED SAND (SP); fine-medium subrounded sand, gray, loose, moist.
PT	PEAT (PT); brown, soft, H2S-like odor.
SP	POORLY GRADED SAND (SP); fine subrounded sand, <5% silt, dark brown, medium dense, wet, H2S-like odor. POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine rounded gravel, <5% silt, light brown, medium dense, wet, H2S-like odor. Fine-coarse, brown sand from 15.6-16.0 ft bgs. Dark brown from 17.1-17.14 ft bgs. ~30-40% fine rounded gravel from 18.3-18.7 ft bgs.

Comments: Soil samples SB210(14-18) and SB210(33-37) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 27, 2007.
Augered from 30.0-33.0 ft bgs and resumed split spoon sampling.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB210

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: May 1, 2007

Boring Location: Southeast Excavation Wall

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger

Sampling Method: 2 ft Split Spoon

Ground Elevation (ft/msl): NA

Total Depth: 37.0 ft bgs

Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-20 to -22	1.8	10 14 14 18	9.1 20.0 0.2				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, light brown, medium dense, wet.
-22 to -24	1.1	9 14 17 25	0.9						
-24 to -26	1.5	6 7 12 14	4.7 2.0						
-26 to -28	2.0	9 8 7 12	5.0 1.7 4.3						Same as above but loose.
-28 to -30	1.7	6 5 6 8	1.8						<5% coarse sand from 29.2-34.2 ft bgs.
-30 to -33	NA								
-33 to -35	2.0	6 5 5 8	0.1 0.0 0.1	SB210 (33-37)					
-35 to -37	1.9	4 5 7 12	0.3 0.0 0.0						

Comments: Soil samples SB210(14-18) and SB210(33-37) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 27, 2007.
Augered from 30.0-33.0 ft bgs and resumed split spoon sampling.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB211

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: April 26, 2007

Boring Location: Southwest Excavation Wall

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 14.0 ft bgs

Logged By: Nic Vrey/ Kevin Kachel

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0 to -2	NA	0.9, 4.2				Fill		WELL GRADED SAND (Fill); loamy sand, ~15-30% silt and gravel, black, moist.
-2 to -4		40.9, 48.1						SILTY SAND (Fill); silty sand, ~15-30% gravel, <5% wood fragments, black, wet at 2 ft bgs, sheen and NLO.
-4 to -8	3.3	49.3, 46.8				SP		POORLY GRADED SAND (SP); medium grained sand, tan-gray, strong NLO. Staining from 5.7-6.4 ft bgs. Tar saturated from 7.6-8.0 ft bgs.
-8 to -12	3.8	162, 201, 110				PT		PEAT (PT); abundant roots, dark brown, strong H2S-like odor and strong NLO.
-12 to -14		71.1				SP		POORLY GRADED SAND (SP); fine grained silty sand, dark brown, wet, H2S-like odor and NLO, light sheen at 12.3 ft bgs.

Comments: Boring location hand cleared to 4.0 ft bgs on April 25, 2007.

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78 Main Street, Suite 3
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Boring ID: SB212

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 18, 2007
Boring Location: Southeast Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval
0 to -4	NA		2.1, 1.6, 7.8, 4.2		
-4 to -6	1.75	29, 28, 8, 5	3.3, 3.8, 2.5		
-6 to -8	2.0	10, 5, 5, 4	32.9, 24.4, 47.8, 22.4		
-8 to -10	0.5	1, 1, 2, 3	20.0, 3.3		
-10 to -12	2.0	4, 4, 8, 13	11.4, 19.3, 48.2, 65.1		
-12 to -14	2.0	3, 8, 11, 12	22.1, 39.4, 33.7, 7.7		
-14 to -16	2.0	11, 14, 18, 24	50.0, 10.7, 46.0, 59.0	SB212 (14-18)	

USCS	Geologic Description
	ASPHALT
SP	POORLY SORTED SAND (SP); fine-medium subangular sand, <5% fine rounded gravel, brown, medium dense, moist.
	ASPHALT
SW	Same as above (0.4-0.7 ft bgs). 2.0'-4.0': WELL GRADED SAND (SW); fine-coarse subrounded sand, light brown, loose, wet, faint NLO. WELL GRADED SAND (SW); fine-coarse subangular sand, grayish brown, loose, wet, NLO from 4.0-7.9 ft bgs. Intermittent tar coating with sheen from 5.0-6.0 ft bgs and from 7.3-7.9 ft bgs. Tar saturation with sheen from 6.0-7.3 ft bgs.
PT	PEAT (PT); <5% fine sand, brown, soft, H2S-like odor. Tar coating with sheen and NLO from 9.5-9.9 ft bgs.
SP	POORLY GRADED SAND (SP); fine subangular sand , <5% silt, wet, strong H2S-like odor.
PT	PEAT (PT); brown, soft, H2S-like odor.
SP	POORLY GRADED SAND (SP); fine subangular sand, brown, medium dense, wet, moderate H2S-like odor, tar coating with sheen and moderate NLO.
PT	PEAT (PT); peat, brown, soft, H2S-like odor.
SP	POORLY GRADED SAND (SP); fine-medium subangular sand, brown, medium dense, wet, tar saturated with sheen and NLO from 12.5-12.7 ft bgs. <5% rootlets from 14.0-15. ft bgs, tar coating with NLO from 14-14.7 ft bgs.

Comments: Soil samples SB212(14-18) and SB212(22-26) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 17, 2007.

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Nyack, New York, 10960

Boring ID: SB212

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 18, 2007
Boring Location: Southeast Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16	1.6	12 12 18 24	21.0 20.0 4.0						Tar saturation with NLO from 14.7-15.0 ft bgs. Same as above but light brown with ~30-40% fine rounded gravel. Same as above with faint H2S-like odor. Same as above but moist.
-18	2.0	10 10 15 21	6.1 14.7 13.8						
-20	2.0	10 15 22 20	10.0 6.2 7.3 3.0				SW SP		WELL GRADED SAND (SW); fine-coarse rounded sand, <5% fine rounded gravel, light brown, medium dense, moist, faint H2S-like odor from 20.0-22.0 ft bgs. POORLY GRADED SAND (SP); fine-medium rounded sand, light brown, medium dense, moist. Same as above but no H2S-like odor.
-22	2.0	12 16 21 24	7.0 11.4 14.0 29	SB212 (22-26)					
-24	2.0	8 6 6 9	4.3						<5% fine rounded gravel at 25.0 ft bgs.
-26	1.5	6 9 9 15	1.1 0.1						<5% fine rounded gravel at 29.0 ft bgs.
-28	1.8	9 15 12 12	3.3						
-30									

Comments: Soil samples SB212(14-18) and SB212(22-26) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 17, 2007.

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Boring ID: SB213

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 25, 2007
Boring Location: Southeast Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.
Drilling Method: Direct Push
Sampling Method: 5 ft Macrocore
Ground Elevation (ft/msl): NA
Total Depth: 14.0 ft bgs
Logged By: Nic Vrey/ Kevin Kachel

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0	NA	0.0				Fill		POORLY GRADED SAND (Fill); coarse sand and well rounded gravel, brown, grading to gray-black, moist.
-2		0.5						NLO from 2.0 ft bgs.
		0.2						Tar saturated from 2.5 ft bgs.
		0.1						WELL GRADED GRAVEL (Fill); coarse angular gravel, ~5% coarse sand, tar saturated, NLO.
-4	4.1	13.4				SP		POORLY GRADED SAND (SP); medium grained sand, wet, sheen from 4.0-7.0 ft bgs, strong NLO.
-6		324						Tar saturated from 7.0-7.9 ft bgs.
-8		318				PT		PEAT (PT); abundant roots, dark brown, wet, strong NLO. Tar saturated from 7.9-8.1 ft bgs.
-10	4.0	298						
		120				SP		POORLY GRADED SAND (SP); fine grained sand, ~5% silt, brown, sheen from 10.5-12.0 ft bgs.
-12		14.4						
-14								

Comments: Boring location hand cleared to 4.0 ft bgs on April 23, 2007

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Boring ID: SB214

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: April 19, 2007

Boring Location: Intersection of southwest & southeast wall

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger

Sampling Method: 2 ft Split Spoon

Ground Elevation (ft/msl): NA

Total Depth: 30.0 ft bgs

Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval
0 to -4	NA		3.9 2.9 3.2 18.6		
-4 to -6	1.0	14 18 2 2	34.6		
-6 to -8	1.6	2 4 4 4	19.7 39.1		
-8 to -10	1.8	8 6 2 2	19.1 24.8 27.0		
-10 to -12	1.0	4 8 10 12	8.4 27.9		
-12 to -14	2.0	6 8 9 12	11.5 15.8 22.0 22.5		
-14 to -16	2.0	4 6 9 14	12.5 20.1		

USCS	Geologic Description
	ASPHALT
SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine rounded gravel, dark gray, medium dense, moist. Faint NLO from 2.0-3.0 ft bgs. POORLY GRADED SAND (SP); fine-medium subrounded sand, ~35-50% fine rounded gravel, brown, loose, wet, tar coated with sheen and NLO. Brick fragments from 5.0-5.4 ft bgs.
PT	PEAT (PT); brown, soft, strong H2S-like odor. Fine tar saturated sand with sheen and NLO distributed through peat from 6.0-7.6 ft bgs, .4" in diameter.
SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, light brown, medium dense, moist, strong H2S-like odor.
PT	PEAT (PT); brown, soft, strong H2S-like odor. Fine tar saturated sand with sheen and NLO distributed through peat, .4" in diameter.
SP	POORLY GRADED SAND (SP); fine subrounded sand, <5% rootlets from 9.2-10.0 ft bgs, brown, medium dense, moist, moderate NLO and H2S-like odor. POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine rounded gravel, brown, medium dense, moist, faint NLO and H2S-like odor.

Comments: Soil samples SB214(16-20) and SB214(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 3.75 ft bgs on April 17, 2007.

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Boring ID: SB214

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 19, 2007
Boring Location: Intersection of southwest & southeast wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
			114						
-16 to -18	1.6	12 15 16 12	3.5 3.4	SB214 (16-20)					Tar saturated with sheen and NLO from 15.8-15.84 ft bgs.
-18 to -20	1.8	10 18 20 18	28.0 26.3 12.2						Some tar coating with NLO from 18.9-19.6 ft bgs. POORLY GRADED SAND (SP); fine-medium subrounded sand, ~15-25% fine rounded gravel, brown, loose, tar coating with sheen and faint NLO from 20.0-21.7 ft bgs.
-20 to -22	2.0	4 8 6 5	10.6 15.0 0.3						
-22 to -24	2.0	10 18 20 22	10 15.0 13.1				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, brown, medium dense, moist, faint H2S-like odor, trace tar coating with sheen and NLO from 22.0-25.2 ft bgs.
-24 to -26	2.0	10 15 10 10	10.0 7.9 2.5				SP		POORLY GRADED SAND (SP); fine-medium subrounded sand, light brown, medium dense, moist, trace tar coating with sheen and NLO from 25.1-25.2 ft bgs.
-26 to -28	2.0	5 7 8 5	5.3 5.8 1.0	SB214 (26-30)					Same as above but fine sand. Same as above but fine-medium sand.
-28 to -30	2.0	7 10 10 12	2.3 0.2 0.5						

Comments: Soil samples SB214(16-20) and SB214(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 3.75 ft bgs on April 17, 2007.

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Boring ID: SB215

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 25, 2007
Boring Location: Southwest Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push
Sampling Method: 5 ft Macrocore
Ground Elevation (ft/msl): NA
Total Depth: 14.0 ft bgs
Logged By: Nic Vrey

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0	NA	0.0				Fill		POORLY GRADED SAND (Fill); medium to coarse sand, ~30-45% medium to coarse rounded gravel, light to dark brown, grading to gray-black, moist at 2.0 ft bgs, no odor.
		0.0						
-2		0.0						SILTY SAND (Fill); silty sand, <5% fine angular gravel, black, no odor.
		0.0				SP		POORLY GRADED SAND (SP); coarse sand, <5% medium rounded gravel, gray to brown to black, wet, no odor.
-4	3.5	10.7						POORLY GRADED SAND (SP); medium sub-rounded sand, gray, wet, strong NLO.
-6								Tar saturated from 6.0-6.2 ft bgs.
		27.4				PT		PEAT (PT); dark brown to black, wet, organic odor.
-8		23.6				SP		POORLY GRADED SAND (SP); fine sand, <5% silt and rounded gravel, brown, wet, faint NLO.
-10	4.3	28.0						
-12		9.7						
		14.4						
-14								

Comments: Boring location hand cleared to 4.5 ft bgs on April 23, 2007.

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Boring ID: SB216

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 30, 2007
Boring Location: Southwest Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	USCS	Geologic Description
0	NA		55.7				ASPHALT
						SM	SILTY SAND (SM); fine grained sand, ~15% silt, brown, moist, petroleum-like odor.
			4.4			SP	
-2			14.1				POORLY GRADED SAND (SP); fine-medium sand, <5% silt, brown, moist. POORLY GRADED SAND (SP); fine-medium sand, <5% silt, <5% fine gravel, dark brown, moist to 3.0 ft bgs, faint NLO.
			74.7				POORLY GRADED SAND (SP); medium sand, dark brown, moderate to strong NLO with sheen at 4.0 ft bgs.
-4	2.0	14 6 2 2	274				POORLY GRADED SAND (SP); fine-medium subrounded sand, , <5% fine gravel, dark brown, loose, wet, tar coating with sheen and NLO from 4.0-4.8 ft bgs, tar saturated with sheen and NLO from 4.8-5.0 ft bgs.
						PT	PEAT (PT); brown grading to dark brown, soft, H2S-like odor, tar coating with faint NLO from 5.0-5.5 ft bgs.
-6	0.9	4 6 6 7	117			SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine rounded gravel, tar saturated with sheen and NLO from 6.0-8.0 ft bgs. Tar coating with sheen and NLO from 8.0-8.2 ft bgs.
-8	2.0	2 4 6 6	12.3 11.3			PT	PEAT (PT); dark brown, soft, H2S-like odor.
			2.7			SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, dark brown, loose, wet, H2S-like odor.
-10	2.0	4 5 9 14	2.2 5.3 16.0				~30-40% fine rounded gravel from 11.7-12.0 ft bgs. Same as above but brown.
-12	1.8	8 8 9 17	7.7 3.7 8.9	SB216 (12-16)	X		~30-40% fine rounded gravel from 12.7-12.8 ft bgs.
-14	1.2	6 7 12 12	6.3 5.2		X		

Comments: Soil samples SB216(12-16) and SB216(20-24) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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Boring ID: SB216

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 30, 2007
Boring Location: Southwest Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16 to -18	2.0	7, 8, 12, 14	15.0, 2.5, 12.2				SW		WELL GRADED SAND (SW); fine-medium subrounded sand, brown, medium dense, wet, H2S-like odor.
-18 to -20	2.0	4, 5, 8, 10	16.1, 16.2, 4.1						
-20 to -22	2.0	4, 5, 5, 7	4.2, 0.0, 0.2	SB216 (20-24)			SP		POORLY GRADED SAND (SP); medium-coarse subrounded sand, dark brown, loose, wet. POORLY GRADED SAND (SP); fine subrounded sand, loose, wet.
-22 to -24	1.0	5, 4, 4, 8	0.0, 0.0						
-24 to -26	1.1	9, 5, 5, 9	0.0, 0.0, 0.0						POORLY GRADED SAND (SP); medium-coarse subrounded sand, loose, wet. POORLY GRADED SAND (SP); fine-medium subrounded sand, loose, wet.
-26 to -28	2.0	10, 12, 14, 14	0.0, 0.0, 0.0				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, light brown, loose, wet.
-28 to -30	1.5	4, 3, 4, 7	0.0, 0.0						Fine sand from 29.5-30.0 ft bgs.

Comments: Soil samples SB216(12-16) and SB216(20-24) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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Boring ID: SB217

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 24, 2007
Boring Location: Southwest Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push
Sampling Method: 5 ft Macrocore
Ground Elevation (ft/msl): NA
Total Depth: 14.0 ft bgs
Logged By: Nic Vrey

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0 to -4	NA	0.0, 0.0, 0.0, 12.9				Fill		POORLY GRADED SAND (Fill); fine silty sand, ~25% silt, organic material (roots), dark brown, moist. POORLY GRADED SAND (Fill); silty sand, ~20% silt, ~5% gravel, dark brown, moist. POORLY GRADED SAND (Fill); fine sand, ~15% medium sand, stained black, moderate NLO, light sheen from 4.0 ft bgs.
-4 to -6.5	3.75	8.3, 11.3				SP		POORLY GRADED SAND (SP); medium subrounded sand, tan, moderate NLO. Tar coating from 5.9-6.1 ft bgs.
-6.5 to -7.7						PT		PEAT (PT); soft, wet, H2S-like odor.
-7.7 to -9		5.2				SP		POORLY GRADED SAND (SP); fine to medium subrounded sand, tan, wet, faint NLO.
-9 to -14	4.0	8.3, 2.4, 3.9						POORLY GRADED SAND (SP); fine sand, <5% gravel, dark brown, H2S-like odor.

Comments: Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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Boring ID: SB218

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 20, 2007
Boring Location: Southwest Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.
Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval
0 to -4	NA		76.4		
-4 to -6	2.0	7, 6, 3, 3	22.4, 115, 176		
-6 to -8	0.9	2, 2, 2, 4	75.5, 44.9, 18.7		
-8 to -10	2.0	10, 12, 14, 11	61.3, 7.0		
-10 to -12	2.0	4, 6, 8, 10	27.5, 15.7		
-12 to -14	1.8	10, 12, 15, 15	44.8		
-14 to -16	1.2	9, 10, 11, 15	17.1, 17.2, 31.9		

USCS	Geologic Description
SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine angular gravel, brown, moist. Wet from 1.0-4.0 ft bgs.
	Tar saturated with sheen and NLO from 2.0-4.0 ft bgs.
	Same as above but wet with trace rootlets.
	Oil saturated with petroleum-like odor from 4.0-6.9 ft bgs.
PT	PEAT (PT); brown, soft, strong H2S-like odor.
SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, trace rootlets, light brown, loose, moist, petroleum-like odor.
PT	PEAT (PT); brown, soft, H2S-like and petroleum-like odor.
SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, trace rootlets, light brown, loose, moist, some oil coating with petroleum-like odor.
PT	PEAT (PT); brown, soft, H2S-like and petroleum-like odor, slight sheen with oil coating.
SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, trace rootlets, light brown, loose, moist, petroleum-like odor.
	POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine rounded gravel, light brown, medium dense, wet.
	Oil saturated lense from 13.40-13.42 ft bgs.
	Sheen with slight NLO from 14.0-17.0 ft bgs.

Comments: Soil samples SB218(16-20) and SB218(23.2-24) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 17, 2007.

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Boring ID: SB218

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: April 20, 2007
Boring Location: Southwest Excavation Wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16 to -18	2.0	12 18 20 22	6.7 10.8 8.5	SB218 (16-20)					
-18 to -20	2.0	10 8 7 10	11.7				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, 5-10% fine rounded gravel, medium dense moist, light brown, slight NLO. Tar coating from 19.6-19.7 ft bgs.
-20 to -22	2.0	9 8 7 9	15.7 8.2 0.0						WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, medium dense, wet, light brown, moderate NLO from 20.0-21.5 ft bgs. Light staining from 21.3-21.4 ft bgs.
-22 to -24	1.0	10 30 30 30	0.0 0.0 0.0	SB218 (23.2-24)			SP		POORLY GRADED SAND (SP); fine subrounded sand, <5% silt, light brown, dense, moist.
-24 to -26	1.1	3 6 9 11	0.0 0.0 0.0						POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, light brown, loose, moist. Same as above but medium dense.
-26 to -28	2.0	12 16 8 10	4.0 3.8 0.0						30-40% fine rounded gravel from 27.2-27.5 ft bgs. Same as above but loose.
-28 to -30	1.5	9 5 5 10	0.0 0.0 0.0						

Comments: Soil samples SB218(16-20) and SB218(23.2-24) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 17, 2007.

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Boring ID: SB219

Project Name:	Sag Harbor Former MGP	**Drilling Method:**	Direct Push
Project Number:	01765066	**Sampling Method:**	5 ft Macrocore
Date Started/Completed:	April 26, 2007	**Ground Elevation (ft/msl):**	NA
Boring Location:	Long Island Avenue	**Total Depth:**	9.0 ft bgs
Drilling Company:	Fenley & Nicol Environmental, Inc.	**Logged By:**	Nic Vrey

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0						Fill		POORLY GRADED SAND (Fill); fine to medium silty sand, ~15-30% gravel, light brown, moist.
		1.1						
-2	NA		SB219 (2-8)					POORLY GRADED SAND (Fill); fine to coarse gravelly sand, ~15-30% silt, black, moist.
		0.0						
-4						SP		POORLY GRADED SAND (SP); medium to coarse subrounded to well rounded sand, ~15-30% rounded gravel, tan, no odor.
								Wet from 5.0 ft bgs.
-6		0.0						
	NR							
-8								

Comments: Soil sample SB219(2-8) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 4.0 ft bgs on April 26, 2007.

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Boring ID: SB220

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: May 1, 2007

Boring Location: Long Island Avenue

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 14.0 ft bgs

Logged By: Kevin Kachel/ Nic Vrey

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	USCS	Geologic Description
0	NA	0.9		Fill	ASPHALT
		0.5			POORLY GRADED SAND (Fill); fine to medium sand, light brown, medium dense, moist.
-2		1.5			WELL GRADED SAND (Fill); fine to coarse angular sand, <5% fine, dark brown to black, medium dense.
		121			POORLY GRADED SAND (Fill); fine to medium subangular sand, <5% rounded gravel, brown, medium dense, tar saturated and NLO from 4.0-4.5 ft bgs.
-4	3.7		SB220 (4-9)	SP	POORLY GRADED SAND (SP); medium subrounded sand, tan, stain throughout, strong NLO. Tar saturated from 5.7-6.6 ft bgs.
-6		55.3		PT	PEAT (PT); abundant roots, strong H2S-like odor.
-8				SP	POORLY GRADED SAND (SP); fine sand, ~5% silt, brown, moderate H2S-like odor and NLO.
-10	4.6	2.8			POORLY GRADED SAND (SP); fine subrounded sand, ~15-30% gravel from 11.8-12.8 ft bgs, ~15-30% medium grained sand from 13.0-14.0 ft bgs, tan.
-12		2.4			
-14					

Comments: Soil sample SB220(4-9) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 4.5 ft bgs on April 30, 2007.

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Boring ID: SB221

Project Name: Sag Harbor Former MGP	**Drilling Method:** Direct Push
Project Number: 01765066	**Sampling Method:** 5 ft Macrocore
Date Started/Completed: May 1, 2007	**Ground Elevation (ft/msl):** NA
Boring Location: Bridge Street	**Total Depth:** 9.0 ft bgs
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Kevin Kachel/ Nic Vrey

Depth scale (Feet): 0, -2, -4, -6, -8

Recovery (Feet)	Depth interval (Feet)
NA	0 to -4
3.6	-4 to -9

PID (ppm)
2.3
1.2
2.0
6.3
124
33.3
14.7

Sample ID	Sample Interval
SB221 (5-8)	5–8 ft

USCS	Geologic Description
Fill	POORLY GRADED SAND (Fill); fine to coarse sand and silt, <5% rootlets, dark brown. POORLY GRADED SAND (Fill); fine to coarse subrounded sand, <5% silt and fine gravel, brown, wet. POORLY GRADED SAND (Fill); fine to coarse sand, <5% angular and rounded fine gravel, loose, wet. Tar coating and sheen from 4.0 ft bgs.
SP	POORLY GRADED SAND (SP); fine sand, tan, strong NLO, wet. Tar coated from 4.0-6.0 ft bgs. POORLY GRADED SAND (SP); medium sand, tan, wet, strong NLO. Tar saturated from 6.0-6.2 ft bgs.
PT	PEAT (PT); abundant roots, brown, wet, strong H2S-like odor.
SP	POORLY GRADED SAND (SP); fine sand, <5% medium grained sand, tan to brown, faint H2S-like odor.

Comments: Soil sample SB221(5-8) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 4.5 ft bgs on April 30, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB222

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: May 1, 2007

Boring Location: Souheast Excavation Wall Stepout

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 14.0 ft bgs

Logged By: Kevin Kachel/ Nic Vrey

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	USCS	Visual Impacts	Geologic Description
0	NA					ASPHALT
		0.3		SP		POORLY GRADED SAND (SP); narrowly graded fine to medium subrounded sand, orange-brown, medium dense, moist.
		0.0		SW		POORLY GRADED SAND (SP); fine to medium subrounded sand and rounded gravel, brown, medium dense.
-2		0.4		SP		WELL GRADED SAND (SW); fine to coarse subrounded sand, <5% fine gravel, light brown, loose.
		0.1				POORLY GRADED SAND (SP); fine to medium subrounded sand and subrounded to subangular gravel, wet.
-4	4.0	26.3	SB222 (5-9)			POORLY GRADED SAND (SP); medium sand, ~15-30% quartz gravel, tan.
-6					Sheen	Heavy sheen from 5.8-6.1 ft bgs.
		152			Tar coating	Tar coating from 7.1-8.2 ft bgs.
-8				PT		PEAT (PT); abundant roots, brown, strong H2S-like odor.
	3.9					PEAT (PT); less roots than above, dark brown to red brown, strong H2S-like odor.
-10		132				
-12		83.3		SP		POORLY GRADED SAND (SP); fine sand, <5% silt, dark brown to brown.
-14						

Comments: Soil sample SB222(5-9) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 4.0 ft bgs on April 27, 2007.

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Nyack, New York, 10960

Boring ID: SB223

Project Name:	Sag Harbor Former MGP	**Drilling Method:**	Direct Push
Project Number:	01765066	**Sampling Method:**	5 ft Macrocore
Date Started/Completed:	May 1, 2007	**Ground Elevation (ft/msl):**	NA
Boring Location:	Northeast Excavation Wall Stepout	**Total Depth:**	14.0 ft bgs
Drilling Company:	Fenley & Nicol Environmental, Inc.	**Logged By:**	Nic Vrey

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts
0	NA	0.5				SP	
		0.6					
-2		0.5					
		0.4				SW	
-4	5.0		SB223 (4-8)	4–8		SP	
-6		0.4					
-8							
	3.8					PT	
-10		52.9					
-12		104					
						SP	
-14							

Geologic Description

POORLY GRADED SAND (SP); medium to coarse sand, tan, moist.

POORLY GRADED SAND (SP); fine to medium sand, ~5% gravel, tan to gray, moist to wet.

POORLY GRADED SAND (SP); fine to coarse sand and gravel, dark brown to black, wet.

WELL GRADED SAND (SW); fine to coarse sand, ~5% gravel, dark brown, wet.

WELL GRADED SAND (SW); poorly sorted fine to coarse sand, ~5% gravel, tan, wet.

PEAT (PT); abundant roots lessening with depth, dark brown, strong H2S-like odor.

POORLY GRADED SAND (SP); fine sand, ~5% silt, dark brown, wet, strong H2S-like odor.

Comments: Soil sample SB223(4-8) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 4.0 ft bgs on May 1, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB224

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: May 8, 2007

Boring Location: Long Island Avenue

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 10.0 ft bgs

Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0	NA					SP		ASPHALT
		4.6						POORLY GRADED SAND (SP); sand and fine gravel, gray, hard, moist.
		1.9						POORLY GRADED SAND (SP); fine to medium sand, <5% fine gravel, brown, moist.
-2		0.7						POORLY GRADED SAND (SP); fine to medium sand, <5% fine gravel, dark brown, moist.
		0.0						POORLY GRADED SAND (SP); fine to medium sand, <5% fine gravel, orange brown, moist.
-4		0.4						POORLY GRADED SAND (SP); fine to medium sand, <5% fine gravel, gray, moist.
-6	3.0	NR				SW		WELL GRADED SAND (SW); fine to coarse sand, <5% fine rounded gravel from 8.0-10.0 ft bgs, light brown, wet.
-8		5.9	SB224 (8-10)					
		4.0						
-10								

Comments: Soil sample SB224(8-10) submitted for BNA, metals and cyanide analysis.

Boring location hand cleared to 5.0 ft bgs on May 4, 2007.

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78 Main Street, Suite 3
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Boring ID: SB225

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: May 8, 2007
Boring Location: Long Island Avenue
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push
Sampling Method: 5 ft Macrocore
Ground Elevation (ft/msl): NA
Total Depth: 10.0 ft bgs
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0	NA							ASPHALT
		0.0				SW		WELL GRADED SAND (SW); fine to coarse sand, <5% angular gravel, brown. WELL GRADED SAND (SW); fine to coarse angular sand and fine angular gravel, black cinders and ash.
		0.0						
-2		0.0				SP		POORLY GRADED SAND (SP); narrowly graded fine to medium subrounded sand, ~15-25% fine rounded and angular gravel, <5% cinders and ash, light brown.
		2.1						POORLY GRADED SAND (SP); fine to medium sand, <5% fine rounded gravel, light brown, very faint NLO.
-4		4.5	SB225 (4-5)					Tar coating and sheen from 4.5-5.8 ft bgs.
	5.0	174						Tar saturated from 5.8-6.0 ft bgs with NLO and sheen. POORLY GRADED SAND (SP); sand with abundant rootlets, light brown, NLO and sheen from 6.1-6.3 ft bgs.
-6						PT		PEAT (PT); dark brown, soft, H2S-like odor.
-8		31.2				SP		POORLY GRADED SAND (SP); fine to medium sand, dark brown to light brown with depth, loose, H2S-like odor.
-10		5.3						

Comments: Soil sample SB225(4-5) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 5.0 ft bgs on May 8, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB226

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: May 7, 2007

Boring Location: Bridge Street

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 10.0 ft bgs

Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0	NA	125				SW		WELL GRADED SAND (SW); fine to medium angular sand and gravel, gray, dry.
		5.0						
-2		1.3				SP		POORLY GRADED SAND (SP); fine to medium sand, <5% gravel, light brown. Wet from 2.7 ft bgs. Black staining from 3.0-3.7 ft bgs, roots from 3.5-3.6 ft bgs. Red brick fragments from 3.7-3.85 ft bgs. POORLY GRADED SAND (SP); fine to medium subrounded sand, loose. Sheen from 4.1-4.35 ft bgs. Tar saturated from 4.2-4.35 ft bgs, with NLO.
		4.3						
-4		3.4	SB226 (4-5)					
	NL	10.3						
-6		19.4				PT		PEAT (PT); brown, soft, strong H2S-like odor.
		7.0				SP		POORLY GRADED SAND (SP); narrowly graded fine to medium subrounded sand, <5% rootlets from 7.4-9.2 ft bgs, brown, loose, moderate H2S-like odor.
-8		8.5						
-10								

Comments: Soil sample SB226(4-5) submitted for BNA, metals and cynanide analysis.

Boring location hand cleared to 2.5 ft bgs on May 4, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB227

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: May 7, 2007

Boring Location: Bridge Street

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 10.0 ft bgs

Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	USCS	Geologic Description
0		8.6			SM	SILTY SAND (SM); silt, <5% sand, light brown, soft, moist.
		0.6				
-2	3.5	0.6			SP	POORLY GRADED SAND (SP); fine to medium sand, <5% fine rounded gravel. Wet from 2.1 ft bgs. Gray staining from 2.8-3.3 ft bgs. Glass fragment at 3.1 ft bgs.
		4.5	SB227 (3.7-5)	3.7-5		
-4		2.5				Slight NLO from 5.0-7.8 ft bgs.
-6	NR	34.6				
-8		12.9			PT	PEAT (PT); dark brown, soft, strong H2S-like odor.
		6.0			SP	POORLY GRADED SAND (SP); fine to medium subrounded sand, <5% rootlets, loose, H2S-like odor.
-10						

Comments: Soil sample SB227(3.7-5) submitted for BNA, metals and cyanide analysis.

Boring location hand cleared to 4.0 ft bgs on May 4, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB228

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: May 9, 2007

Boring Location: Long Island Avenue

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 15.0 ft bgs

Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0	NA	5.9				SP		ASPHALT
		9.7				SW		POORLY GRADED SAND (SP); fine to medium subrounded sand, <5% silt and fine gravel, brown. Tan from 0.6-1.5 ft bgs.
-2		0.7				SP		WELL GRADED SAND (SW); fine to coarse angular sand and fine angular gravel, black cinders and ash.
		65.1						
-4		152						POORLY GRADED SAND (SP); fine to medium sand, <5% fine rounded gravel, brown, wet. Faint NLO and <5% wood fragments from 3.5-3.9 ft bgs. Tar coating with sheen and NLO from 3.9-4.7 ft bgs. Tar saturated from 4.7-4.8 ft bgs. POORLY GRADED SAND (SP); Same as above with gravel. POORLY GRADED SAND (SP); fine to medium sand, <5% rootlets and silt, brown, wet, H2S-like odor.
-6								
	3.0	6.5						
-8								
-10								POORLY GRADED SAND (SP); Same as above with ~30-45% fine rounded gravel from 13.2-13.4 ft bgs and without rootlets.
-12	3.5	2.2						
-14								

Comments: Boring location hand cleared to 4.5 ft bgs on May 9, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB229

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: July 11, 2007

Boring Location: Bridge Street Parking Lot

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 15.0 ft bgs

Logged By: Julia Shackford

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0						SP		Grass and topsoil
		3.1						POORLY GRADED SAND (SP); medium sand, yellow-brown, damp, no impact.
		6.4						POORLY GRADED SAND (SP); medium sand, yellow-brown to black, damp, slight staining and NLO.
-2								POORLY GRADED SAND (SP); medium to fine sand, brown, damp, faint NLO.
	NA	7.2						
		7.0						Wet at 3.5 ft bgs.
-4								POORLY GRADED SAND (SP); medium to fine sand, brown, <5% larger cobbles (1-2" diameter), NLO, tar-coating, and sheen.
		8.9						End pre-clear at 5.0 ft bgs.
		70.3						POORLY GRADED SAND (SP); medium to fine sand, brown, <5% cobbles (1-2" diameter), medium dense to loose, wet, strong NLO and tar-coating.
-6						PT		PEAT (PT); dark brown, soft, abundant rootlets, faint H2S-like odor, damp, no impact.
		0.1						
						SP		POORLY GRADED SAND (SP); medium to fine sand, medium dense to loose, wet, no impact.
	4.0							
-8		1.4						
-10								POORLY GRADED SAND (SP); medium to fine sand, light brown, medium dense, wet, no impact.
		1.3						
-12								
	3.5							
-14								

Comments: Boring location hand cleared to 5 ft bgs on July 11, 2007.

Very humid - high PID readings partially attributed to higher humidity.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB230

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: July 11, 2007

Boring Location: Bridge Street Parking Lot

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 15.0 ft bgs

Logged By: Julia Shackford

Depth (Feet): 0, -2, -4, -6, -8, -10, -12, -14

Recovery (Feet): NA, 4.9, 4.1

PID (ppm): 7.4, 11.7, 14.3, 14.6, 13.0, 9.9, 0.0, 1.3, 1.6

Sample ID: SB-230 (5-6), SB-230 (7.5-10)

USCS	Geologic Description
SP	POORLY GRADED SAND (SP); medium sand, brown, dry, no impact. Yellow from 0.75-1.0 ft bgs, dry, no impact. POORLY GRADED SAND (SP); medium to fine sand and soil, yellow, dry, no impact. POORLY GRADED SAND (SP); medium to fine sand and soil, brown, <5% rootlets, dry to damp, no impact. POORLY GRADED SAND (SP); medium to fine sand, brown to tan, 5-10% larger cobbles (1-2" diameter), wet, very faint NLO, no visual impact. End pre-clear at 5.0 ft bgs. POORLY GRADED SAND (SP); medium sand, gray, <5% fine sand, wet, loose, faint NLO, no visual impact.
PT	PEAT (PT); dark brown, soft, abundant rootlets, H2S-like odor, no impact.
SP	POORLY GRADED SAND (SP); fine to medium sand, medium dense to loose, wet, no impact.

Comments: Soil samples SB230(5-6) and SB230(7.5-10) submitted for BNA, metals and cynaide analysis.
Boring location hand cleared to 5.0 ft bgs on July 11, 2007.
Very humid - high PID readings partially attributed to higher humidity.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB231

Project Name: Sag Harbor Former MGP	**Drilling Method:** Direct Push
Project Number: 01765066	**Sampling Method:** 5 ft Macrocore
Date Started/Completed: July 11, 2007	**Ground Elevation (ft/msl):** NA
Boring Location: Bridge Street Parking Lot	**Total Depth:** 10.0 ft bgs
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Julia Shackford

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0						SP		POORLY GRADED SAND (SP); medium subrounded sand, brown.
		0.0						Yellow from 0.75-1.0 ft bgs.
		0.4						
-2								POORLY GRADED SAND (SP); medium to fine subrounded sand and soil, yellow, faint organic odor.
	NA	0.6						POORLY GRADED SAND (SP); medium to fine sand brown, <5% yellow medium to fine sand, wet, no impact.
		0.5						
-4								
		0.3						End pre-clear at 5.0 ft bgs.
			SB-231 (5-6)					
		0.1						
-6						PT		PEAT (PT); brown, soft, abundant rootlets, H2S-like odor.
	6.0	0.1						
-8			SB-231 (8-10)			SP		POORLY GRADED SAND (SP); medium sand, loose to medium dense, wet, no impact.
		0.4						
-10								

Comments: Soil samples SB231(5-6) and SB231(8-10) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 5.0 ft bgs on July 11, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB232

Project Name: Sag Harbor Former MGP

Project Number: 01765066

Date Started/Completed: July 17, 2007

Boring Location: Long Island Avenue

Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push

Sampling Method: 5 ft Macrocore

Ground Elevation (ft/msl): NA

Total Depth: 15.0 ft bgs

Logged By: Julia Shackford/ Gemma Kirkwood

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	USCS	Geologic Description
0				SP	ASPHALT
		9.6			
					POORLY GRADED SAND (SP); medium to fine sand, <5% pebbles (0.5" diameter), light brown to brown, dry, no impact.
		7.7			POORLY GRADED SAND (SP); medium to fine sand, <5% pebbles (0.5" diameter), brown to gray-brown, dry, no impact.
-2					
	NA	13.0			POORLY GRADED SAND (SP); medium to fine sand, <5% rootlets, brown to gray-brown, damp, no impact.
					POORLY GRADED SAND (SP); medium to fine sand, brown to gray-brown, wet, no impact.
		11.6			Wet at 4.0 ft bgs.
-4					POORLY GRADED SAND (SP); medium sand, ~10-20% fine sand, dark brown, wet, no impact.
		11.6			
			SB-232 (5-6)		End pre-clear at 5.0 ft bgs.
		1.5			POORLY GRADED SAND (SP); medium to fine sand, <5% pebbles and rootlets, black to brown, medium dense to dense, wet, no impact.
-6		0.8			POORLY GRADED SAND (SP); medium to fine sand, <5% rootlets, brown to gray-brown, medium dense to dense, wet, no impact.
	4.6				POORLY GRADED SAND (SP); medium to fine sand, brown to light brown, medium dense to dense, wet, faint NLO.
-8		2.1			
		2.6			POORLY GRADED SAND (SP); medium to fine sand, brown to light brown, dense to medium dense, wet, no impact.
-10			SB-232 (10-12)		POORLY GRADED SAND (SP); medium to fine sand, light brown, dense to medium dense, wet, no impact.
-12	4.4	1.5			
-14					

Comments: Soil samples SB232(5-6) and SB232(10-12) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 5.0 ft bgs on July 17, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB233

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: July 17, 2007
Boring Location: Long Island Avenue
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push
Sampling Method: 5 ft Macrocore
Ground Elevation (ft/msl): NA
Total Depth: 15.0 ft bgs
Logged By: Julia Shackford/ Gemma Kirkwood

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0	NA					SP		ASPHALT
		9.1						POORLY GRADED SAND (SP); medium to fine sand, brown, ~10-20% clay at 1.0 ft bgs, brown to gray, medium soft to stiff, <5% pebbles (0.5" diameter), dry, no impact.
-2		11.7						POORLY GRADED SAND (SP); medium to fine sand, dark brown to black, <5% clay, brown, medium soft, damp, no impact.
		13.5						POORLY GRADED SAND (SP); medium to fine sand, <5% pebbles (0.5-1" diameter), dark brown to black, wet, no impact. Wet at 3.0 ft bgs.
		7.1						SAA with smaller pebbles (0.5" diameter), wet, no impact.
-4		10.8						POORLY GRADED SAND (SP); medium to fine sand, wet, faint NLO, blebs, and sheen. End pre-clear at 5.0 ft bgs.
-6	4.8	4.4						POORLY GRADED SAND (SP); medium to coarse sand, <5% fine sand and rootlets, loose, wet, no odor, blebs from 5.0-6.6 ft bgs.
-8		2.5						POORLY GRADED SAND (SP); medium to fine sand, brown, loose to medium dense with depth, wet, no visual impact, faint NLO from 8.9-9.8 ft bgs.
-10								POORLY GRADED SAND (SP); medium to fine sand, <5% pebbles (0.5" diameter), medium dense, wet, no impact. SAA with <5% coarse sand from 13.1-13.4 ft bgs.
-12	4.3	0.6						
-14								

Comments: Boring location hand cleared to 5.0 ft bgs on July 17, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB234

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: July 17, 2007
Boring Location: Long Island Avenue
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push
Sampling Method: 5 ft Macrocore
Ground Elevation (ft/msl): NA
Total Depth: 15.0 ft bgs
Logged By: Julia Shackford/ Gemma Kirkwood

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0	NA					SP		ASPHALT
		3.5						POORLY GRADED SAND (SP); medium sand, <5% pebbles (0.5-1" diameter), light brown, dry, no impact.
-2		2.6						SAA but damp.
		4.8						
		10.7						Wet at 3.5 ft bgs.
-4		5.9						SAA with smaller pebbles (0.5" diameter), wet, no impact.
	4.8		SB-234 (5-6)					End pre-clear at 5.0 ft bgs. POORLY GRADED SAND (SP); medium to coarse sand, <5% fine sand and pebbles (0.25-0.5" diameter), very dark brown, loose, wet, no impact.
-6		0.0						POORLY GRADED SAND (SP); medium to fine sand, light brown, loose to medium dense to dense with depth, wet, no impact.
-8		0.0						
-10	4.2		SB-234 (10-12)					SAA but dense with faint organic odor.
-12		0.0						
-14								

Comments: Soil samples SB234(5-6) and SB234(10-12) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 5.0 ft bgs on July 17, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB235

Project Name:	Sag Harbor Former MGP	**Drilling Method:**	Direct Push
Project Number:	01765066	**Sampling Method:**	5 ft Macrocore
Date Started/Completed:	July 17, 2007	**Ground Elevation (ft/msl):**	NA
Boring Location:	Long Island Avenue	**Total Depth:**	15.0 ft bgs
Drilling Company:	Fenley & Nicol Environmental, Inc.	**Logged By:**	Julia Shackford/ Gemma Kirkwood

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0	NA					SP		ASPHALT
		0.0						POORLY GRADED SAND (SP); medium sand, ~10-20% fine sand, <5% pebbles, yellow-brown to light brown, dry, no impact.
-2		0.0						POORLY GRADED SAND (SP); medium to fine sand, <5% pebbles, yellow-brown to light brown, dry, no impact.
		0.0						POORLY GRADED SAND (SP); medium sand, <5% fine sand, clay, and pebbles, yellow-brown to light brown, dry, no impact.
		2.8						Damp at 3.0 ft bgs.
-4		3.2						POORLY GRADED SAND (SP); medium sand, ~10-20% fine sand, <5% pebbles, wet, faint NLO, no visible impact. Wet at 4.5 ft bgs. End pre-clear at 5.0 ft bgs.
-6	2.6	0.2						POORLY GRADED SAND (SP); medium to fine sand, ~10-15% silt, <5% pebbles, very dark brown, loose, wet, moderate NLO, no visible impact.
		0.0	SB-235 (6.5-7.5)					POORLY GRADED SAND (SP); fine to medium sand, light brown, loose to medium dense, wet, faint NLO, no visible impact.
-8								
-10	4.0		SB-235 (10-12)					POORLY GRADED SAND (SP); medium to fine sand, light brown, medium dense to dense with depth, wet, faint NLO, no visual impact.
-12		0.5						
-14								Slightly darker discolored narrow vertical band from 13.4-14 ft bgs.

Comments: Soil samples SB235(6.5-7.5) and SB235(10-12) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 5.0 ft bgs on July 17, 2007.

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Boring ID: SB236

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: July 17, 2007
Boring Location: Long Island Avenue
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push
Sampling Method: 5 ft Macrocore
Ground Elevation (ft/msl): NA
Total Depth: 15.0 ft bgs
Logged By: Julia Shackford/ Gemma Kirkwood

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	USCS	Visual Impacts	Geologic Description
0	NA	0.0			SP		ASPHALT
		0.9					POORLY GRADED SAND (SP); medium sand, <5% fine sand and pebbles, light brown, dry, no impact.
-2		2.5					Damp at 2.0 ft bgs.
		2.5					SAA with fewer pebbles and faint organic odor.
-4		1.7					Wet at 4.0 ft bgs. SAA with <5% roots and no odor.
	4.8						End pre-clear at 5 ft bgs. POORLY GRADED SAND (SP); medium sand, <5% pebbles, very dark brown, loose, wet, faint organic odor, no visible impact.
-6		0.0	SB-236 (6-7)	6-7			
-8		0.0			PT		PEAT (PT); <5% medium sand and roots, dark brown to black, soft, wet, slight NLO and organic odor, no visible impact.
		0.6			SP		POORLY GRADED SAND (SP); medium sand, <5% pebbles from 8.1-8.4 ft bgs, light brown, medium dense, wet, slight NLO, no visible impact.
-10	5.0		SB-236 (10-12)	10-12			
-12		1.1					
-14							

Comments: Soil samples SB236(6-7) and SB236(10-12) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 5 ft bgs on July 17, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB237

Project Name: Sag Harbor Former MGP
Project Number: 01765066
Date Started/Completed: July 17, 2007
Boring Location: Long Island Avenue
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Direct Push
Sampling Method: 5 ft Macrocore
Ground Elevation (ft/msl): NA
Total Depth: 15.0 ft bgs
Logged By: Julia Shackford/ Gemma Kirkwood

Depth (Feet)	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0								ASPHALT
	NA	7.3				SP		POORLY GRADED SAND (SP); medium to fine sand, <5% pebbles and wood fragments, light to dark brown, dry, no impact. POORLY GRADED SAND (SP); medium sand, <5% pebbles, dark brown, dry, no impact.
		1.3						
-2			SB-237 (2-3)					
		0.0				PT		PEAT (PT); <5% roots, dark brown to black, soft, wet, faint organic odor, no visible impact.
		0.0				SP		
-4								POORLY GRADED SAND (SP); medium sand, <5% pebbles, light to dark brown, damp, no impact. Wet at 4.0 ft bgs. End pre-clear at 5.0 ft bgs. POORLY GRADED SAND (SP); medium sand, <5% fine sand and pebbles, very dark brown, loose, wet, no impact. POORLY GRADED SAND (SP); medium to fine sand, light brown, medium dense, wet, no impact.
		0.0						
-6		0.0						
			SB-237 (7-8)					
-8	4.8	0.0						
-10								POORLY GRADED SAND (SP); fine to medium sand, light brown, medium dense, wet, very faint NLO, no visible impact.
						SW		WELL GRADED SAND (SW); fine to coarse sand, <5% pebbles (<0.5" diameter), light brown, medium dense, wet, very faint NLO, no visible impact.
-12						SP		POORLY GRADED SAND (SP); fine to medium sand, light brown, medium dense, wet, very faint NLO, no visible impact.
	4.2							
		2.0						
-14								

Comments: Soil samples SB237(2-3) and SB237(7-8) submitted for BNA, metals and cyanide analysis.
Boring location hand cleared to 5.0 ft bgs on July 17, 2007.

Appendix D

PDI Geotechnical Results (CD format)

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1145 Massachusetts Avenue
Boxborough, MA 01719
978 635 0424 Tel
978 635 0266 Fax

Geotechnical Test Report

April 24, 2007

GTX-7416
Sag Harbor Former MGP Project

Sag Harbor, NY

Prepared for:

RETEC

STRATEGIC
ENVIRONMENTAL
MANAGEMENT

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID: ---		Sample Type:	---	Tested By:	mll
Sample ID:---		Test Date:	04/24/07	Checked By:	n/a
Depth : ---		Sample Id:	---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	Corn 10%	---	Moist, very dark grayish brown silt with organics	32.8
---	Polymer 2%	---	Moist, dark olive brown silt with organics	37.1
---	Quicklime 10%	---	Moist, gray silty sand	23
---	Quicklime 15%	---	Moist, dark gray sand	20.7
---	Quicklime 20%	---	Moist, gray sand	22.9

Notes: Temperature of Drying : 110° Celsius

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GeoTesting express

a subsidiary of Geocomp Corporation

Client:	The Retec Group
Project Name:	Sag Harbor Former MGP
Project Location:	Sag Harbor, NY
GTX #:	7416
Test Date:	04/20/07
Tested By:	jbr
Checked By:	jdt

Bulk Density of Soil

Boring ID	Sample ID	Depth ft	Visual Description	Bulk Density lb/ft^3	Moisture Content %	Dry Density lb/ft^3
---	Quicklime 10%	---	Moist, gray silty sand	107	23	87
---	Polymer 2%	---	Moist, dark olive brown silt with organics	83	37	61
---	Corn 10%	---	Moist, very dark grayish brown silt with organics	85	33	64
---	Quicklime 15%	---	Moist, dark gray sand	103	21	85
---	Quicklime 20%	---	Moist, gray sand	102	23	83

Notes: Density determined on disturbed samples by hand compacting into a container of known volume, measuring mass of soil and calculating.

Moisture content determined by ASTM D 2216 at 110° C

GeoTesting express
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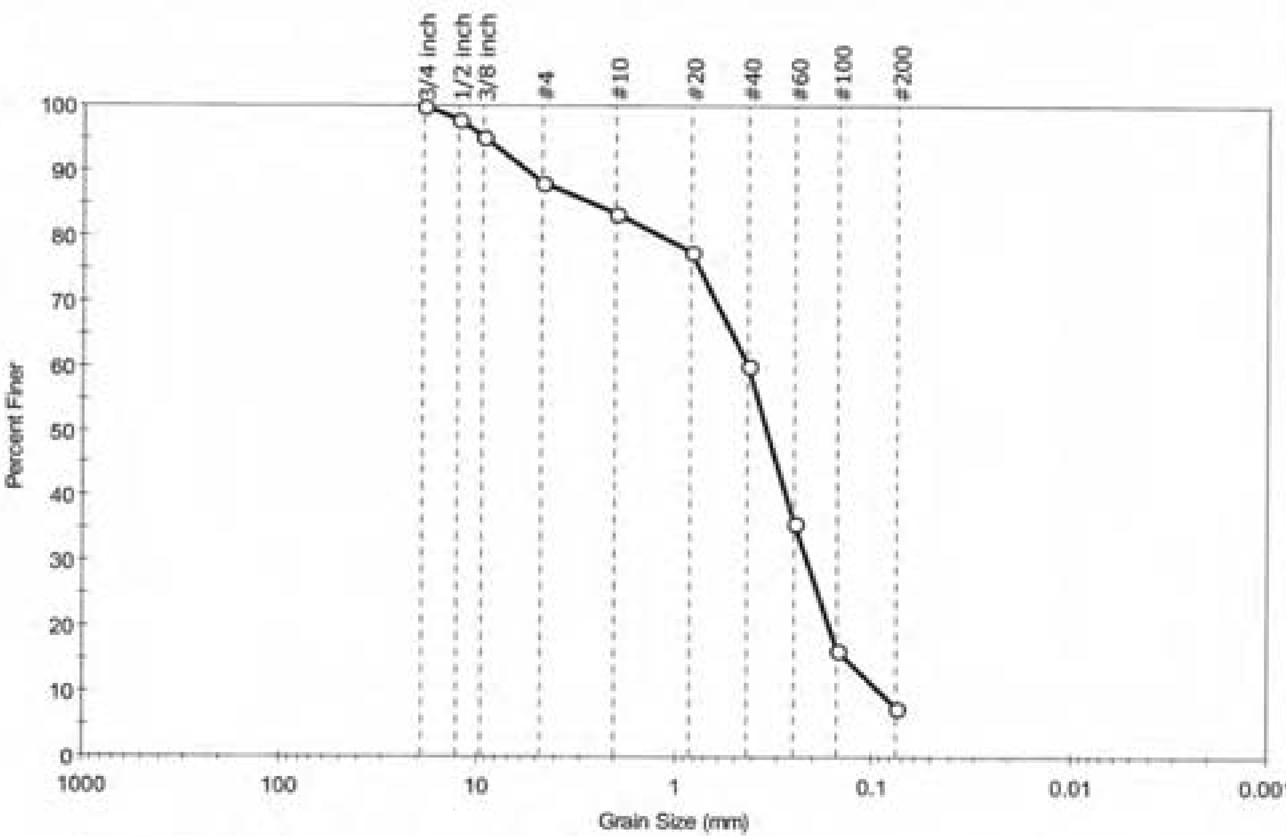
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB212	Test Date:	04/20/07	Checked By:	jdt
Depth :	14-18 ft	Test Id:	110600		

Test Comment: ---
Sample Description: Moist, brown sand with silt
Sample Comment: ---

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	11.7	80.7	7.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/4 inch	19.00	100		
1/2 inch	12.70	98		
3/8 inch	9.51	95		
#4	4.75	88		
#10	2.00	84		
#20	0.84	78		
#40	0.42	60		
#60	0.25	36		
#100	0.15	17		
#200	0.075	8		

Coefficients

D_{85} =2.6002 mm
D_{30} =0.2132 mm
D_{60} =0.4244 mm
D_{15} =0.1321 mm
D_{50} =0.3405 mm
D_{10} =0.0903 mm
C_u =4.700
C_c =1.186

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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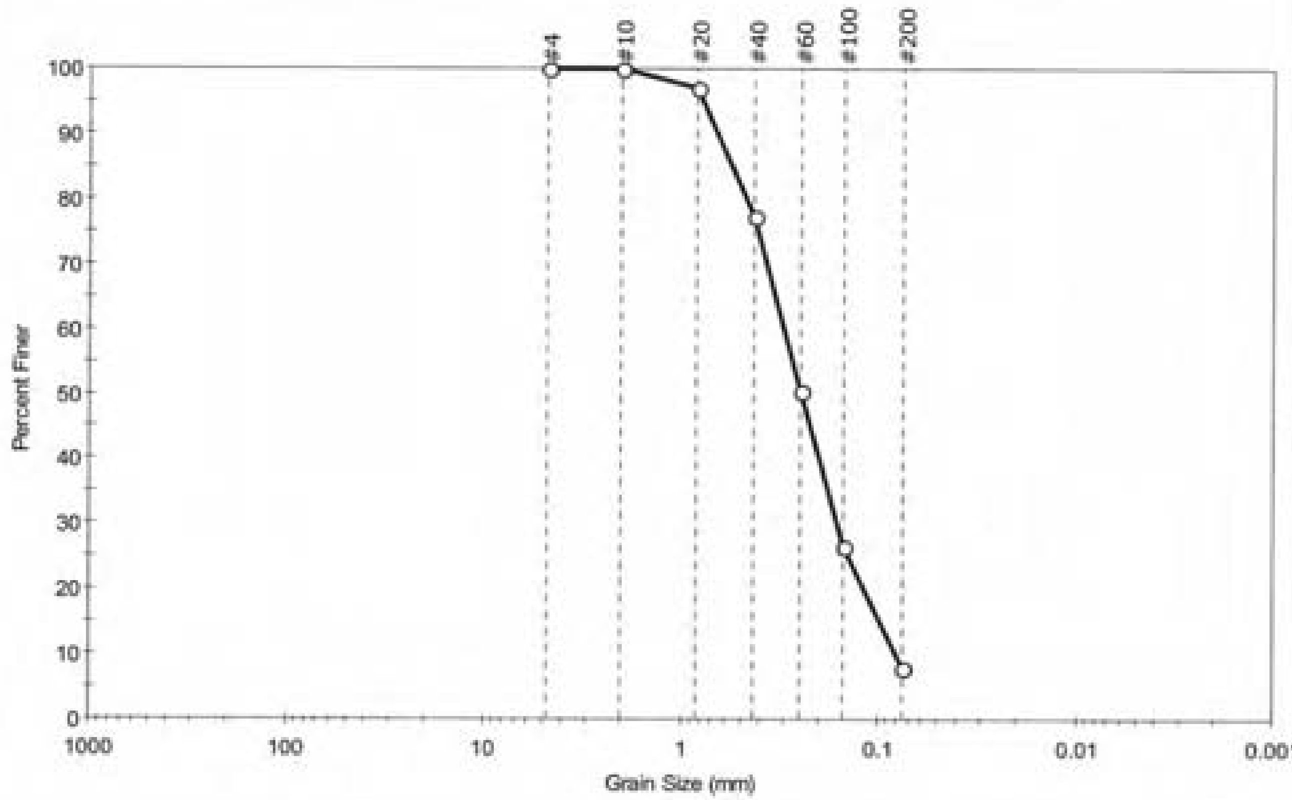
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB212	Test Date:	04/23/07	Checked By:	jdt
Depth :	22-26 ft	Test Id:	110601		
Test Comment:	---				
Sample Description:	Moist, brown sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	92.0	8.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	97		
#40	0.42	77		
#60	0.25	50		
#100	0.15	27		
#200	0.075	8		

Coefficients

D_{85} =0.5562 mm | D_{30} =0.1606 mm

D_{60} =0.3026 mm | D_{15} =0.0972 mm

D_{50} =0.2484 mm | D_{10} =0.0808 mm

C_u =3.745 | C_c =1.055

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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GeoTesting express
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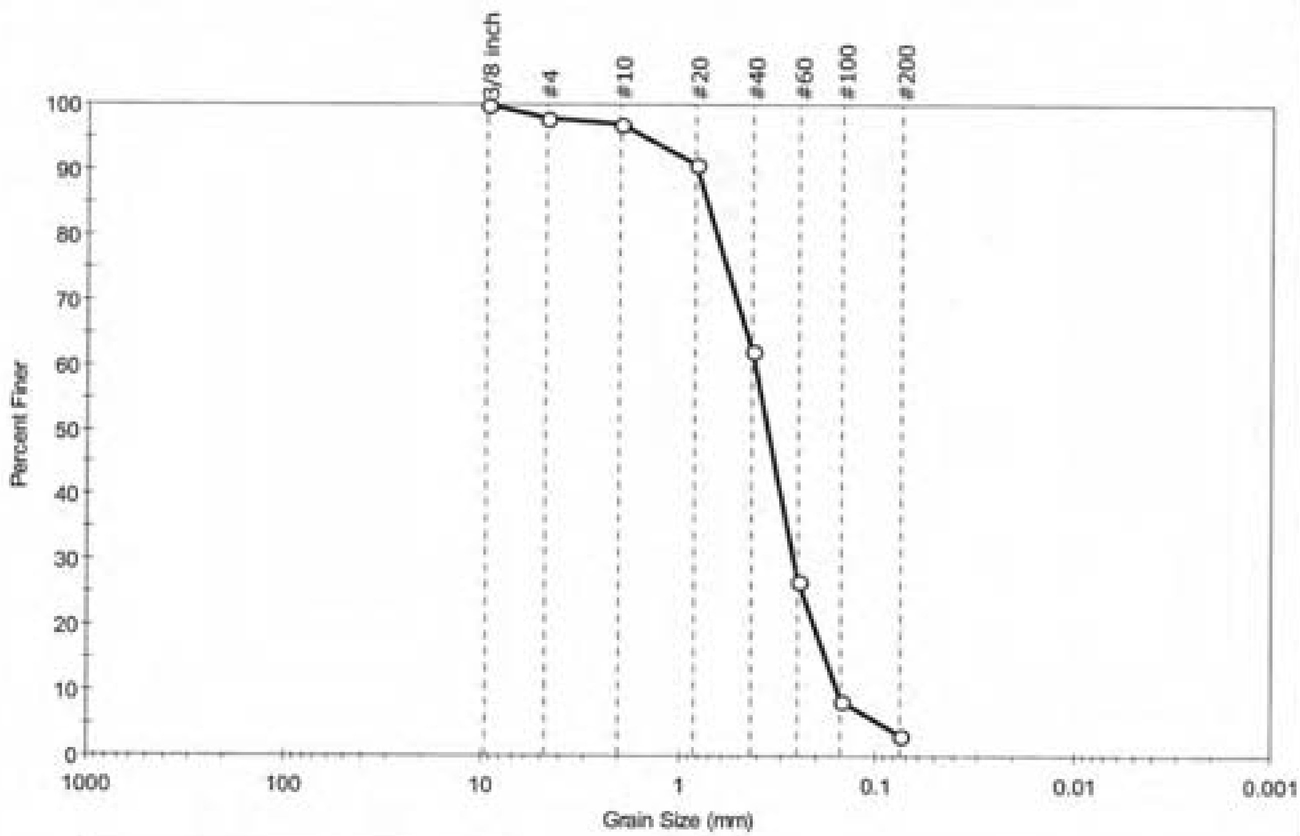
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID: ---		Sample Type:	bag	Tested By:	mll
Sample ID:SB214		Test Date:	04/23/07	Checked By:	jdt
Depth : 16-20 ft		Test Id:	110602		
Test Comment:	---				
Sample Description:	Moist, dark yellowish brown sand				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	2.1	94.5	3.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	98		
#10	2.00	97		
#20	0.84	91		
#40	0.42	62		
#60	0.25	27		
#100	0.15	9		
#200	0.075	3		

Coefficients

D_{85} =0.7307 mm D_{30} =0.2626 mm

D_{60} =0.4106 mm D_{15} =0.1791 mm

D_{50} =0.3537 mm D_{10} =0.1553 mm

C_u =2.644 C_c =1.081

Classification

ASTM Poorly graded sand (SP)

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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GeoTesting express
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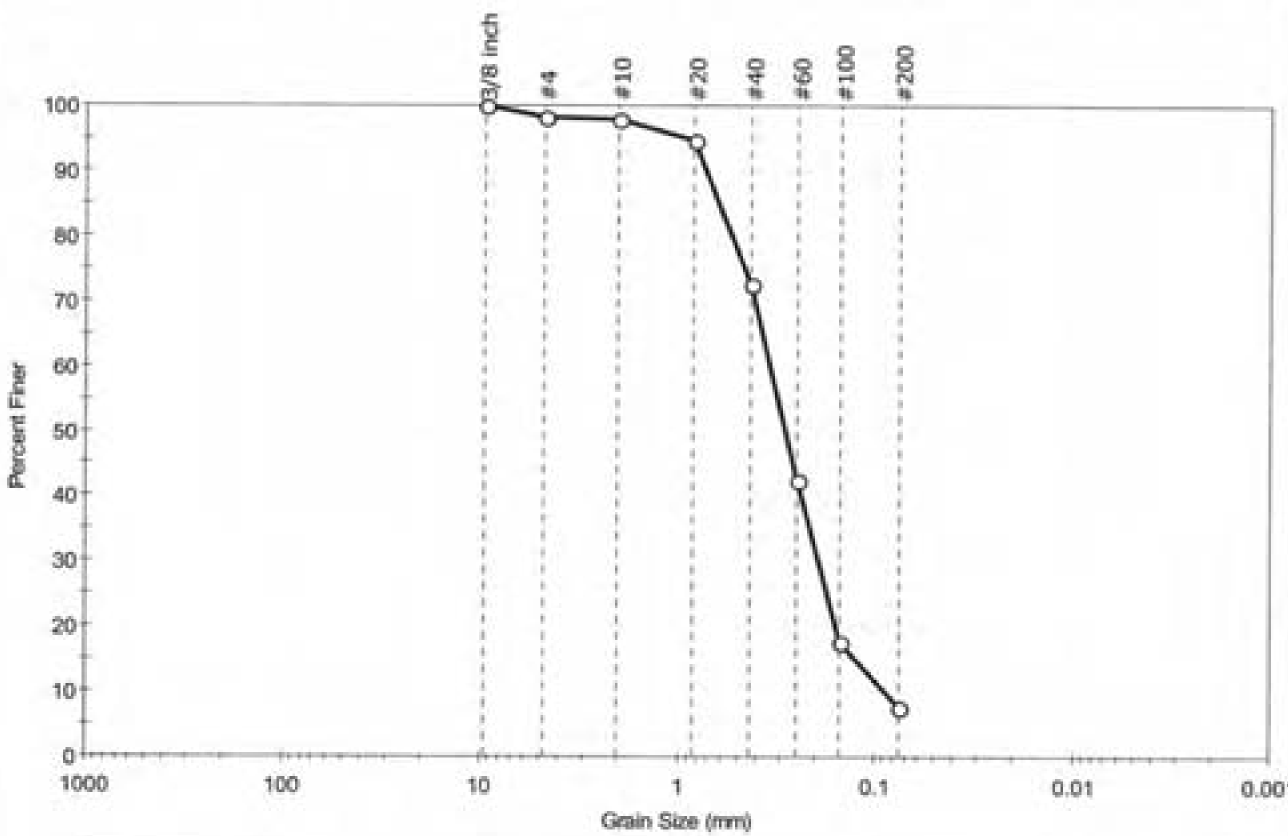
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID: ---		Sample Type:	bag	Tested By:	mll
Sample ID:	SB214	Test Date:	04/23/07	Checked By:	jdt
Depth :	26-30 ft	Test Id:	110603		
Test Comment:	---				
Sample Description:	Moist, light yellowish brown sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	1.8	90.6	7.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	98		
#10	2.00	98		
#20	0.84	95		
#40	0.42	73		
#60	0.25	42		
#100	0.15	18		
#200	0.075	8		

Coefficients

D_{85} =0.6231 mm
D_{30} =0.1928 mm
D_{60} =0.3407 mm
D_{15} =0.1241 mm
D_{50} =0.2857 mm
D_{10} =0.0884 mm
C_u =3.854
C_c =1.234

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape :

Sand/Gravel Hardness :

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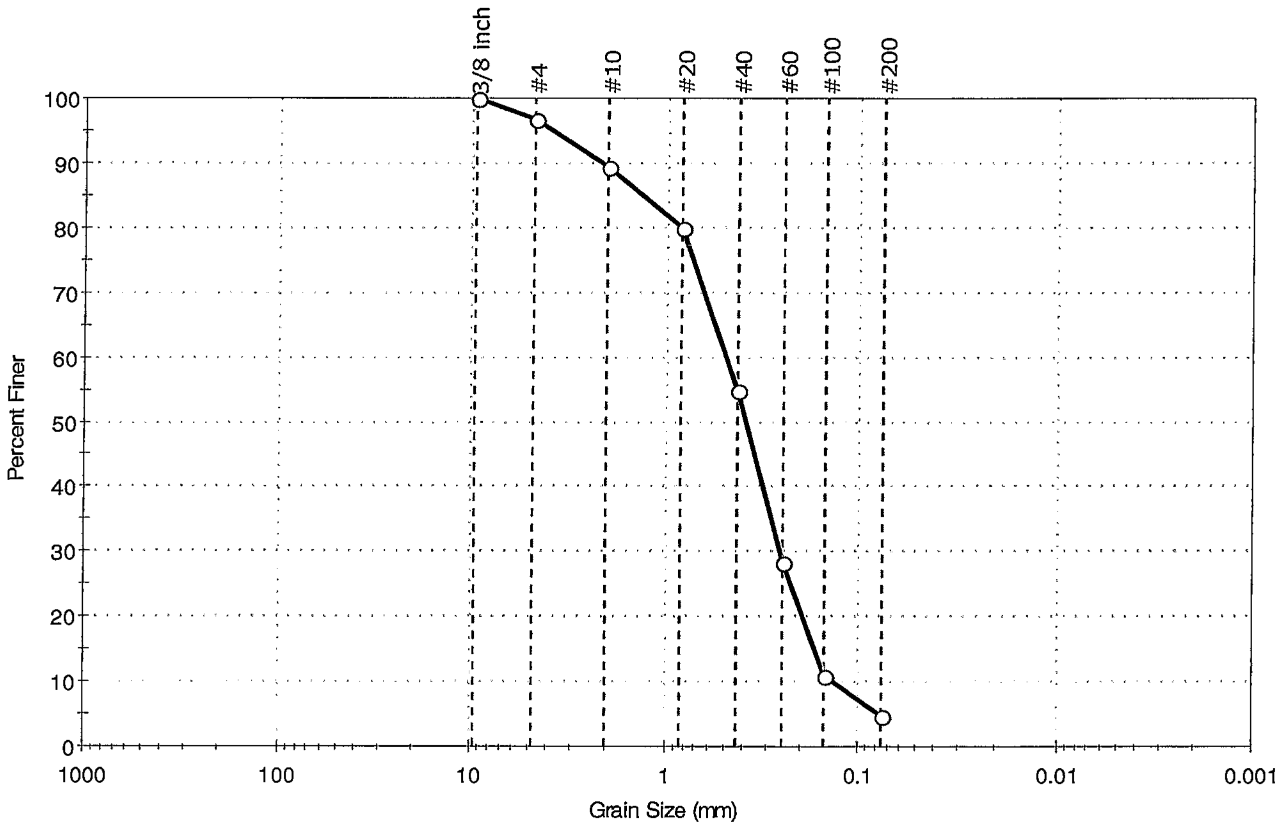
Client: The Retec Group, Inc			
Project: Sag Harbor Former MGP			
Location: Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID: SB218	Test Date: 04/24/07	Checked By:	jdt
Depth : 16-20 ft	Test Id: 110675		
Test Comment: ---			
Sample Description: Moist, dark grayish brown sand			
Sample Comment: ---			

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	3.2	92.0	4.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	97		
#10	2.00	89		
#20	0.84	80		
#40	0.42	55		
#60	0.25	28		
#100	0.15	11		
#200	0.075	5		

Coefficients

D_{85} =1.3499 mm　　D_{30} =0.2582 mm

D_{60} =0.4876 mm　　D_{15} =0.1684 mm

D_{50} =0.3847 mm　　D_{10} =0.1353 mm

C_u =3.604　　C_c =1.011

Classification

ASTM　Poorly graded sand (SP)

AASHTO　Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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GeoTesting express
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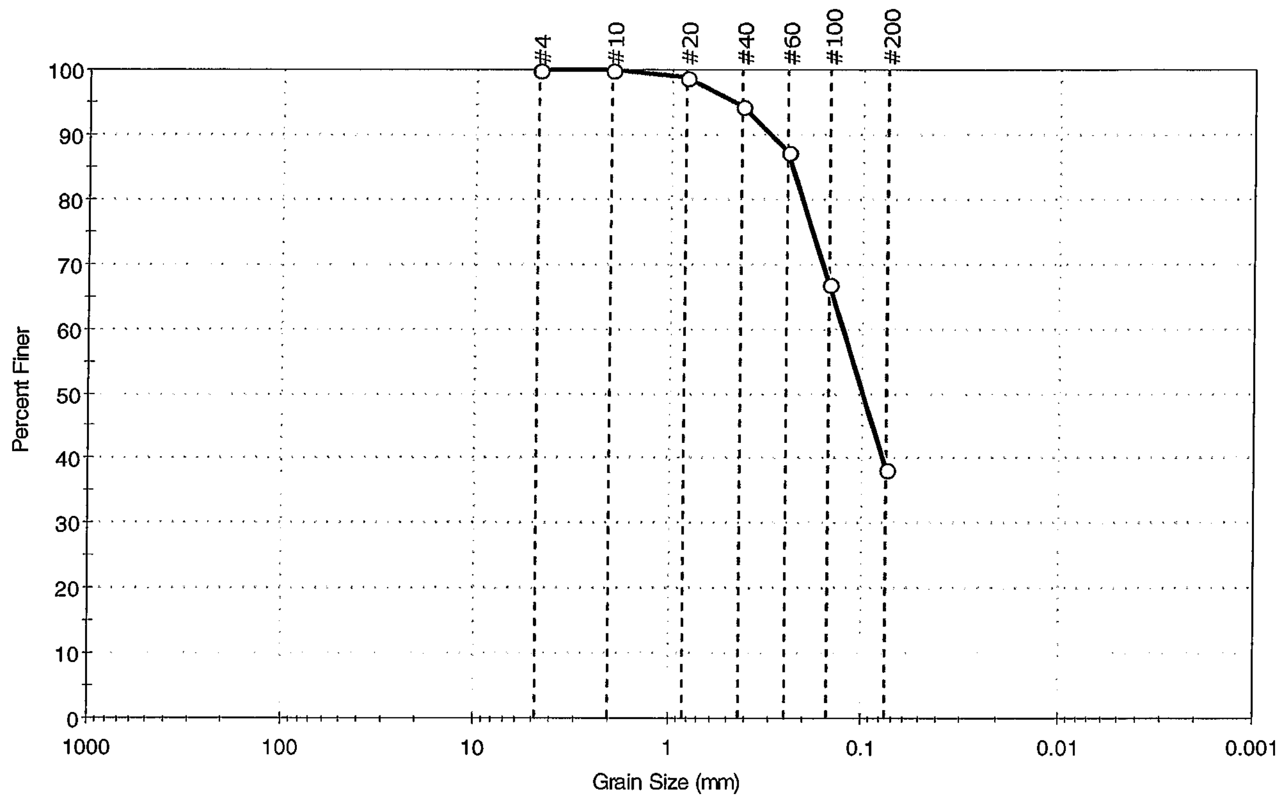
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB218	Test Date:	04/24/07	Checked By:	jdt
Depth :	23.2-24 ft	Test Id:	110676		

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

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	61.6	38.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	99		
#40	0.42	94		
#60	0.25	87		
#100	0.15	67		
#200	0.075	38		

Coefficients

D_{85} = 0.2356 mm　　D_{30} = N/A
D_{60} = 0.1260 mm　　D_{15} = N/A
D_{50} = 0.0991 mm　　D_{10} = N/A
C_u = N/A　　C_c = N/A

Classification

ASTM　N/A

AASHTO　Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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GeoTesting express
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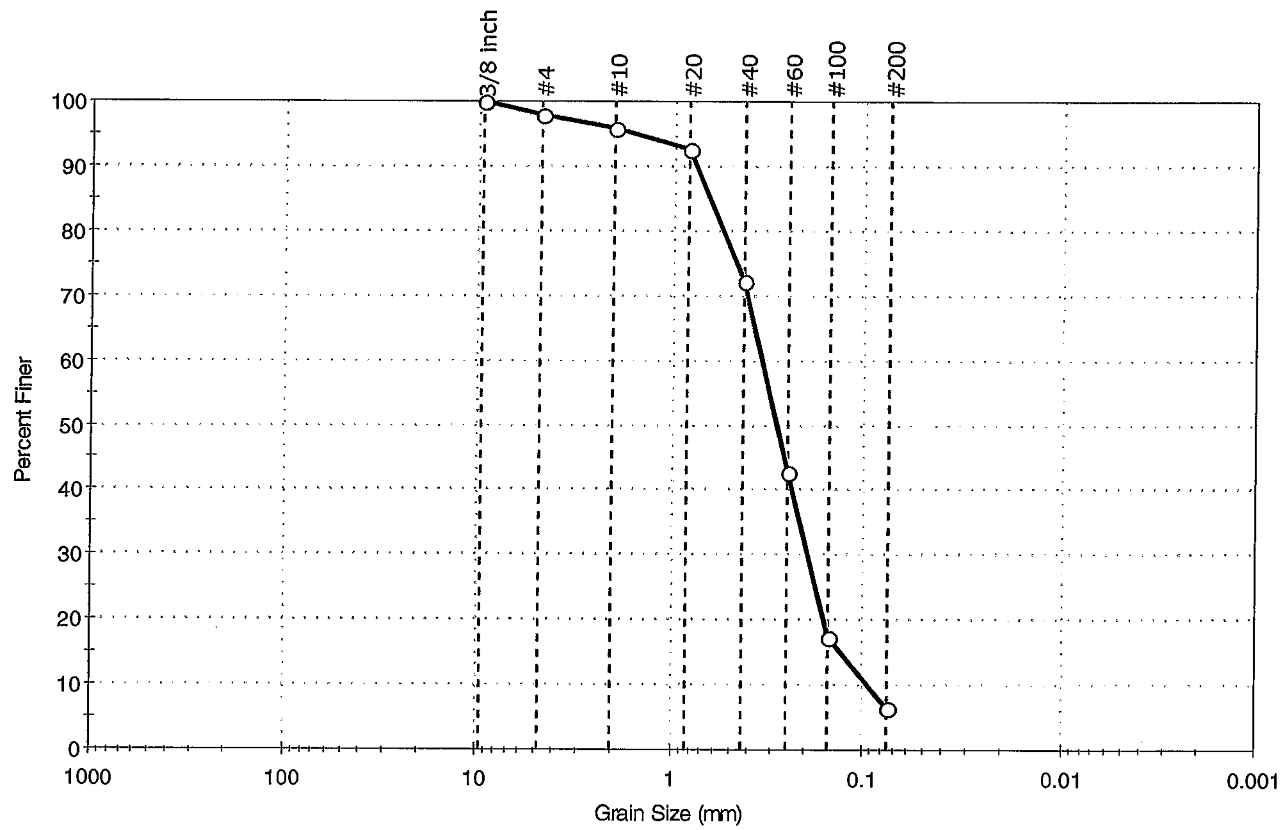
Client: The Retec Group, Inc			
Project: Sag Harbor Former MGP			
Location: Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID:SB201	Test Date: 04/26/07	Checked By:	jdt
Depth : 14-18 ft	Test Id: 110796		

Test Comment: ---
Sample Description: Wet, dark yellowish brown sand with silt
Sample Comment: ---

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	2.0	91.5	6.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	98		
#10	2.00	96		
#20	0.84	93		
#40	0.42	72		
#60	0.25	43		
#100	0.15	17		
#200	0.075	6		

Coefficients

D_{85} =0.6497 mm D_{30} =0.1930 mm
D_{60} =0.3408 mm D_{15} =0.1289 mm
D_{50} =0.2849 mm D_{10} =0.0939 mm
C_u =3.629 C_c =1.164

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape :

Sand/Gravel Hardness :

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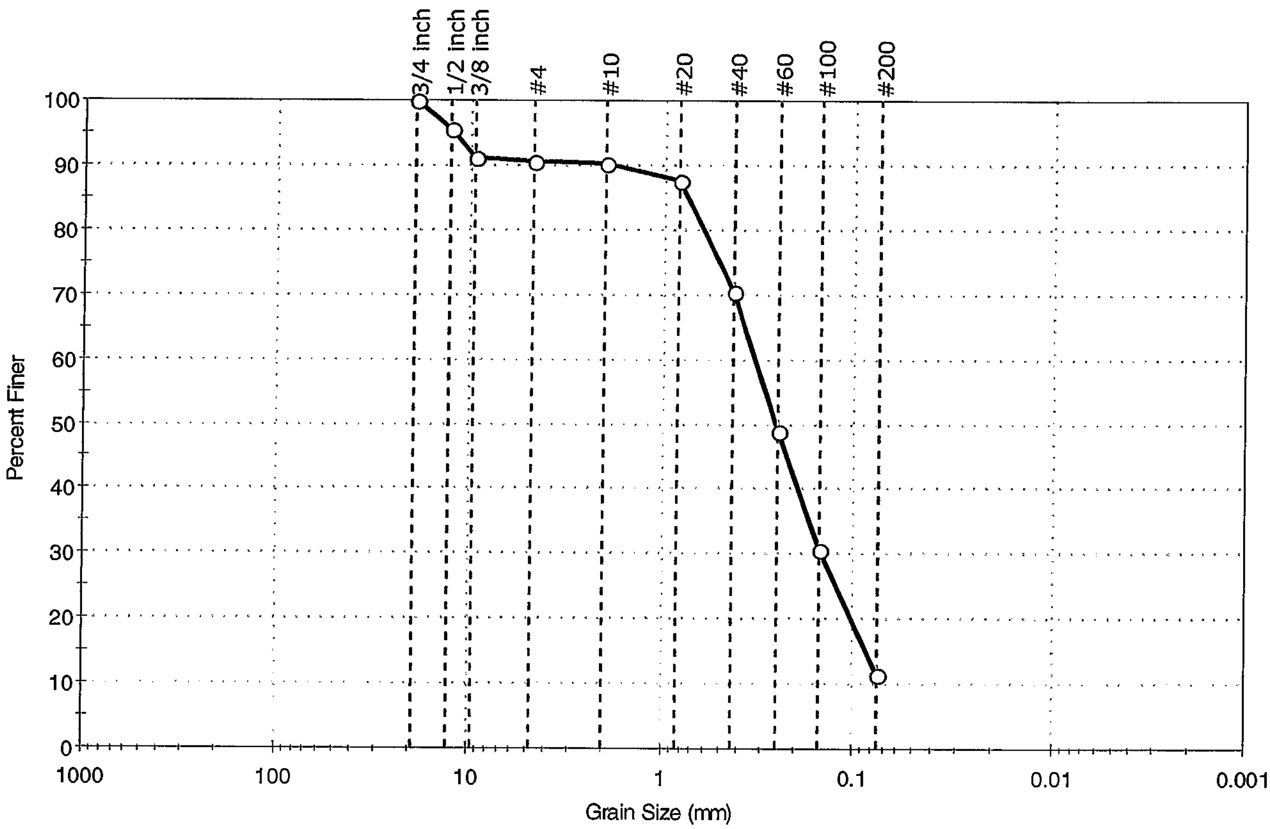
Client: The Retec Group, Inc			
Project: Sag Harbor Former MGP			
Location: Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID:SB201	Test Date: 04/27/07	Checked By:	jdt
Depth : 26-30 ft	Test Id: 110797		

Test Comment: ---
Sample Description: Wet, light yellowish brown sand with silt
Sample Comment: ---

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	9.6	79.0	11.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/4 inch	19.00	100		
1/2 inch	12.70	96		
3/8 inch	9.51	91		
#4	4.75	90		
#10	2.00	90		
#20	0.84	88		
#40	0.42	70		
#60	0.25	49		
#100	0.15	31		
#200	0.075	11		

Coefficients

D_{85} = 0.7548 mm
D_{30} = 0.1460 mm
D_{60} = 0.3287 mm
D_{15} = 0.0852 mm
D_{50} = 0.2567 mm
D_{10} = 0.0713 mm
C_u = 4.610
C_c = 0.910

Classification

ASTM N/A

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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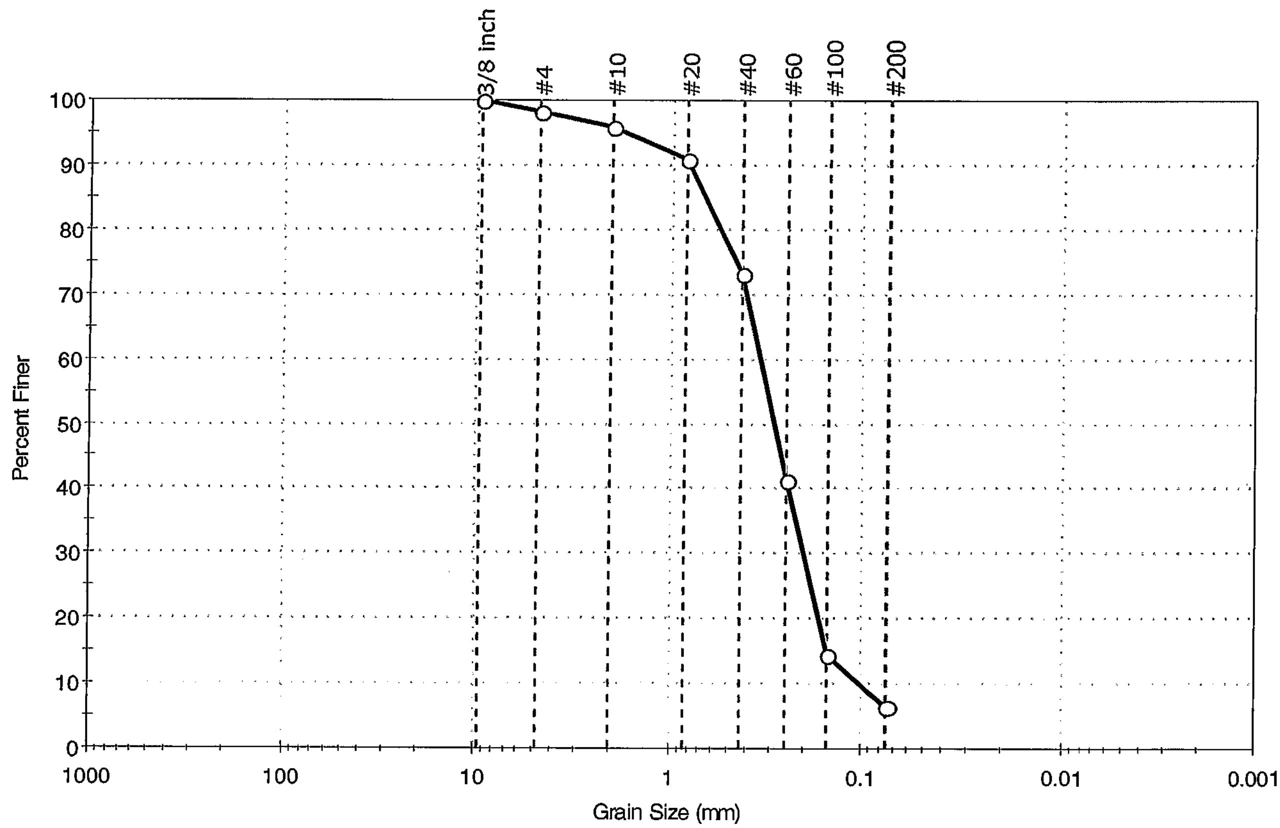
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID: ---		Sample Type:	bag	Tested By:	mll
Sample ID:	SB208	Test Date:	04/27/07	Checked By:	jdt
Depth :	12-16 ft	Test Id:	110798		
Test Comment:	---				
Sample Description:	Wet, dark brown sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	1.7	91.8	6.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	98		
#10	2.00	96		
#20	0.84	91		
#40	0.42	73		
#60	0.25	41		
#100	0.15	15		
#200	0.075	7		

Coefficients

D_{85} =0.6696 mm | D_{30} =0.2011 mm

D_{60} =0.3413 mm | D_{15} =0.1503 mm

D_{50} =0.2892 mm | D_{10} =0.1009 mm

C_u =3.383 | C_c =1.174

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

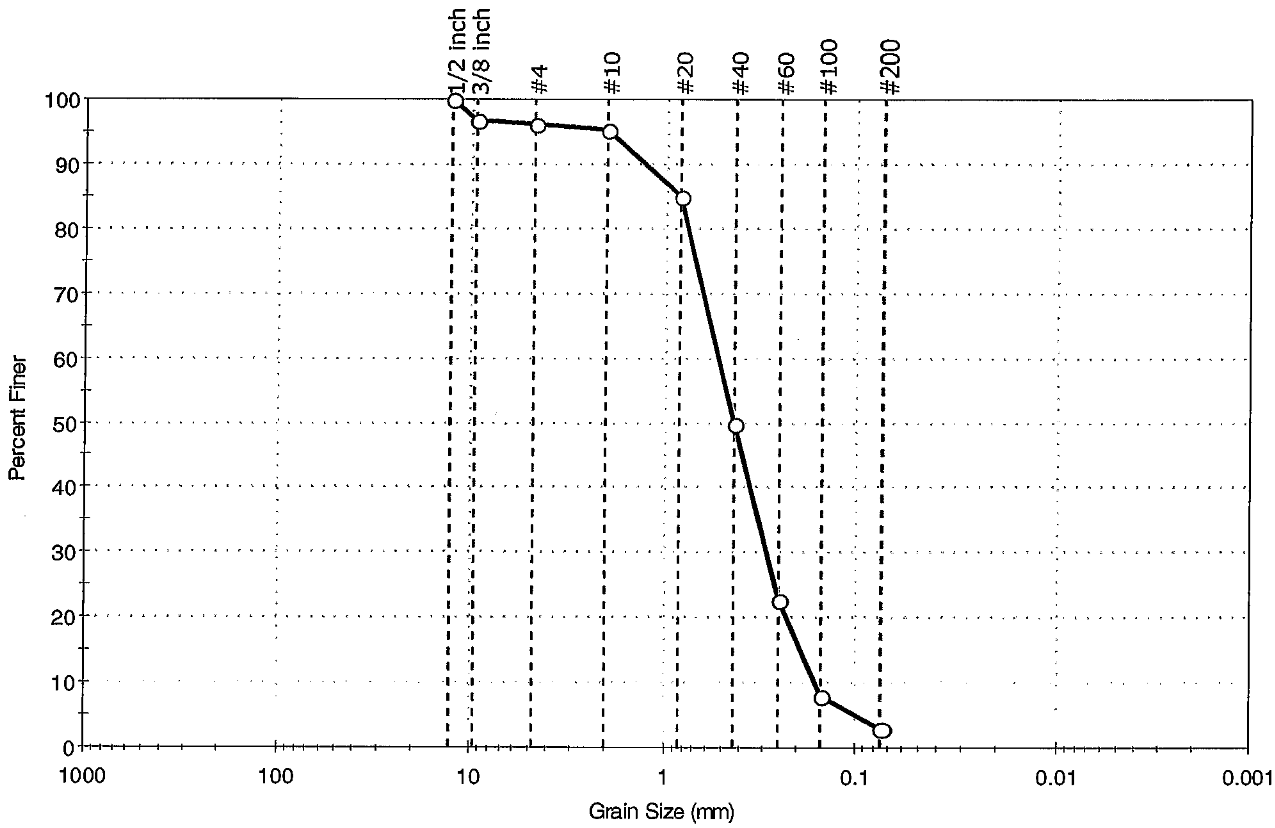
printed 4/27/2007 12:25:15 PM

GeoTesting express
a subsidiary of Geocomp Corporation

Client: The Retec Group, Inc			
Project: Sag Harbor Former MGP			
Location: Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID:SB208	Test Date: 04/26/07	Checked By:	jdt
Depth : 26-30 ft	Test Id: 110799		

Test Comment: ---
Sample Description: Wet, light gray sand
Sample Comment: ---

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	3.9	93.0	3.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1/2 inch	12.70	100		
3/8 inch	9.51	97		
#4	4.75	96		
#10	2.00	95		
#20	0.84	85		
#40	0.42	50		
#60	0.25	23		
#100	0.15	8		
#200	0.075	3		

Coefficients

D_{85} =0.8405 mm D_{30} =0.2882 mm
D_{60} =0.5165 mm D_{15} =0.1904 mm
D_{50} =0.4251 mm D_{10} =0.1595 mm
C_u =3.238 C_c =1.008

Classification

ASTM   Poorly graded sand (SP)

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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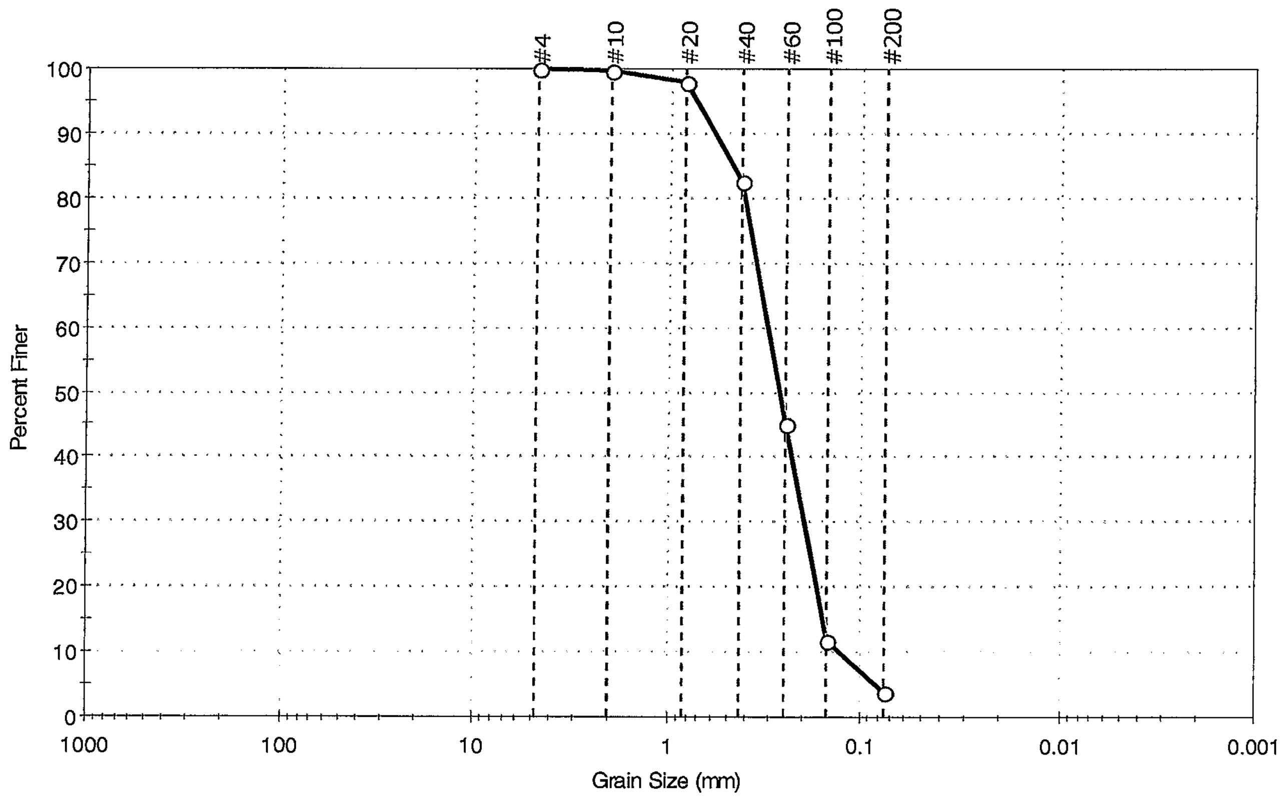
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID: ---		Sample Type:	bag	Tested By:	mll
Sample ID:SB203		Test Date:	04/26/07	Checked By:	jdt
Depth :	12-16 ft	Test Id:	110800		
Test Comment:	---				
Sample Description:	Wet, dark brown sand				
Sample Comment:	--				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	96.1	3.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	98		
#40	0.42	83		
#60	0.25	45		
#100	0.15	12		
#200	0.075	4		

Coefficients

D_{85} =0.4701 mm	D_{30} =0.1977 mm
D_{60} =0.3082 mm	D_{15} =0.1569 mm
D_{50} =0.2676 mm	D_{10} =0.1286 mm
C_u =2.397	C_c =0.986

Classification

ASTM Poorly graded sand (SP)

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

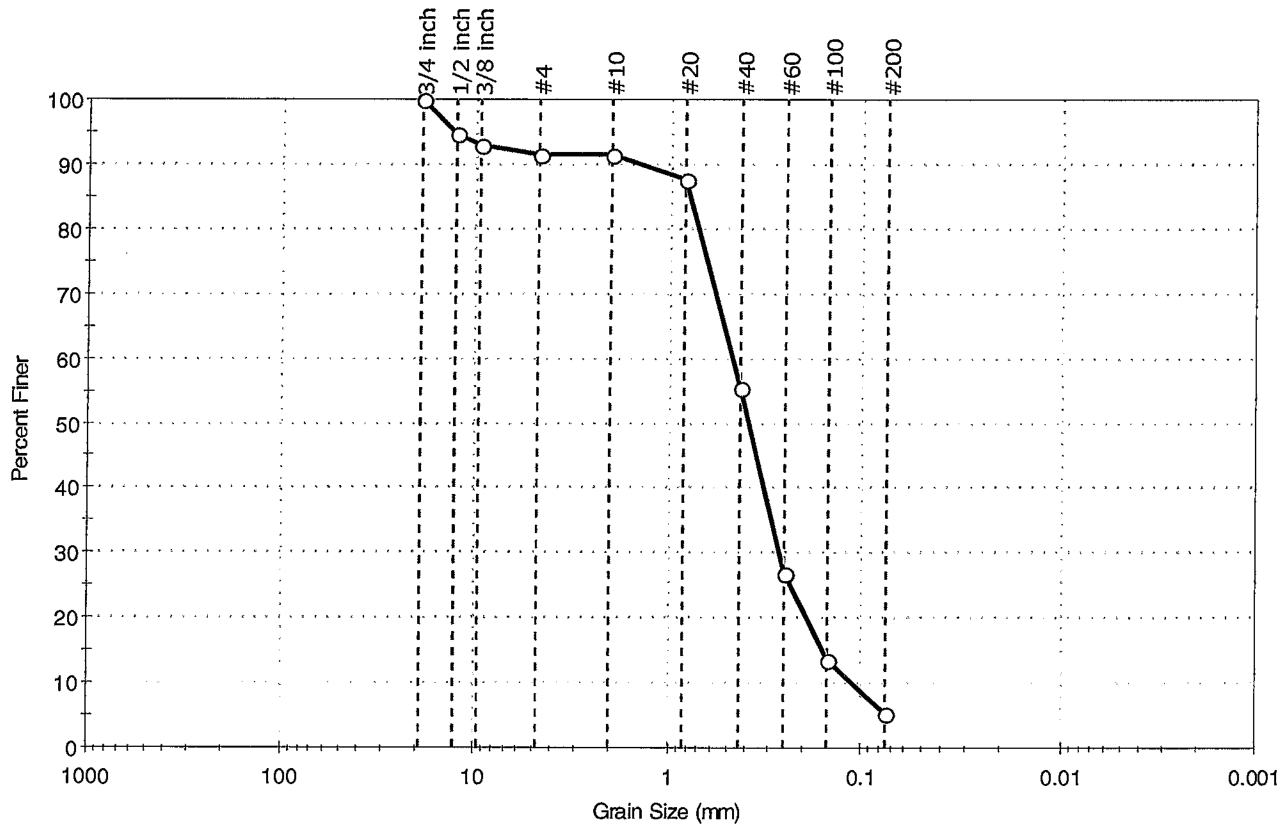
Sand/Gravel Hardness : HARD

printed 4/27/2007 12:25:40 PM

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB203	Test Date:	04/27/07	Checked By:	jdt
Depth :	26-30 ft	Test Id:	110801		
Test Comment:	---				
Sample Description:	Wet, dark brown sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	8.5	86.1	5.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/4 inch	19.00	100		
1/2 inch	12.70	95		
3/8 inch	9.51	93		
#4	4.75	91		
#10	2.00	91		
#20	0.84	88		
#40	0.42	56		
#60	0.25	27		
#100	0.15	14		
#200	0.075	5		

Coefficients

D_{85} =0.7961 mm	D_{30} =0.2644 mm
D_{60} =0.4671 mm	D_{15} =0.1570 mm
D_{50} =0.3832 mm	D_{10} =0.1100 mm
C_u =4.246	C_c =1.361

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape :

Sand/Gravel Hardness :

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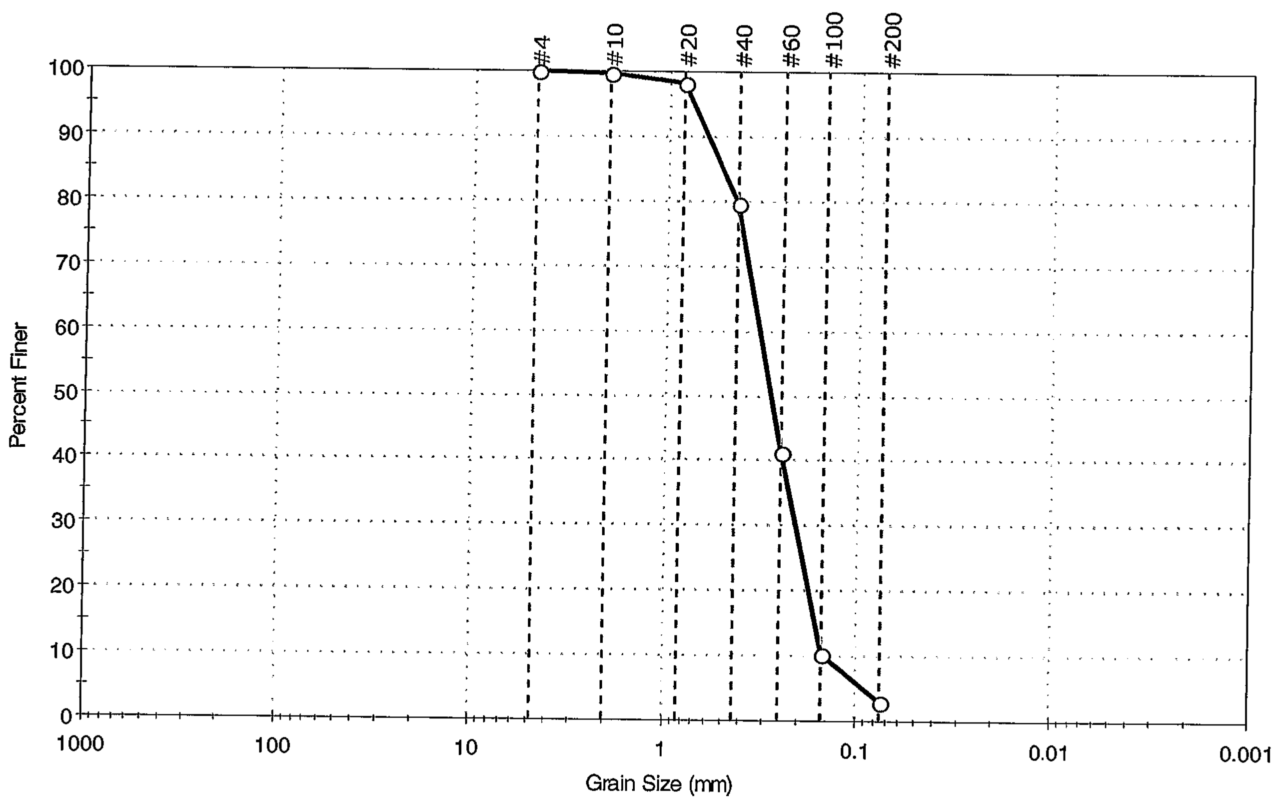
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB204	Test Date:	04/30/07	Checked By:	jdt
Depth :	12-16 ft	Test Id:	110894		
Test Comment:	---				
Sample Description:	Moist, dark brown sand				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	97.0	3.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	98		
#40	0.42	80		
#60	0.25	41		
#100	0.15	10		
#200	0.075	3		

Coefficients

D_{85} =0.5182 mm D_{30} =0.2070 mm
D_{60} =0.3239 mm D_{15} =0.1613 mm
D_{50} =0.2820 mm D_{10} =0.1457 mm
C_u =2.223 C_c =0.908

Classification

ASTM Poorly graded sand (SP)

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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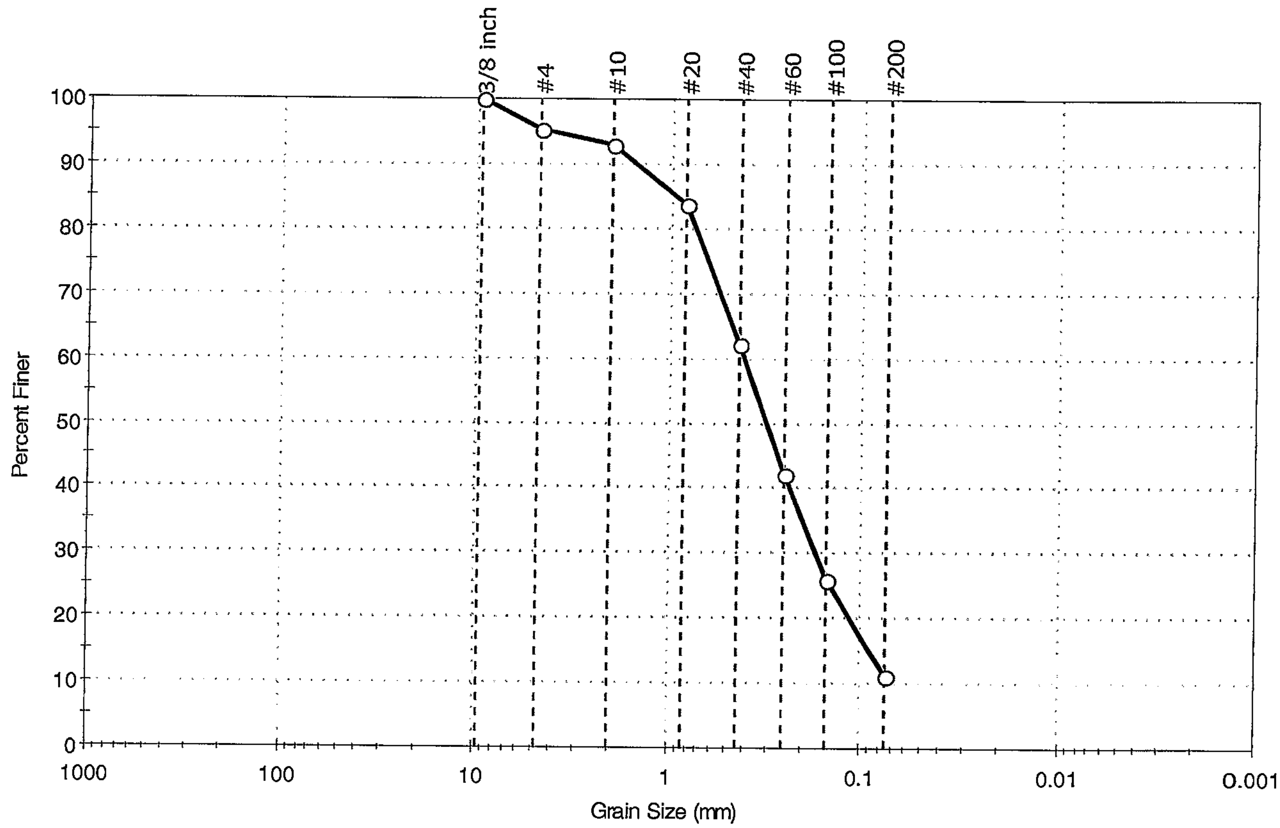
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB204	Test Date:	04/30/07	Checked By:	jdt
Depth :	26-30 ft	Test Id:	110895		
Test Comment:	---				
Sample Description:	Moist, brown sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	4.7	84.0	11.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	95		
#10	2.00	93		
#20	0.84	84		
#40	0.42	62		
#60	0.25	42		
#100	0.15	26		
#200	0.075	11		

Coefficients

D_{85} =0.9437 mm
D_{30} =0.1694 mm
D_{60} =0.4003 mm
D_{15} =0.0890 mm
D_{50} =0.3079 mm
D_{10} =0.0705 mm
C_u =5.678
C_c =1.017

Classification

ASTM N/A

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

printed 5/1/2007 9:31:38 AM

GeoTesting express
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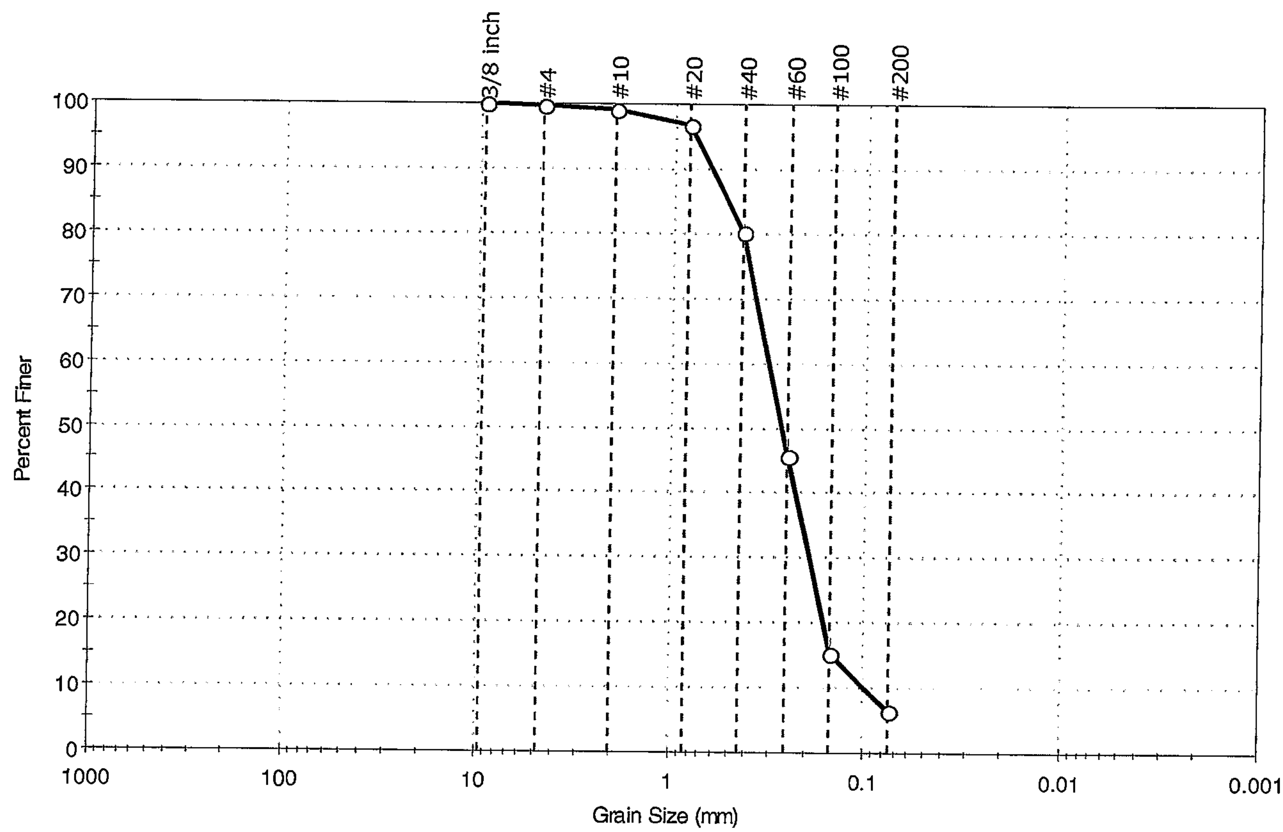
Client: The Retec Group, Inc			
Project: Sag Harbor Former MGP			
Location: Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID: SB206	Test Date: 04/30/07	Checked By:	jdt
Depth : 14-18 ft	Test Id: 110896		
Test Comment: ---			
Sample Description: Moist, dark brown sand with silt			
Sample Comment: ---			

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.2	93.3	6.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	100		
#10	2.00	99		
#20	0.84	97		
#40	0.42	80		
#60	0.25	46		
#100	0.15	15		
#200	0.075	7		

Coefficients

D_{85} =0.5169 mm D_{30} =0.1908 mm
D_{60} =0.3110 mm D_{15} =0.1438 mm
D_{50} =0.2665 mm D_{10} =0.0978 mm
C_u =3.180 C_c =1.197

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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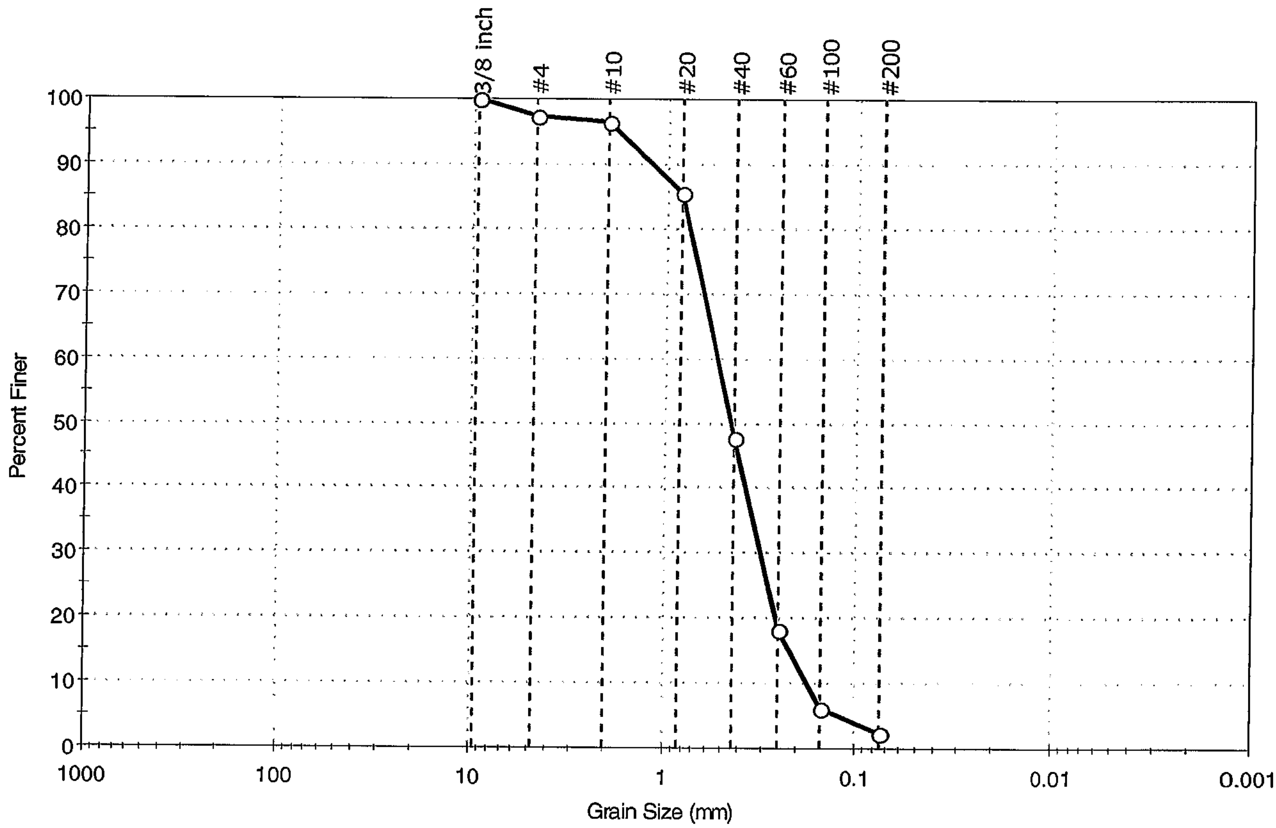
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB206	Test Date:	04/30/07	Checked By:	jdt
Depth :	26-30 ft	Test Id:	110897		
Test Comment:	---				
Sample Description:	Moist, light yellowish brown sand				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	2.6	94.9	2.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	97		
#10	2.00	97		
#20	0.84	86		
#40	0.42	48		
#60	0.25	18		
#100	0.15	6		
#200	0.075	2		

Coefficients

D_{85} = 0.8334 mm D_{30} = 0.3091 mm
D_{60} = 0.5308 mm D_{15} = 0.2181 mm
D_{50} = 0.4431 mm D_{10} = 0.1763 mm
C_u = 3.011 C_c = 1.021

Classification

ASTM   Poorly graded sand (SP)

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

printed 5/1/2007 9:32:22 AM

GeoTesting express
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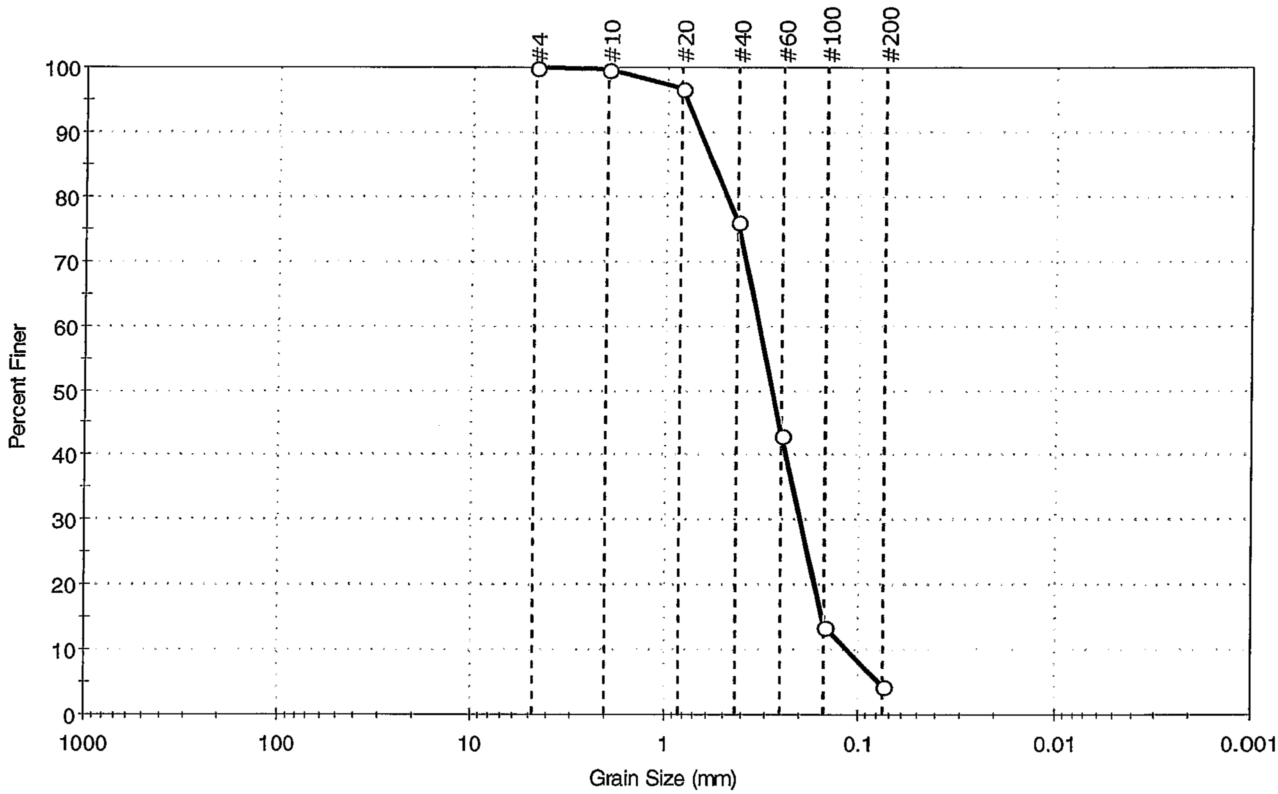
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID: ---		Sample Type:	bag	Tested By:	mll
Sample ID:SB216		Test Date:	05/03/07	Checked By:	jdt
Depth :	12-16 ft	Test Id:	110949		
Test Comment:	---				
Sample Description:	Wet, dark brown sand				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	95.5	4.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	97		
#40	0.42	76		
#60	0.25	43		
#100	0.15	14		
#200	0.075	5		

Coefficients

D_{85} =0.5707 mm D_{30} =0.1988 mm
D_{60} =0.3284 mm D_{15} =0.1525 mm
D_{50} =0.2798 mm D_{10} =0.1130 mm
C_u =2.906 C_c =1.065

Classification

ASTM Poorly graded sand (SP)

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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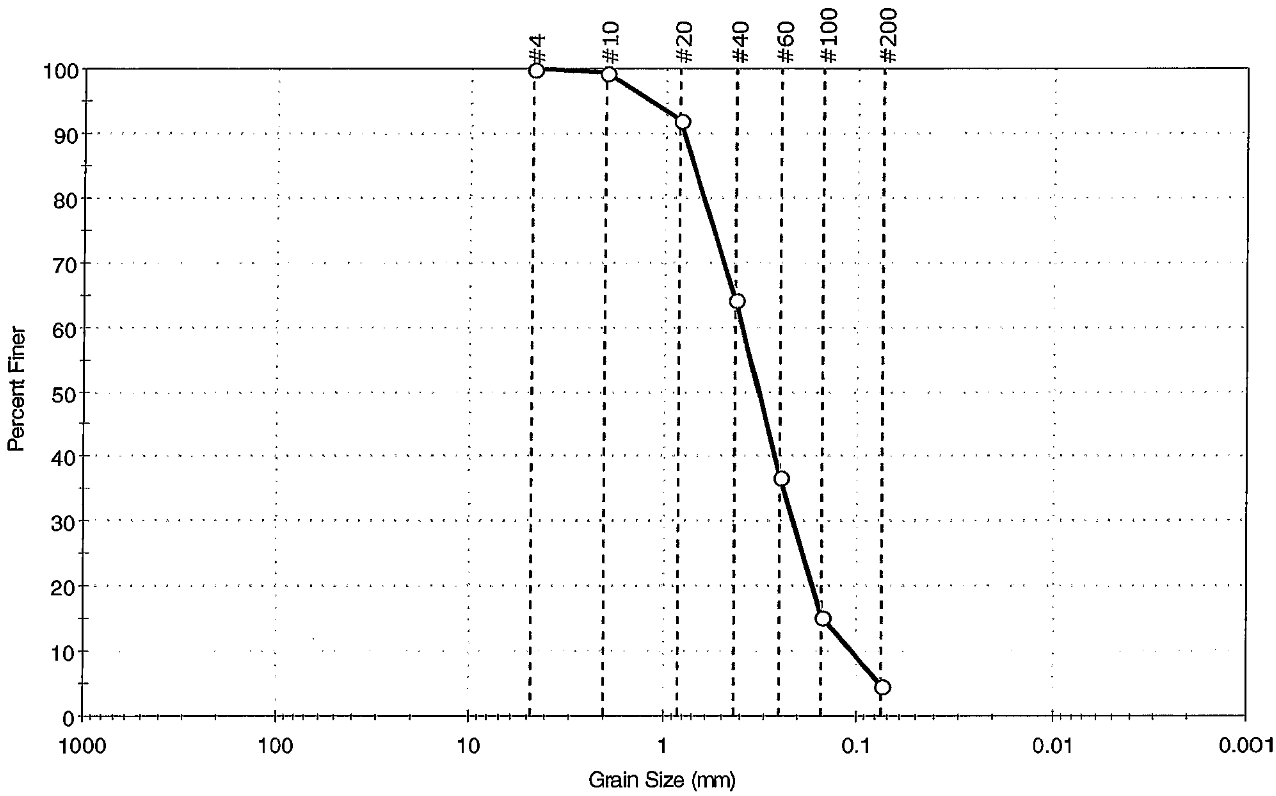
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB216	Test Date:	05/03/07	Checked By:	jdt
Depth :	20-24 ft	Test Id:	110950		
Test Comment:	---				
Sample Description:	Moist, brown sand				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	---	95.4	4.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.84	92		
#40	0.42	64		
#60	0.25	37		
#100	0.15	15		
#200	0.075	5		

Coefficients

D_{85} =0.7072 mm D_{30} =0.2121 mm
D_{60} =0.3907 mm D_{15} =0.1454 mm
D_{50} =0.3223 mm D_{10} =0.1058 mm
C_u =3.693 C_c =1.088

Classification

ASTM Poorly graded sand (SP)

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

printed 5/3/2007 1:08:42 PM

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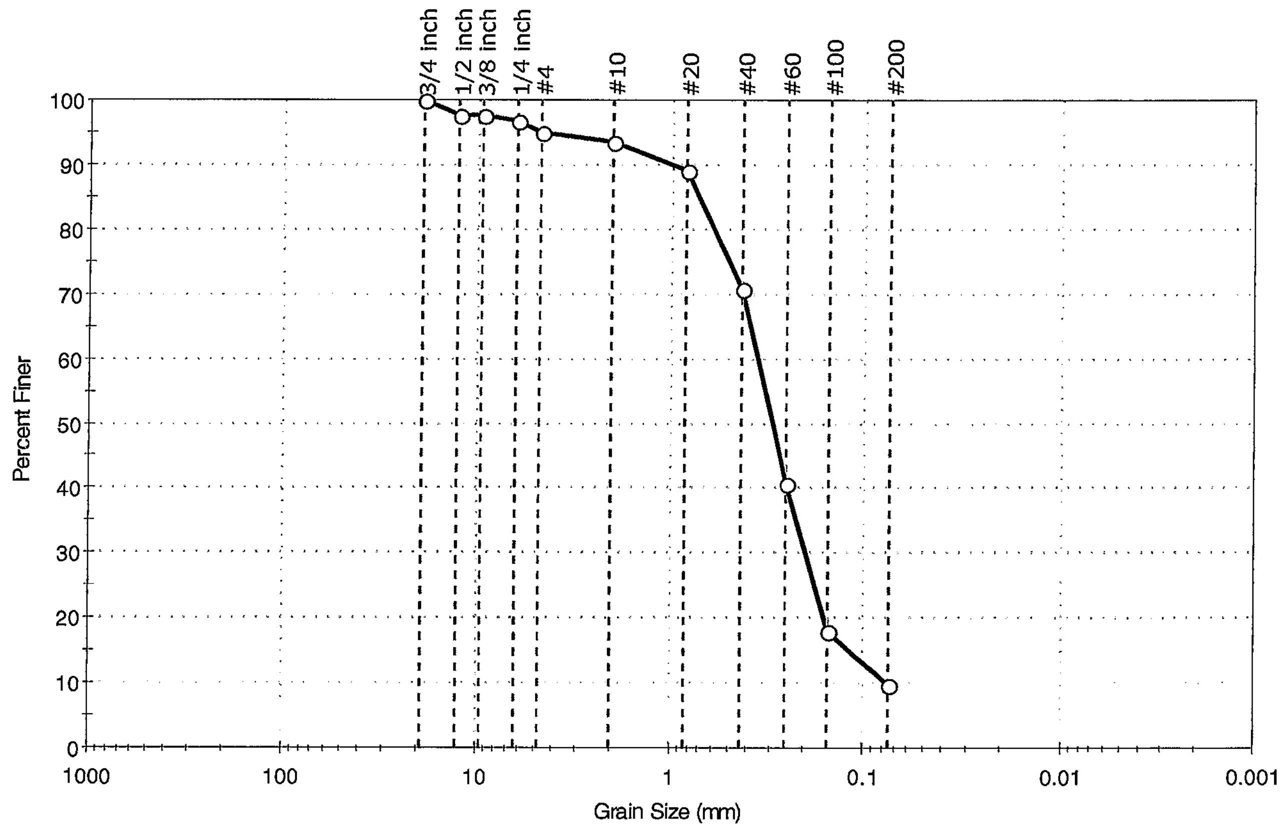
Client: The Retec Group, Inc			
Project: Sag Harbor Former MGP			
Location: Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID:SB210	Test Date: 05/03/07	Checked By:	jdt
Depth : 14-18 ft	Test Id: 110951		
Test Comment: ---			
Sample Description: Wet,dark brown sand with silt			
Sample Comment: ---			

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	4.9	85.4	9.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/4 inch	19.00	100		
1/2 inch	12.70	98		
3/8 inch	9.51	98		
1/4 inch	6.35	97		
#4	4.75	95		
#10	2.00	93		
#20	0.84	89		
#40	0.42	71		
#60	0.25	41		
#100	0.15	18		
#200	0.075	10		

Coefficients

D_{85} =0.7226 mm D_{30} =0.1962 mm
D_{60} =0.3516 mm D_{15} =0.1170 mm
D_{50} =0.2946 mm D_{10} =0.0767 mm
C_u =4.584 C_c =1.427

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

printed 5/3/2007 1:09:00 PM

GeoTesting express
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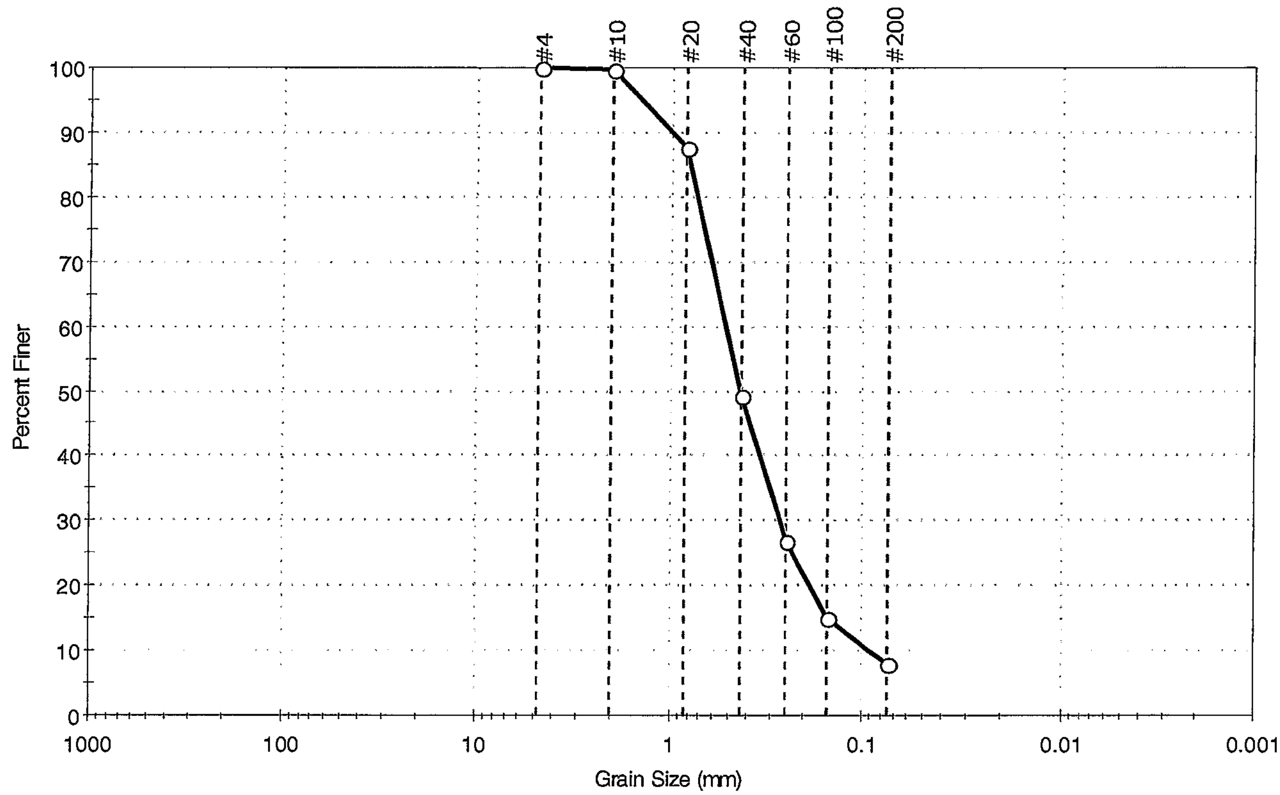
Client: The Retec Group, Inc			
Project: Sag Harbor Former MGP			
Location: Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID:SB210	Test Date: 05/02/07	Checked By:	jdt
Depth : 33-37 ft	Test Id: 110952		
Test Comment: ---			
Sample Description: Wet, light brownish gray sand with silt			
Sample Comment: ---			

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	—	92.2	7.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	88		
#40	0.42	49		
#60	0.25	27		
#100	0.15	15		
#200	0.075	8		

Coefficients

D_{85} =0.8014 mm
D_{30} =0.2702 mm
D_{60} =0.5151 mm
D_{15} =0.1493 mm
D_{50} =0.4316 mm
D_{10} =0.0923 mm
C_u =5.581
C_c =1.536

Classification

ASTM N/A

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

printed 5/3/2007 1:09:14 PM

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1145 Massachusetts Avenue
Boxborough, MA 01719
978 635 0424 Tel
978 635 0266 Fax

Geotechnical Test Report April 24, 2007

GTX-7416
Sag Harbor Former MGP Project

Sag Harbor, NY

Prepared for:

RETEC

STRATEGIC
ENVIRONMENTAL
MANAGEMENT

GeoTesting express
a subsidiary of Geocomp Corporation

Client: The Retec Group, Inc			
Project: Sag Harbor Former MGP			
Location: Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---	Sample Type: ---	Tested By:	mll
Sample ID:---	Test Date: 04/24/07	Checked By:	n/a
Depth : ---	Sample Id: ---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	Corn 10%	---	Moist, very dark grayish brown silt with organics	32.8
---	Polymer 2%	---	Moist, dark olive brown silt with organics	37.1
---	Quicklime 10%	---	Moist, gray silty sand	23
---	Quicklime 15%	---	Moist, dark gray sand	20.7
---	Quicklime 20%	---	Moist, gray sand	22.9

Notes: Temperature of Drying : 110° Celsius

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Client:	The Retec Group
Project Name:	Sag Harbor Former MGP
Project Location:	Sag Harbor, NY
GTX #:	7416
Test Date:	04/20/07
Tested By:	jbr
Checked By:	jdt

Bulk Density of Soil

Boring ID	Sample ID	Depth ft	Visual Description	Bulk Density lb/ft^3	Moisture Content %	Dry Density lb/ft^3
---	Quicklime 10%	---	Moist, gray silty sand	107	23	87
---	Polymer 2%	---	Moist, dark olive brown silt with organics	83	37	61
---	Corn 10%	---	Moist, very dark grayish brown silt with organics	85	33	64
---	Quicklime 15%	---	Moist, dark gray sand	103	21	85
---	Quicklime 20%	---	Moist, gray sand	102	23	83

Notes: Density determined on disturbed samples by hand compacting into a container of known volume, measuring mass of soil and calculating.

Moisture content determined by ASTM D 2216 at 110° C

GeoTesting express

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1145 Massachusetts Avenue
Boxborough, MA 01719
978 635 0424 Tel
978 635 0266 Fax

Transmittal

TO:

Mr. Kevin Kachel
The Retec Group, Inc.
2550 Eisenhower Avenue
Norristown, PA 19403

DATE: 6/29/07	GTX NO: 7416
RE: Sag Harbor Former MGP Project	
Client Project No. KED04-20183-022	

COPIES	DATE	DESCRIPTION
	6/29/07	**June 2007 Laboratory Test Reports**

REMARKS:

CC:

SIGNED: Joe Tomei

Joe Tomei – Laboratory Manager

APPROVED BY: Gary

Gary Torosian – Director of Testing Services

GeoTesting express
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1145 Massachusetts Avenue
Boxborough, MA 01719
978 635 0424 Tel
978 635 0266 Fax

Geotechnical Test Report

June 29, 2007

GTX-7416
Sag Harbor Former MGP Project

Sag Harbor, NY

Prepared for:

RETEC

STRATEGIC
ENVIRONMENTAL
MANAGEMENT

GeoTesting
express
a subsidiary of Geocomp Corporation

Boston
Atlanta
New York

www.geocomp.com/geotesting

June 29, 2007

Mr. Kevin Kachel
The Retec Group, Inc.
2550 Eisenhower Avenue
Norristown, PA 19403

Re: Sag Harbor Former MGP Project (GTX-7416)

Dear Mr. Kachel:

Enclosed are the test results you requested for the above referenced project. GeoTesting Express, Inc. (GTX) received two soil samples from you on May 29, 2007. These samples were labeled as follows:

SH-1
SH-2

GTX performed the following test on each of these samples:

Specific Gravity (ASTM D 854)
Gravity Drainage Test

See the attached test reports for procedures followed.

The results presented in this report apply only to the items tested. This report shall not be reproduced except in full, without written approval from GeoTesting Express. The remainder of these samples will be retained for a period of sixty (60) days and will then be discarded unless otherwise notified by you. Please call me if you have any questions or require additional information. Thank you for allowing GeoTesting Express the opportunity of providing you with testing of soil. We look forward to working with you again in the future.

Respectfully yours,

Joe Tomei
Laboratory Manager

GeoTesting Express, Inc. | 1145 Massachusetts Ave. | Boxborough, MA 01719 | Toll Free 800 434 1062 | Fax 978 635 0266

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	The Retec Group, Inc
Project:	Sag Harbor Former MGP
Location:	Sag Harbor, NY
Project No:	GTX-7416
Boring ID:	---
Sample ID:	---
Depth :	---
Sample Type:	---
Test Date:	06/08/07
Test Id:	112589
Tested By:	ap
Checked By:	jdt

Specific Gravity of Soils by ASTM D 854-06

Boring ID	Sample ID	Depth	Visual Description	Coarse %	Coarse SG	Fine %	Fine SG	Specific Gravity
---	SH-1	---	Moist, very dark grayish brown sand with gravel	14.3	2.5	85.7	2.54	2.54
---	SH-2	---	Moist, very dark grayish brown sand with gravel	18.8	2.32	81.2	2.54	2.5

Notes: Specific Gravity performed by using method A (oven dried specimens) of ASTM D 854
Moisture Content determined by ASTM D 2216.
coarse fraction > #4 sieve
fine fraction < #4 sieve

printed 6/28/2007 12:38:12 PM

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Client:	The Retec Group, Inc.
Project Name:	Sag Harbor Former MGP
Project Location:	Sag Harbor, NY
GTX #:	7416
Date:	06/15/07
Tested by:	jw/da
Checked by:	jdt

Gravity Drainage Test

Boring ID	Sample ID	Depth, ft	Initial				Final				Soak Time, hrs	Time to End of Free Flow, min	Time to End of Draining, min
			Moisture Content, %	Soil Height, in	Wet Density, pcf	Dry Density, pcf	Soil Height, in	Moisture Content, %	Wet Density, pcf	Dry Density, pcf			
---	SH-1	---	15.8	10	121	105	8.6	18.3	119	101	24	11.4	67
---	SH-2	---	19.5	10	120	100	8.2	18.3	124	105	24	0	111

Test Procedure:

1. The sample was thoroughly mixed and a representative moisture content test was performed.
2. The sample was placed into the test bucket and the nitial height and mass were recorded.
3. The test bucket was a 5-gallon bucket with 3/8-inch-diameter holes drilled into the bottom with a layer of geotextile placed at the bottom before the soil was
4. The bucket was then submerged in water for 24 hours.
5. After 24 hours, the bucket was removed from the water and allowed to drain freely.
6. The time of free flow (constant stream) drainage and the time to end of drainage (no more dripping) were recorded.
7. The final height of the soil and the mass of the soil were recorded.
8. A final moisture content test was performed.

GeoTesting express

a subsidiary of Geocomp Corporation

WARRANTY and LIABILITY

GeoTesting Express (GTX) warrants that all tests it performs are run in general accordance with the specified test procedures and accepted industry practice. GTX will correct or repeat any test that does not comply with this warranty. GTX has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GTX may report engineering parameters that require us to interpret the test data. Such parameters are determined using accepted engineering procedures. However, GTX does not warrant that these parameters accurately reflect the true engineering properties of the *in situ* material. Responsibility for interpretation and use of the test data and these parameters for engineering and/or construction purposes rests solely with the user and not with GTX or any of its employees.

GTX's liability will be limited to correcting or repeating a test which fails our warranty. GTX's liability for damages to the Purchaser of testing services for any cause whatsoever shall be limited to the amount GTX received for the testing services. GTX will not be liable for any damages, or for any lost benefits or other consequential damages resulting from the use of these test results, even if GTX has been advised of the possibility of such damages. GTX will not be responsible for any liability of the Purchaser to any third party.

Commonly Used Symbols

A	pore pressure parameter for $\Delta\sigma_1 - \Delta\sigma_3$
B	pore pressure parameter for $\Delta\sigma_3$
CIU	isotropically consolidated undrained triaxial shear test
CR	compression ratio for one dimensional consolidation
C_c	coefficient of curvature, $(D_{30})^2 / (D_{10} \times D_{60})$
C_u	coefficient of uniformity, D_{60}/D_{10}
C_c	compression index for one dimensional consolidation
C_α	coefficient of secondary compression
c_v	coefficient of consolidation
c	cohesion intercept for total stresses
c'	cohesion intercept for effective stresses
D	diameter of specimen
D_{10}	diameter at which 10% of soil is finer
D_{15}	diameter at which 15% of soil is finer
D_{30}	diameter at which 30% of soil is finer
D_{50}	diameter at which 50% of soil is finer
D_{60}	diameter at which 60% of soil is finer
D_{85}	diameter at which 85% of soil is finer
d_{50}	displacement for 50% consolidation
d_{90}	displacement for 90% consolidation
d_{100}	displacement for 100% consolidation
E	Young's modulus
e	void ratio
e_c	void ratio after consolidation
e_0	initial void ratio
G	shear modulus
G_s	specific gravity of soil particles
H	height of specimen
PI	plasticity index
i	gradient
K_0	lateral stress ratio for one dimensional strain
k	permeability
LI	Liquidity Index
m_v	coefficient of volume change
n	porosity
PI	plasticity index
P_c	preconsolidation pressure
p	$(\sigma_1 + \sigma_3) / 2$, $(\sigma_v + \sigma_h) / 2$
p'	$(\sigma'_1 + \sigma'_3) / 2$, $(\sigma'_v + \sigma'_h) / 2$
p'_c	p' at consolidation
Q	quantity of flow
q	$(\sigma_1 - \sigma_3) / 2$
q_f	q at failure
q_0, q_i	initial q
q_c	q at consolidation
S	degree of saturation
SL	shrinkage limit
s_u	undrained shear strength
T	time factor for consolidation

T	temperature
t	time
U, UC	unconfined compression test
UU, Q	unconsolidated undrained triaxial test
u_a	pore gas pressure
u_e	excess pore water pressure
u, u_w	pore water pressure
V	total volume
V_g	volume of gas
V_s	volume of solids
V_v	volume of voids
V_w	volume of water
V_0	initial volume
v	velocity
W	total weight
W_s	weight of solids
W_w	weight of water
w	water content
w_c	water content at consolidation
w_f	final water content
w_l	liquid limit
w_n	natural water content
w_p	plastic limit
w_s	shrinkage limit
w_0, w_i	initial water content
α	slope of q_f versus p_f
α'	slope of q_f versus p_f'
γ_t	total unit weight
γ_d	dry unit weight
γ_s	unit weight of solids
γ_w	unit weight of water
ε	strain
ε_{vol}	volume strain
ε_h, ε_v	horizontal strain, vertical strain
μ	Poisson's ratio, also viscosity
σ	normal stress
σ'	effective normal stress
σ_c, σ'_c	consolidation stress in isotropic stress system
σ_h, σ'_h	horizontal normal stress
σ_v, σ'_v	vertical normal stress
σ_1	major principal stress
σ_2	intermediate principal stress
σ_3	minor principal stress
τ	shear stress
φ	friction angle based on total stresses
φ'	friction angle based on effective stresses
φ'_r	residual friction angle
φ_{ult}	φ for ultimate strength

Appendix E

PDI Pump Test Results (CD Format)

TEST 1

April 30, 2007- Pumped from a 2" drop tube in 16-PW (6-inch diameter pumping well)

11:30 to 11:36 – Pumped at maximum flow rate of 30 gpm. Shut down at to lower drop tube to bottom of well.

12:18 to 13:38 – Pumped at maximum flow rate between 30 and 36 gpm.

13:40 to 14:00 – Pumped then break vacuum to surge the well. Repeated this several times first few times this generated a lot of silt. Water would cleanup after approx. 15 seconds. Minimal silt generation after about ten pulses. This broke the flow meter and a new one was installed.

14:02 to 14:18 – Pumped at a maximum flow rate. Shut down to change out broken flow meter.

14:40 to 15:01 – Pumped at maximum flow rate of 36 gpm.

TEST 2

April 30, 2007 - Pumped from SHMW 2D (applied vacuum to well head at 2-inch diameter monitoring well).

15:06 to 15:32 – Pumped at a maximum flow rate of 50 gpm to 58 gpm.

TEST 3

April 30, 2007 – Pumped from SHMW 2I (applied vacuum to well head at 2-inch diameter monitoring well).

15:57 to 16:08 – Pumped at maximum flow rate of 30 to 40 gpm.

16:08 to 16:20 – Found and fixed vacuum leak at 16:08. Maximum flow rate increased to 55 gpm to 60 gpm.

TEST 4

May 1, 2007 – Pumped from SHMW 1I (applied vacuum to well head at 2-inch diameter monitoring well).

8:00 to 10:00 – Tried pumping from SHMW 18I. Could not get any sustained flow. Intermittent flow at 5 gpm, well drying up.

10:18 to 10:39 – Pumped from SHMW 1I at a maximum flow rate of 40 gpm to 45 gpm.

TEST 5

May 1, 2007 – Pumped from SHMW 18I (applied vacuum to well head at 2-inch diameter monitoring well).

14:00 to 14:47 – Pumped from 18I maximum flow rate approximately 5 gpm.

15:00 to 17:00 – Installed a Furnco bushing with 2-inch pvc riser on 16PW. Tried applying vacuum directly to the riser. Surged well by breaking vacuum. Repeated this several times. This generated minimal silt and the water cleaned up quickly. Maximum flow rate from the well is still approximately 30 gpm to 35 gpm.

TEST 6

May 2, 2007 – Pumped from SHMW 16PW (applied vacuum to well head at 6-inch diameter pumping well).

<u>7:00 to 11:30</u> – Setup transducers. Replaced broken flow meter with in-line 5 gallon drum. Tried pumping several times but pump would no prime.

<u>11:30 to 13:14</u> – Pumped maximum pumping rate of 24 gpm. Transducer data for 16 PW terminates at 11:44.

TEST 7

May 2, 2007 – Pumped from SHMW 06I (applied vacuum to well head at 2-inch diameter monitoring well).

<u>13:51 to 14:25</u> – Pumped from 06I at maximum flow rate of about 10 gpm. Water very silty tried breaking vacuum to surge well. This reduced silt by the water was still cloudy.

TEST 1

Time	16PW	17I	2I	2D	14I	14S	15S	15I	18S	18I	10S	10I
0.46	1.95		1.9	1.9							4.5	3.9
11:00:30	1.946		1.902	1.902							4.497	3.904
11:01:00	1.946		1.902	1.9							4.495	3.9
11:01:30	1.944		1.902	1.9							4.497	3.902
11:02:00	1.946		1.902	1.9							4.493	3.898
11:02:30	1.944		1.902	1.902							4.493	3.902
11:03:00	1.942		1.902	1.902							4.495	3.9
11:03:30	1.946		1.898	1.9							4.493	3.898
11:04:00	1.948		1.9	1.904							4.493	3.904
11:04:30	1.946		1.904	1.904							4.493	3.9
11:05:00	1.946		1.902	1.902							4.493	3.9
11:05:30	1.946		1.902	1.9							4.493	3.9
11:06:00	1.944		1.904	1.906							4.491	3.898
11:06:30	1.948		1.9	1.902							4.491	3.896
11:07:00	1.948		1.902	1.902							4.493	3.9
11:07:30	1.946		1.898	1.9							4.491	3.9
11:08:00	1.944		1.902	1.9							4.491	3.9
11:08:30	1.866		1.902	1.902							4.491	3.9
11:09:00	1.87		1.904	1.904							4.488	3.902
11:09:30	1.87		1.902	1.902							4.493	3.902
11:10:00	1.87		1.906	1.906							4.488	3.9
11:10:30	1.872		1.902	1.902							4.491	3.9
11:11:00	1.872		1.902	1.9							4.491	3.902
11:11:30	1.874		1.904	1.9							4.493	3.9
11:12:00	1.874		1.902	1.902							4.493	3.906
11:12:30	1.876		1.902	1.9							4.491	3.9
11:13:00	1.874		1.902	1.902							4.491	3.9
11:13:30	1.876		1.906	1.906							4.488	3.904
11:14:00	1.876		1.902	1.902							4.491	3.904
11:14:30	1.878		1.906	1.904							4.488	3.908
11:15:00	1.878		1.904	1.906							4.491	3.904
11:15:30	1.878		1.904	1.904							4.491	3.908
11:16:00	1.878		1.9	1.904							4.491	3.904
11:16:30	1.878		1.902	1.906							4.491	3.904
11:17:00	1.878		1.902	1.906							4.488	3.902
11:17:30	1.876		1.902	1.903							4.488	3.902
11:18:00	1.874		1.9	1.901							4.488	3.904
11:18:30	1.874		1.904	1.905							4.486	3.904
11:19:00	1.874		1.906	1.903							4.491	3.906
11:19:30	1.872		1.904	1.905							4.491	3.91
11:20:00	1.87		1.902	1.901							4.488	3.91
11:20:30	1.87		1.908	1.907							4.493	3.912
11:21:00	1.87		1.906	1.905							4.491	3.914
11:21:30	1.87		1.906	1.903							4.493	3.916
11:22:00	1.866		1.908	1.907							4.493	3.92
11:22:30	1.868		1.908	1.907							4.491	3.914
11:23:00	1.866		1.906	1.907							4.491	3.918
11:23:30	1.87		1.902	1.907							4.491	3.914
11:24:00	1.866		1.904	1.907							4.491	3.918
11:24:30	1.868		1.91	1.909							4.493	3.916
11:25:00	1.868		1.904	1.909							4.491	3.916
11:25:30	1.866		1.908	1.907							4.493	3.922
11:26:00	1.866		1.908	1.909							4.493	3.922
11:26:30	1.868		1.907	1.911							4.493	3.92
11:27:00	1.866		1.907	1.907							4.493	3.922
11:27:30	1.868		1.907	1.909							4.493	3.922
11:28:00	1.864		1.909	1.909							4.491	3.918
11:28:30	1.864		1.907	1.909							4.495	3.922
11:29:00	1.866		1.909	1.909							4.495	3.924
11:29:30	1.866		1.909	1.909							4.491	3.922
11:30:00	1.864		1.907	1.909							4.493	3.922
11:30:30	20.632		1.901	1.901							4.495	3.922
11:31:00	15.41		1.901	1.901							4.495	3.924
11:31:30	12.002		1.906	1.923							4.495	3.924
11:32:00	18.43		1.902	1.933							4.495	3.924
11:32:30	17.581		1.906	1.962							4.497	3.928
11:33:00	16.854		1.906	1.974							4.493	3.924

TEST 1

Time	16PW	17I	2I	2D	14I	14S	15S	15I	18S	18I	10S	10I
11:33:30	21.878		1.904	2							4.495	3.93
11:34:00	15.449		1.908	2.016							4.495	3.928
11:34:30	22.477		1.906	2.034							4.493	3.928
11:35:00	14.468		1.91	2.058							4.495	3.924
11:35:30	20.65		1.906	2.069							4.493	3.926
11:36:00	13.587		1.91	2.093							4.493	3.924
11:36:30	19.035		1.906	2.101							4.493	3.924
11:37:00	11.99		1.906	2.121							4.493	3.926
11:37:30	8.112		1.912	2.137							4.495	3.928
11:38:00	5.844		1.912	2.146							4.493	3.928
11:38:30	4.471		1.916	2.148							4.493	3.926
11:39:00	3.656		1.914	2.141							4.491	3.926
11:39:30	3.132		1.914	2.133							4.491	3.92
11:40:00	2.769		1.916	2.125							4.491	3.926
11:40:30	2.513		1.916	2.117							4.491	3.922
11:41:00	2.333		1.916	2.105							4.488	3.922
11:41:30	2.201		1.916	2.097							4.488	3.918
11:42:00	2.099		1.914	2.085							4.488	3.926
11:42:30	2.019		1.918	2.079							4.491	3.926
11:43:00	1.96		1.916	2.068							4.488	3.924
11:43:30	1.912		1.92	2.058							4.488	3.924
11:44:00	1.872		1.918	2.052							4.491	3.928
11:44:30	1.844		1.916	2.044							4.491	3.93
11:45:00	1.824		1.92	2.036							4.491	3.926
11:45:30	1.802		1.916	2.028							4.491	3.932
11:46:00	1.78		1.918	2.024							4.491	3.928
11:46:30	1.764		1.918	2.016							4.493	3.934
11:47:00	1.754		1.914	2.01							4.488	3.928
11:47:30	1.738		1.914	2.006							4.491	3.928
11:48:00	1.726		1.916	2							4.491	3.93
11:48:30	1.714		1.916	1.996							4.491	3.928
11:49:00	1.706		1.915	1.992							4.491	3.932
11:49:30	1.698		1.915	1.988							4.491	3.93
11:50:00	1.689		1.917	1.984							4.491	3.934
11:50:30	1.681		1.918	1.98							4.491	3.934
11:51:00	1.673		1.916	1.976							4.491	3.932
11:51:30	1.671		1.916	1.974							4.491	3.93
11:52:00	1.665		1.916	1.972							4.488	3.932
11:52:30	1.659		1.916	1.968							4.491	3.93
11:53:00	1.655		1.915	1.966							4.488	3.928
11:53:30	1.657		1.917	1.964							4.488	3.934
11:54:00	1.649		1.915	1.962							4.493	3.934
11:54:30	1.647		1.917	1.96	1.9	1.86	0.5	1.64	1.91	1.95	4.491	3.94
11:55:00	1.643		1.917	1.956							4.491	3.94
11:55:30	1.833		1.912	1.958							4.493	3.942
11:56:00	22.059		1.912	1.942							4.491	3.94
11:56:30	14.784		1.914	1.95							4.493	3.942
11:57:00	22.808		1.908	1.96							4.493	3.942
11:57:30	14.288		1.914	1.982							4.493	3.942
11:58:00	21.975		1.91	2	7.08	1.9	0.5	5.33	1.95	3.2	4.493	3.944
11:58:30	14.737		1.917	2.024							4.493	3.94
11:59:00	21.982		1.912	2.039							4.495	3.946
11:59:30	17.404		1.914	2.065							4.495	3.948
12:00:00	19.639		1.914	2.077							4.495	3.952
12:00:30	20.04		1.916	2.103							4.495	3.954
12:01:00	17.637		1.918	2.117							4.497	3.958
12:01:30	21.839		1.918	2.138							4.497	3.96
12:02:00	16.23		1.922	2.156							4.497	3.962
12:02:30	22.85		1.918	2.166							4.497	3.964
12:03:00	15.617		1.92	2.186							4.5	3.96
12:03:30	21.164		1.92	2.194							4.5	3.96
12:04:00	18.22		1.92	2.212							4.495	3.956
12:04:30	19.043		1.922	2.218							4.497	3.964
12:05:00	20.317		1.924	2.234							4.497	3.96
12:05:30	17.483		1.924	2.242							4.5	3.97
12:06:00	22.279		1.924	2.254							4.5	3.972
12:06:30	15.945		1.928	2.262							4.502	3.975

TEST 1

Time	16PW	17I	2I	2D	14I	14S	15S	15I	18S	18I	10S	10I
12:07:00	22.742		1.928	2.268							4.502	3.974
12:07:30	16.066		1.932	2.282							4.504	3.977
12:08:00	12.864		1.932	2.291							4.502	3.977
12:08:30	8.568		1.934	2.299							4.502	3.975
12:09:00	6.154		1.939	2.297							4.506	3.981
12:09:30	4.731		1.939	2.293							4.504	3.977
12:10:00	3.852		1.939	2.28							4.504	3.979
12:10:30	3.293		1.941	2.268							4.504	3.979
12:11:00	2.919		1.941	2.256							4.506	3.987
12:11:30	2.657		1.939	2.236							4.506	3.985
12:12:00	2.471		1.944	2.222							4.506	3.991
12:12:30	2.335		1.946	2.21							4.509	3.993
12:13:00	2.228		1.948	2.196							4.511	3.997
12:13:30	2.15		1.947	2.182							4.511	3.999
12:14:00	2.745		1.949	2.171							4.511	4.003
12:14:30	2.449		1.949	2.159							4.515	4.005
12:15:00	2.274		1.949	2.147							4.515	4.009
12:15:30	2.16		1.951	2.137							4.52	4.009
12:16:00	2.08		1.953	2.129							4.515	4.009
12:16:30	2.018		1.959	2.117							4.518	4.013
12:17:00	1.886		1.954	2.111							4.52	4.017
12:17:30	0.951		1.956	2.103							4.52	4.015
12:18:00	1.323		1.96	2.093							4.522	4.027
12:18:30	10.165		1.952	2.085							4.524	4.027
12:19:00	25.917	1.98	1.946	2.065							4.524	4.031
12:19:30	27.48	1.98	1.948	2.073							4.527	4.031
12:20:00	27.706	1.984	1.946	2.097							4.524	4.027
12:20:30	27.768	1.99	1.95	2.126							4.529	4.031
12:21:00	27.814	1.997	1.952	2.154							4.529	4.035
12:21:30	27.816	1.999	1.952	2.182							4.531	4.041
12:22:00	27.83	2.004	1.954	2.21							4.529	4.039
12:22:30	27.852	2.008	1.953	2.237							4.531	4.047
12:23:00	27.85	2.014	1.957	2.261							4.533	4.045
12:23:30	27.86	2.018	1.957	2.285							4.536	4.051
12:24:00	27.868	2.018	1.957	2.312							4.538	4.053
12:24:30	27.888	2.023	1.961	2.33							4.54	4.059
12:25:00	27.874	2.031	1.961	2.354							4.538	4.057
12:25:30	27.876	2.031	1.963	2.368							4.538	4.063
12:26:00	27.894	2.033	1.967	2.39							4.54	4.065
12:26:30	27.904	2.034	1.969	2.402							4.542	4.071
12:27:00	27.9	2.038	1.975	2.422							4.545	4.071
12:27:30	27.88	2.038	1.973	2.433							4.547	4.075
12:28:00	27.88	2.042	1.975	2.445	9.4	2.2	0.5	7.5	1.95	4.01	4.547	4.077
12:28:30	27.872	2.046	1.973	2.465							4.549	4.081
12:29:00	27.884	2.044	1.979	2.477							4.552	4.091
12:29:30	27.866	2.042	1.981								4.549	4.089
12:30:00	27.884	2.044	1.989								4.554	4.089
12:30:30	27.892	2.046	1.989								4.554	4.095
12:31:00	27.894	2.048	1.987								4.558	4.103
12:31:30	27.906	2.052	1.991								4.558	4.107
12:32:00	27.902	2.053	1.993	2.502							4.561	4.105
12:32:30	27.89	2.055	1.995	2.508							4.563	4.109
12:33:00	27.912	2.053	1.995	2.516							4.563	4.113
12:33:30	27.906	2.053	2.001	2.53							4.565	4.119
12:34:00	27.906	2.055	2.001	2.532							4.57	4.125
12:34:30	27.9	2.057	2.005	2.534							4.57	4.131
12:35:00	27.904	2.057	2.007	2.542							4.574	4.135
12:35:30	27.904	2.057	2.003	2.552							4.574	4.137
12:36:00	27.916	2.061	2.007	2.56							4.576	4.141
12:36:30	27.908	2.059	2.017	2.564							4.581	4.145
12:37:00	27.932	2.055	2.013	2.572							4.581	4.145
12:37:30	27.923	2.058	2.015	2.58							4.581	4.151
12:38:00	27.908	2.058	2.019	2.584							4.583	4.155
12:38:30	27.906	2.056	2.019	2.591							4.585	4.164
12:39:00	27.941	2.061	2.021	2.599	9.65	2.4	0.5	7.48	2.05	4.2	4.588	4.166
12:39:30	27.906	2.063	2.027	2.603							4.59	4.172
12:40:00	27.919	2.059	2.025	2.607							4.592	4.176

TEST 1

Time	16PW	17I	2I	2D	14I	14S	15S	15I	18S	18I	10S	10I
12:40:30	27.907	2.063	2.027	2.611							4.594	4.178
12:41:00	27.917	2.069	2.035	2.617							4.599	4.186
12:41:30	27.913	2.067	2.027	2.621							4.599	4.182
12:42:00	27.923	2.07	2.031	2.627							4.601	4.19
12:42:30	27.919	2.07	2.035	2.629							4.601	4.19
12:43:00	27.925	2.07	2.037	2.633							4.603	4.196
12:43:30	27.925	2.068	2.037	2.637							4.606	4.196
12:44:00	27.929	2.068	2.041	2.637							4.606	4.202
12:44:30	27.925	2.072	2.043	2.643							4.61	4.206
12:45:00	27.909	2.071	2.043	2.649							4.608	4.208
12:45:30	27.907	2.072	2.045	2.654							4.612	4.212
12:46:00	27.915	2.072	2.047	2.656							4.612	4.216
12:46:30	27.921	2.074	2.051	2.66							4.615	4.214
12:47:00	27.937	2.074	2.049	2.664							4.617	4.222
12:47:30	27.917	2.074	2.053	2.666							4.617	4.218
12:48:00	27.929	2.074	2.053	2.67							4.617	4.226
12:48:30	27.935	2.076	2.053	2.672							4.619	4.226
12:49:00	27.927	2.076	2.059	2.674							4.622	4.228
12:49:30	27.911	2.076	2.055	2.68							4.622	4.228
12:50:00	27.913	2.076	2.057	2.68							4.621	4.23
12:50:30	27.923	2.076	2.057	2.682							4.624	4.238
12:51:00	27.927	2.078	2.059	2.684							4.626	4.236
12:51:30	27.919	2.078	2.059	2.688							4.628	4.244
12:52:00	27.915	2.077	2.063	2.688							4.628	4.24
12:52:30	27.907	2.08	2.063	2.698							4.63	4.244
12:53:00	27.931	2.08	2.065	2.698							4.628	4.24
12:53:30	27.923	2.082	2.063	2.7							4.631	4.244
12:54:00	27.931	2.08	2.065	2.702							4.631	4.25
12:54:30	27.923	2.08	2.067	2.706							4.633	4.25
12:55:00	27.925	2.078	2.069	2.706							4.635	4.256
12:55:30	27.933	2.08	2.067	2.71							4.632	4.254
12:56:00	27.927	2.078	2.071	2.71							4.635	4.258
12:56:30	27.947	2.081	2.071	2.712							4.635	4.258
12:57:00	27.933	2.081	2.075	2.718							4.635	4.262
12:57:30	27.943	2.077	2.071	2.718							4.639	4.266
12:58:00	27.935	2.079	2.073	2.72							4.639	4.27
12:58:30	27.943	2.081	2.077	2.72							4.642	4.274
12:59:00	27.929	2.081	2.079	2.724							4.644	4.274
12:59:30	27.913	2.081	2.081	2.726							4.646	4.282
13:00:00	27.929	2.079	2.083	2.728							4.646	4.284
13:00:30	27.905	2.077	2.067	2.73							4.648	4.286
13:01:00	27.911	2.077	2.083	2.73							4.65	4.286
13:01:30	27.907	2.079	2.087	2.732							4.653	4.294
13:02:00	27.909	2.077	2.085	2.736							4.655	4.296
13:02:30	27.909	2.079	2.091	2.738							4.655	4.298
13:03:00	27.909	2.079	2.091	2.74							4.657	4.298
13:03:30	27.899	2.081	2.093	2.742							4.657	4.306
13:04:00	27.881	2.081	2.095	2.744							4.66	4.31
13:04:30	27.895	2.08	2.097	2.746	9.7	2.65	0.5	7.52	2.05	4.31	4.662	4.312
13:05:00	27.885	2.082	2.097	2.75							4.664	4.318
13:05:30	27.901	2.084	2.099	2.748							4.666	4.318
13:06:00	27.895	2.086	2.101	2.754							4.666	4.32
13:06:30	27.897	2.086	2.101	2.756							4.668	4.324
13:07:00	27.917	2.086	2.103	2.758							4.668	4.328
13:07:30	27.889	2.082	2.105	2.761							4.671	4.33
13:08:00	27.889	2.086	2.104	2.763							4.673	4.334
13:08:30	27.901	2.088	2.106	2.763							4.675	4.336
13:09:00	27.895	2.091	2.11	2.765							4.678	4.338
13:09:30	27.897	2.092	2.112	2.769							4.678	4.338
13:10:00	27.913	2.093	2.112	2.769							4.678	4.34
13:10:30	27.905	2.093	2.11	2.771							4.68	4.348
13:11:00	27.905	2.093	2.114	2.773							4.682	4.348
13:11:30	27.909	2.095	2.114	2.773							4.684	4.351
13:12:00	27.897	2.095	2.114	2.775	9.7	2.9	0.4	7.56	2.12	4.35	4.684	4.351
13:12:30	27.907	2.095	2.116	2.779							4.689	4.357
13:13:00	27.925	2.097	2.116	2.779							4.689	4.359
13:13:30	27.907	2.097	2.118	2.781							4.691	4.359

TEST 1

Time	16PW	17I	2I	2D	14I	14S	15S	15I	18S	18I	10S	10I
13:14:00	27.921	2.095	2.12	2.781							4.691	4.363
13:14:30	27.915	2.093	2.122	2.783							4.691	4.367
13:15:00	27.943	2.094	2.12	2.785							4.696	4.371
13:15:30	27.927	2.092	2.122	2.789							4.698	4.375
13:16:00	27.903	2.094	2.124	2.791							4.698	4.371
13:16:30	27.927	2.094	2.124	2.789							4.7	4.379
13:17:00	27.917	2.096	2.128	2.795							4.7	4.381
13:17:30	27.925	2.097	2.128	2.797							4.7	4.379
13:18:00	27.897	2.097	2.13	2.793							4.702	4.387
13:18:30	27.903	2.097	2.132	2.797							4.705	4.387
13:19:00	27.919	2.096	2.134	2.8							4.702	4.387
13:19:30	27.919	2.097	2.134	2.8							4.705	4.393
13:20:00	27.937	2.097	2.134	2.802							4.705	4.393
13:20:30	27.937	2.097	2.138	2.804							4.709	4.397
13:21:00	27.933	2.097	2.138	2.804							4.709	4.397
13:21:30	27.937	2.097	2.14	2.808							4.709	4.401
13:22:00	27.917	2.096	2.14	2.81							4.711	4.403
13:22:30	27.929	2.101	2.14	2.81							4.714	4.405
13:23:00	27.917	2.101	2.142	2.81							4.716	4.405
13:23:30	27.905	2.101	2.144	2.812							4.714	4.407
13:24:00	27.909	2.101	2.146	2.816							4.716	4.409
13:24:30	27.887	2.101	2.146	2.818							4.716	4.415
13:25:00	27.909	2.101	2.148	2.82							4.718	4.419
13:25:30	27.909	2.103	2.152	2.819							4.723	4.423
13:26:00	27.899	2.099	2.152	2.82							4.723	4.427
13:26:30	27.901	2.099	2.152	2.822							4.725	4.433
13:27:00	27.893	2.1	2.156	2.827							4.725	4.431
13:27:30	27.891	2.1	2.16	2.827							4.727	4.437
13:28:00	27.881	2.098	2.158	2.831							4.729	4.439
13:28:30	27.893	2.098	2.162	2.831							4.732	4.443
13:29:00	27.883	2.098	2.162	2.831							4.732	4.447
13:29:30	27.873	2.096	2.164	2.831							4.736	4.449
13:30:00	27.887	2.102	2.168	2.831							4.741	4.455
13:30:30	27.903	2.1	2.168	2.833							4.741	4.451
13:31:00	27.881	2.102	2.17	2.838							4.741	4.457
13:31:30	27.895	2.1	2.172	2.84							4.743	4.461
13:32:00	27.881	2.1	2.172	2.842							4.745	4.467
13:32:30	27.893	2.1	2.176	2.842							4.747	4.469
13:33:00	27.879	2.098	2.174	2.842							4.747	4.471
13:33:30	27.881	2.1	2.178	2.844							4.75	4.473
13:34:00	27.895	2.096	2.18	2.846							4.752	4.473
13:34:30	27.885	2.098	2.18	2.85							4.752	4.477
13:35:00	27.893	2.1	2.184	2.854							4.754	4.481
13:35:30	27.881	2.1	2.184	2.854							4.754	4.487
13:36:00	27.889	2.1	2.186	2.854							4.757	4.491
13:36:30	27.871	2.102	2.186	2.858							4.761	4.497
13:37:00	27.889	2.1	2.19	2.858							4.763	4.499
13:37:30	27.859	2.104	2.192	2.858							4.766	4.505
13:38:00	23.377	2.104	2.192	2.862							4.766	4.511
13:38:30	15.835	2.105	2.2	2.868							4.77	4.517
13:39:00	11.471	2.105	2.206	2.87							4.772	4.517
13:39:30	11.85	2.105	2.206	2.858							4.772	4.521
13:40:00	9.523	2.105	2.21	2.844							4.775	4.517
13:40:30	7.727	2.099	2.218	2.823							4.775	4.521
13:41:00	10.797	2.094	2.21	2.803							4.777	4.523
13:41:30	7.72	2.09	2.214	2.785							4.779	4.529
13:42:00	9.659	2.088	2.214	2.767							4.781	4.533
13:42:30	7.78	2.081	2.214	2.745							4.786	4.538
13:43:00	8.747	2.077	2.216	2.727							4.786	4.538
13:43:30	9.526	2.077	2.216	2.709							4.786	4.54
13:44:00	6.975	2.073	2.218	2.69							4.786	4.54
13:44:30	9.365	2.072	2.218	2.674							4.79	4.54
13:45:00	9.601	2.068	2.218	2.658							4.788	4.542
13:45:30	9.499	2.066	2.218	2.644							4.79	4.544
13:46:00	9.592	2.062	2.218	2.632							4.793	4.548
13:46:30	9.461	2.06	2.22	2.624							4.795	4.55
13:47:00	9.364	2.058	2.222	2.612							4.795	4.552

TEST 1

Time	16PW	17I	2I	2D	14I	14S	15S	15I	18S	18I	10S	10I
13:47:30	9.408	2.058	2.224	2.606							4.797	4.556
13:48:00	9.43	2.056	2.226	2.596							4.799	4.558
13:48:30	9.388	2.053	2.226	2.59							4.802	4.564
13:49:00	9.546	2.054	2.226	2.581							4.802	4.566
13:49:30	9.21	2.052	2.228	2.575							4.804	4.568
13:50:00	9.264	2.052	2.228	2.57							4.806	4.574
13:50:30	9.354	2.054	2.232	2.563							4.811	4.578
13:51:00	9.438	2.052	2.23	2.555							4.808	4.576
13:51:30	9.322	2.048	2.234	2.551							4.811	4.58
13:52:00	9.218	2.045	2.234	2.547							4.813	4.584
13:52:30	9.26	2.043	2.236	2.541							4.813	4.582
13:53:00	6.904	2.043	2.238	2.539							4.815	4.584
13:53:30	8.508	2.039	2.238	2.535							4.815	4.584
13:54:00	8.835	2.039	2.238	2.525							4.817	4.592
13:54:30	8.744	2.037	2.24	2.521							4.82	4.59
13:55:00	6.234	2.037	2.242	2.521							4.82	4.59
13:55:30	4.598	2.035	2.242	2.517							4.822	4.592
13:56:00	8.763	2.035	2.242	2.507							4.824	4.594
13:56:30	5.833	2.034	2.246	2.503							4.824	4.596
13:57:00	4.336	2.033	2.246	2.501							4.824	4.596
13:57:30	3.501	2.033	2.246	2.495							4.827	4.598
13:58:00	3.014	2.031	2.248	2.487							4.827	4.598
13:58:30	2.71	2.029	2.248	2.477							4.827	4.598
13:59:00	2.512	2.028	2.246	2.469							4.827	4.602
13:59:30	2.379	2.026	2.25	2.457							4.831	4.606
14:00:00	2.281	2.022	2.248	2.449							4.831	4.61
14:00:30	2.211	2.02	2.25	2.438							4.833	4.614
14:01:00	2.153	2.02	2.254	2.426							4.836	4.614
14:01:30	2.109	2.016	2.252	2.42							4.836	4.612
14:02:00	22.9	2.012	2.244	2.4							4.838	4.616
14:02:30	27.227	2.012	2.24	2.386							4.838	4.616
14:03:00	27.565	2.012	2.244	2.404							4.838	4.62
14:03:30	27.664	2.016	2.244	2.434							4.84	4.616
14:04:00	27.721	2.018	2.244	2.457							4.84	4.62
14:04:30	27.727	2.021	2.246	2.485							4.842	4.622
14:05:00	17.935	2.027	2.248	2.513							4.842	4.626
14:05:30	12.347	2.035	2.254	2.545							4.845	4.626
14:06:00	18.507	2.035	2.258	2.562							4.845	4.628
14:06:30	27.165	2.033	2.252	2.556							4.847	4.63
14:07:00	16.559	2.037	2.252	2.572							4.847	4.634
14:07:30	11.529	2.04	2.26	2.594							4.849	4.634
14:08:00	21.373	2.04	2.258	2.602							4.851	4.638
14:08:30	27.406	2.039	2.256	2.59							4.851	4.64
14:09:00	27.707	2.04	2.258	2.602							4.854	4.638
14:09:30	27.745	2.043	2.26	2.62							4.854	4.642
14:10:00	27.763	2.043	2.262	2.638							4.856	4.642
14:10:30	27.929	2.047	2.264	2.656							4.858	4.648
14:11:00	27.995	2.048	2.266	2.675							4.86	4.652
14:11:30	20.748	2.05	2.27	2.691							4.86	4.654
14:12:00	14.131	2.054	2.274	2.713							4.863	4.66
14:12:30	10.642	2.056	2.28	2.723							4.865	4.662
14:13:00	26.391	2.054	2.276	2.707							4.865	4.67
14:13:30	16.61	2.058	2.28	2.719							4.869	4.67
14:14:00	11.641	2.059	2.286	2.73							4.872	4.674
14:14:30	21.742	2.06	2.284	2.732							4.872	4.678
14:15:00	27.599	2.056	2.28	2.711							4.876	4.68
14:15:30	27.903	2.056	2.282	2.717							4.876	4.68
14:16:00	27.947	2.056	2.28	2.73							4.876	4.686
14:16:30	27.981	2.058	2.286	2.74							4.878	4.684
14:17:00	27.975	2.06	2.288	2.752							4.881	4.69
14:17:30	27.977	2.061	2.29	2.764							4.881	4.692
14:18:00	27.983	2.063	2.29	2.778							4.883	4.698
14:18:30	24.932	2.064	2.292	2.788							4.885	4.7
14:19:00	15.304	2.067	2.3	2.804							4.885	4.704
14:19:30	10.167	2.069	2.305	2.818							4.887	4.706
14:20:00	7.386	2.067	2.307	2.816							4.887	4.712
14:20:30	11.307	2.064	2.307	2.802							4.89	4.712

TEST 1

Time	16PW	17I	2I	2D	14I	14S	15S	15I	18S	18I	10S	10I
14:21:00	7.903	2.062	2.311	2.788							4.892	4.716
14:21:30	5.792	2.06	2.313	2.778							4.894	4.718
14:22:00	4.59	2.06	2.317	2.762							4.894	4.724
14:22:30	3.864	2.054	2.317	2.744							4.894	4.724
14:23:00	3.401	2.049	2.319	2.723							4.896	4.727
14:23:30	3.091	2.047	2.321	2.703							4.899	4.729
14:24:00	2.873	2.041	2.319	2.681							4.901	4.733
14:24:30	2.711	2.037	2.323	2.663							4.901	4.733
14:25:00	2.593	2.035	2.325	2.643							4.906	4.735
14:25:30	2.497	2.03	2.321	2.623							4.906	4.735
14:26:00	2.425	2.028	2.325	2.608							4.903	4.739
14:26:30	2.363	2.024	2.329	2.59							4.908	4.739
14:27:00	2.315	2.021	2.325	2.574							4.91	4.743
14:27:30	2.269	2.021	2.325	2.56							4.908	4.743
14:28:00	2.231	2.019	2.327	2.548							4.91	4.743
14:28:30	2.197	2.013	2.337	2.534							4.912	4.741
14:29:00	2.169	2.013	2.327	2.522							4.912	4.743
14:29:30	2.141	2.013	2.327	2.511							4.915	4.743
14:30:00	2.117	2.013	2.329	2.499							4.917	4.747
14:30:30	2.097	2.009	2.331	2.491							4.915	4.749
14:31:00	2.077	2.007	2.331	2.481							4.917	4.753
14:31:30	2.059	2.005	2.331	2.473							4.919	4.753
14:32:00	2.045	2.003	2.331	2.463							4.919	4.757
14:32:30	2.029	2.003	2.335	2.457							4.921	4.759
14:33:00	2.013	1.997	2.331	2.444							4.921	4.757
14:33:30	1.999	1.997	2.331	2.438							4.921	4.757
14:34:00	1.987	1.999	2.331	2.434							4.921	4.755
14:34:30	1.975	1.999	2.333	2.428							4.921	4.753
14:35:00	1.963	1.995	2.331	2.42							4.924	4.757
14:35:30	1.955	1.995	2.333	2.416							4.926	4.759
14:36:00	1.945	1.993	2.331	2.412							4.926	4.761
14:36:30	1.939	1.995	2.335	2.41							4.928	4.763
14:37:00	1.935	1.995	2.337	2.408							4.928	4.763
14:37:30	1.927	1.993	2.337	2.402							4.928	4.763
14:38:00	1.917	1.991	2.337	2.396							4.931	4.769
14:38:30	1.901	1.991	2.337	2.392							4.933	4.765
14:39:00	1.888	1.993	2.336	2.388							4.933	4.767
14:39:30	1.876	1.993	2.338	2.386							4.935	4.765
14:40:00	6.129	1.991	2.338	2.382							4.935	4.769
14:40:30	24.918	1.987	2.326	2.366							4.935	4.771
14:41:00	27.397	1.985	2.333	2.368							4.935	4.773
14:41:30	27.649	1.989	2.327	2.394							4.937	4.775
14:42:00	27.741	1.993	2.329	2.427							4.937	4.775
14:42:30	27.791	1.999	2.331	2.459							4.937	4.777
14:43:00	27.807	2.002	2.333	2.491							4.942	4.783
14:43:30	27.837	2.008	2.335	2.524							4.944	4.785
14:44:00	27.867	2.01	2.335	2.552							4.944	4.787
14:44:30	27.867	2.016	2.337	2.58							4.944	4.791
14:45:00	27.887	2.021	2.339	2.608							4.946	4.795
14:45:30	27.897	2.025	2.341	2.633							4.948	4.797
14:46:00	27.895	2.029	2.345	2.657							4.951	4.797
14:46:30	27.917	2.031	2.345	2.679							4.951	4.799
14:47:00	27.931	2.035	2.345	2.701							4.953	4.799
14:47:30	27.933	2.039	2.345	2.717							4.953	4.799
14:48:00	27.927	2.041	2.349	2.736							4.953	4.803
14:48:30	27.955	2.041	2.351	2.754							4.955	4.803
14:49:00	27.943	2.045	2.351	2.77							4.957	4.809
14:49:30	27.943	2.047	2.355	2.786							4.957	4.813
14:50:00	27.941	2.048	2.355	2.798							4.96	4.817
14:50:30	27.953	2.05	2.357	2.812							4.962	4.821
14:51:00	27.945	2.052	2.361	2.826							4.962	4.825
14:51:30	27.957	2.054	2.363	2.838							4.966	4.829
14:52:00	27.963	2.056	2.363	2.848							4.966	4.827
14:52:30	27.957	2.058	2.369	2.858							4.969	4.831
14:53:00	27.961	2.06	2.369	2.87							4.971	4.835
14:53:30	27.945	2.063	2.365	2.876							4.973	4.837
14:54:00	27.961	2.066	2.371	2.892							4.971	4.839

TEST 1

Time	16PW	17I	2I	2D	14I	14S	15S	15I	18S	18I	10S	10I
14:54:30	27.957	2.066	2.373	2.898							4.973	4.839
14:55:00	27.959	2.066	2.375	2.904							4.976	4.845
14:55:30	27.959	2.067	2.375	2.912							4.976	4.847
14:56:00	27.957	2.065	2.377	2.919							4.978	4.849
14:56:30	27.961	2.069	2.379	2.927							4.978	4.853
14:57:00	27.965	2.071	2.381	2.933							4.98	4.857
14:57:30	27.969	2.073	2.383	2.937							4.982	4.861
14:58:00	27.967	2.071	2.385	2.945							4.985	4.863
14:58:30	27.973	2.071	2.385	2.949							4.985	4.865
14:59:00	27.971	2.069	2.389	2.957							4.987	4.869
14:59:30	27.969	2.073	2.391	2.965							4.987	4.873
15:00:00	27.963	2.069	2.391	2.969							4.991	4.875
15:00:30	27.965	2.071	2.395	2.973							4.991	4.877
15:01:00	27.953	2.073	2.395	2.977							4.994	4.879
15:01:30	16.632	2.075	2.399	2.983							4.991	4.877
15:02:00	11.309	2.077	2.403	2.991							4.994	4.885
15:02:30	8.272	2.079	2.407	2.987							4.996	4.887
15:03:00	6.395	2.075	2.411	2.975							4.998	4.891
15:03:30	5.196	2.073	2.411	2.953							4.998	4.893
15:04:00	4.389	2.067	2.413	2.929							5	4.895
15:04:30	3.839	2.064	2.411	2.905							5.003	4.893
15:05:00	3.459	2.06	2.413	2.878							5.003	4.895
15:05:30	3.171	2.054	2.415	2.852							5.005	4.897
15:06:00	2.955	2.05	2.417	2.814							5.005	4.897
15:06:30	2.797	2.045	2.415	2.795							5.005	4.899
15:07:00	2.677	2.045	2.399	3.488							5.005	4.899
15:07:30	2.565	2.159	2.399	14.041							5.009	4.903
15:08:00	2.495	2.313	2.405	14.466							5.009	4.907
15:08:30	2.444	2.406	2.407	14.56							5.012	4.909
15:09:00	2.416	2.462	2.411	14.675							5.012	4.911
0.63	2.406	2.498	2.413	14.706							5.012	4.911

TEST 2 (Pump 2D at 58 gpm)

Time	2 D	2I	17I	16PW	10S	10I
15:24	14.765	2.453	2.639	2.695	5.03	4.916
15:25	14.718	2.455	2.643	2.701	5.03	4.914
15:25	14.672	2.455	2.645	2.707	5.03	4.916
15:26	14.696	2.457	2.644	2.711	5.03	4.92
15:26	14.728	2.457	2.644	2.717	5.03	4.923
15:27	14.738	2.459	2.643	2.719	5.032	4.92
15:27	14.694	2.463	2.645	2.723	5.032	4.92
15:28	14.757	2.461	2.643	2.725	5.032	4.918
15:28	14.696	2.459	2.645	2.731	5.034	4.92
15:29	14.704	2.459	2.645	2.735	5.032	4.92
15:29	14.712	2.461	2.647	2.735	5.034	4.922
15:30	14.7	2.459	2.648	2.739	5.034	4.924
15:30	14.799	2.461	2.65	2.741	5.034	4.924
15:31	14.736	2.461	2.65	2.745	5.036	4.926
15:31	14.827	2.463	2.65	2.747	5.034	4.924
15:32	14.781	2.465	2.652	2.748	5.036	4.926
15:32	5.724	2.465	2.652	2.75	5.039	4.928
15:33	4.537	2.483	2.637	2.76	5.039	4.928
15:33	4.133	2.479	2.454	2.776	5.041	4.93
15:34	3.872	2.477	2.339	2.772	5.036	4.926
15:34	3.687	2.423	2.267	2.754	5.039	4.93
15:35	3.547	2.473	2.222	2.724	5.039	4.93
15:35	3.434	2.475	2.19	2.69	5.041	4.93
15:36	3.339	2.473	2.163	2.652	5.041	4.932
15:36	3.261	2.471	2.144	2.614	5.041	4.936
15:37	3.192	2.471	2.127	2.574	5.041	4.932
15:37	3.135	2.469	2.112	2.534	5.043	4.94
15:38	3.085	2.467	2.099	2.497	5.043	4.938
15:38	3.039	2.467	2.088	2.463	5.046	4.943
15:39	2.996	2.465	2.079	2.427	5.046	4.94
15:39	2.96	2.465	2.073	2.395	5.048	4.942
15:40	2.927	2.461	2.065	2.363	5.048	4.944
15:40	2.897	2.463	2.056	2.333	5.048	4.942
15:41	2.869	2.461	2.05	2.308	5.048	4.942
15:41	2.843	2.463	2.047	2.282	5.048	4.944
15:42	2.818	2.459	2.041	2.257	5.048	4.944
15:42	2.796	2.459	2.037	2.233	5.05	4.946
15:43	2.776	2.459	2.031	2.213	5.05	4.948
15:43	2.756	2.457	2.028	2.191	5.05	4.948
15:44	2.74	2.455	2.024	2.171	5.05	4.948
15:44	2.726	2.455	2.022	2.153	5.05	4.948
15:45	2.709	2.453	2.02	2.135	5.052	4.946
15:45	2.693	2.453	2.016	2.119	5.052	4.946
15:46	2.681	2.453	2.014	2.105	5.052	4.944
15:46	2.669	2.451	2.012	2.091	5.055	4.946
15:47	2.657	2.451	2.007	2.077	5.052	4.942
15:47	2.645	2.451	2.007	2.063	5.052	4.946
15:48	2.634	2.449	2.005	2.051	5.052	4.942
15:48	2.624	2.447	2.003	2.037	5.052	4.94

TEST 2 (Pump 2D at 58 gpm)

Time	2 D	2I	17I	16PW	10S	10I
15:49	2.617	2.449	2.001	2.029	5.052	4.938
15:49	2.604	2.449	2.001	2.019	5.055	4.938
15:50	2.596	2.447	1.999	2.007	5.05	4.937
15:50	2.586	2.445	1.995	1.997	5.052	4.938
15:51	2.58	2.442	1.995	1.987	5.052	4.934
15:51	2.574	2.444	1.993	1.979	5.052	4.934
15:52	2.566	2.442	1.993	1.971	5.052	4.926
15:52	2.558	2.442	1.992	1.963	5.05	4.922
15:53	2.552	2.438	1.993	1.957	5.052	4.918
15:53	2.548	2.436	1.992	1.947	5.048	4.916
15:54	2.544	2.436	1.993	1.943	5.05	4.914
15:54	2.533	2.432	1.991	1.933	5.048	4.913
15:55	2.531	2.434	1.989	1.927	5.046	4.913
15:55	2.523	2.434	1.989	1.925	5.048	4.914
15:56	2.515	2.432	1.989	1.915	5.046	4.913
15:56	2.513	2.432	1.989	1.911	5.046	4.913
15:57	2.512	2.432	1.987	1.905	5.048	4.909
15:57	2.505	2.591	1.987	1.901	5.048	4.907
15:58	2.491	5.92	1.987	1.895	5.046	4.903
15:58	2.489	5.404	1.985	1.883	5.052	4.909
15:59	2.485	5.591	1.985	1.879	5.048	4.899
15:59	2.483	5.338	1.985	1.873	5.043	4.893
16:00	2.481	5.199	1.983	1.867	5.046	4.893

TEST 3 Pump 2I

Time	2I	2D	17I	16 PW	10S	10I
15:50	2.447	2.604	1.999	2.007	5.05	4.937
15:50	2.445	2.596	1.995	1.997	5.052	4.938
15:51	2.442	2.586	1.995	1.987	5.052	4.934
15:51	2.444	2.58	1.993	1.979	5.052	4.934
15:52	2.442	2.574	1.993	1.971	5.052	4.926
15:52	2.442	2.566	1.992	1.963	5.05	4.922
15:53	2.438	2.558	1.993	1.957	5.052	4.918
15:53	2.436	2.552	1.992	1.947	5.048	4.916
15:54	2.436	2.548	1.993	1.943	5.05	4.914
15:54	2.432	2.544	1.991	1.933	5.048	4.913
15:55	2.434	2.533	1.989	1.927	5.046	4.913
15:55	2.434	2.531	1.989	1.925	5.048	4.914
15:56	2.432	2.523	1.989	1.915	5.046	4.913
15:56	2.432	2.515	1.989	1.911	5.046	4.913
15:57	2.432	2.513	1.987	1.905	5.048	4.909
15:57	2.591	2.512	1.987	1.901	5.048	4.907
15:58	5.92	2.505	1.987	1.895	5.046	4.903
15:58	5.404	2.491	1.985	1.883	5.052	4.909
15:59	5.591	2.489	1.985	1.879	5.048	4.899
15:59	5.338	2.485	1.985	1.873	5.043	4.893
16:00	5.199	2.483	1.983	1.867	5.046	4.893
16:00	5.485	2.481	1.983	1.863	5.043	4.889
16:01	4.827	2.479	1.981	1.859	5.041	4.887
16:01	4.535	2.475	1.981	1.857	5.041	4.885
16:02	4.978	2.473	1.983	1.853	5.041	4.883
16:02	5.314	2.471	1.981	1.851	5.041	4.879
16:03	4.789	2.469	1.985	1.845	5.043	4.879
16:03	4.787	2.467	1.983	1.843	5.039	4.875
16:04	4.646	2.467	1.981	1.841	5.041	4.873
16:04	4.873	2.461	1.981	1.837	5.039	4.871
16:05	5.099	2.459	1.983	1.835	5.036	4.867
16:05	5.078	2.457	1.983	1.835	5.039	4.869
16:06	4.749	2.457	1.983	1.831	5.039	4.869
16:06	5.322	2.455	1.981	1.829	5.036	4.867
16:07	5.217	2.455	1.981	1.827	5.039	4.867
16:07	3.952	2.451	1.981	1.825	5.039	4.869
16:08	4.55	2.449	1.981	1.823	5.039	4.865
16:08	9.799	2.441	1.981	1.819	5.039	4.865
16:09	9.664	2.434	1.977	1.813	5.036	4.863
16:09	9.937	2.434	1.977	1.807	5.036	4.863
16:10	9.895	2.436	1.977	1.805	5.039	4.859
16:10	9.827	2.436	1.975	1.803	5.036	4.861
16:11	9.958	2.436	1.979	1.799	5.036	4.859
16:11	9.483	2.438	1.979	1.797	5.036	4.859
16:12	9.389	2.436	1.979	1.797	5.036	4.859
16:12	9.618	2.438	1.979	1.797	5.039	4.859
16:13	9.923	2.438	1.979	1.798	5.039	4.857
16:13	9.622	2.436	1.983	1.796	5.041	4.859
16:14	9.527	2.438	1.981	1.796	5.039	4.859

TEST 3 Pump 2I

Time	2I	2D	17I	16 PW	10S	10I
16:14	9.596	2.436	1.979	1.792	5.036	4.859
16:15	9.646	2.434	1.979	1.792	5.039	4.857
16:15	9.879	2.436	1.979	1.792	5.041	4.859
16:16	9.694	2.436	1.981	1.79	5.039	4.855
16:16	9.632	2.436	1.981	1.791	5.041	4.857
16:17	10.08	2.436	1.979	1.79	5.039	4.853
16:17	9.907	2.438	1.981	1.788	5.041	4.855
16:18	9.895	2.436	1.979	1.789	5.036	4.853
16:18	10.078	2.436	1.981	1.789	5.039	4.857
16:19	9.513	2.436	1.981	1.787	5.039	4.855
16:19	9.572	2.436	1.984	1.786	5.041	4.857
16:20	9.751	2.438	1.984	1.787	5.041	4.859
16:20	9.66	2.438	1.986	1.789	5.041	4.859
16:21	9.988	2.438	1.988	1.787	5.043	4.859
16:21	9.594	2.438	1.988	1.787	5.043	4.861
16:22	9.706	2.438	1.988	1.787	5.043	4.859
16:22	2.142	2.457	1.988	1.791	5.043	4.857
16:23	2.55	2.453	1.988	1.799	5.043	4.857
16:23	2.544	2.451	1.988	1.803	5.043	4.857
16:24	2.53	2.449	1.986	1.803	5.043	4.855
16:24	2.524	2.445	1.986	1.803	5.043	4.855
16:25	2.516	2.443	1.986	1.805	5.043	4.855
16:25	2.51	2.438	1.984	1.802	5.043	4.853
16:26	2.51	2.438	1.984	1.8	5.046	4.855
16:26	2.502	2.434	1.984	1.798	5.043	4.853
16:27	2.498	2.436	1.986	1.798	5.043	4.853
16:27	2.496	2.432	1.986	1.796	5.041	4.855
16:28	2.492	2.428	1.986	1.794	5.043	4.853
16:28	2.49	2.428	1.988	1.794	5.046	4.853
16:29	2.486	2.424	1.986	1.79	5.043	4.853
16:29	2.485	2.426	1.986	1.792	5.046	4.853
16:30	2.485	2.424	1.988	1.79	5.046	4.855
16:30	2.481	2.422	1.988	1.79	5.046	4.853
16:31	2.479	2.418	1.986	1.79	5.046	4.853
16:31	2.475	2.416	1.988	1.786	5.046	4.853
16:32	2.475	2.416	1.99	1.784	5.046	4.853
16:32	2.477	2.416	1.986	1.784	5.046	4.853
16:33	2.475	2.414	1.986	1.813	5.046	4.851
16:33	2.465	2.398	1.986	2.607	5.043	4.849
16:34	2.465	2.394	1.982	3.77	5.043	4.849
16:34	2.463	2.404	1.984	4.497	5.046	4.849
16:35	2.463	2.42	1.986	4.986	5.043	4.847
16:35	2.467	2.453	1.988	4.383	5.043	4.847
16:36	2.467	2.465	1.99	3.6	5.046	4.845
16:36	2.467	2.473	1.994	3.006	5.046	4.845
16:37	2.467	2.475	1.994	2.655	5.046	4.845
16:37	2.465	2.473	1.992	2.423	5.046	4.847
16:38	2.467	2.473	1.994	2.267	5.046	4.847
16:38	2.463	2.469	1.992	2.157	5.046	4.847

TEST 3 Pump 2I

Time	2I	2D	17I	16 PW	10S	10I
16:39	2.461	2.465	1.994	2.079	5.046	4.847
16:39	2.463	2.461	1.99	2.022	5.046	4.847
16:40	2.465	2.457	1.992	1.978	5.048	4.849
16:40	2.457	2.451	1.99	2.359	5.046	4.849
16:41	2.455	2.43	1.986	3.722	5.048	4.849
16:41	2.455	2.438	1.988	4.603	5.048	4.849
16:42	2.455	2.451	1.992	5.151	5.046	4.851
16:42	2.453	2.467	1.996	5.482	5.048	4.851
16:43	2.453	2.481	1.996	5.748	5.048	4.853
16:43	2.451	2.497	1.999	5.927	5.05	4.851
16:44	2.453	2.511	2.003	6.005	5.048	4.853
16:44	2.453	2.527	2.007	6.065	5.05	4.853
16:45	2.455	2.541	2.007	6.109	5.05	4.851
16:45	2.455	2.556	2.013	6.151	5.05	4.853
16:46	2.455	2.568	2.015	6.181	5.05	4.855
16:46	2.457	2.582	2.015	6.204	5.05	4.851
16:47	2.455	2.592	2.018	6.206	5.052	4.859
16:47	2.455	2.612	2.022	5.754	5.052	4.857
16:48	2.457	2.61	2.022	5.908	5.052	4.861
16:48	2.459	2.616	2.022	6.056	5.052	4.861
16:49	2.459	2.626	2.024	6.15	5.055	4.865
16:49	2.459	2.634	2.024	6.208	5.057	4.867
16:50	2.461	2.642	2.026	6.244	5.057	4.867

Test 4 Pump from SHMW-01I

Time	01I	01S	16PW	17I	2D	10S	10I
10:15:00	1.678	1.31	1.663	2.254	1.877	4.711	4.105
10:15:30	1.674		1.659	2.254	1.873	4.711	4.101
10:16:00	1.672		1.657	2.252	1.871	4.709	4.101
10:16:30	1.668		1.653	2.254	1.869	4.709	4.103
10:17:00	1.664		1.649	2.254	1.865	4.711	4.097
10:17:30	1.637		1.647	2.254	1.862	4.707	4.095
10:18:00	1.605		1.645	2.252	1.86	4.707	4.093
10:18:30	11.282	1.31	1.643	2.252	1.86	4.705	4.091
10:19:00	12.097		1.637	2.254	1.887	4.705	4.089
10:19:30	12.248		1.635	2.271	1.963	4.702	4.091
10:20:00	12.445		1.633	2.288	2.034	4.702	4.087
10:20:30	12.613		1.635	2.303	2.094	4.702	4.085
10:21:00	12.605		1.637	2.313	2.145	4.7	4.083
10:21:30	12.455		1.643	2.324	2.189	4.698	4.079
10:22:00	12.704		1.651	2.332	2.227	4.696	4.075
10:22:30	12.677		1.659	2.339	2.258	4.696	4.075
10:23:00	12.653		1.667	2.345	2.29	4.693	4.073
10:23:30	12.704		1.679	2.351	2.316	4.693	4.067
10:24:00	12.876	1.28	1.687	2.357	2.339	4.691	4.067
10:24:30	12.794		1.695	2.359	2.361	4.691	4.067
10:25:00	13.043		1.709	2.366	2.381	4.689	4.067
10:25:30	12.979		1.717	2.368	2.399	4.689	4.065
10:26:00	12.981		1.725	2.372	2.413	4.689	4.065
10:26:30	12.923		1.735	2.374	2.429	4.687	4.065
10:27:00	13.013		1.747	2.377	2.441	4.684	4.067
10:27:30	12.999		1.755	2.379	2.455	4.684	4.067
10:28:00	13.163		1.763	2.385	2.467	4.682	4.065
10:28:30	13.057		1.771	2.389	2.477	4.682	4.065
10:29:00	13.133		1.777	2.388	2.488	4.682	4.065
10:29:30	13.328		1.787	2.392	2.5	4.682	4.065
10:30:00	13.204		1.793	2.394	2.508	4.68	4.065
10:30:30	13.113		1.799	2.398	2.516	4.68	4.065
10:31:00	13.236		1.807	2.4	2.524	4.68	4.065
10:31:30	13.437		1.813	2.4	2.534	4.678	4.065
10:32:00	13.487		1.819	2.404	2.54	4.678	4.065
10:32:30	13.145		1.825	2.406	2.548	4.678	4.067
10:33:00	13.232		1.829	2.407	2.554	4.678	4.065
10:33:30	13.354		1.837	2.409	2.558	4.678	4.067
10:34:00	13.258		1.841	2.409	2.568	4.675	4.069
10:34:30	13.388		1.847	2.409	2.574	4.675	4.069
10:35:00	13.515		1.851	2.411	2.578	4.675	4.071
10:35:30	13.388		1.855	2.411	2.582	4.675	4.073
10:36:00	13.334		1.855	2.411	2.588	4.673	4.073
10:36:30	13.274		1.859	2.413	2.59	4.673	4.073
10:37:00	13.406		1.865	2.413	2.596	4.671	4.073
10:37:30	13.585		1.869	2.411	2.6	4.673	4.077
10:38:00	13.551		1.873	2.414	2.604	4.673	4.077
10:38:30	13.415		1.877	2.412	2.608	4.671	4.077
10:39:00	13.304		1.881	2.415	2.612	4.673	4.079
10:39:30	2.663		1.885	2.415	2.608	4.671	4.077
10:40:00	2.424		1.891	2.406	2.541	4.671	4.079

Test 4 Pump from SHMW-01I

Time	01I	01S	16PW	17I	2D	10S	10I
10:40:30	2.295		1.895	2.385	2.465	4.668	4.079
10:41:00	2.205		1.897	2.37	2.398	4.671	4.081
10:41:30	2.14		1.893	2.355	2.346	4.671	4.081
10:42:00	2.088		1.891	2.342	2.299	4.671	4.085
10:42:30	2.044		1.885	2.334	2.257	4.671	4.085
10:43:00	2.007		1.879	2.325	2.22	4.671	4.089
10:43:30	1.975		1.867	2.319	2.192	4.671	4.091
10:44:00	1.945		1.857	2.311	2.162	4.671	4.093
10:44:30	1.919		1.847	2.307	2.14	4.671	4.093
10:45:00	1.895		1.837	2.302	2.117	4.671	4.093
10:45:30	1.875		1.827	2.298	2.095	4.671	4.093
10:46:00	1.858		1.816	2.294	2.075	4.668	4.091
10:46:30	1.84		1.807	2.291	2.061	4.671	4.091
10:47:00	1.824		1.797	2.287	2.045	4.671	4.089
10:47:30	1.81		1.787	2.285	2.031	4.671	4.091
10:48:00	1.796	1.32	1.779	2.283	2.016	4.668	4.089
10:48:30	1.782		1.769	2.281	2.004	4.666	4.087
10:49:00	1.772		1.761	2.277	1.993	4.668	4.089
10:49:30	1.762		1.753	2.279	1.984	4.666	4.089
10:50:00	1.75		1.744	2.275	1.974	4.666	4.085
10:50:30	1.74		1.736	2.275	1.964	4.668	4.087
10:51:00	1.728		1.728	2.272	1.954	4.666	4.087
10:51:30	1.726		1.722	2.27	1.946	4.666	4.085
10:52:00	1.716		1.716	2.268	1.938	4.666	4.085
10:52:30	1.708		1.71	2.266	1.934	4.666	4.085
10:53:00	1.704		1.702	2.264	1.926	4.666	4.083
10:53:30	1.698		1.696	2.264	1.919	4.666	4.087
10:54:00	1.69		1.688	2.266	1.913	4.666	4.083
10:54:30	1.682		1.682	2.262	1.907	4.666	4.081
10:55:00	1.679		1.678	2.264	1.903	4.666	4.079
10:55:30	1.673		1.672	2.262	1.897	4.666	4.079
10:56:00	1.669		1.66	2.262	1.891	4.664	4.079
10:56:30	1.665		1.642	2.258	1.887	4.664	4.077
10:57:00	1.659		1.626	2.258	1.881	4.664	4.079
10:57:30	1.655		1.618	2.256	1.873	4.662	4.077
10:58:00	1.651		1.614	2.255	1.867	4.664	4.077
10:58:30	1.645		1.612	2.255	1.863	4.662	4.075
10:59:00	1.641		1.612	2.253	1.857	4.662	4.075
10:59:30	1.635		1.61	2.253	1.853	4.662	4.075
11:00:00	1.631		1.61	2.253	1.849	4.662	4.073
11:00:30	1.625		1.61	2.253	1.849	4.662	4.077
11:01:00	1.627		1.606	2.251	1.847	4.662	4.075
11:01:30	1.623		1.596	2.251	1.845	4.662	4.073
11:02:00	1.619		1.588	2.249	1.841	4.659	4.073
11:02:30	1.617		1.58	2.249	1.837	4.662	4.073
11:03:00	1.613		1.578	2.247	1.833	4.659	4.071
11:03:30	1.613		1.576	2.249	1.829	4.662	4.071

TEST 5 18I

Time	18I	17I	2D	16PW	10S	10I
13:21:29	1.85	2.251	1.878	1.554	4.802	4.413
13:21:59	1.858	2.249	1.884	1.554	4.804	4.417
13:22:29	1.86	2.251	1.886	1.558	4.806	4.419
13:22:59	1.862	2.253	1.886	1.56	4.806	4.423
13:23:29	1.862	2.253	1.888	1.562	4.806	4.423
13:23:59	1.86	2.253	1.888	1.564	4.808	4.429
13:24:29	1.862	2.255	1.89	1.569	4.811	4.435
13:24:59	1.852	2.255	1.89	1.569	4.813	4.435
13:25:29	1.856	2.253	1.892	1.566	4.815	4.439
13:25:59	1.858	2.253	1.892	1.569	4.815	4.439
13:26:29	1.86	2.255	1.894	1.569	4.817	4.441
13:26:59	1.86	2.255	1.894	1.569	4.82	4.447
13:27:29	1.86	2.256	1.896	1.569	4.82	4.447
13:27:59	1.86	2.255	1.902	1.571	4.822	4.451
13:28:29	1.876	2.258	1.908	1.575	4.822	4.455
13:28:59	1.872	2.258	1.904	1.575	4.824	4.457
13:29:29	1.872	2.258	1.906	1.577	4.824	4.461
13:29:59	1.874	2.258	1.902	1.578	4.827	4.467
13:30:29	1.87	2.26	1.904	1.576	4.827	4.467
13:30:59	1.866	2.26	1.894	1.572	4.829	4.473
13:31:29	1.862	2.26	1.912	1.576	4.831	4.475
13:31:59	1.866	2.26	1.91	1.58	4.833	4.477
13:32:29	1.868	2.262	1.91	1.58	4.833	4.483
13:32:59	1.87	2.262	1.912	1.58	4.838	4.482
13:33:29	1.87	2.264	1.914	1.581	4.838	4.489
13:33:59	1.868	2.264	1.912	1.583	4.84	4.493
13:34:29	1.872	2.263	1.916	1.583	4.84	4.499
13:34:59	1.872	2.267	1.918	1.583	4.845	4.503
13:35:29	1.876	2.267	1.92	1.585	4.847	4.505
13:35:59	1.876	2.269	1.92	1.585	4.847	4.509
13:36:29	1.876	2.269	1.924	1.587	4.849	4.511
13:36:59	1.878	2.269	1.924	1.586	4.849	4.516
13:37:29	1.878	2.271	1.926	1.589	4.851	4.519
13:37:59	1.88	2.271	1.926	1.588	4.854	4.522
13:38:29	1.88	2.271	1.928	1.59	4.856	4.526
13:38:59	1.88	2.271	1.93	1.59	4.858	4.531
13:39:29	1.884	2.273	1.93	1.59	4.858	4.533
13:39:59	1.884	2.273	1.932	1.592	4.86	4.535
13:40:29	1.884	2.271	1.932	1.594	4.86	4.54
13:40:59	1.888	2.271	1.934	1.595	4.863	4.542
13:41:29	1.886	2.273	1.936	1.594	4.864	4.548
13:41:59	1.888	2.271	1.94	1.594	4.867	4.552
13:42:29	1.89	2.269	1.94	1.597	4.869	4.558
13:42:59	1.89	2.269	1.942	1.599	4.872	4.56
13:43:29	1.89	2.271	1.943	1.598	4.874	4.566
13:43:59	1.892	2.273	1.945	1.6	4.878	4.57
13:44:29	1.892	2.273	1.947	1.6	4.878	4.572
13:44:59	1.892	2.271	1.947	1.6	4.878	4.576
13:45:29	1.894	2.273	1.95	1.602	4.883	4.58

TEST 5 18I

Time	18I	17I	2D	16PW	10S	10I
13:45:59	1.894	2.271	1.952	1.602	4.883	4.586
13:46:29	1.894	2.273	1.954	1.604	4.885	4.59
13:46:59	1.896	2.273	1.954	1.606	4.887	4.592
13:47:29	1.896	2.273	1.958	1.604	4.889	4.594
13:47:59	1.896	2.275	1.958	1.608	4.892	4.602
13:48:29	1.898	2.275	1.96	1.606	4.892	4.604
13:48:59	1.898	2.273	1.964	1.608	4.894	4.608
13:49:29	1.898	2.273	1.964	1.61	4.894	4.61
13:49:59	1.9	2.273	1.966	1.61	4.896	4.614
13:50:29	1.9	2.275	1.968	1.612	4.899	4.614
13:50:59	1.904	2.275	1.968	1.612	4.901	4.62
13:51:29	1.904	2.277	1.97	1.612	4.903	4.622
13:51:59	1.906	2.277	1.972	1.616	4.906	4.628
13:52:29	1.906	2.279	1.974	1.614	4.906	4.63
13:52:59	1.906	2.275	1.974	1.618	4.908	4.636
13:53:29	1.908	2.277	1.978	1.618	4.91	4.642
13:53:59	1.91	2.279	1.978	1.618	4.912	4.642
13:54:29	1.906	2.277	1.98	1.62	4.917	4.65
13:54:59	1.915	2.275	1.98	1.62	4.916	4.652
13:55:29	2.122	2.275	1.982	1.622	4.917	4.654
13:55:59	1.856	2.275	1.984	1.624	4.921	4.658
13:56:29	2.015	2.275	1.986	1.624	4.926	4.66
13:56:59	1.764	2.274	1.984	1.624	4.924	4.664
13:57:29	1.897	2.274	1.988	1.624	4.926	4.666
13:57:59	1.911	2.275	1.99	1.622	4.926	4.671
13:58:29	1.923	2.277	1.996	1.626	4.93	4.674
13:58:59	1.923	2.277	1.997	1.628	4.933	4.679
13:59:29	1.923	2.279	1.999	1.628	4.933	4.681
13:59:59	1.84	2.277	1.999	1.63	4.935	4.685
14:00:29	3.651	2.277	2.001	1.63	4.937	4.687
14:00:59	6.961	2.279	1.999	1.64	4.939	4.693
14:01:29	12.561	2.279	1.995	1.672	4.939	4.695
14:01:59	12.83	2.281	1.997	1.736	4.942	4.7
14:02:29	13.996	2.281	2.003	1.806	4.943	4.703
14:02:59	13.464	2.282	2.007	1.871	4.946	4.705
14:03:29	13.263	2.284	2.017	1.925	4.948	4.707
14:03:59	14.878	2.284	2.023	1.967	4.946	4.711
14:04:29	14.432	2.284	2.029	2.007	4.95	4.715
14:04:59	13.687	2.286	2.037	2.041	4.951	4.718
14:05:29	13.386	2.288	2.042	2.065	4.951	4.721
14:05:59	13.249	2.288	2.05	2.083	4.953	4.723
14:06:29	13.141	2.29	2.059	2.095	4.955	4.727
14:06:59	2.194	2.292	2.067	2.105	4.959	4.733
14:07:29	2.137	2.294	2.079	2.075	4.96	4.737
14:07:59	2.262	2.293	2.086	2.023	4.959	4.739
14:08:29	2.206	2.294	2.084	1.965	4.962	4.741
14:08:59	2.168	2.296	2.086	1.915	4.962	4.745
14:09:29	17.928	2.292	2.078	1.879	4.966	4.749
14:09:59	15.289	2.288	2.07	1.909	4.968	4.753

TEST 5 18I

Time	18I	17I	2D	16PW	10S	10I
14:10:29	13.625	2.288	2.076	1.965	4.971	4.755
14:10:59	14.598	2.292	2.078	2.013	4.971	4.759
14:11:29	14.343	2.292	2.084	2.053	4.973	4.765
14:11:59	2.445	2.292	2.088	2.087	4.976	4.765
14:12:29	2.137	2.296	2.104	2.079	4.977	4.769
14:12:59	2.266	2.294	2.106	2.027	4.98	4.773
14:13:29	2.216	2.294	2.108	1.973	4.98	4.779
14:13:59	2.186	2.294	2.108	1.929	4.982	4.779
14:14:29	2.154	2.294	2.108	1.891	4.985	4.781
14:14:59	2.139	2.292	2.108	1.861	4.985	4.787
14:15:29	2.119	2.294	2.104	1.839	4.989	4.789
14:15:59	9.764	2.294	2.102	1.818	4.989	4.791
14:16:29	16.222	2.29	2.09	1.839	4.989	4.795
14:16:59	16.333	2.292	2.09	1.907	4.991	4.799
14:17:29	18.656	2.29	2.094	1.985	4.995	4.803
14:17:59	18.229	2.294	2.098	2.061	4.995	4.809
14:18:29	18.129	2.296	2.108	2.123	5	4.813
14:18:59	18.098	2.298	2.114	2.171	5	4.815
14:19:29	17.92	2.296	2.122	2.211	5	4.817
14:19:59	18.115	2.3	2.126	2.243	5.002	4.821
14:20:29	17.862	2.298	2.13	2.269	5.005	4.825
14:20:59	18.124	2.299	2.138	2.293	5.004	4.827
14:21:29	17.98	2.298	2.144	2.311	5.007	4.831
14:21:59	15.739	2.299	2.15	2.329	5.009	4.833
14:22:29	13.852	2.303	2.171	2.347	5.011	4.837
14:22:59	12.522	2.307	2.179	2.337	5.011	4.841
14:23:29	15.231	2.307	2.179	2.311	5.013	4.843
14:23:59	14.777	2.309	2.181	2.305	5.016	4.847
14:24:29	16.002	2.305	2.183	2.306	5.018	4.849
14:24:59	17.605	2.309	2.187	2.308	5.021	4.853
14:25:29	13.227	2.309	2.187	2.312	5.022	4.856
14:25:59	13.249	2.309	2.193	2.31	5.025	4.86
14:26:29	12.773	2.309	2.197	2.302	5.027	4.864
14:26:59	13.847	2.309	2.199	2.298	5.027	4.866
14:27:29	13.462	2.311	2.199	2.292	5.029	4.87
14:27:59	13.133	2.309	2.201	2.292	5.032	4.874
14:28:29	13.243	2.309	2.203	2.288	5.034	4.876
14:28:59	13.032	2.309	2.205	2.286	5.036	4.882
14:29:29	14.119	2.309	2.207	2.286	5.036	4.884
14:29:59	13.281	2.306	2.209	2.286	5.038	4.888
14:30:29	13.958	2.307	2.211	2.286	5.041	4.894
14:30:59	13.48	2.307	2.213	2.288	5.043	4.896
14:31:29	2.32	2.307	2.219	2.29	5.045	4.9
14:31:59	2.302	2.309	2.227	2.248	5.045	4.904
14:32:29	2.415	2.31	2.229	2.184	5.047	4.908
14:32:59	2.367	2.306	2.225	2.122	5.05	4.91
14:33:29	6.884	2.304	2.223	2.07	5.05	4.912
14:33:59	16.08	2.304	2.211	2.042	5.052	4.918
14:34:29	12.785	2.3	2.205	2.072	5.054	4.92

TEST 5 18I

Time	18I	17I	2D	16PW	10S	10I
14:34:59	13.275	2.3	2.207	2.112	5.056	4.924
14:35:29	13.352	2.302	2.209	2.148	5.059	4.928
14:35:59	13.177	2.302	2.213	2.176	5.061	4.93
14:36:29	2.274	2.304	2.223	2.19	5.061	4.934
14:36:59	2.52	2.308	2.225	2.152	5.063	4.934
14:37:29	2.389	2.37	12.996	2.088	5.065	4.938
14:37:59	2.298	2.537	13.529	2.04	5.068	4.944
14:38:29	2.308	2.573	3.181	2.036	5.068	4.946
14:38:59	2.308	2.478	2.812	2.034	5.07	4.946
14:39:29	12.735	2.419	2.626	2.032	5.07	4.95
14:39:59	12.701	2.385	2.516	2.064	5.072	4.95
14:40:29	12.309	2.363	2.449	2.114	5.074	4.956
14:40:59	12.968	2.35	2.407	2.158	5.077	4.958
14:41:29	12.855	2.344	2.378	2.198	5.077	4.96
14:41:59	12.751	2.336	2.356	2.228	5.077	4.962
14:42:29	13.034	2.331	2.34	2.25	5.079	4.964
14:42:59	13.01	2.329	2.328	2.27	5.081	4.966
14:43:29	13.291	2.327	2.318	2.282	5.083	4.97
14:43:59	12.982	2.325	2.312	2.294	5.086	4.972
14:44:29	13.221	2.323	2.306	2.3	5.088	4.974
14:44:59	12.512	2.321	2.3	2.306	5.088	4.978
14:45:29	13.002	2.32	2.296	2.313	5.088	4.978
14:45:59	13.04	2.32	2.296	2.317	5.09	4.984
14:46:29	13.01	2.32	2.293	2.317	5.09	4.984
14:46:59	12.924	2.32	2.291	2.318	5.092	4.986

TEST 6 - 16PW

Time	16PW	14S	14I	15S	15I	17S	17I	18S	18I	2I	2D	1S	1D	6I	6D
10:18:00	1.6	1.58	1.346	0.8	1.48	1.83	1.58	1.7	1.6	1.36	1.774	1.05	1.35	1.19	0.52
10:18:30	1.6		1.344		1.48		1.58				1.774				
10:19:00	1.598		1.344		1.48		1.582				1.772				
10:19:30	1.606		1.338		1.48		1.58				1.77				
10:20:00	1.596		1.338		1.472		1.58				1.77				
10:20:30	1.594		1.334		1.468		1.58				1.768				
10:21:00	1.592		1.336		1.468		1.58				1.766				
10:21:30	1.592		1.333		1.466		1.58				1.764				
10:22:00	1.592		1.333		1.466		1.578				1.764				
10:22:30	1.59		1.331		1.466		1.58				1.762				
10:23:00	1.588		1.331		1.464		1.58				1.76				
10:23:30	1.588		1.329		1.466		1.578				1.758				
10:24:00	1.586		1.327		1.468		1.58				1.758				
10:24:30	1.584		1.327		1.462		1.582				1.756				
10:25:00	1.582		1.325		1.46		1.582				1.756				
10:25:30	1.582		1.326		1.462		1.582				1.754				
10:26:00	1.582		1.324		1.458		1.582				1.752				
10:26:30	1.58		1.324		1.46		1.582				1.752				
10:27:00	1.578		1.324		1.458		1.582				1.752				
10:27:30	1.58		1.324		1.458		1.58				1.752				
10:28:00	1.578		1.322		1.458		1.582				1.75				
10:28:30	1.578		1.322		1.458		1.582				1.748				
10:29:00	1.574		1.32		1.458		1.582				1.746				
10:29:30	1.574		1.32		1.456		1.584				1.746				
10:30:00	1.572		1.318		1.454		1.584				1.744				
10:30:30	1.572		1.317		1.452		1.586				1.744				
10:31:00	1.57		1.317		1.454		1.586				1.742				
10:31:30	1.566		1.313		1.452		1.586				1.734				
10:32:00	1.564		1.313		1.45		1.588				1.735				
10:32:30	1.556		1.309		1.448		1.586				1.738				
10:33:00	1.584		1.313		1.446		1.588				1.735				
10:33:30	1.564		1.305		1.444		1.59				1.734				
10:34:00	1.564		1.309		1.444		1.589				1.734				
10:34:30	1.568		1.309		1.444		1.59				1.734				
10:35:00	1.566		1.309		1.446		1.59				1.731				
10:35:30	2.105		1.421		1.464		1.589				1.73				
10:36:00	2.101		1.471		1.516		1.59				1.73				
10:36:30	1.874		1.467		1.54		1.591				1.729				
10:37:00	1.701		1.417		1.536		1.591				1.729				
10:37:30	1.035		1.215		1.488		1.591				1.731				
10:38:00	1.276		1.213		1.426		1.59				1.729				
10:38:30	1.425		1.243		1.409		1.59				1.727				
10:39:00	1.455		1.263		1.411		1.59				1.725				
10:39:30	1.256		1.265		1.414		1.59				1.725				
10:40:00	2.346		1.473		1.452		1.59				1.723				
10:40:30	1.825		1.439		1.512		1.59				1.721				
10:41:00	0.721		1.297		1.502		1.59				1.723				
10:41:30	2.191		1.277		1.432		1.59				1.721				
10:42:00	1.725		1.407		1.478		1.588				1.719				

TEST 6 - 16PW

Time	16PW	14S	14I	15S	15I	17S	17I	18S	18I	2I	2D	1S	1D	6I	6D
10:42:30	1.045		1.161		1.424		1.59				1.719				
10:43:00	2.469		1.495		1.448		1.591				1.718				
10:43:30	13.938		3.043		1.84		1.591				1.71				
10:44:00	14.749		4.596		2.813		1.588				1.701				
10:44:30	18.561		5.164		3.518		1.591				1.714				
10:45:00	12.93		5.338		4.059		1.593				1.73				
10:45:30	18.725		5.605		4.195		1.598				1.752				
10:46:00	13.367		5.552		4.47		1.599				1.768				
10:46:30	14.824		5.673		4.498		1.603				1.785				
10:47:00	13.658		5.563		4.549		1.607				1.805				
10:47:30	14.567		5.678		4.559		1.61				1.819				
10:48:00	14.394		6.319		4.796		1.613				1.827				
10:48:30	2.079		5.7		4.782		1.616				1.853				
10:49:00	2.642		2.848		3.745		1.622				1.887				
10:49:30	2.339		2.36		2.987		1.624				1.889				
10:50:00	2.262		2.11		2.53		1.624				1.887				
10:50:30	4.378		2.15		2.282		1.622				1.881				
10:51:00	16.138		4.332		2.699		1.62				1.855				
10:51:30	17.908		6.03		3.804		1.618				1.844				
10:52:00	19.851		6.849		4.654		1.618				1.848				
10:52:30	20.002		7.222		5.224		1.622				1.865				
10:53:00	12.463		6.878		5.488		1.623				1.881				
10:53:30	2.771		3.443		4.468		1.629				1.929				
10:54:00	2.67		2.672		3.455		1.635				1.935				
10:54:30	2.401		2.324		2.846		1.635				1.931				
10:55:00	2.204		2.096		2.474		1.633				1.923				
10:55:30	2.073		1.938		2.239		1.633				1.913				
10:56:00	1.437		1.791		2.074		1.633				1.903				
10:56:30	1.713		1.659		1.927		1.631				1.891				
10:57:00	1.809		1.639		1.846		1.631				1.879				
10:57:30	1.834		1.619		1.796		1.631				1.869				
10:58:00	1.834		1.596		1.762		1.629				1.859				
10:58:30	1.821		1.574		1.733		1.627				1.846				
10:59:00	1.803		1.552		1.708		1.625				1.838				
10:59:30	1.783		1.53		1.687		1.623				1.828				
11:00:00	1.767		1.516		1.668		1.623				1.824				
11:00:30	1.751		1.498		1.65		1.622				1.816				
11:01:00	1.733		1.484		1.634		1.62				1.808				
11:01:30	1.717		1.468		1.618		1.618				1.799				
11:02:00	1.705		1.456		1.604		1.614				1.794				
11:02:30	1.691		1.442		1.592		1.614				1.787				
11:03:00	1.677		1.431		1.58		1.612				1.779				
11:03:30	1.667		1.421		1.57		1.611				1.775				
11:04:00	1.655		1.413		1.56		1.611				1.769				
11:04:30	1.645		1.401		1.55		1.609				1.763				
11:05:00	1.638		1.395		1.541		1.607				1.757				
11:05:30	1.632		1.387		1.535		1.605				1.753				
11:06:00	1.624		1.381		1.527		1.607				1.752				
11:06:30	1.618		1.374		1.523		1.605				1.748				

TEST 6 - 16PW

Time	16PW	14S	14I	15S	15I	17S	17I	18S	18I	2I	2D	1S	1D	6I	6D
11:07:00	1.612		1.368		1.514		1.605				1.743				
11:07:30	1.606		1.364		1.51		1.605				1.739				
11:08:00	1.6		1.358		1.505		1.605				1.737				
11:08:30	1.596		1.354		1.499		1.604				1.733				
11:09:00	1.592		1.348		1.495		1.604				1.734				
11:09:30	1.588		1.344		1.49		1.604				1.729				
11:10:00	1.582		1.34		1.487		1.604				1.727				
11:10:30	1.578		1.336		1.484		1.602				1.723				
11:11:00	1.574		1.332		1.478		1.602				1.721				
11:11:30	1.57		1.329		1.474		1.602				1.719				
11:12:00	1.568		1.325		1.472		1.604				1.717				
11:12:30	1.564		1.321		1.47		1.602				1.715				
11:13:00	1.56		1.319		1.465		1.604				1.713				
11:13:30	1.558		1.317		1.463		1.604				1.711				
11:14:00	1.554		1.315		1.463		1.606				1.709				
11:14:30	1.554		1.313		1.459		1.606				1.709				
11:15:00	1.55		1.311		1.459		1.606				1.707				
11:15:30	1.55		1.308		1.455		1.608				1.705				
11:16:00	1.546		1.306		1.453		1.606				1.703				
11:16:30	1.544		1.304		1.453		1.607				1.701				
11:17:00	1.542		1.302		1.448		1.606				1.701				
11:17:30	1.54		1.3		1.448		1.606				1.699				
11:18:00	1.54		1.298		1.446		1.605				1.697				
11:18:30	1.536		1.296		1.444		1.606				1.697				
11:19:00	1.534		1.294		1.442		1.608				1.695				
11:19:30	1.53		1.292		1.44		1.607				1.693				
11:20:00	1.53		1.292		1.44		1.607				1.693				
11:20:30	1.526		1.29		1.44		1.607				1.691				
11:21:00	1.526		1.288		1.436		1.607				1.689				
11:21:30	1.524		1.288		1.436		1.607				1.689				
11:22:00	1.522		1.286		1.434		1.607				1.687				
11:22:30	1.52		1.284		1.432		1.607				1.687				
11:23:00	1.518		1.282		1.43		1.607				1.687				
11:23:30	1.518		1.28		1.43		1.609				1.685				
11:24:00	1.518		1.282		1.43		1.611				1.685				
11:24:30	1.516		1.278		1.428		1.609				1.685				
11:25:00	1.516		1.278		1.426		1.611				1.683				
11:25:30	1.514		1.276		1.423		1.611				1.681				
11:26:00	1.502		1.272		1.423		1.611				1.681				
11:26:30	2.397		1.341		1.427		1.615				1.68				
11:27:00	2.162		1.475		1.499		1.613				1.678				
11:27:30	1.045		1.308		1.513		1.613				1.68				
11:28:00	1.327		1.225		1.443		1.617				1.68				
11:28:30	1.417		1.238		1.415		1.617				1.68				
11:29:00	1.441		1.248		1.407		1.617				1.678				
11:29:30	1.112		1.192		1.393		1.617				1.676				
11:30:00	3.503		1.384		1.401		1.618				1.676				
11:30:30	15.374		4.186		2.119		1.617				1.657				
11:31:00	14.978		5.081		3.207		1.614				1.659				

TEST 6 - 16PW

Time	16PW	14S	14I	15S	15I	17S	17I	18S	18I	2I	2D	1S	1D	6I	6D
11:31:30	15.362		5.403		3.823		1.618				1.676				
11:32:00	15.422		5.636		4.2		1.622				1.698				
11:32:30	14.547		5.674		4.407		1.624				1.718				
11:33:00	14.085	1.75	5.623	0.8	4.492	2.05	1.629	1.73	2.71	1.27	1.74	1.05	1.38	1.3	0.6
11:33:30	13.424		5.501		4.493		1.633				1.76				
11:34:00	13.647		5.486		4.489		1.637				1.776				
11:34:30	13.743		5.491		4.497		1.641				1.792				
11:35:00	13.703		5.494		4.504		1.645				1.809				
11:35:30	13.772		5.505		4.516		1.647				1.825				
11:36:00	13.744		5.507		4.531		1.65				1.839				
11:36:30	13.394		5.504		4.534		1.652				1.849				
11:37:00	13.759		5.51		4.545		1.656				1.861				
11:37:30	13.581		5.508		4.549		1.66				1.871				
11:38:00	13.705		5.514		4.556		1.661				1.881				
11:38:30	13.424		5.507		4.563		1.663				1.891				
11:39:00	13.504		5.515		4.568		1.665				1.899				
11:39:30	13.513		5.497		4.567		1.669				1.909				
11:40:00	13.284		5.509		4.57		1.671				1.915				
11:40:30	13.47		5.509		4.573		1.673				1.923				
11:41:00	13.494		5.517		4.582		1.671				1.93				
11:41:30	13.35		5.519		4.586		1.673				1.935				
11:42:00	13.404		5.511		4.587		1.677				1.941				
11:42:30	13.44		5.503		4.586		1.678				1.947				
11:43:00	13.518		5.513		4.588		1.678				1.951				
11:43:30	13.095		5.495		4.59		1.678				1.957				
11:44:00			5.493		4.585		1.68				1.961				
11:44:30			5.495		4.582		1.68				1.965				
11:45:00			5.491		4.581		1.68				1.969				
11:45:30			5.487		4.584		1.679				1.973				
11:46:00			5.491		4.583		1.682				1.977				
11:46:30			5.487		4.583		1.68				1.979				
11:47:00			5.495		4.588		1.679				1.983				
11:47:30			5.479		4.587		1.683				1.987				
11:48:00			5.493		4.59		1.685				1.992				
11:48:30			5.477		4.586		1.686				1.992				
11:49:00			5.475		4.583		1.686				1.994				
11:49:30			5.475		4.584		1.688				1.998				
11:50:00			5.463		4.582		1.686				2				
11:50:30			5.477		4.581		1.686				2.002				
11:51:00			5.479		4.585		1.69				2.006				
11:51:30			5.463		4.581		1.69				2.008				
11:52:00			5.471		4.582		1.686				2.006				
11:52:30			5.461		4.578		1.687				2.008				
11:53:00			5.467		4.578		1.689				2.012				
11:53:30			5.469		4.579		1.689				2.012				
11:54:00			5.467		4.582		1.689				2.014				
11:54:30			5.465		4.583		1.691				2.016				
11:55:00			5.473		4.582		1.693				2.018				
11:55:30			5.463		4.58		1.694				2.018				

TEST 6 - 16PW

Time	16PW	14S	14I	15S	15I	17S	17I	18S	18I	2I	2D	1S	1D	6I	6D
11:56:00			5.46		4.578		1.694				2.02				
11:56:30			5.453		4.575		1.694				2.022				
11:57:00			5.456		4.577		1.692				2.022				
11:57:30			5.45		4.571		1.694				2.022				
11:58:00			5.446		4.569		1.694				2.026				
11:58:30			5.458		4.575		1.694				2.029				
11:59:00			5.476		4.583		1.694				2.029				
11:59:30			5.449		4.581		1.696				2.03				
12:00:00			5.464		4.579		1.696				2.031				
12:00:30			5.46		4.582		1.696				2.03				
12:01:00			5.454		4.576		1.698				2.032				
12:01:30			5.454		4.575		1.698				2.033				
12:02:00			5.45		4.576		1.696				2.034				
12:02:30			5.45		4.576		1.694				2.035				
12:03:00			5.46		4.579		1.698				2.037				
12:03:30			5.444		4.576		1.702				2.037				
12:04:00			5.442		4.571		1.704				2.037				
12:04:30			5.446		4.575		1.704				2.039				
12:05:00			5.454		4.576		1.704				2.038				
12:05:30			5.44		4.575		1.704				2.04				
12:06:00			5.454		4.577		1.702				2.04				
12:06:30			5.458		4.582		1.702				2.039				
12:07:00		2.15	5.438	1	4.577	2.45	1.706	1.77	2.85	1.3	2.041	1.05	1.48	1.42	0.6
12:07:30			5.432		4.571		1.707				2.043				
12:08:00			5.454		4.572		1.707				2.043				
12:08:30			5.368		4.574		1.707				2.043				
12:09:00			5.366		4.573		1.707				2.045				
12:09:30			5.352		4.571		1.707				2.045				
12:10:00			5.354		4.563		1.709				2.045				
12:10:30			5.362		4.563		1.709				2.046				
12:11:00			5.358		4.569		1.711				2.046				
12:11:30			5.356		4.565		1.711				2.048				
12:12:00			5.35		4.565		1.709				2.048				
12:12:30			5.364		4.568		1.709				2.05				
12:13:00			5.344		4.566		1.709				2.05				
12:13:30			5.37		4.569		1.713				2.05				
12:14:00			5.366		4.569		1.712				2.051				
12:14:30			5.358		4.571		1.712				2.051				
12:15:00			5.362		4.569		1.712				2.051				
12:15:30			5.36		4.571		1.713				2.053				
12:16:00			5.348		4.567		1.712				2.053				
12:16:30			5.344		4.563		1.712				2.056				
12:17:00			5.352		4.566		1.71				2.054				
12:17:30			5.338		4.563		1.712				2.056				
12:18:00			5.764		4.691		1.712				2.052				
12:18:30			5.842		4.81		1.712				2.054				
12:19:00			5.888		4.884		1.714				2.058				
12:19:30			5.912		4.926		1.714				2.06				
12:20:00			5.918		4.951		1.716				2.064				

TEST 6 - 16PW

Time	16PW	14S	14I	15S	15I	17S	17I	18S	18I	2I	2D	1S	1D	6I	6D
12:20:30			5.504		4.834		1.714				2.07				
12:21:00			5.412		4.715		1.716				2.074				
12:21:30			5.4		4.653		1.714				2.074				
12:22:00			5.392		4.624		1.714				2.072				
12:22:30			5.362		4.602		1.71				2.074				
12:23:00			5.364		4.592		1.714				2.074				
12:23:30			5.356		4.58		1.716				2.072				
12:24:00		2.32	5.356	1.05	4.576	2.52	1.716	1.78	2.88	1.31	2.072	1.05	1.52	1.46	0.6
12:24:30			5.364		4.578		1.716				2.072				
12:25:00			5.358		4.58		1.719				2.072				
12:25:30			5.366		4.578		1.719				2.072				
12:26:00			5.36		4.578		1.719				2.074				
12:26:30			5.358		4.576		1.719				2.072				
12:27:00			5.36		4.575		1.721				2.072				
12:27:30			5.356		4.577		1.721				2.072				
12:28:00			5.37		4.581		1.721				2.072				
12:28:30			5.362		4.578		1.723				2.071				
12:29:00			5.366		4.582		1.723				2.073				
12:29:30			5.362		4.578		1.721				2.073				
12:30:00			5.388		4.584		1.721				2.073				
12:30:30			5.384		4.588		1.721				2.074				
12:31:00			5.396		4.594		1.721				2.074				
12:31:30			5.38		4.592		1.719				2.076				
12:32:00			5.386		4.592		1.719				2.075				
12:32:30			5.394		4.598		1.719				2.075				
12:33:00			5.384		4.594		1.723				2.075				
12:33:30			5.394		4.596		1.721				2.077				
12:34:00			5.39		4.598		1.723				2.077				
12:34:30			5.396		4.6		1.723				2.077				
12:35:00			5.386		4.599		1.723				2.079				
12:35:30			5.392		4.597		1.725				2.077				
12:36:00			5.384		4.602		1.725				2.079				
12:36:30			5.39		4.598		1.725				2.081				
12:37:00			5.382		4.598		1.725				2.081				
12:37:30			5.382		4.594		1.727				2.079				
12:38:00			5.38		4.594		1.725				2.081				
12:38:30			5.378		4.593		1.725				2.081				
12:39:00			5.388		4.595		1.727				2.081				
12:39:30			5.386		4.599		1.727				2.081				
12:40:00			5.382		4.596		1.731				2.081				
12:40:30			5.374		4.592		1.731				2.081				
12:41:00			5.376		4.59		1.731				2.083				
12:41:30			5.37		4.591		1.731				2.083				
12:42:00			5.376		4.594		1.731				2.082				
12:42:30			5.378		4.592		1.731				2.083				
12:43:00			5.358		4.587		1.729				2.084				
12:43:30			5.366		4.587		1.731				2.082				
12:44:00			5.746		4.685		1.733				2.078				
12:44:30			5.856		4.815		1.733				2.08				

TEST 6 - 16PW

Time	16PW	14S	14I	15S	15I	17S	17I	18S	18I	2I	2D	1S	1D	6I	6D
12:45:00			5.898		4.895		1.733				2.084				
12:45:30			5.92		4.94		1.733				2.086				
12:46:00			5.932		4.968		1.731				2.09				
12:46:30			5.61		4.914		1.733				2.097				
12:47:00			5.424		4.768		1.733				2.101				
12:47:30			5.402		4.684		1.733				2.099				
12:48:00			5.404		4.649		1.735				2.099				
12:48:30			5.4		4.631		1.733				2.099				
12:49:00			5.376		4.615		1.731				2.097				
12:49:30			5.378		4.605		1.735				2.097				
12:50:00			5.378		4.598		1.733				2.097				
12:50:30			5.374		4.596		1.733				2.097				
12:51:00			5.368		4.595		1.733				2.097				
12:51:30			5.37		4.59		1.733				2.095				
12:52:00			5.372		4.592		1.733				2.095				
12:52:30			5.378		4.595		1.731				2.095				
12:53:00			5.36		4.594		1.733				2.095				
12:53:30			5.368		4.588		1.731				2.093				
12:54:00			5.372		4.59		1.732				2.093				
12:54:30			5.382		4.594		1.732				2.091				
12:55:00			5.38		4.594		1.732				2.093				
12:55:30			5.376		4.594		1.732				2.091				
12:56:00			5.368		4.589		1.733				2.089				
12:56:30			5.386		4.592		1.733				2.089				
12:57:00			5.37		4.592		1.733				2.091				
12:57:30			5.362		4.589		1.732				2.089				
12:58:00			5.382		4.591		1.732				2.091				
12:58:30			5.378		4.594		1.732				2.089				
12:59:00			5.36		4.59		1.73				2.089				
12:59:30			5.37		4.588		1.732				2.089				
13:00:00			5.372		4.592		1.732				2.089				
13:00:30			5.364		4.588		1.735				2.091				
13:01:00			5.356		4.584		1.737				2.089				
13:01:30			5.374		4.588		1.735				2.091				
13:02:00			5.372		4.59		1.733				2.089				
13:02:30			5.376		4.592		1.733				2.091				
13:03:00		2.42	5.374	1.05	4.596	2.54	1.732	1.82	2.88	1.32	2.091	1.05	1.52	1.46	0.5
13:03:30			5.366		4.593		1.735				2.091				
13:04:00			5.364		4.547		1.735				2.091				
13:04:30			5.354		4.542		1.737				2.091				
13:05:00			5.38		4.547		1.737				2.091				
13:05:30			5.37		4.55		1.737				2.091				
13:06:00			5.368		4.548		1.739				2.091				
13:06:30			5.368		4.55		1.737				2.091				
13:07:00			5.356		4.547		1.739				2.091				
13:07:30			5.358		4.543		1.739				2.091				
13:08:00			5.354		4.541		1.737				2.091				
13:08:30			5.36		4.541		1.737				2.091				
13:09:00			5.364		4.543		1.739				2.091				

TEST 6 - 16PW

Time	16PW	14S	14I	15S	15I	17S	17I	18S	18I	2I	2D	1S	1D	6I	6D
13:09:30			5.356		4.54		1.739				2.091				
13:10:00			5.356		4.538		1.739				2.091				
13:10:30			5.354		4.537		1.741				2.094				
13:11:00			5.366		4.54		1.741				2.092				
13:11:30			5.358		4.544		1.741				2.094				
13:12:00			5.354		4.54		1.741				2.094				
13:12:30			5.352		4.541		1.741				2.092				
13:13:00			5.366		4.541		1.743				2.094				
13:13:30			5.338		4.539		1.745				2.094				
13:14:00			5.346		4.535		1.745				2.094				
13:14:30			3.342		4.155		1.746				2.112				
13:15:00			2.607		3.329		1.746				2.108				
13:15:30			2.331		2.841		1.746				2.096				
13:16:00			2.137		2.536		1.745				2.081				
13:16:30			2		2.335		1.741				2.065				
13:17:00			1.896		2.2		1.739				2.049				
13:17:30			1.821		2.097		1.739				2.035				
13:18:00			1.758		2.021		1.735				2.019				
13:18:30			1.674		1.954		1.735				2.005				
13:19:00			1.644		1.896		1.729				1.991				
13:19:30			1.626		1.86		1.727				1.978				
13:20:00			1.6		1.832		1.727				1.966				
13:20:30			1.578		1.806		1.726				1.954				
13:21:00			1.553		1.781		1.724				1.942				
13:21:30			1.533		1.759		1.722				1.932				
13:22:00			1.513		1.739		1.722				1.922				
13:22:30			1.497		1.721		1.718				1.912				
13:23:00			1.481		1.704		1.72				1.906				
13:23:30			1.465		1.688		1.718				1.898				
13:24:00			1.453		1.674		1.716				1.89				
13:24:30			1.439		1.66		1.714				1.882				
13:25:00		2.38	1.427	1.12	1.648	2.18	1.714	1.83	1.75	1.34	1.878	1.05	1.42	1.2	0.5
13:25:30			1.411		1.636		1.713				1.868				
13:26:00			1.403		1.624		1.711				1.868				
13:26:30			1.395		1.615		1.711				1.86				
13:27:00			1.385		1.602		1.709				1.856				
13:27:30			1.379		1.597		1.709				1.852				
13:28:00			1.37		1.589		1.707				1.846				
13:28:30			1.364		1.581		1.707				1.842				
13:29:00			1.356		1.575		1.707				1.838				
13:29:30			1.35		1.566		1.707				1.834				
13:30:00			1.342		1.562		1.707				1.83				

TEST 7 - 6I

Time	6I	14I	15I	17I	2D
13:45:31	1.2	1.244	1.462	1.708	1.777
13:46:01	1.2	1.242	1.46	1.71	1.779
13:46:31	1.966	1.24	1.46	1.708	1.779
13:47:01	0.914	1.242	1.458	1.71	1.779
13:47:31	1.167	1.24	1.458	1.708	1.779
13:48:01	1.187	1.24	1.456	1.707	1.779
13:48:31	1.189	1.238	1.456	1.708	1.777
13:49:01	1.191	1.236	1.454	1.708	1.779
13:49:31	1.191	1.236	1.454	1.705	1.779
13:50:01	1.191	1.236	1.454	1.707	1.779
13:50:31	1.191	1.234	1.451	1.707	1.781
13:51:01	1.211	1.234	1.453	1.707	1.781
13:51:31	2.571	1.236	1.451	1.707	1.781
13:52:01	7.382	1.234	1.451	1.709	1.787
13:52:31	7.783	1.232	1.449	1.714	1.803
13:53:01	13.314	1.236	1.451	1.716	1.813
13:53:31	16.253	1.238	1.453	1.72	1.823
13:54:01	10.096	1.242	1.457	1.726	1.839
13:54:31	12.535	1.246	1.46	1.727	1.85
13:55:01	14.238	1.25	1.464	1.733	1.858
13:55:31	6.511	1.251	1.47	1.735	1.868
13:56:01	4.687	1.257	1.474	1.739	1.876
13:56:31	5.299	1.259	1.478	1.739	1.868
13:57:01	4.816	1.261	1.482	1.737	1.864
13:57:31	5.138	1.265	1.484	1.737	1.86
13:58:01	5.679	1.267	1.484	1.737	1.858
13:58:31	15.615	1.267	1.486	1.738	1.858
13:59:01	14.971	1.265	1.486	1.738	1.866
13:59:31	15.079	1.267	1.488	1.74	1.88
14:00:01	6.244	1.269	1.489	1.744	1.892
14:00:31	6.621	1.273	1.495	1.748	1.89
14:01:01	0.529	1.275	1.497	1.746	1.888
14:01:31	8.989	1.275	1.497	1.744	1.884
14:02:01	5.299	1.277	1.499	1.744	1.884
14:02:31	1.368	1.279	1.501	1.744	1.888
14:03:01	6.358	1.281	1.503	1.748	1.894
14:03:31	1.29	1.281	1.503	1.748	1.896
14:04:01	6.147	1.283	1.505	1.748	1.892
14:04:31	5.719	1.285	1.507	1.748	1.89
14:05:01	5.936	1.285	1.506	1.75	1.89
14:05:31	2.785	1.285	1.508	1.75	1.89
14:06:01	6.479	1.287	1.508	1.75	1.886
14:06:31	14.42	1.285	1.508	1.75	1.886
14:07:01	16.933	1.285	1.508	1.75	1.894
14:07:31	15.617	1.287	1.508	1.754	1.906
14:08:01	5.031	1.289	1.51	1.757	1.912
14:08:31	7.494	1.291	1.512	1.756	1.912
14:09:01	7.341	1.291	1.514	1.756	1.908
14:09:31	7.019	1.291	1.514	1.757	1.91

TEST 7 - 6I

Time	6I	14I	15I	17I	2D
14:10:01	6.662	1.293	1.514	1.757	1.908
14:10:31	9.658	1.293	1.516	1.757	1.904
14:11:01	3.125	1.295	1.516	1.757	1.904
14:11:31	8.836	1.295	1.518	1.757	1.906
14:12:01	8.782	1.295	1.516	1.759	1.906
14:12:31	9.339	1.295	1.518	1.759	1.914
14:13:01	8.503	1.295	1.517	1.763	1.92
14:13:31	7.094	1.299	1.519	1.763	1.924
14:14:01	7.114	1.299	1.521	1.763	1.924
14:14:31	7.693	1.3	1.523	1.765	1.924
14:15:01	7.452	1.3	1.523	1.765	1.924
14:15:31	7.534	1.302	1.525	1.767	1.926
14:16:01	8.211	1.302	1.527	1.765	1.926
14:16:31	7.661	1.304	1.527	1.765	1.926
14:17:01	8.973	1.304	1.527	1.767	1.93
14:17:31	8.989	1.306	1.529	1.765	1.932
14:18:01	9.6	1.308	1.531	1.769	1.936
14:18:31	9.481	1.306	1.531	1.77	1.94
14:19:01	9.628	1.31	1.533	1.772	1.944
14:19:31	9.244	1.312	1.535	1.772	1.946
14:20:01	9.795	1.312	1.537	1.774	1.95
14:20:31	8.66	1.314	1.539	1.776	1.952
14:21:01	9.268	1.316	1.541	1.776	1.954
14:21:31	8.766	1.32	1.543	1.778	1.956
14:22:01	9.276	1.32	1.545	1.778	1.958
14:22:31	8.981	1.32	1.547	1.78	1.959
14:23:01	7.241	1.322	1.549	1.778	1.961
14:23:31	7.331	1.324	1.548	1.78	1.959
14:24:01	7.61	1.324	1.551	1.78	1.959
14:24:31	9.041	1.326	1.55	1.782	1.959
14:25:01	7.263	1.326	1.55	1.782	1.959
14:25:31	7.633	1.328	1.557	1.782	1.961

ENSR | AECOM
78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB212

Project Name: Sag Harbor Former MGP	**Drilling Method:** Hollow Stem Auger
Project Number: KEDO4-20183	**Sampling Method:** 2 ft Split Spoon
Date Started/Completed: April 18, 2007	**Ground Elevation (ft/msl):** NA
Boring Location: Southeast wall	**Total Depth:** 30.0'
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval
0-4			2.1, 1.6, 7.8, 4.2		
4-6	1.75	29, 28, 8, 5	3.3, 3.8, 2.5, 32.9		
6-8	2.0	10, 5, 5, 4	24.4, 47.8, 22.4, 20.0		
8-10	0.5	1, 1, 2, 3	3.3, 11.4		
10-12	2.0	4, 4, 8, 13	19.3, 48.2, 65.1, 22.1		
12-14	2.0	3, 8, 11, 12	39.4, 33.7, 7.7, 50		
14-16	2.0	11, 14, 18, 24	10.7, 46.0, 59.0		14-16

USCS	Geologic Description
	Asphalt
SP	POORLY SORTED SAND (SP); fine-medium subangular sand, <5% fine rounded gravel, brown, medium dense, moist.
	Asphalt
SW	Same as above (0.4-0.7 ft bgs). 2.0'-4.0': WELL GRADED SAND (SW); fine-coarse subrounded sand, light brown, loose, wet, slight NLO. WELL GRADED SAND (SW); fine-coarse subangular sand, grayish brown, loose, wet, NLO from 4.0-7.9 ft bgs. Intermittent tar coating with sheen from 5.0-6.0 ft bgs and from 7.3-7.9 ft bgs. Tar saturation with sheen from 6.0-7.3 ft bgs.
PT	PEAT (PT); <5% fine sand, brown, soft, H2S-like odor. Tar coating with sheen and NLO from 9.5-9.9 ft bgs.
SP	POORLY GRADED SAND (SP); fine subangular sand , <5% silt, wet, strong H2S-like odor.
PT	PEAT (PT); brown, soft, H2S-like odor.
SP	POORLY GRADED SAND (SP); fine subangular sand, brown, medium dense, wet, moderate H2S-like odor, tar coating with sheen and moderate NLO.
PT	PEAT (PT); brown, soft, H2S-like odor.
SP	POORLY GRADED SAND (SP); fine-medium subangular sand, brown, medium dense, wet, tar saturated with sheen and NLO from 12.5-12.7 ft bgs. Trace rootlets from 14.0-15. ft bgs, tar coating with NLO from 14-14.7 ft bgs.

Comments: Soil samples SB212(14-18) and SB212(22-26) submitted for particle size analysis ASTM D 422-63.

Boring location hand cleared to 4.0 ft bgs on April 17, 2007.

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Boring ID: SB212

Project Name:	Sag Harbor Former MGP	**Drilling Method:**	Hollow Stem Auger
Project Number:	KEDO4-20183	**Sampling Method:**	2 ft Split Spoon
Date Started/Completed:	April 18, 2007	**Ground Elevation (ft/msl):**	NA
Boring Location:	Southeast wall	**Total Depth:**	30.0'
Drilling Company:	Fenley & Nicol Environmental, Inc.	**Logged By:**	Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16			21.0	SB212 (14-18)					Tar saturation with NLO from 14.7-15.0 ft bgs.
-16 to -18	1.6	12 12 18 24	20.0 4.0						Same as above but light brown with 30-40% fine rounded gravel. Same as above with slight H2S-like odor. Same as above but moist.
-18 to -20	2.0	10 10 15 21	6.1 14.7 13.8						
-20 to -22	2.0	10 15 22 20	10.0 6.2 7.3 3.0				SW SP		WELL GRADED SAND (SW); fine-coarse rounded sand, <5% fine rounded gravel, light brown, medium dense, moist, slight H2S-like odor from 20.0-22.0 ft bgs. POORLY GRADED SAND (SP); fine-medium rounded sand, light brown, medium dense, moist. Same as above but no H2S-like odor.
-22 to -24	2.0	12 16 21 24	7.0 11.4 14.0 29	SB212 (22-26)					
-24 to -26	2.0	8 6 6 9	4.3						<5% fine rounded gravel at 25.0 ft bgs.
-26 to -28	1.5	6 9 9 15	1.1 0.1						<5% fine rounded gravel at 29.0 ft bgs.
-28 to -30	1.8	9 15 12 12	3.3						

Comments: Soil samples SB212(14-18) and SB212(22-26) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 17, 2007.

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Boring ID: SB214

Project Name:	Sag Harbor Former MGP	**Drilling Method:**	Hollow Stem Auger
Project Number:	KEDO4-20183	**Sampling Method:**	2 ft Split Spoon
Date Started/Completed:	April 19, 2007	**Ground Elevation (ft/msl):**	NA
Boring Location:	Intersection of southwest & southeast wall	**Total Depth:**	30.0'
Drilling Company:	Fenley & Nicol Environmental, Inc.	**Logged By:**	Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0 – -4			3.9 2.9 3.2 18.6				SP		Asphalt POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% finr rounded gravel, dark gray, medium dense, moist. Slight NLO from 2.0-3.0 ft bgs. POORLY GRADED SAND (SP); fine-medium subrounded sand, 35-50% fine rounded gravel, brown, loose, wet, tar coated with sheen and NLO.
-4 – -6	1.0	14 18 2 2	34.6						Brick fragments from 5.0-5.4 ft bgs.
-6 – -8	1.6	2 4 4 4	19.7 39.1 19.1				PT		PEAT (PT); brown, soft, strong H2S-like odor. Fine tar saturated sand with sheen and NLO distributed through peat from 6.0-7.6 ft bgs, .4" in diameter.
-8 – -10	1.8	8 6 2 2	24.8 27.0				SP PT SP		POORLY GRADED SAND (SP); fine-medium subrounded sand, light brown, medium dense, moist, strong H2S-like odor. PEAT (PT); brown, soft, strong H2S-like odor. Fine tar saturated sand with sheen and NLO distributed through peat, .4" in diameter.
-10 – -12	1.0	4 8 10 12	8.4 27.9						POORLY GRADED SAND (SP); fine subrounded sand, trace rootlets from 9.2-10.0 ft bgs, brown, medium dense, moist, moderate NLO and H2S-like odor. POORLY GRADED SAND (SP); fine-medium subrounded sand, trace fine rounded gravel, brown, medium dense, moist, slight NLO and H2S-like odor.
-12 – -14	2.0	6 8 9 12	11.5 15.8 22.0 22.5						
-14 – -16	2.0	4 6 9 14	12.5 20.1						Tar saturated with sheen and NLO from 15.8-15.84 ft bgs.

Comments: Soil samples SB214(16-20) and SB214(26-30) submitted for particle size analysis ASTM D 422-63.

Boring location hand cleared to 3.75 ft bgs on April 17, 2007.

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78 Main Street, Suite 3
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Boring ID: SB214

Project Name: Sag Harbor Former MGP
Project Number: KEDO4-20183
Date Started/Completed: April 19, 2007
Boring Location: Intersection of southwest & southeast wall
Drilling Company: Fenley & Nicol Environmental, Inc.
Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0'
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	USCS	Geologic Description
-16			114			
-16 to -18	1.6	12, 15, 16, 12	3.5, 3.4	SB214 (16-20)		Some tar coating with NLO from 18.9-19.6 ft bgs.
-18 to -20	1.8	10, 18, 20, 18	28.0, 26.3, 12.2			POORLY GRADED SAND (SP); fine-medium subrounded sand, 15-25% fine rounded gravel, brown, loose, tar coating with sheen and slight NLO from 20.0-21.7 ft bgs.
-20 to -22	2.0	4, 8, 6, 5	10.6, 15.0, 0.3			
-22 to -24	2.0	10, 18, 20, 22	10, 15.0, 13.1		SW	WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, medium dense, moist, brown, slight H2S-like odor, trace tar coating with sheen and NLO from 22.0-25.2 ft bgs.
-24 to -26	2.0	10, 15, 10, 10	10.0, 7.9, 2.5		SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, light brown, medium dense, moist, trace tar coating with sheen and NLO from 25.1-25.2 ft bgs.
-26 to -28	2.0	5, 7, 8, 5	5.3, 5.8, 1.0	SB214 (26-30)		Same as above but fine sand.
-28 to -30	2.0	7, 10, 10, 12	2.3, 0.2, 0.5			Same as above hut fine-medium sand.

Comments: Soil samples SB214(16-20) and SB214(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 3.75 ft bgs on April 17, 2007.

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Boring ID: SB208

Project Name: Sag Harbor Former MGP	**Drilling Method:** Hollow Stem Auger
Project Number: KEDO4-20183	**Sampling Method:** 2 ft Split Spoon
Date Started/Completed: April 20, 2007	**Ground Elevation (ft/msl):** NA
Boring Location: Northeast wall	**Total Depth:** 30.0'
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0 – -4			1.7 168 605 850				SW		WELL GRADED SAND (SW); fine-coarse sand, <5% fine sub-angular gravel, dark brown, wet. Tar coated with sheen and moderate NLO from 1.0-2.0 ft bgs. WELL GRADED SAND (SW); fine-coarse sand, <5% fine sub-angular gravel, brown, wet. Tar coated with sheen and strong NLO from 2.0-4.0 ft bgs. Same as above but tar saturated with sheen and NLO from 4.0-5.0 ft bgs.
-4 – -6	1.3	8 2 2 5	675 350 875						WELL GRADED SAND (SW); fine-coarse sand, <5% fine sub-rounded gravel, trace rootlets from 6.6-7.1 ft bgs, gray, loose, wet, TAR saturated with sheen and NLO and petroleum-like odor from 5.0-6.6 ft bgs. Slight petroleum-like odor and NLO from 6.6-7.1 ft bgs.
-6 – -8	1.8	3 2 2 3	167 53				OH		SILTY CLAY (OH); <5% fine sand, trace rootlets, dark gray, soft, strong H2S-like odor.
-8 – -10	2.2	5 2 2 3	78.8 100				PT		PEAT (PT); soft, dark brown, strong H2S-like odor.
-10 – -12	1.9	4 5 5 4	57 53.0 29.0				SP		POORLY GRADED SAND (SP); fine-medium subrounded sand, dark brown, medium dense, wet, moderate H2S-like odor and petroleum-like odor. Trace tar coating with sheen and NLO at 11.0 ft bgs.
-12 – -14	1.9	5 7 10 8	25.7 15.6	SB208 (12-16)					POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine rounded gravel from 13.6-14.0 ft bgs, dark brown, medium dense, wet, moderate H2S-like odor.
-14 – -16	1.7	4 8 12 18	7.8 9.5 18.7						Same as above but brown.

Comments: Soil samples SB208(12-16) and SB208(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 5.0 ft bgs on April 20, 2007.

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Boring ID: SB208

Project Name:	Sag Harbor Former MGP	**Drilling Method:**	Hollow Stem Auger
Project Number:	KEDO4-20183	**Sampling Method:**	2 ft Split Spoon
Date Started/Completed:	April 20, 2007	**Ground Elevation (ft/msl):**	NA
Boring Location:	Northeast wall	**Total Depth:**	30.0'
Drilling Company:	Fenley & Nicol Environmental, Inc.	**Logged By:**	Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16 to -18	2.0	6 11 12 18	2.4 0.7 0.3				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, brown, medium dense, wet, moderate H2S-like odor. Same as above but light brown.
-18 to -20	1.8	5 8 12 17	1.1 0.3 0.3						
-20 to -22	0.6	12 12 14 18	1.2						Same as above but light brown-tan with <5% fine rounded gravel from 22.8-23.4 ft bgs.
-22 to -24	1.7	10 12 14 18	1.2 0.3 0.1						
-24 to -26	2.0	6 7 10 14	0.4 0.0 0.3						Same as above but with <5% fine rounded gravel.
-26 to -28	2.0	12 20 20 20	0.9 0.1 0.4	SB208 (26-30)					
-28 to -30	1.7	18 18 15 18	1.4 0.8 0.5						

Comments: Soil samples SB208(12-16) and SB208(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 5.0 ft bgs on April 20, 2007.

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Boring ID: SB218

Project Name: Sag Harbor Former MGP	**Drilling Method:** Hollow Stem Auger
Project Number: KEDO4-20183	**Sampling Method:** 2 ft Split Spoon
Date Started/Completed: April 20, 2007	**Ground Elevation (ft/msl):** NA
Boring Location: Southwest wall	**Total Depth:** 30.0'
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	USCS	Geologic Description
0 to -4			76.4			SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine angular gravel, brown, moist. Wet from 1.0-4.0 ft bgs. Saturated with sheen and NLO from 2.0-4.0 ft bgs.
-4 to -6	2.0	7 6 3 3	22.4 115 176				Same as above but wet with trace rootlets. Oil saturated with petroleum-like odor from 4.0-6.9 ft bgs.
-6 to -8	0.9	2 2 2 4	75.5 44.9 18.7			PT SP	PEAT (PT); browm, soft, strong H2S-like odor. POORLY GRADED SAND (SP); fine-medium subrounded sand, trace rootlets, light brown, loose, moist, petroleum-like odor.
-8 to -10	2.0	10 12 14 11	61.3 7.0			PT SP	PEAT (PT); browm, soft, H2S-like and petroleum-like odor. POORLY GRADED SAND (SP); fine-medium subrounded sand, trace rootlets, light brown, loose, moist, some oil coating with petroleum-like odor.
-10 to -12	2.0	4 6 8 10	27.5 15.7			PT SP	PEAT (PT); browm, soft, H2S-like and petroleum-like odor, slight sheen. POORLY GRADED SAND (SP); fine-medium subrounded sand, trace rootlets, light brown, loose, moist, petroleum-like odor.
-12 to -14	1.8	10 12 15 15	44.8				POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% finr rounded gravel, light brown, medium dense, wet. Oil saturated lense from 13.40-13.42 ft bgs. Sheen with slight NLO from 14.0-17.0 ft bgs.
-14 to -16	1.2	9 10 11 15	17.1 17.2 31.9				

Comments: Soil samples SB218(16-20) and SB218(23.2-24) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 17, 2007.

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Boring ID: SB218

Project Name: Sag Harbor Former MGP	**Drilling Method:** Hollow Stem Auger
Project Number: KEDO4-20183	**Sampling Method:** 2 ft Split Spoon
Date Started/Completed: April 20, 2007	**Ground Elevation (ft/msl):** NA
Boring Location: Southwest wall	**Total Depth:** 30.0'
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16 to -18	2.0	12 18 20 22	6.7 10.8 8.5	SB218 (16-20)			SW		
-18 to -20	2.0	10 8 7 10	11.7						WELL GRADED SAND (SW); fine-coarse subrounded sand, 5-10% fine rounded gravel, medium dense moist, light brown, slight NLO. Tar coating from 19.6-19.7 ft bgs.
-20 to -22	2.0	9 8 7 9	15.7 8.2 0.0						WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, medium dense, wet, light brown, moderate NLO from 20.0-21.5 ft bgs. Light staining from 21.3-21.4 ft bgs.
-22 to -24	1.0	10 30 30 30	0.0 0.0 0.0	SB218 (23.2-24)			SP		POORLY GRADED SAND (SP); fine subrounded sand, <5% silt, light brown, dense, moist.
-24 to -26	1.1	3 6 9 11	0.0 0.0 0.0						POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, light brown, loose, moist. Same as above but medium dense.
-26 to -28	2.0	12 16 8 10	4.0 3.8 0.0						30-40% fine rounded gravel from 27.2-27.5 ft bgs. Same as above but loose.
-28 to -30	1.5	9 5 5 10	0.0 0.0 0.0						

Comments: Soil samples SB218(16-20) and SB218(23.2-24) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 17, 2007.

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Boring ID: SB203

Project Name: Sag Harbor Former MGP
Project Number: KEDO4-20183
Date Started/Completed: April 25, 2007
Boring Location: Northwest wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0'
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	USCS
0 to -4			0.0 0.0 32.4 190			SW SM SP
-4 to -6	1.8	8 8 15 15	10.8 240 412			
-6 to -8	1.8	3 2 3 10	181 93.9 23.7			
-8 to -10	1.2	5 6 6 12	166 12.4			
-10 to -12	2.0	6 7 10 10	49.0 27.0 14.1			
-12 to -14	1.6	5 6 7 11	11.9 5.8 2.9	SB203 (12-16)	12-16	
-14 to -16	1.5	4 6 9 12	5.0 0.6			

Geologic Description

Asphalt

WELL GRADED SAND (SW); medium sand, ~30% coarse rounded grave, brown, moist.

SILTY SAND (SM); medium sand, <5% rounded gravel and brick fragments, brown. moist.
SILTY SAND (SM); coarse-medium sand, <5% fine angular gravel, brown, moist, slight NLO

POORLY GRADED SAND (SP); medium sand, 15-25% medium rounded gravel, black, tar saturated with strong NLO.
POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, <5% fine rounded gravel, dark gray to brown, loose, wet, tar coated with NLO.
Brown with tar saturation and moderate NLO from 6.0-7.0 ft bgs.
Gray with tar coating and slight NLO from 7.0-8.0 ft bgs.

Brown with tar saturation and NLO from 8.0-9.5 ft bgs.

Petroleum-like odor from 10.0-11.0 ft bgs.

POORLY GRADED SAND (SP); fine subrounded sand, <5% silt, brown, medium dense, H2S-like odor.

POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, <5% fine rounded gravel, brown, medium dense, H2S-like odor.

Comments: Soil samples SB203(12-16) and SB203(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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Boring ID: SB203

Project Name: Sag Harbor Former MGP
Project Number: KEDO4-20183
Date Started/Completed: April 25, 2007
Boring Location: Northwest wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0'
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16 to -18	1.7	5 10 14 18	0.6 0.3 0.3						
-18 to -20	2.0	6 11 12 15	0.0 1.8						30-40% fine rounded gravel layer and slight NLO from 22.6-23.0 ft bgs.
-20 to -22	2.0	8 9 14 17	1.8 2.9 4.5						
-22 to -24	2.0	6 8 9 14	7.4 7.4 4.4						
-24 to -26	1.7	5 6 6 11	0.0 0.0 0.6				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% silt, <5% fine rounded gravel, brown, medium dense. 40-50% fine rounded gravel from 26.1-26.4 ft bgs.
-26 to -28	1.6	5 7 11 20	0.0 0.0 0.2	SB203 (26-30)					
-28 to -30	2.0	6 7 9 12	0.0 0.0 0.0				SP		POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, <5% fine rounded gravel, light brown, medium dense.

Comments: Soil samples SB203(12-16) and SB203(26-30) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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Boring ID: SB204

Project Name: Sag Harbor Former MGP	**Drilling Method:** Hollow Stem Auger
Project Number: KEDO4-20183	**Sampling Method:** 2 ft Split Spoon
Date Started/Completed: April 26, 2007	**Ground Elevation (ft/msl):** NA
Boring Location: Northeast wall	**Total Depth:** 30.0'
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0									Asphalt
0 – -2			0.0				SP		POORLY GRADED SAND (SP); coarse sand, 30-40% fine rounded gravel, brown, dry.
-2 – -4			0.0 0.0				SM		SILTY SAND (SM); medium sand, <5% fine rounded gravel, black, dry.
-4 – -6	1.5	10 14 17 6	0.1 0.0				SP		POORLY GRADED SAND (SP); coarse sand 25-30% fine rounded gravel, brown, moist. POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine rounded gravel, light brown, medium dense, moist.
-6 – -8	1.8	6 8 10 14	0.0 0.0 0.0	SB204 (4-10)			SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine sub rounded gravel, light brown-tan, loose, wet.
-8 – -10	2.0	9 5 7 12	0.0 0.0						Slight H2S-like odor from 10.7-11.2 ft bgs.
-10 – -12	2.0	3 3 4 8	0.0 0.4 0.8				SP		POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, trace rootlets from 11.2-12.0 ft bgs, medium dense, wet, moderate H2S-like odor.
-12 – -14	1.0	7 9 10 12	1.4	SB204 (12-16)					
-14 – -16	1.5	4 6 9 14	3.8 3.5						

Comments: Soil samples SB204(12-16) and SB204(26-30) submitted for particle size analysis ASTM D 422-63.
Soil samples SB204(4-10)-042607 and SB204(16-18)-042607 analyzed for VOC, BNA, metals, and cyanide.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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Boring ID: SB204

Project Name: Sag Harbor Former MGP
Project Number: KEDO4-20183
Date Started/Completed: April 26, 2007
Boring Location: Northeast wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0'
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	USCS	Geologic Description
-16 to -18	2.0	5 8 12 22	6.5 6.5 3.6	SB204 (16-18)		<5% fine subrounded gravel from 18.0-24.0 ft bgs
-18 to -20	2.0	6 10 14 20				
-20 to -22	2.0	10 14 14 18	0.7		SW	WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, wet, medium dense, slight H2S-like odor.
-22 to -24	2.0	8 12 17 24	0.5 0.8 0.1			
-24 to -26	1.5	9 12 14 18	0.0 0.4			Dense from 26.0-30.0 ft bgs.
-26 to -28	2.0	6 12 19 26	0.0 0.0 0.1	SB204 (26-30)		
-28 to -30	2.0	7 10 14 18	0.0 0.3 0.0			

Comments: Soil samples SB204(12-16) and SB204(26-30) submitted for particle size analysis ASTM D 422-63.
Soil samples SB204(4-10)-042607 and SB204(16-18)-042607 analyzed for VOC, BNA, metals, and cyanide.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB206

Project Name: Sag Harbor Former MGP
Project Number: KEDO4-20183
Date Started/Completed: 4-26-2007 / 4-27-2007
Boring Location: Northeast excavation wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0'
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	USCS	Geologic Description
0					SW	WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, <5% brick fragments, dark brown, medium dense, wet. WELL GRADED SAND (SW); fine-coarse subangular sand, <5% fine augular gravel, dark brown, loose, wet. WELL GRADED SAND (SW); fine-coarse subangular sand, 30-40% brick fragments, light gray and tan, wet.
-2	.6	4 5 8 2	0.1			
-4	1.2	10 28 14 12	0.7 2.3	SB206 (2-8)	SP	POORLY GRADED SAND (SP); fine-medium subangular sand, dark gray, loose, wet, slight NLO.
-6	1.7	3 1 1 2	27.1 9.7		SM	SILTY SAND (SM); fine-medium subangular sand, abundant rootlets, gray, loose, wet, slight NLO.
					PT	PEAT (PT); <5% fine sand, brown, soft, moderate H2S-like odor and petroleum-like odor from 7.3-9.1 ft bgs. Dark brown with strong H2S-like odor and petroleum-like odor from 9.1-10.65ft bgs.
-8	2.0	1 2 2 2	9.3 73.3 85.9			
-10	2.0	2 5 14 18	27.4 60.1 81.1		SP	5POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, light brown grading to dark brown, medium dense, wet, moderate H2S-like odor and slight NLO. Same as above but dark browu grading to light brown, slight H2S-like odor and no NLO.
-12	1.4	12 17 15 17	66.2 131			Same as above but brown and dense.
-14	2.0	8 20 27 32	81.2 56.4 34.1	SB206		

Comments: Soil samples SB206(14-18) and SB206(26'-30') submitted for particle size analysis ASTM D 422-63.
Soil samples SB206(2-8')-042707 analyzed for BNA, metals, and cyanide.
Boring location hand cleared to 2.0 ft bgs on 4-26-2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB206

Project Name: Sag Harbor Former MGP	**Drilling Method:** Hollow Stem Auger
Project Number: KEDO4-20183	**Sampling Method:** 2 ft Split Spoon
Date Started/Completed: 4-26-2007 / 4-27-2007	**Ground Elevation (ft/msl):** NA
Boring Location: Northeast excavation wall	**Total Depth:** 30.0'
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16 to -18	2.0	12 15 15 25	72.6 60.0 13.7	SB206 (14-18)					POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, <5% fine rounded gravel, light brown, medium dense, wet, slight H2S-like odor.
-18 to -20	1.8	10 15 20 25	9.0 6.0 1.2						Same as above but loose-medium dense with no odor.
-20 to -22	2.0	5 8 12 16	2.8 1 0.6						
-22 to -24	2.0	10 12 16 16	0.7 0.4 0.4				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% silt, <5% fine rounded gravel, light brown from 22.0-23.0 ft bgs and light brown to tan from 23.0-24.0 ft bgs, loose-medium dense, wet.
-24 to -26	1.7	8 8 10 16	0.0 0.0 0.1						Same as above but light brown to tan.
-26 to -28	1.7	9 8 8 16	0.1 0.1 0.2	SB206 (26-30)					
-28 to -30	1.8	5 12 20 26	0.1 0.0 0.0						

Comments: Soil samples SB206(14-18) and SB206(26'-30') submitted for particle size analysis ASTM D 422-63.
Soil samples SB206(2-8')-042707 analyzed for BNA, metals, and cyanide.
Boring location hand cleared to 2.0 ft bgs on 4-26-2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB216

Project Name: Sag Harbor Former MGP	**Drilling Method:** Hollow Stem Auger
Project Number: KEDO4-20183	**Sampling Method:** 2 ft Split Spoon
Date Started/Completed: April 30, 2007	**Ground Elevation (ft/msl):** NA
Boring Location: Southwest wall	**Total Depth:** 30.0'
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval
0 to -4			55.7 4.4 14.1 74.7		
-4 to -6	2.0	14 6 2 2	274		
-6 to -8	0.9	4 6 6 7	117		
-8 to -10	2.0	2 4 6 6	12.3 11.3 2.7		
-10 to -12	2.0	4 5 9 14	2.2 5.3 16.0		
-12 to -14	1.8	8 8 9 17	7.7 3.7 8.9	SB216 (12-16)	12-16
-14 to -16	1.2	6 7 12 12	6.3 5.2		

USCS	Geologic Description
	Asphalt
SM	SILTY SAND (SM); fine grained sand, ~15% silt, brown, moist, petroleum-like odor.
SP	POORLY GRADED SAND (SP); fine-medium sand, <5% silt, brown, moist. POORLY GRADED SAND (SP); fine-medium sand, <5% silt, <5% fine gravel, moist to 3.0 ft bgs, dark brown with slight NLO POORLY GRADED SAND (SP); medium sand, dark brown, moderate to strong NLO with sheen at 4.0 ft bgs. POORLY GRADED SAND (SP); fine-medium subrounded sand, , <5% fine gravel, dark brown, loose, wet, tar coating with sheen and NLO from 4.0-4.8 ft bgs, tar satnrated with sheen and NLO from 4.8-5.0 ft bgs.
PT	PEAT (PT); brown rading to dark brown, soft, H2S-like odor, tar coating with slight NLO from 5.0-5.5 ft bgs.
SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine rounded gravel, tar saturated with sheen and NLO from 6.0-8.0' ft bgs. Tar coatIing with sheen and NLO from 8.0-8.2 ft bgs.
PT	PEAT (PT); dark brown, soft, H2S-like odor.
SP	POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% silt, dark brown, loose, wet, H2S-like odor. 30-40% fine rounded gravel from 11.7-12.0 ft bgs. Same as above but brown. 30-40% fine rounded gravel from 12.7-12.8 ft bgs.

Comments: Soil samples SB216(12-16) and SB216(20-24) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB216

Project Name: Sag Harbor Former MGP
Project Number: KEDO4-20183
Date Started/Completed: April 30, 2007
Boring Location: Southwest wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 30.0'
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16	2.0	7 8 12 14	15.0 2.5 12.2				SW		WELL GRADED SAND (SW); fine-medium subrounded sand, brown, medium dense. wet, H2S-like odor.
-18	2.0	4 5 8 10	16.1 16.2 4.1						
-20	2.0	4 5 5 7	4.2 0.0 0.2	SB216 (20-24)			SP		POORLY GRADED SAND (SP); medium-coarse subrounded sand, dark brown, loose, wet. POORLY GRADED SAND (SP); fine subronded sand, loose, wet,
-22	1.0	5 4 4 8	0.0 0.0						
-24	1.1	9 5 5 9	0.0 0.0 0.0						POORLY GRADED SAND (SP); medium-coarse subrounded sand, loose, wet. POORLY GRADED SAND (SP); fine-medium subrounded sand, loose, wet.
-26	2.0	10 12 14 14	0.0 0.0 0.0				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, light brown, loose, wet. Fine sand from 29.5-30.0 ft bgs.
-28	1.5	4 3 4 7	0.0 0.0						
-30									

Comments: Soil samples SB216(12-16) and SB216(20-24) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 23, 2007.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB210

Project Name: Sag Harbor Former MGP	**Drilling Method:** Hollow Stem Auger
Project Number: KEDO4-20183	**Sampling Method:** 2 ft Split Spoon
Date Started/Completed: May 1, 2007	**Ground Elevation (ft/msl):** NA
Boring Location: Southeast excavation wall	**Total Depth:** 37.0'
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
0			0.5				SM		SILTY SAND (SM); fine-medium subrounded sand, <5% fine rounded gravel, trace rootlets, grayish brown, medium dense, moist.
			0.3				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, trace rootlets, grayish brown, loose, moist.
-2			0.9						Same as above but dark brown
			1.0						Tar saturated iwth sheen and NLO from 4.0-5.5 ft bgs.
-4	1.6	9 6 5 6	130						
			16.9				SM		SILTY SAND (SM); fine subrounded sand, brown, loose, moist.
-6	1.0	13 2 2 3	12.6						POORLY GRADED SAND (SP); fine-medium subrounded sand, gray, loose, moist.
-8	2.0	1 1 2 1	8.1 98.0 318 187				PT		PEAT (PT); brown, soft, H2S-like odor.
-10	0.3	1 2 1 4	37.1						
-12	2.0	5 6 9 11	64.0 72.1 47.0				SP		POORLY GRADED SAND (SP); fine subrounded sand, <5% silt, dark brown, medium dense, wet, H2S-like odor.
-14	2.0	3 8 15 22	44.0 51.0						POORLY GRADED SAND (SP); fine-medium subrounded sand, <5% fine rounded gravel, <5% silt, light brown, medium dense, wet, H2S-like odor. Fine-coarse and brown from 15.6-16.0 ft bgs.

Comments: Soil samples SB210(14-18) and SB210(33-37) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 27, 2007.
Augered from 30.0 - 33.0 ft bgs and resumed split spoon sampling.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB210

Project Name: Sag Harbor Former MGP	**Drilling Method:** Hollow Stem Auger
Project Number: KEDO4-20183	**Sampling Method:** 2 ft Split Spoon
Date Started/Completed: May 1, 2007	**Ground Elevation (ft/msl):** NA
Boring Location: Southeast excavation wall	**Total Depth:** 37.0'
Drilling Company: Fenley & Nicol Environmental, Inc.	**Logged By:** Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-16 to -18	1.3	5 12 14 18	11.6 10.1	SB210 (14-18)					Dark brown from 17.1-17.14 ft bgs. 30-40% fine rounded gravel from 18.3-18.7 ft bgs.
-18 to -20	1.4	5 12 5 22	2.6 0.7						
-20 to -22	1.8	10 14 14 18	9.1 20.0 0.2				SW		WELL GRADED SAND (SW); fine-coarse subrounded sand, <5% fine rounded gravel, light brown, medium dense, wet.
-22 to -24	1.1	9 14 17 25	0.9						
-24 to -26	1.5	6 7 12 14	4.7 2.0						same as above but loose.
-26 to -28	2.0	9 8 7 12	5.0 1.7 4.3						Trace coarse sand from 29.2-34.2 ft bgs.
-28 to -30	1.7	6 5 6 8	1.8						
-30									

Comments: Soil samples SB210(14-18) and SB210(33-37) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 27, 2007.
Augered from 30.0 - 33.0 ft bgs and resumed split spoon sampling.

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78 Main Street, Suite 3
Nyack, New York, 10960

Boring ID: SB210

Project Name: Sag Harbor Former MGP
Project Number: KEDO4-20183
Date Started/Completed: May 1, 2007
Boring Location: Southeast excavation wall
Drilling Company: Fenley & Nicol Environmental, Inc.

Drilling Method: Hollow Stem Auger
Sampling Method: 2 ft Split Spoon
Ground Elevation (ft/msl): NA
Total Depth: 37.0'
Logged By: Kevin Kachel

Depth (Feet)	Recovery (Feet)	Blow Counts	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Visual Impacts	Geologic Description
-32									
-34	2.0	6 5 5 8	0.1 0.0 0.1	SB210 (33-37)					
-36	1.9	4 5 7 12	0.3 0.0 0.0						

Comments: Soil samples SB210(14-18) and SB210(33-37) submitted for particle size analysis ASTM D 422-63.
Boring location hand cleared to 4.0 ft bgs on April 27, 2007.
Augered from 30.0 - 33.0 ft bgs and resumed split spoon sampling.

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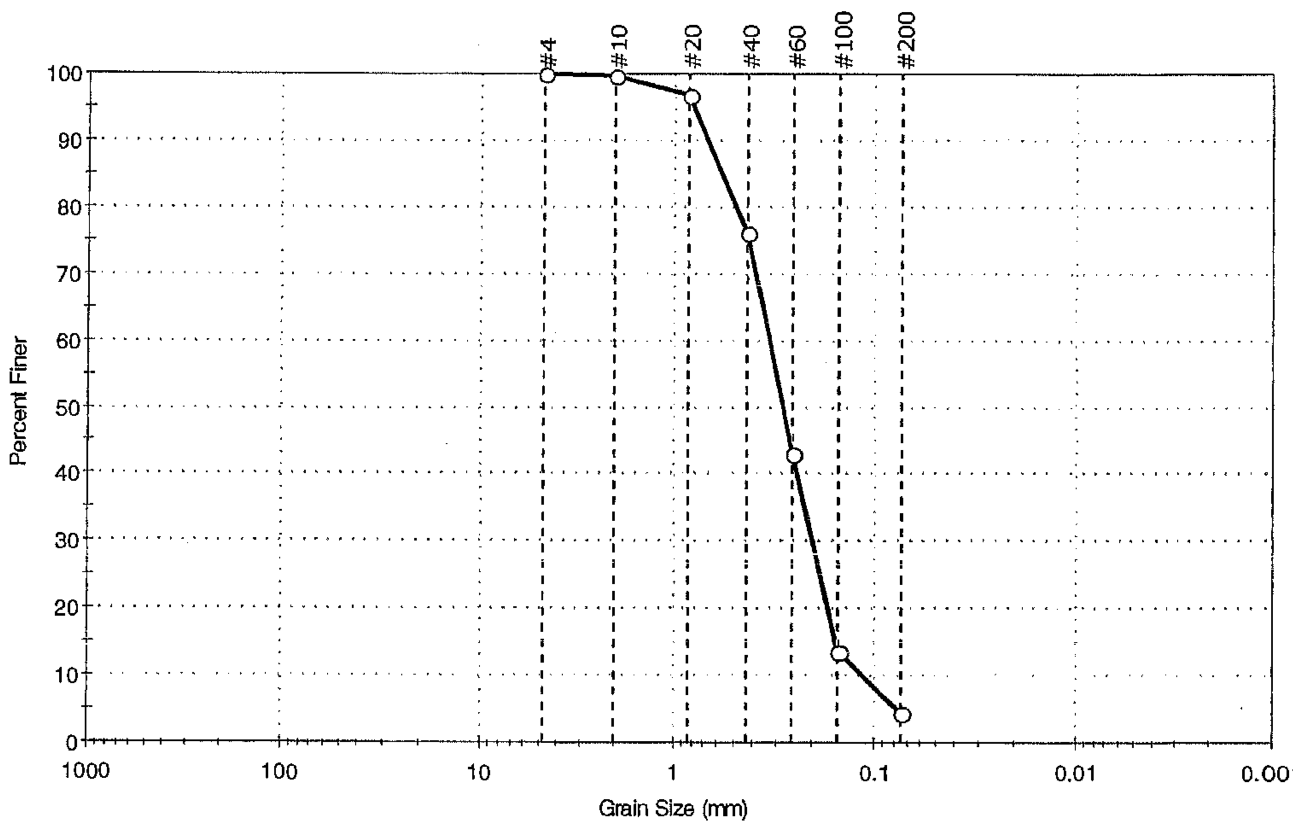
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB216	Test Date:	05/03/07	Checked By:	jdt
Depth :	12-16 ft	Test Id:	110949		

Test Comment: ---
Sample Description: Wet, dark brown sand
Sample Comment: ---

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	95.5	4.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	97		
#40	0.42	76		
#60	0.25	43		
#100	0.15	14		
#200	0.075	5		

Coefficients

D_{85} = 0.5707 mm — D_{30} = 0.1988 mm
D_{60} = 0.3284 mm — D_{15} = 0.1525 mm
D_{50} = 0.2798 mm — D_{10} = 0.1130 mm
C_u = 2.906 — C_c = 1.065

Classification

ASTM Poorly graded sand (SP)

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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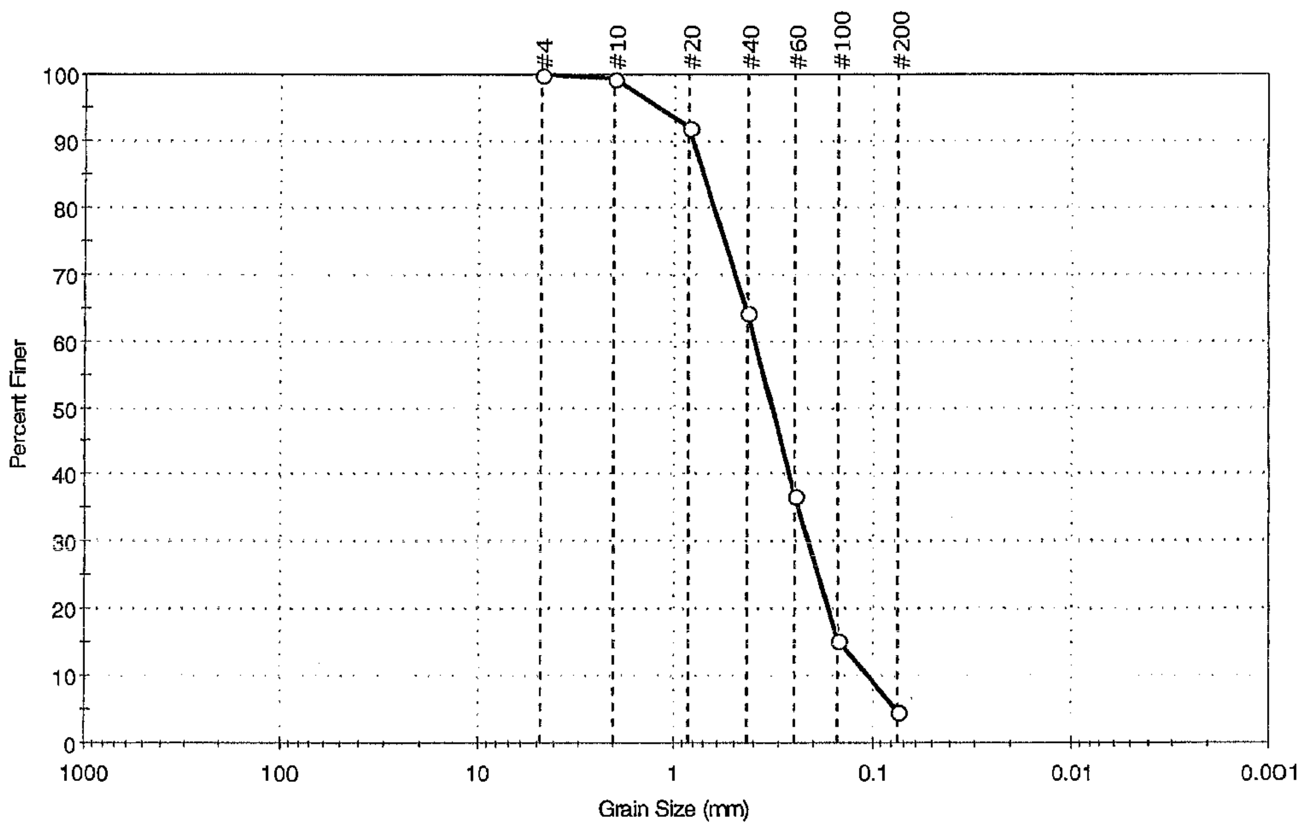
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB216	Test Date:	05/03/07	Checked By:	jdt
Depth :	20-24 ft	Test Id:	110950		
Test Comment:	---				
Sample Description:	Moist, brown sand				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	---	95.4	4.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.84	92		
#40	0.42	64		
#60	0.25	37		
#100	0.15	15		
#200	0.075	5		

Coefficients

D_{85} =0.7072 mm	D_{30} =0.2121 mm
D_{60} =0.3907 mm	D_{15} =0.1454 mm
D_{50} =0.3223 mm	D_{10} =0.1058 mm
C_u =3.693	C_c =1.088

Classification

ASTM Poorly graded sand (SP)

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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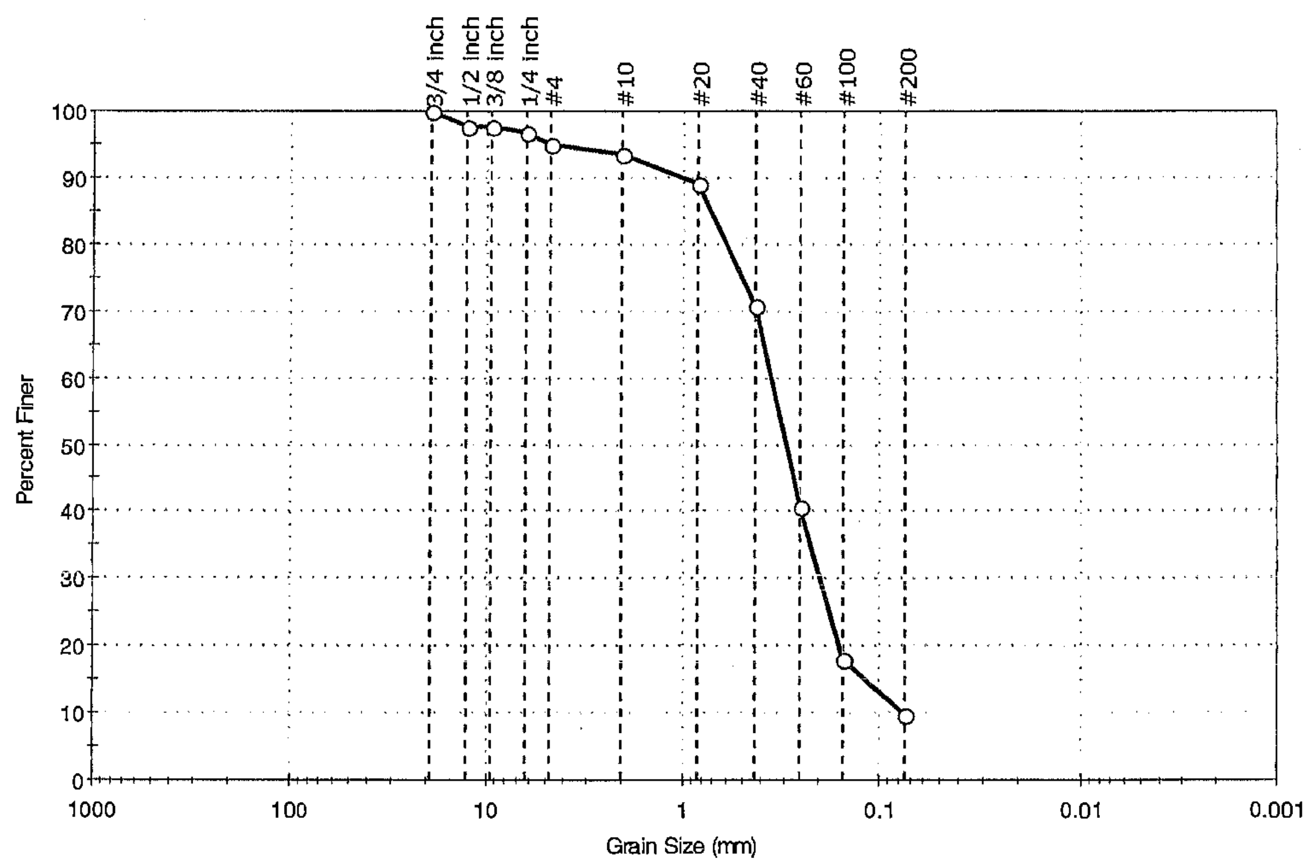
Client:	The Retec Group, Inc		
Project:	Sag Harbor Former MGP		
Location:	Sag Harbor, NY	Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID:SB210	Test Date: 05/03/07	Checked By:	jdt
Depth : 14-18 ft	Test Id: 110951		
Test Comment:	---		
Sample Description:	Wet,dark brown sand with silt		
Sample Comment:	---		

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	4.9	85.4	9.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/4 inch	19.00	100		
1/2 inch	12.70	98		
3/8 inch	9.51	98		
1/4 inch	6.35	97		
#4	4.75	95		
#10	2.00	93		
#20	0.84	89		
#40	0.42	71		
#60	0.25	41		
#100	0.15	18		
#200	0.075	10		

Coefficients

D_{85} =0.7226 mm	D_{30} =0.1962 mm
D_{60} =0.3516 mm	D_{15} =0.1170 mm
D_{50} =0.2946 mm	D_{10} =0.0767 mm
C_u =4.584	C_c =1.427

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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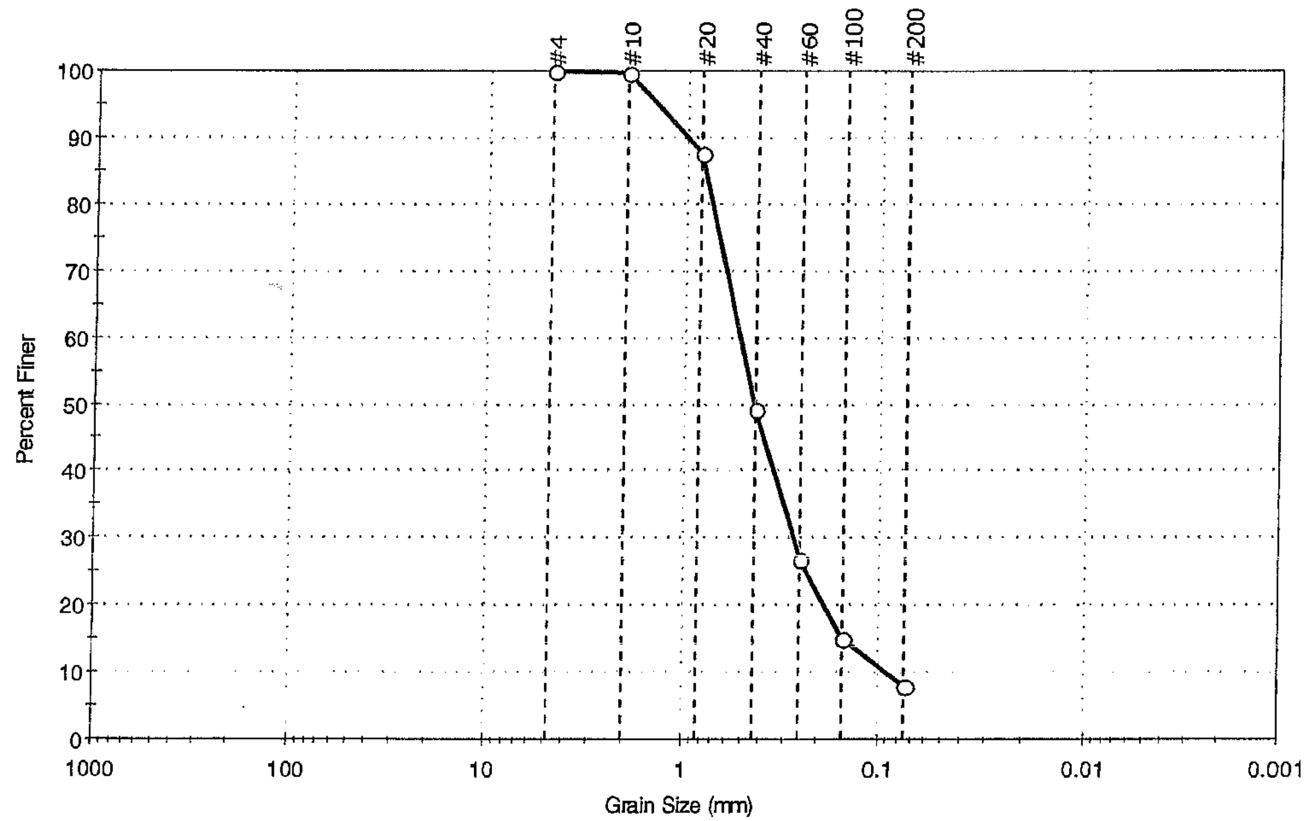
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB210	Test Date:	05/02/07	Checked By:	jdt
Depth :	33-37 ft	Test Id:	110952		
Test Comment:	---				
Sample Description:	Wet, light brownish gray sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	—	92.2	7.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	88		
#40	0.42	49		
#60	0.25	27		
#100	0.15	15		
#200	0.075	8		

Coefficients

D_{85} = 0.8014 mm　　D_{30} = 0.2702 mm

D_{60} = 0.5151 mm　　D_{15} = 0.1493 mm

D_{50} = 0.4316 mm　　D_{10} = 0.0923 mm

C_u = 5.581　　C_c = 1.536

Classification

ASTM　N/A

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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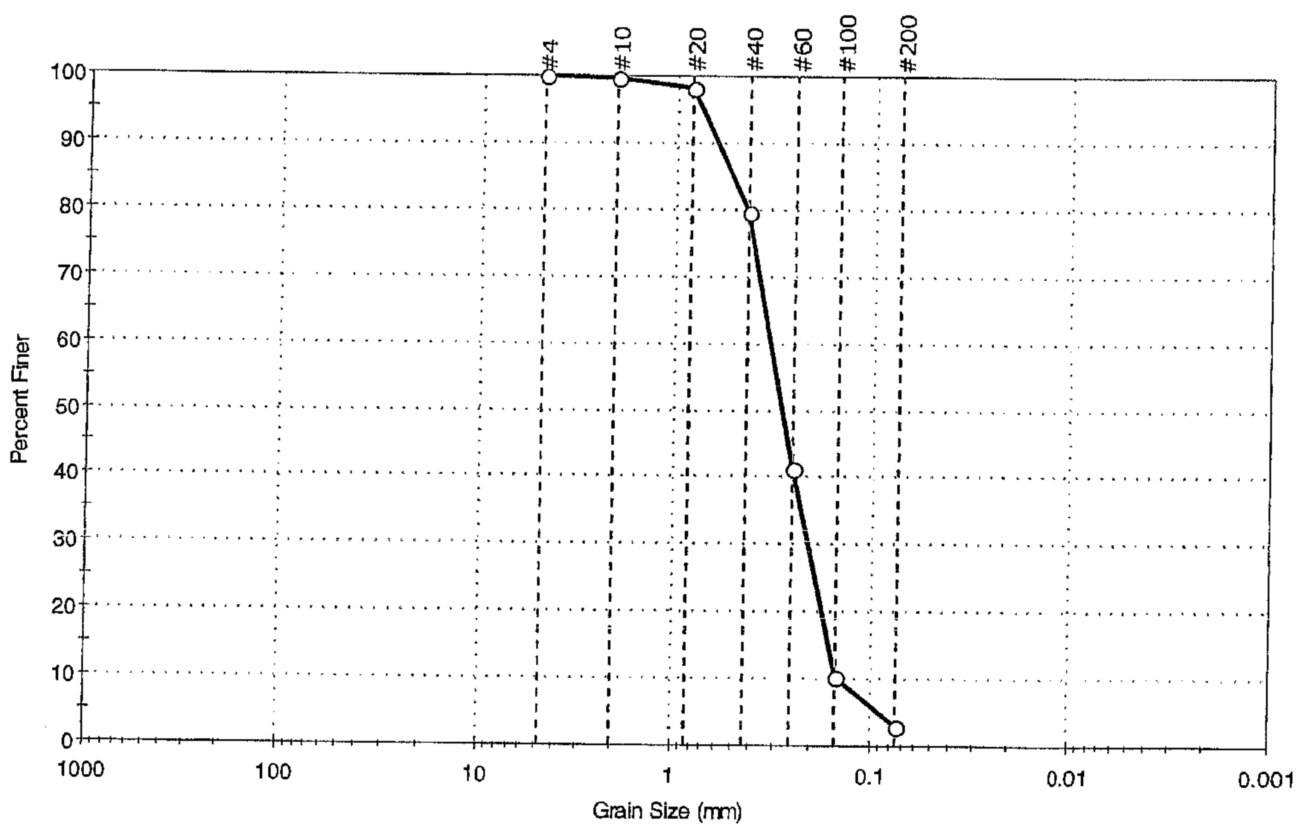
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB204	Test Date:	04/30/07	Checked By:	jdt
Depth :	12-16 ft	Test Id:	110894		
Test Comment:	---				
Sample Description:	Moist, dark brown sand				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	97.0	3.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	98		
#40	0.42	80		
#60	0.25	41		
#100	0.15	10		
#200	0.075	3		

Coefficients

D_{85} = 0.5182 mm	D_{30} = 0.2070 mm
D_{60} = 0.3239 mm	D_{15} = 0.1613 mm
D_{50} = 0.2820 mm	D_{10} = 0.1457 mm
C_u = 2.223	C_c = 0.908

Classification

ASTM Poorly graded sand (SP)

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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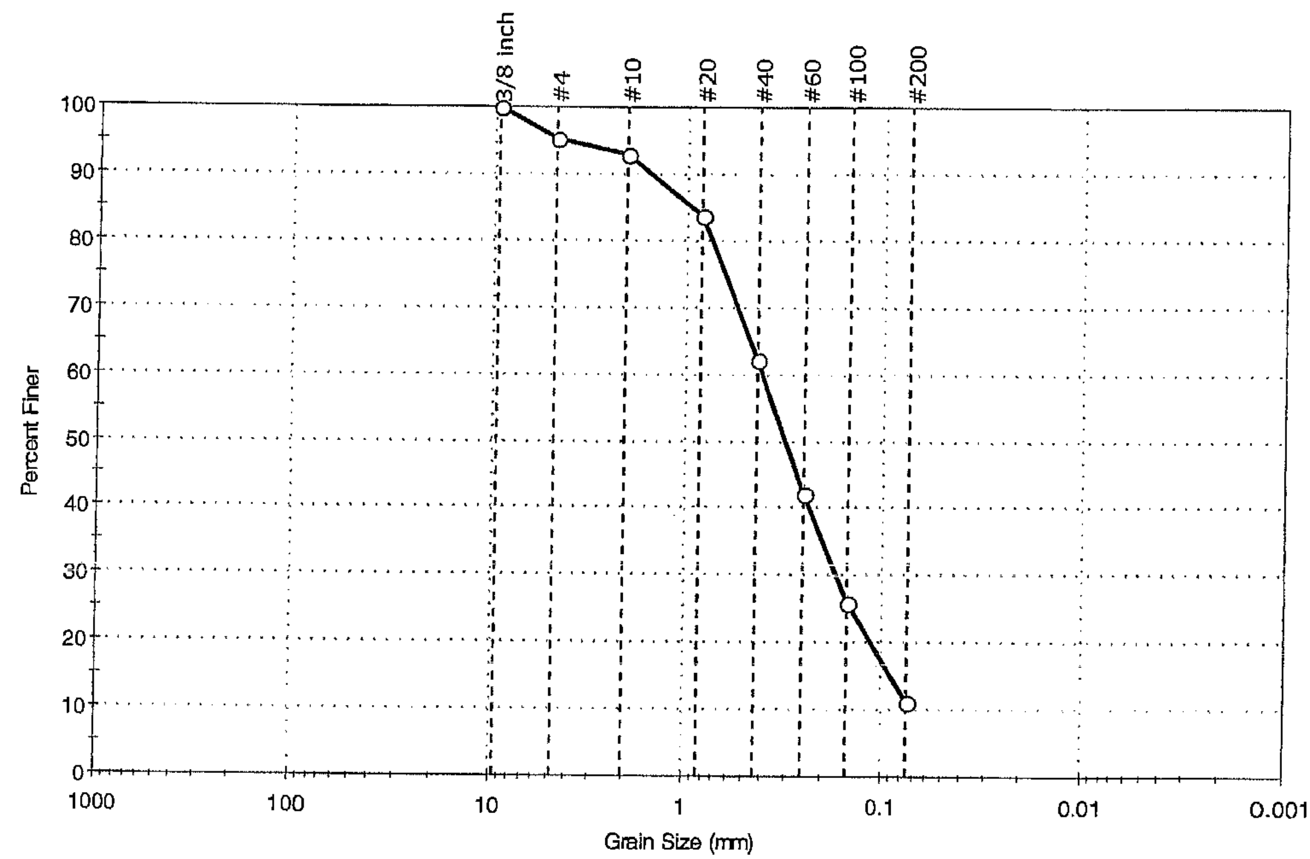
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB204	Test Date:	04/30/07	Checked By:	jdt
Depth :	26-30 ft	Test Id:	110895		
Test Comment:	---				
Sample Description:	Moist, brown sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	4.7	84.0	11.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	95		
#10	2.00	93		
#20	0.84	84		
#40	0.42	62		
#60	0.25	42		
#100	0.15	26		
#200	0.075	11		

Coefficients

D_{85} =0.9437 mm
D_{30} =0.1694 mm
D_{60} =0.4003 mm
D_{15} =0.0890 mm
D_{50} =0.3079 mm
D_{10} =0.0705 mm
C_u =5.678
C_c =1.017

Classification

ASTM N/A

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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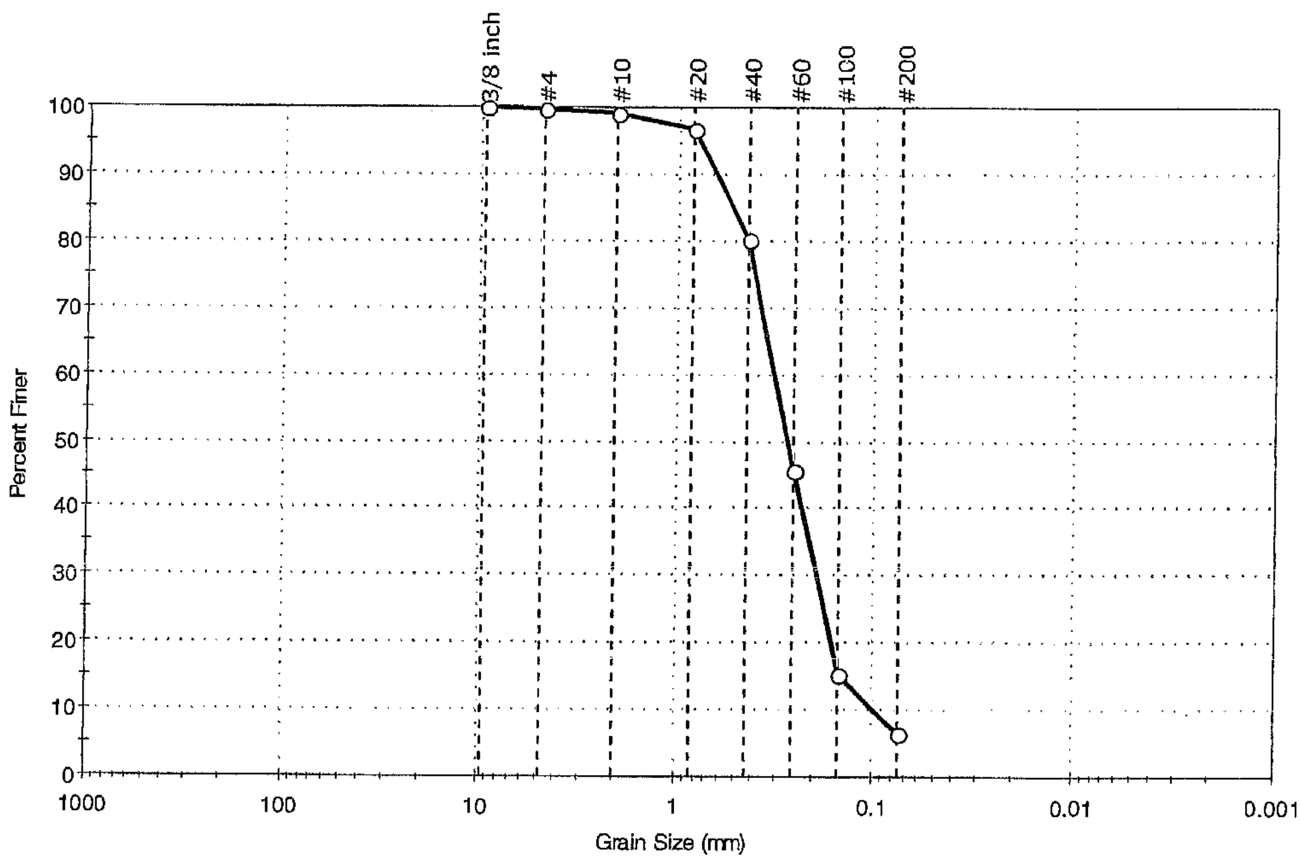
Client:	The Retec Group, Inc		
Project:	Sag Harbor Former MGP		
Location:	Sag Harbor, NY	Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID: SB206	Test Date: 04/30/07	Checked By:	jdt
Depth : 14-18 ft	Test Id: 110896		
Test Comment:	---		
Sample Description:	Moist, dark brown sand with silt		
Sample Comment:	---		

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.2	93.3	6.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	100		
#10	2.00	99		
#20	0.84	97		
#40	0.42	80		
#60	0.25	46		
#100	0.15	15		
#200	0.075	7		

Coefficients

D_{85} =0.5169 mm
D_{30} =0.1908 mm
D_{60} =0.3110 mm
D_{15} =0.1438 mm
D_{50} =0.2665 mm
D_{10} =0.0978 mm
C_u =3.180
C_c =1.197

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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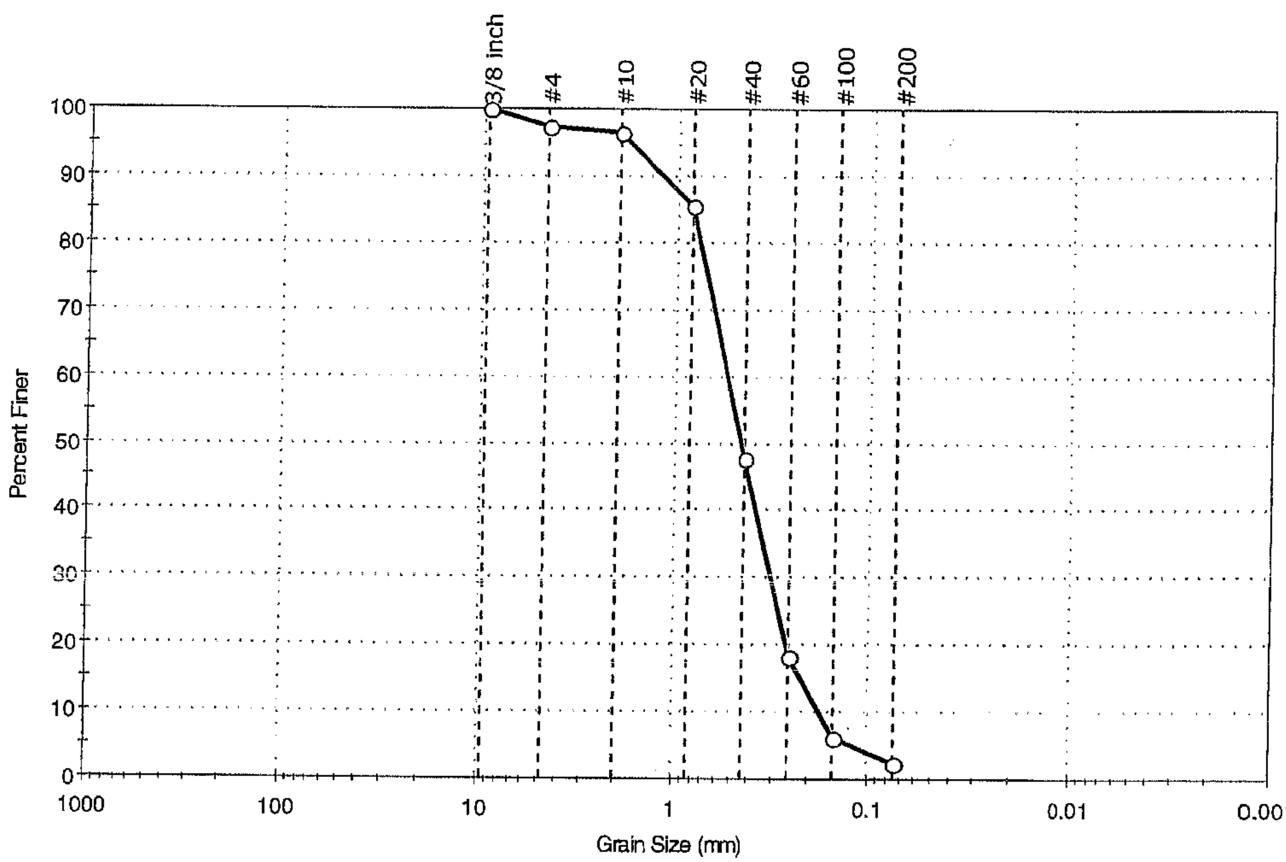
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID: ---		Sample Type:	bag	Tested By:	mll
Sample ID: SB206		Test Date:	04/30/07	Checked By:	jdt
Depth :	26-30 ft	Test Id:	110897		
Test Comment:	---				
Sample Description:	Moist, light yellowish brown sand				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	2.6	94.9	2.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	97		
#10	2.00	97		
#20	0.84	86		
#40	0.42	48		
#60	0.25	18		
#100	0.15	6		
#200	0.075	2		

Coefficients

D_{85} =0.8334 mm D_{30} =0.3091 mm
D_{60} =0.5308 mm D_{15} =0.2181 mm
D_{50} =0.4431 mm D_{10} =0.1763 mm
C_u =3.011 C_c =1.021

Classification

ASTM Poorly graded sand (SP)

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

printed 5/1/2007 9:32:22 AM

GeoTesting express
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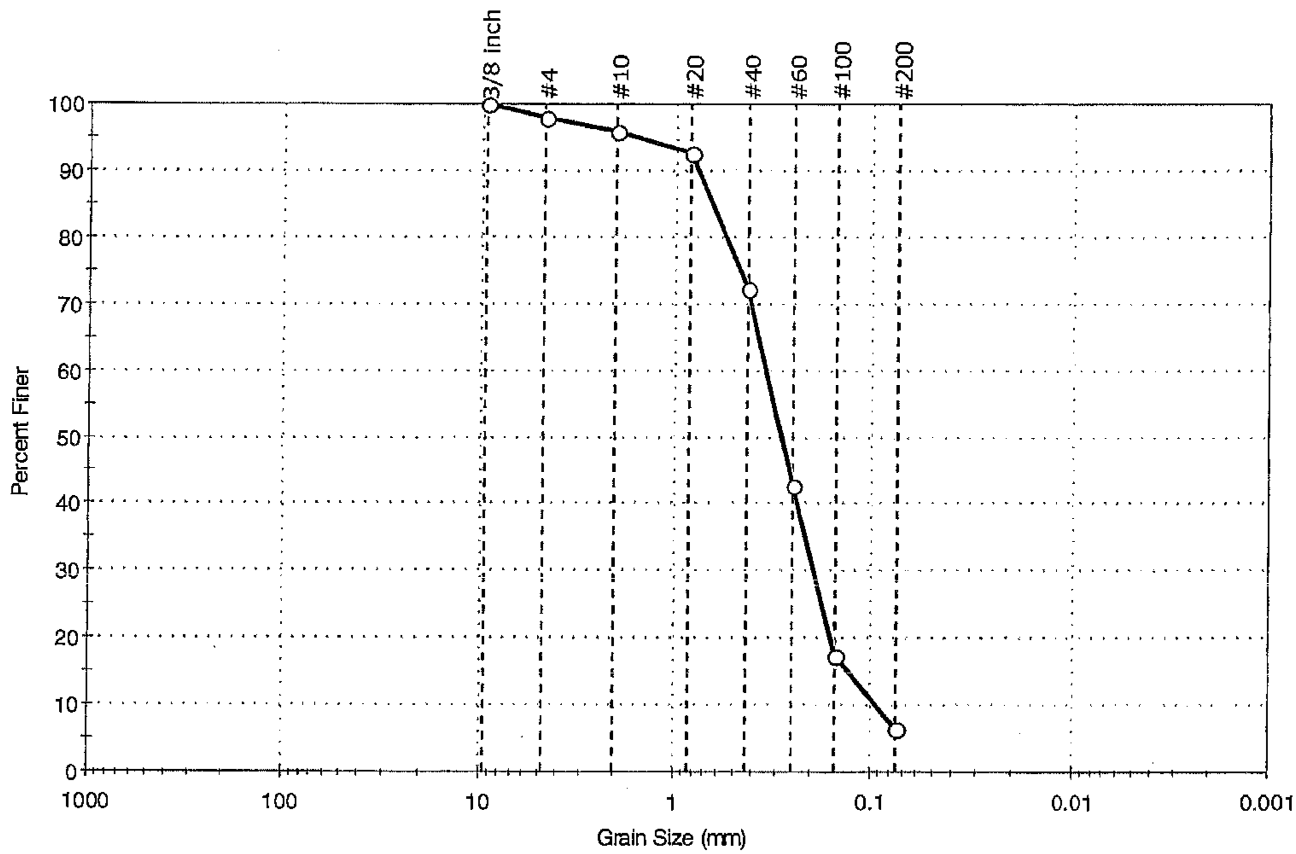
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB201	Test Date:	04/26/07	Checked By:	jdt
Depth :	14-18 ft	Test Id:	110796		
Test Comment:	---				
Sample Description:	Wet, dark yellowish brown sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	2.0	91.5	6.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	98		
#10	2.00	96		
#20	0.84	93		
#40	0.42	72		
#60	0.25	43		
#100	0.15	17		
#200	0.075	6		

Coefficients

D_{85} =0.6497 mm D_{30} =0.1930 mm

D_{60} =0.3408 mm D_{15} =0.1289 mm

D_{50} =0.2849 mm D_{10} =0.0939 mm

C_u =3.629 C_c =1.164

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape :

Sand/Gravel Hardness :

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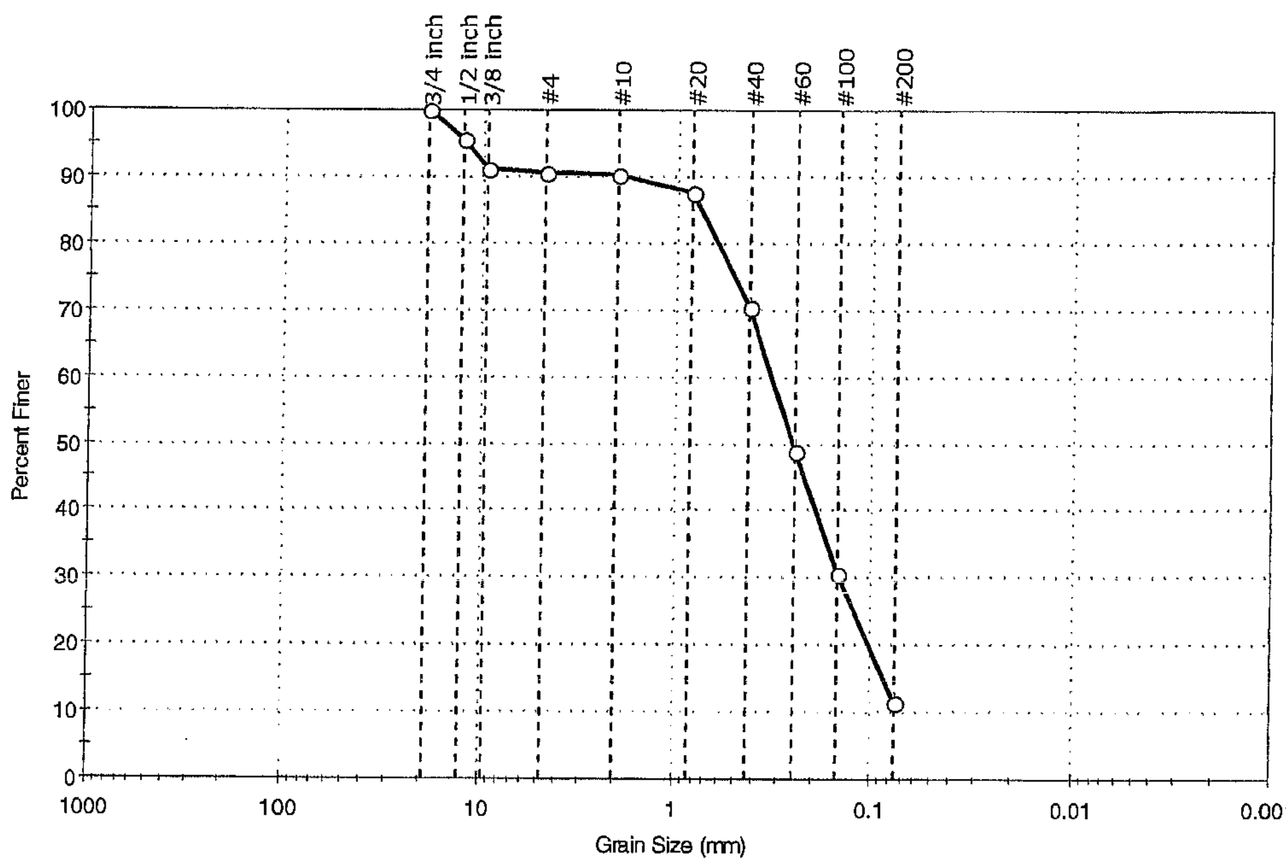
Client: The Retec Group, Inc			
Project: Sag Harbor Former MGP			
Location: Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID: SB201	Test Date: 04/27/07	Checked By:	jdt
Depth : 26-30 ft	Test Id: 110797		

Test Comment: ---
Sample Description: Wet, light yellowish brown sand with silt
Sample Comment: ---

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	9.6	79.0	11.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/4 inch	19.00	100		
1/2 inch	12.70	96		
3/8 inch	9.51	91		
#4	4.75	90		
#10	2.00	90		
#20	0.84	88		
#40	0.42	70		
#60	0.25	49		
#100	0.15	31		
#200	0.075	11		

Coefficients

D_{85} =0.7548 mm　D_{30} =0.1460 mm
D_{60} =0.3287 mm　D_{15} =0.0852 mm
D_{50} =0.2567 mm　D_{10} =0.0713 mm
C_u =4.610　C_c =0.910

Classification

ASTM　N/A

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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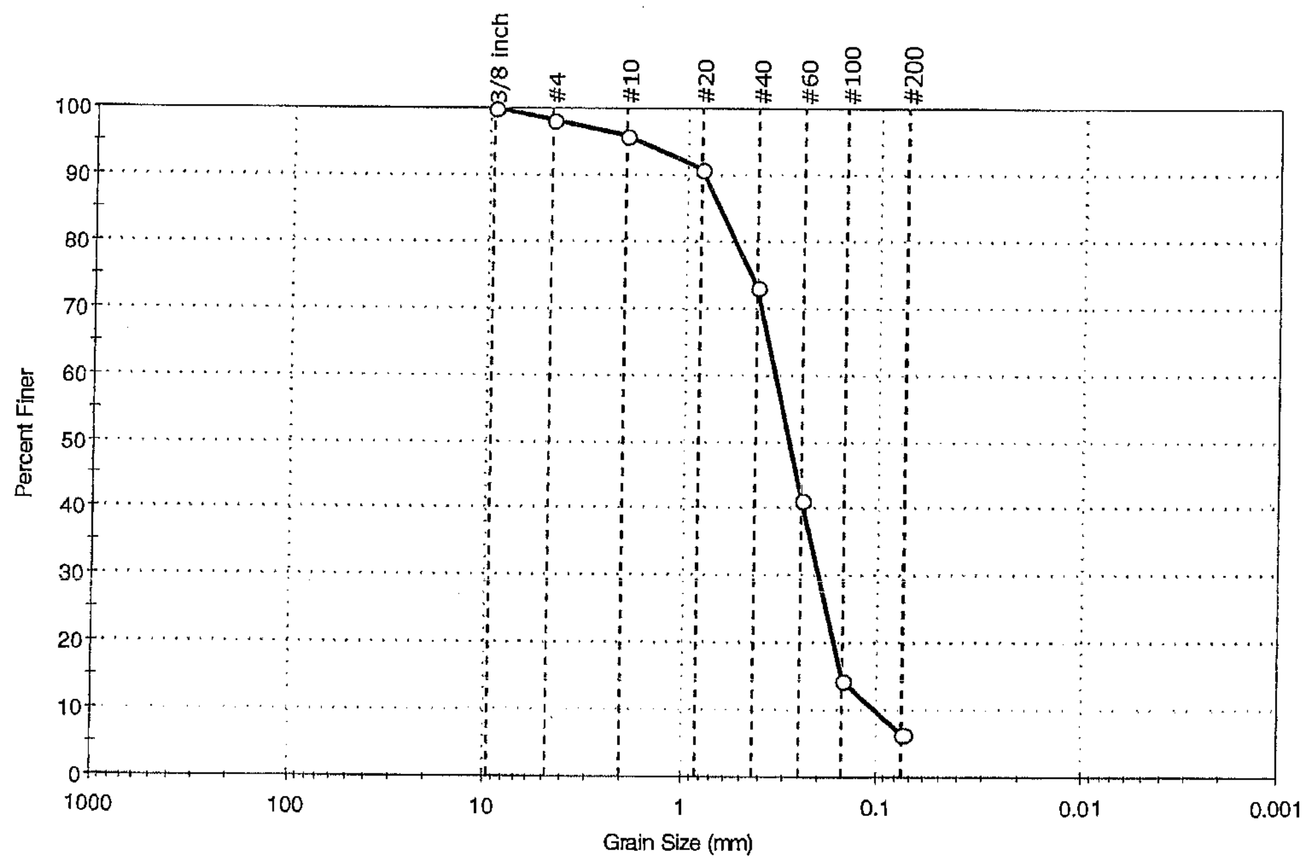
Client: The Retec Group, Inc			
Project: Sag Harbor Former MGP			
Location: Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID:SB208	Test Date: 04/27/07	Checked By:	jdt
Depth : 12-16 ft	Test Id: 110798		
Test Comment: ---			
Sample Description: Wet, dark brown sand with silt			
Sample Comment: ---			

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	1.7	91.8	6.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	98		
#10	2.00	96		
#20	0.84	91		
#40	0.42	73		
#60	0.25	41		
#100	0.15	15		
#200	0.075	7		

Coefficients

D_{85} =0.6696 mm	D_{30} =0.2011 mm
D_{60} =0.3413 mm	D_{15} =0.1503 mm
D_{50} =0.2892 mm	D_{10} =0.1009 mm
C_u =3.383	C_c =1.174

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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GeoTesting express
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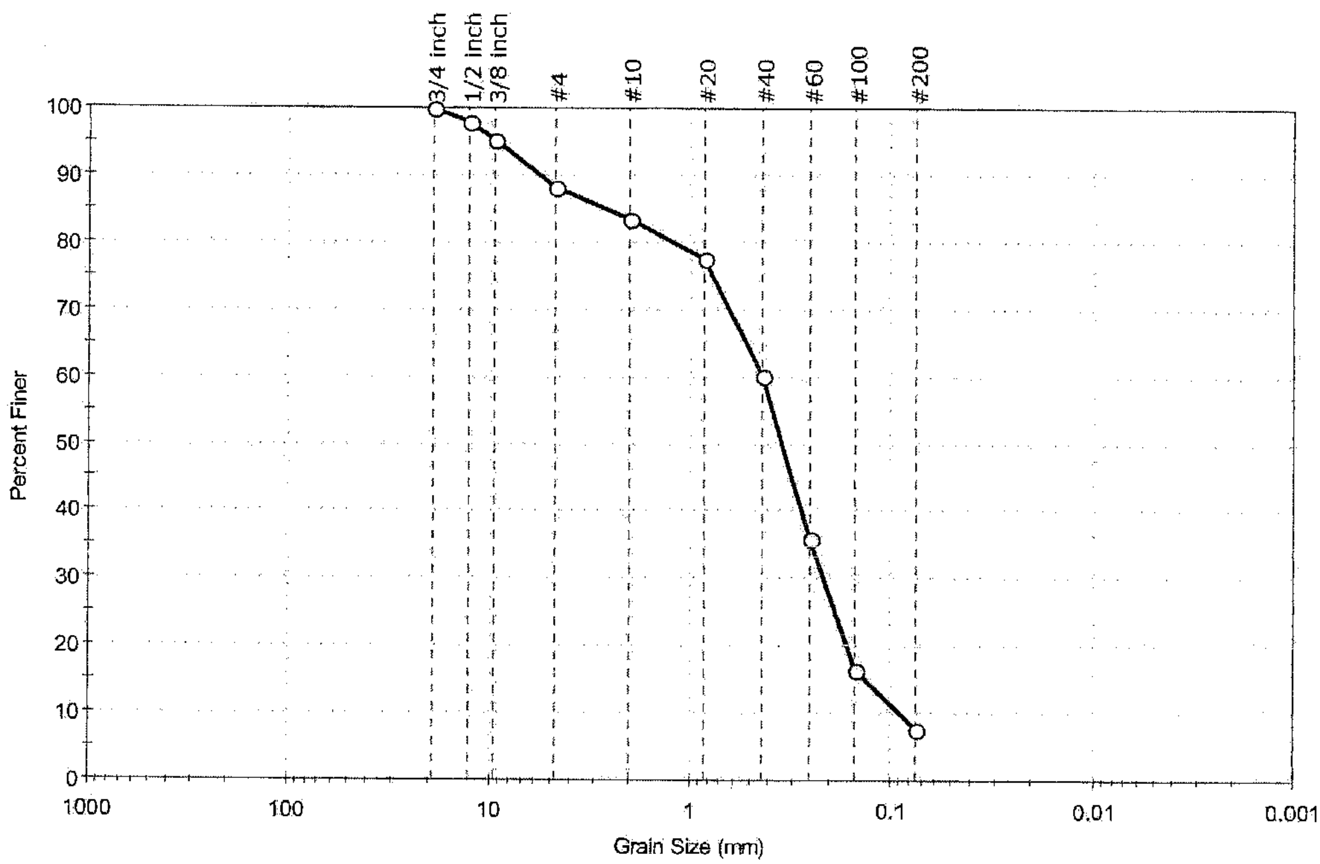
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB212	Test Date:	04/20/07	Checked By:	jdt
Depth :	14-18 ft	Test Id:	110600		
Test Comment:	---				
Sample Description:	Moist, brown sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	11.7	80.7	7.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/4 inch	19.00	100		
1/2 inch	12.70	98		
3/8 inch	9.51	95		
#4	4.75	88		
#10	2.00	84		
#20	0.84	78		
#40	0.42	60		
#60	0.25	36		
#100	0.15	17		
#200	0.075	8		

Coefficients

D_{85} =2.6002 mm	D_{30} =0.2132 mm
D_{60} =0.4244 mm	D_{15} =0.1321 mm
D_{50} =0.3405 mm	D_{10} =0.0903 mm
C_u =4.700	C_c =1.186

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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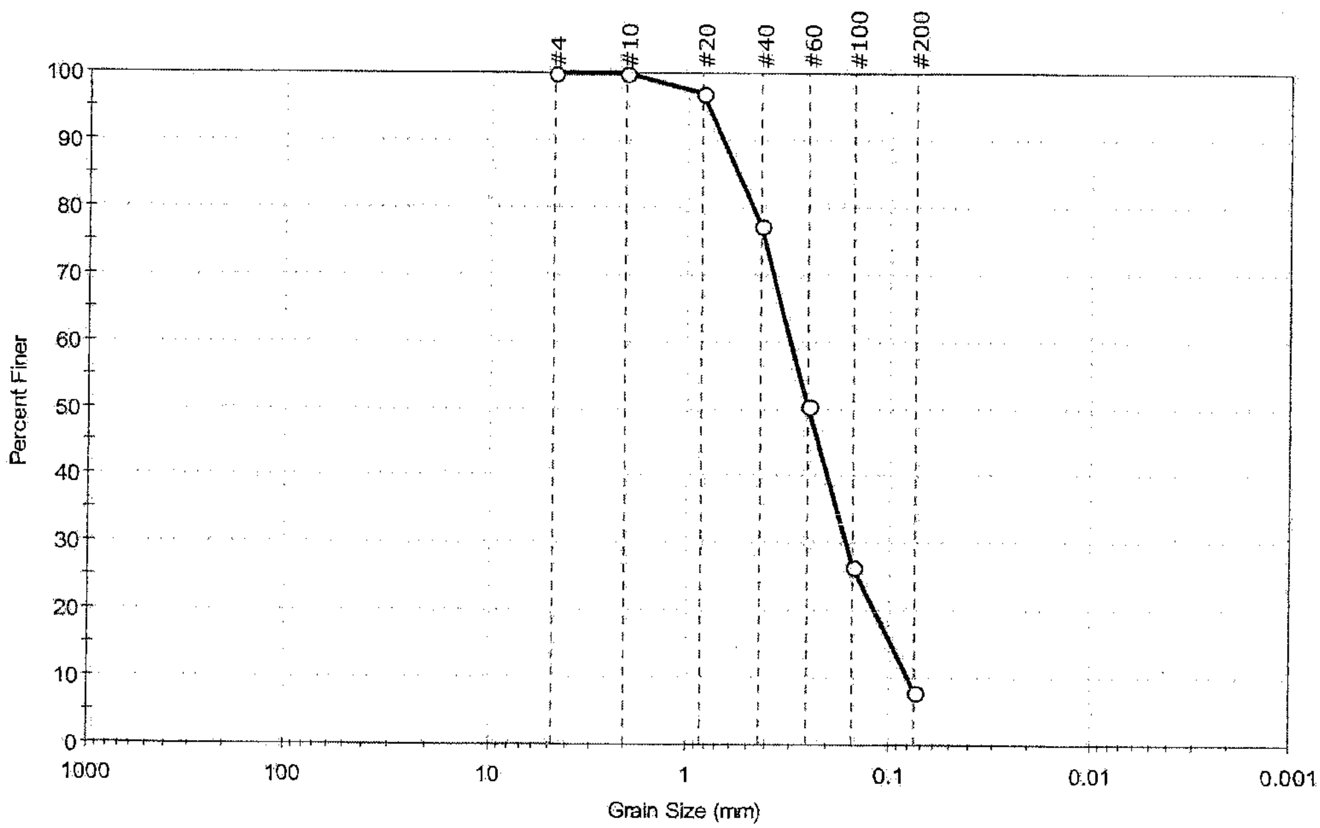
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB212	Test Date:	04/23/07	Checked By:	jdt
Depth :	22-26 ft	Test Id:	110601		
Test Comment:	---				
Sample Description:	Moist, brown sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	92.0	8.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	97		
#40	0.42	77		
#60	0.25	50		
#100	0.15	27		
#200	0.075	8		

Coefficients

D_{85} =0.5562 mm　D_{30} =0.1606 mm
D_{60} =0.3026 mm　D_{15} =0.0972 mm
D_{50} =0.2484 mm　D_{10} =0.0808 mm
C_u =3.745　C_c =1.055

Classification

ASTM　N/A

AASHTO　Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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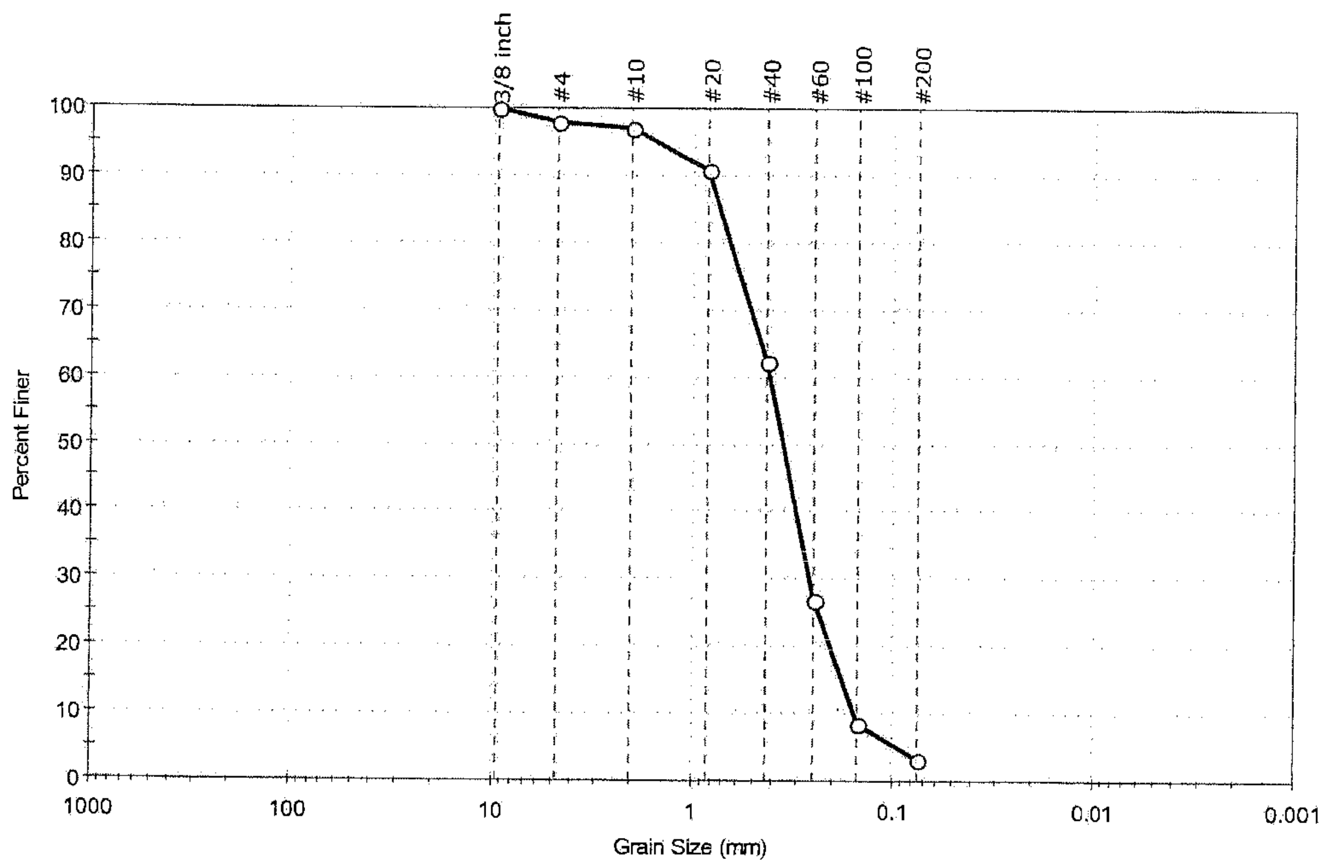
Client: The Retec Group, Inc			
Project: Sag Harbor Former MGP			
Location: Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---	Sample Type: bag	Tested By:	mll
Sample ID:SB214	Test Date: 04/23/07	Checked By:	jdt
Depth : 16-20 ft	Test Id: 110602		
Test Comment: ---			
Sample Description: Moist, dark yellowish brown sand			
Sample Comment: ---			

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	2.1	94.5	3.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	98		
#10	2.00	97		
#20	0.84	91		
#40	0.42	62		
#60	0.25	27		
#100	0.15	9		
#200	0.075	3		

Coefficients

D_{85} =0.7307 mm D_{30} =0.2626 mm

D_{60} =0.4106 mm D_{15} =0.1791 mm

D_{50} =0.3537 mm D_{10} =0.1553 mm

C_u =2.644 C_c =1.081

Classification

ASTM Poorly graded sand (SP)

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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GeoTesting express
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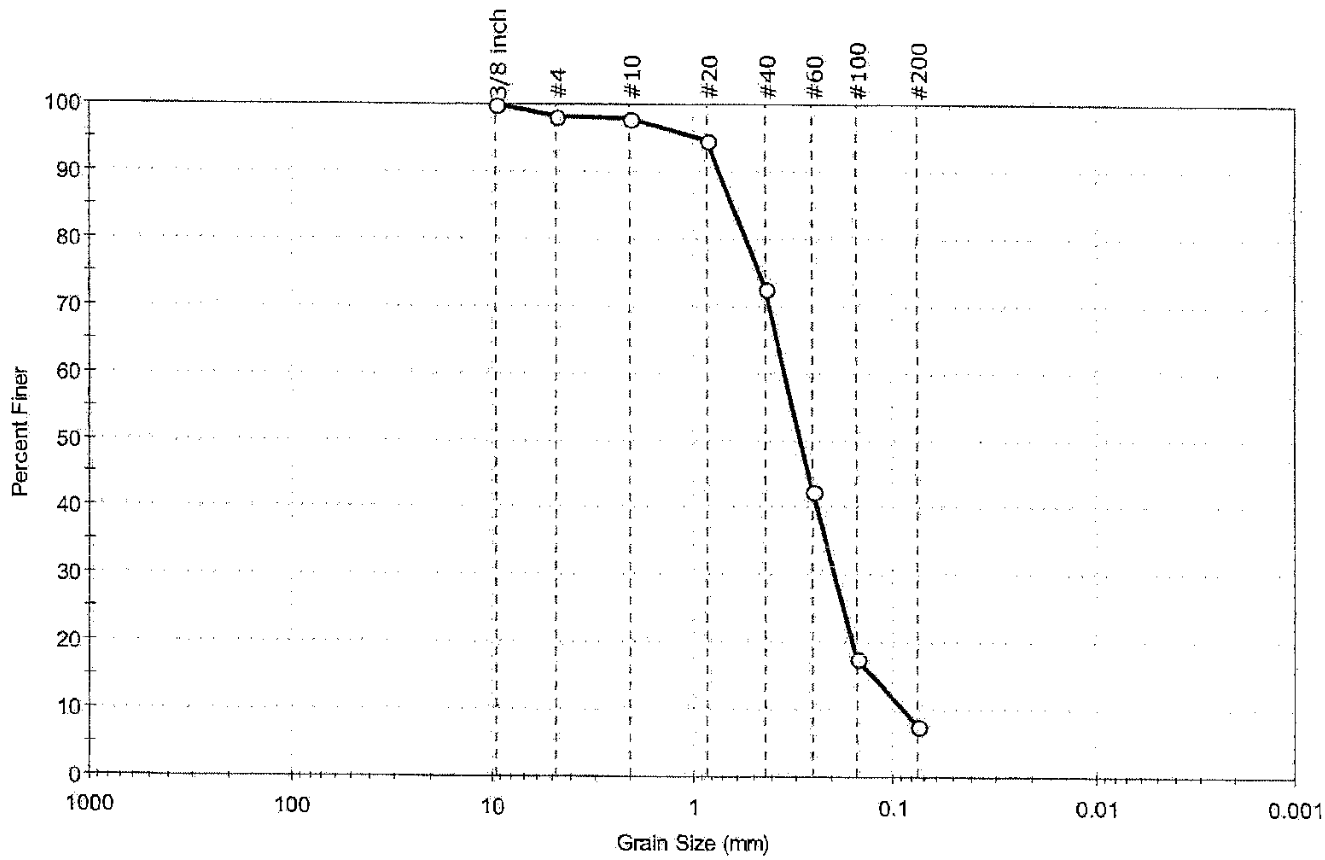
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB214	Test Date:	04/23/07	Checked By:	jdt
Depth :	26-30 ft	Test Id:	110603		
Test Comment:	---				
Sample Description:	Moist, light yellowish brown sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	1.8	90.6	7.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	98		
#10	2.00	98		
#20	0.84	95		
#40	0.42	73		
#60	0.25	42		
#100	0.15	18		
#200	0.075	8		

Coefficients

D_{85} =0.6231 mm — D_{30} =0.1928 mm

D_{60} =0.3407 mm — D_{15} =0.1241 mm

D_{50} =0.2857 mm — D_{10} =0.0884 mm

C_u =3.854 — C_c =1.234

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape :

Sand/Gravel Hardness :

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GeoTesting express
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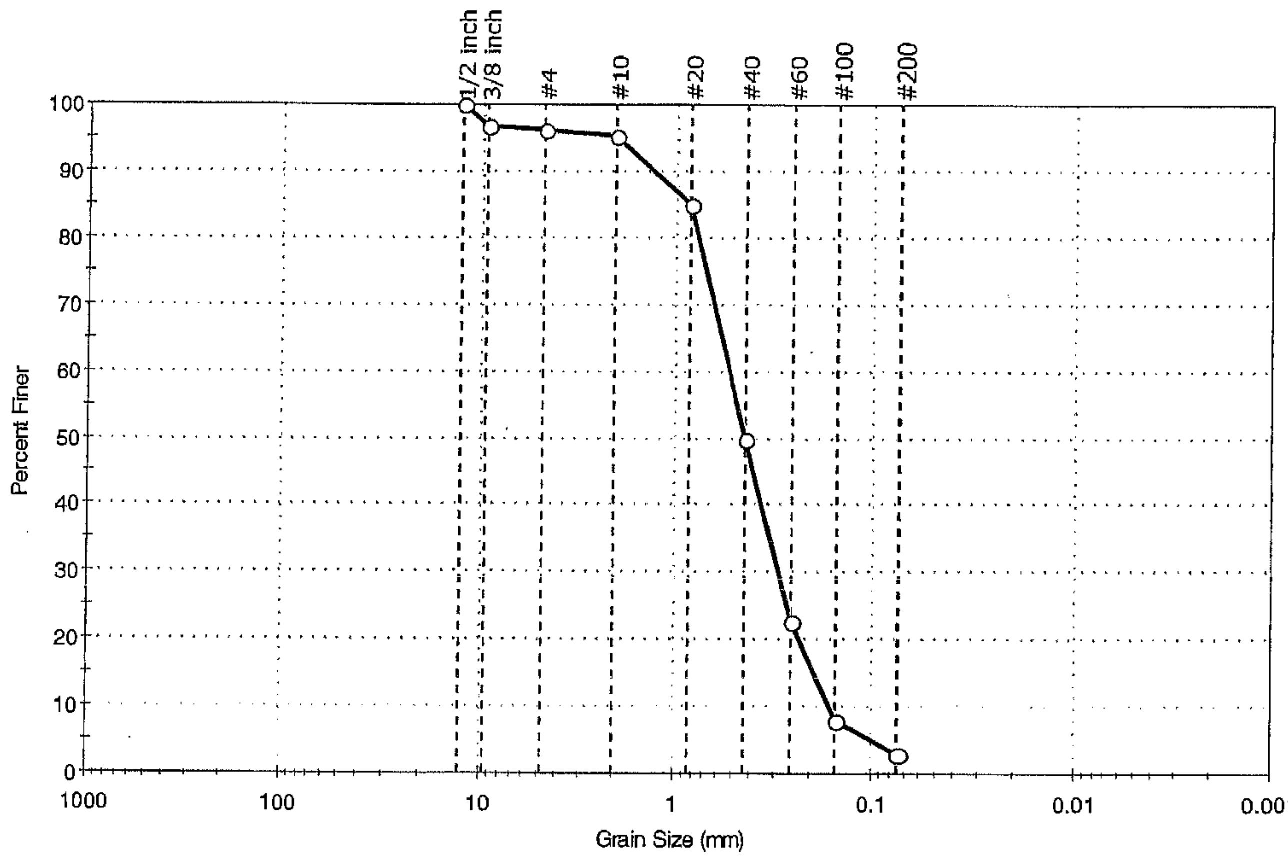
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB208	Test Date:	04/26/07	Checked By:	jdt
Depth :	26-30 ft	Test Id:	110799		
Test Comment:	---				
Sample Description:	Wet, light gray sand				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	3.9	93.0	3.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1/2 inch	12.70	100		
3/8 inch	9.51	97		
#4	4.75	96		
#10	2.00	95		
#20	0.84	85		
#40	0.42	50		
#60	0.25	23		
#100	0.15	8		
#200	0.075	3		

Coefficients

D_{85} =0.8405 mm
D_{60} =0.5165 mm
D_{50} =0.4251 mm
C_u =3.238
D_{30} =0.2882 mm
D_{15} =0.1904 mm
D_{10} =0.1595 mm
C_c =1.008

Classification

ASTM Poorly graded sand (SP)

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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GeoTesting express
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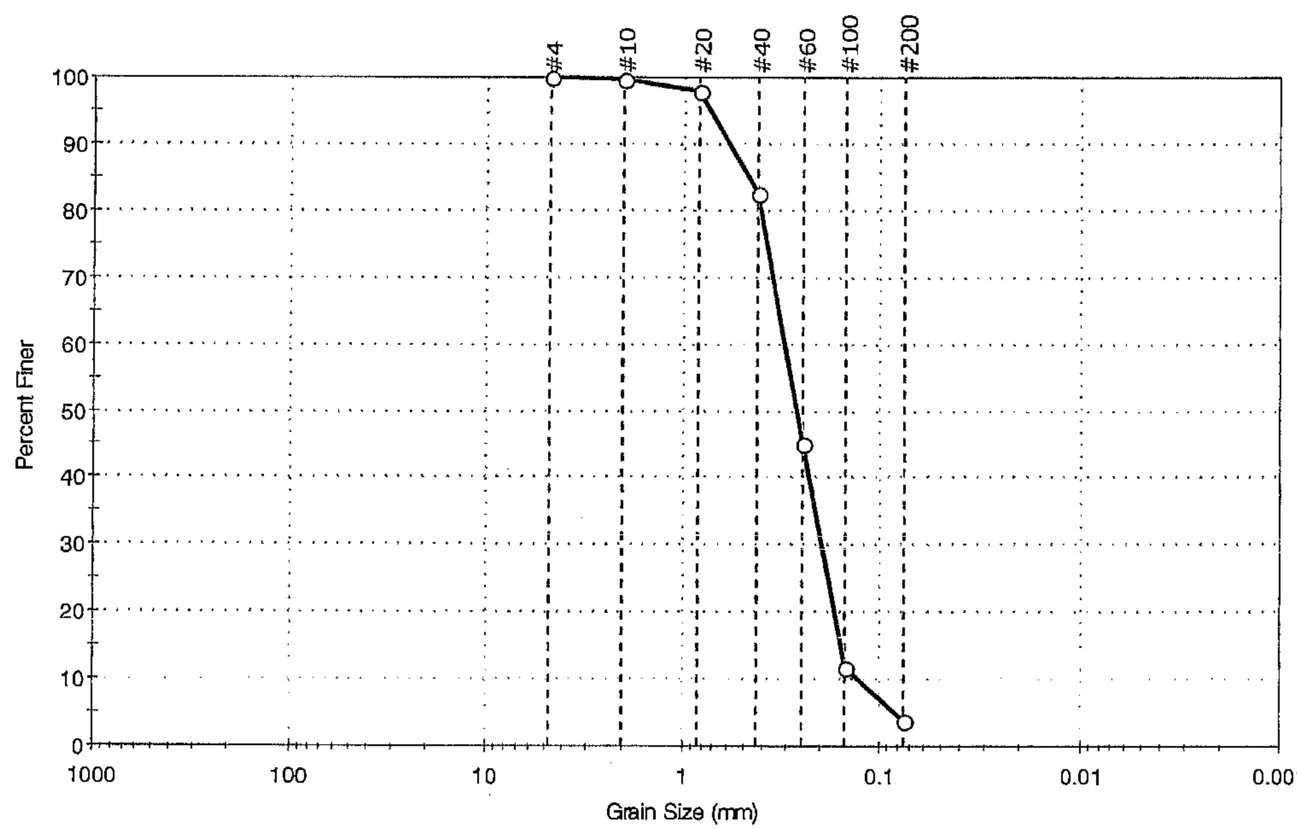
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB203	Test Date:	04/26/07	Checked By:	jdt
Depth :	12-16 ft	Test Id:	110800		
Test Comment:	---				
Sample Description:	Wet, dark brown sand				
Sample Comment:	--				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	96.1	3.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	98		
#40	0.42	83		
#60	0.25	45		
#100	0.15	12		
#200	0.075	4		

Coefficients

D_{85} =0.4701 mm D_{30} =0.1977 mm
D_{60} =0.3082 mm D_{15} =0.1569 mm
D_{50} =0.2676 mm D_{10} =0.1286 mm
C_u =2.397 C_c =0.986

Classification

ASTM   Poorly graded sand (SP)

AASHTO   Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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GeoTesting express
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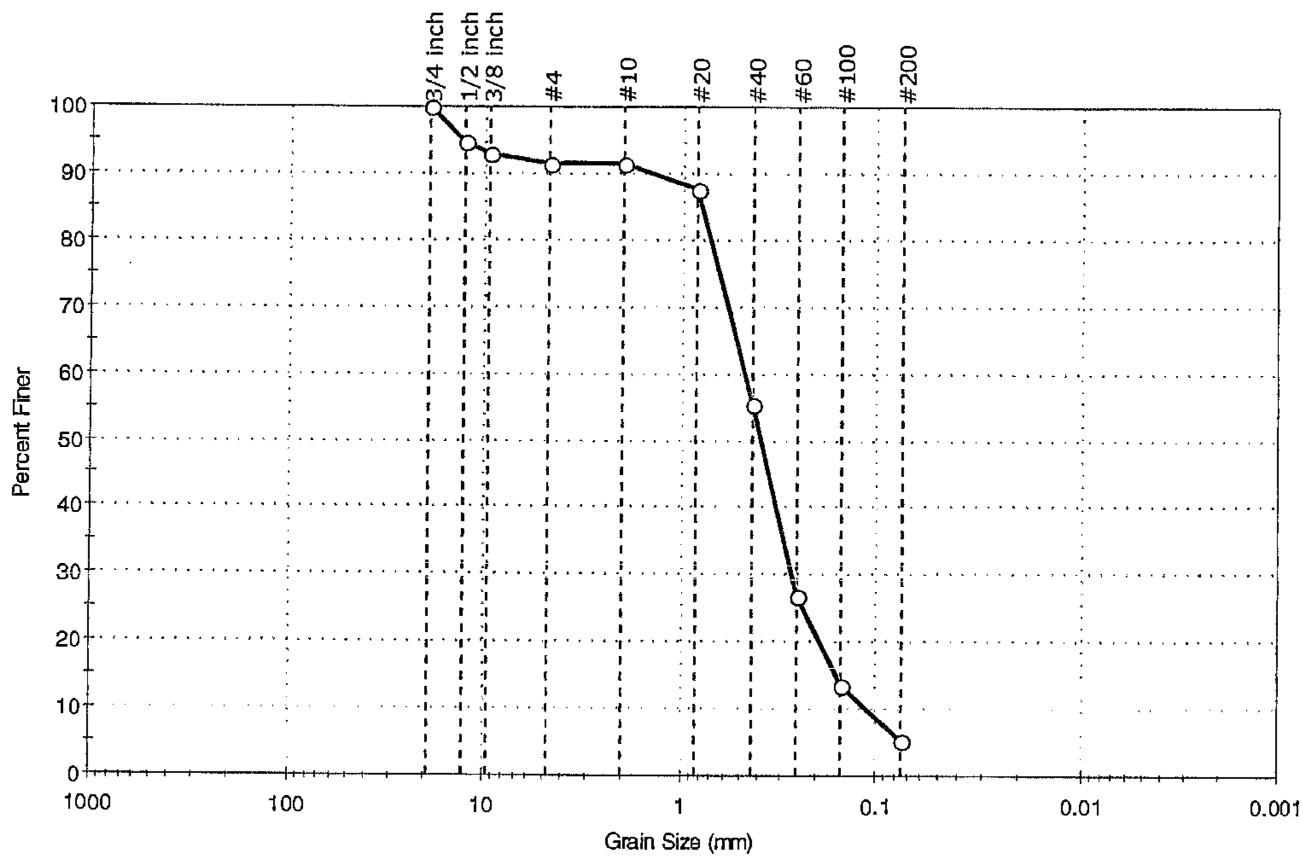
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB203	Test Date:	04/27/07	Checked By:	jdt
Depth :	26-30 ft	Test Id:	110801		
Test Comment:	---				
Sample Description:	Wet, dark brown sand with silt				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	8.5	86.1	5.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/4 inch	19.00	100		
1/2 inch	12.70	95		
3/8 inch	9.51	93		
#4	4.75	91		
#10	2.00	91		
#20	0.84	88		
#40	0.42	56		
#60	0.25	27		
#100	0.15	14		
#200	0.075	5		

Coefficients

D_{85} =0.7961 mm
D_{30} =0.2644 mm
D_{60} =0.4671 mm
D_{15} =0.1570 mm
D_{50} =0.3832 mm
D_{10} =0.1100 mm
C_u =4.246
C_c =1.361

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape :

Sand/Gravel Hardness :

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GeoTesting express
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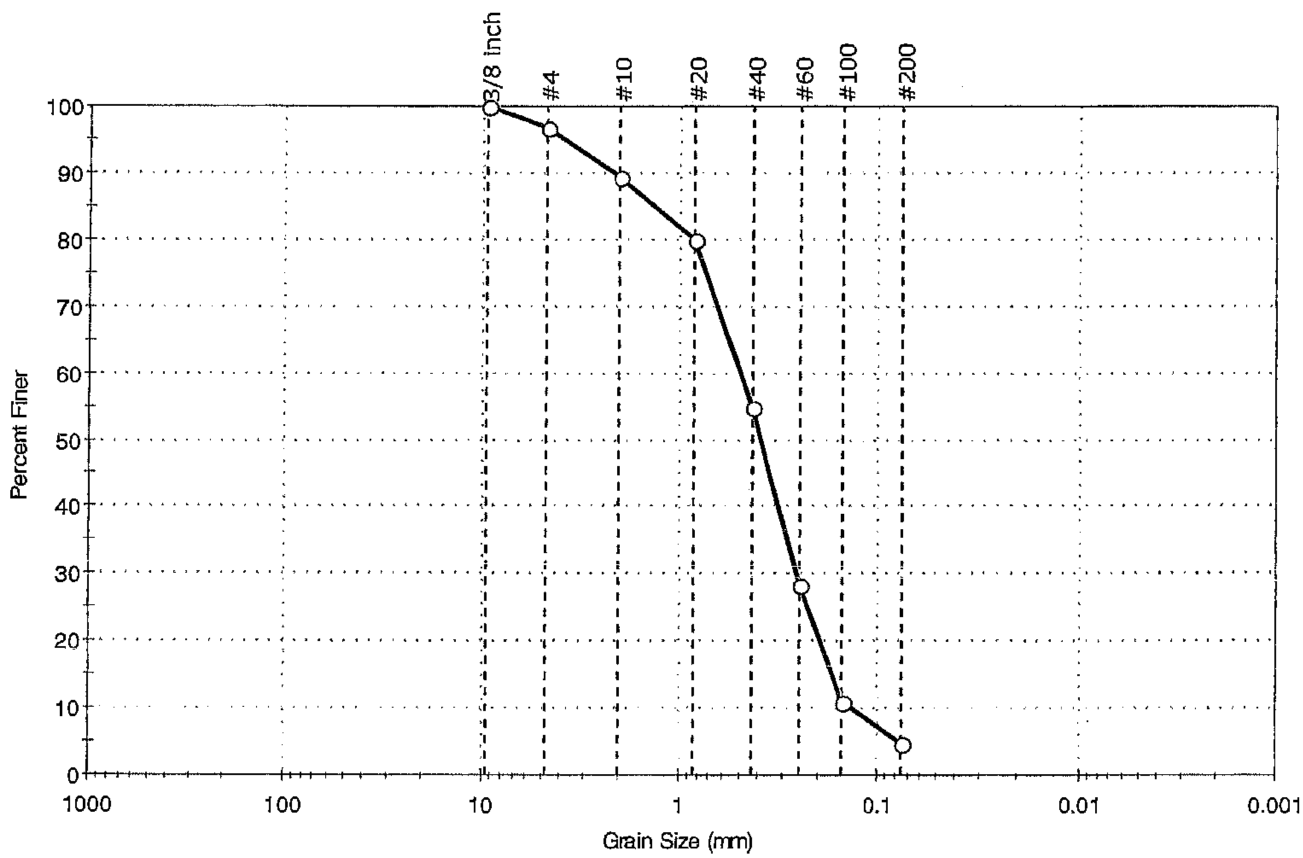
Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	bag	Tested By:	mll
Sample ID:	SB218	Test Date:	04/24/07	Checked By:	jdt
Depth :	16-20 ft	Test Id:	110675		
Test Comment:	---				
Sample Description:	Moist, dark grayish brown sand				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	3.2	92.0	4.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.51	100		
#4	4.75	97		
#10	2.00	89		
#20	0.84	80		
#40	0.42	55		
#60	0.25	28		
#100	0.15	11		
#200	0.075	5		

Coefficients

D_{85} =1.3499 mm | D_{30} =0.2582 mm
D_{60} =0.4876 mm | D_{15} =0.1684 mm
D_{50} =0.3847 mm | D_{10} =0.1353 mm
C_u =3.604 | C_c =1.011

Classification

ASTM Poorly graded sand (SP)

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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GeoTesting express
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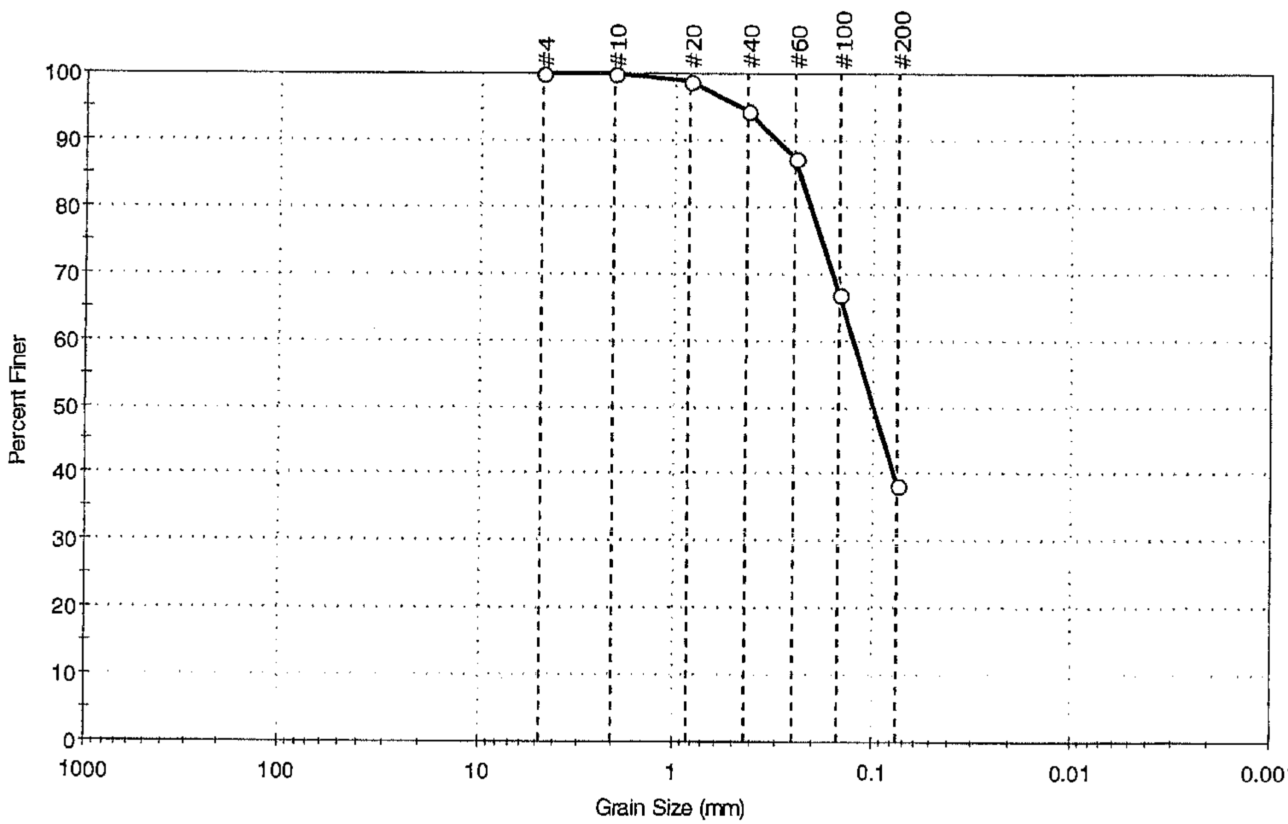
Client:	The Retec Group, Inc			
Project:	Sag Harbor Former MGP			
Location:	Sag Harbor, NY		Project No:	GTX-7416
Boring ID: ---		Sample Type: bag	Tested By:	mll
Sample ID: SB218		Test Date: 04/24/07	Checked By:	jdt
Depth : 23.2-24 ft		Test Id: 110676		
Test Comment:	---			
Sample Description:	Moist, light olive brown silty sand			
Sample Comment:	---			

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	61.6	38.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	99		
#40	0.42	94		
#60	0.25	87		
#100	0.15	67		
#200	0.075	38		

Coefficients

D_{85} = 0.2356 mm — D_{30} = N/A

D_{60} = 0.1260 mm — D_{15} = N/A

D_{50} = 0.0991 mm — D_{10} = N/A

C_u = N/A — C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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Boxborough, MA 01719
978 635 0424 Tel
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Geotechnical Test Report

April 24, 2007

GTX-7416
Sag Harbor Former MGP Project

Sag Harbor, NY

Prepared for:

RETEC

STRATEGIC
ENVIRONMENTAL
MANAGEMENT

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	The Retec Group, Inc				
Project:	Sag Harbor Former MGP				
Location:	Sag Harbor, NY			Project No:	GTX-7416
Boring ID:	---	Sample Type:	---	Tested By:	mll
Sample ID:	---	Test Date:	04/24/07	Checked By:	n/a
Depth :	---	Sample Id:	---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	Corn 10%	---	Moist, very dark grayish brown silt with organics	32.8
---	Polymer 2%	---	Moist, dark olive brown silt with organics	37.1
---	Quicklime 10%	---	Moist, gray silty sand	23
---	Quicklime 15%	---	Moist, dark gray sand	20.7
---	Quicklime 20%	---	Moist, gray sand	22.9

Notes: Temperature of Drying : 110° Celsius

GeoTesting express
a subsidiary of Geocomp Corporation

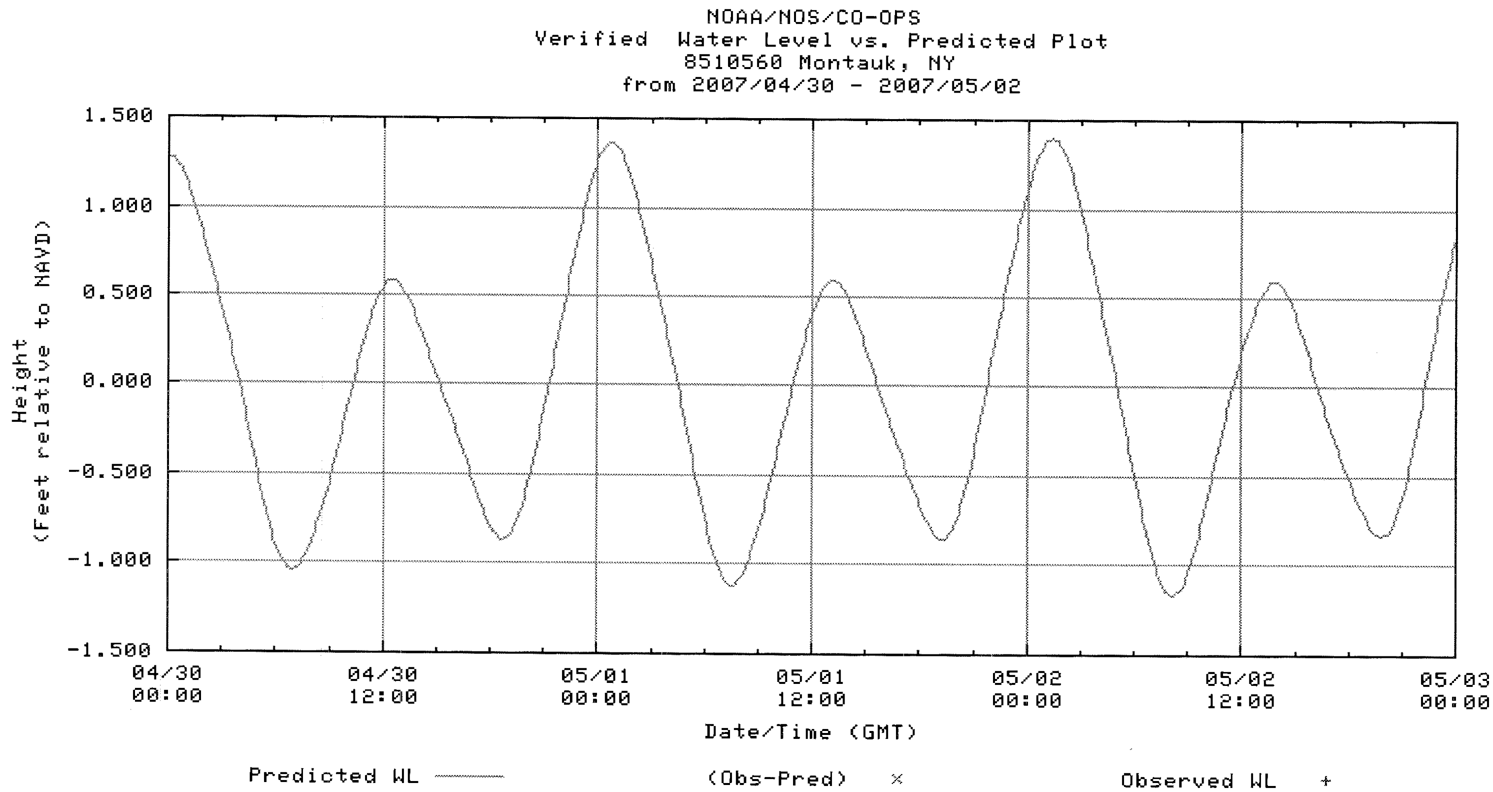
Client:	The Retec Group
Project Name:	Sag Harbor Former MGP
Project Location:	Sag Harbor, NY
GTX #:	7416
Test Date:	04/20/07
Tested By:	jbr
Checked By:	jdt

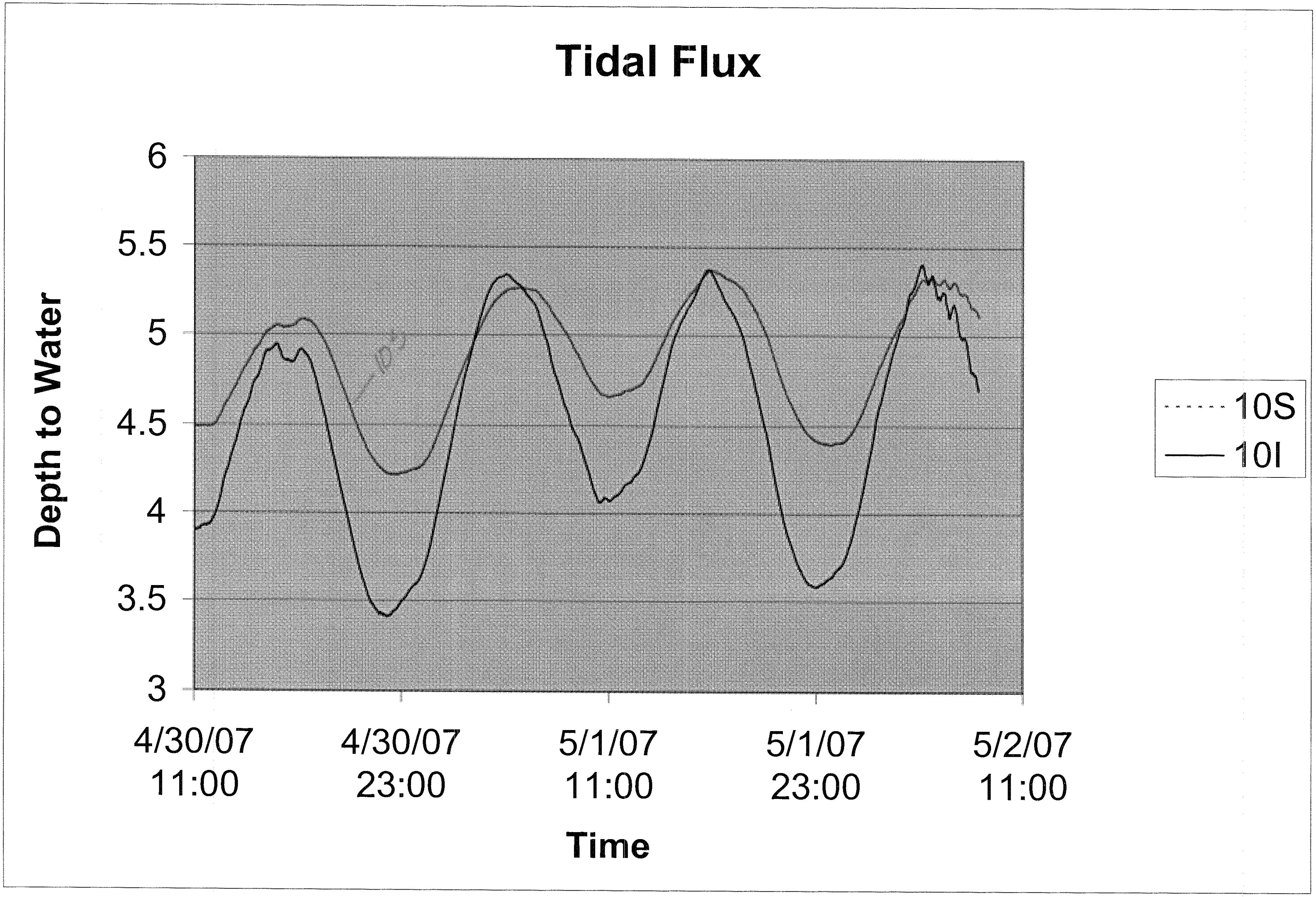
Bulk Density of Soil

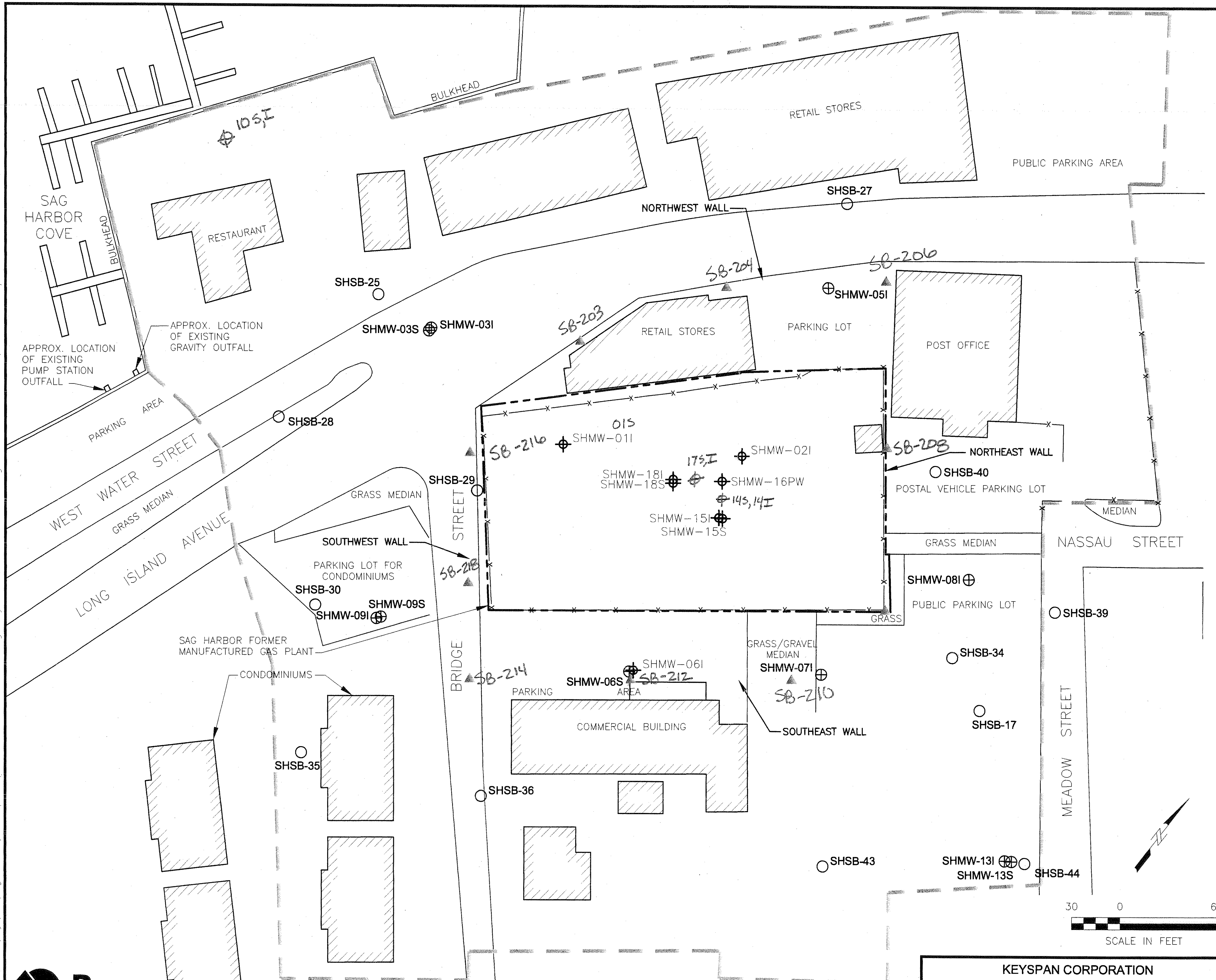
Boring ID	Sample ID	Depth ft	Visual Description	Bulk Density lb/ft^3	Moisture Content %	Dry Density lb/ft^3
---	Quicklime 10%	---	Moist, gray silty sand	107	23	87
---	Polymer 2%	---	Moist, dark olive brown silt with organics	83	37	61
---	Corn 10%	---	Moist, very dark grayish brown silt with organics	85	33	64
---	Quicklime 15%	---	Moist, dark gray sand	103	21	85
---	Quicklime 20%	---	Moist, gray sand	102	23	83

Notes: Density determined on disturbed samples by hand compacting into a container of known volume, measuring mass of soil and calculating.

Moisture content determined by ASTM D 2216 at 110° C


NOAA/NOS/CO-OPS
Verified Water Level vs. Predicted Plot
8510560 Montauk, NY
from 2007/04/30 - 2007/05/02
Height (Feet relative to NAVD)
1.500
1.000
0.500
0.000
-0.500
-1.000
-1.500
04/30 00:00
04/30 12:00
05/01 00:00
05/01 12:00
05/02 00:00
05/02 12:00
05/03 00:00
Date/Time (GMT)
Predicted WL
(Obs-Pred) ×
Observed WL +


Tidal Flux
Depth to Water
6
5.5
5
4.5
4
3.5
3
4/30/07 11:00
4/30/07 23:00
5/1/07 11:00
5/1/07 23:00
5/2/07 11:00
Time
10S
10I



LEGEND

APPROXIMATE LOCATION OF FORMER STRUCTURE

LOCATION OF EXISTING STRUCTURE

CURRENT SITE BOUNDARY

FENCE

SHMW-05S MW-01 EXISTING MONITORING WELL LOCATION

APPROXIMATE LIMITS OF OFF-SITE PROPERTIES REQUIRING MONITORING OR INSTITUTIONAL AND/OR ENGINEERING CONTROLS

PROPOSED EXCAVATION AREA (10')

FIELD OBSERVATIONS

SHSB-02 TAR\NAPL SATURATED

SHSB-08 BLEBS, GLOBS, LENSES, GRAIN-COATING, SHEENS

SHSB-03 STAINED, AND/OR NAPHTHALENE/ HYDROCARBON - LIKE ODORS

NO VISIBLE IMPACTS NOTED

GEOTECH BORING (~30' BGS)

DELINEATION BORING (~10-15' BGS)

AREAS BEYOND PROPOSED EXCAVATION PERIMETER THAT MAY REQUIRE ADDITIONAL DELINEATION

NOTE:

1. VIEW ONLY SHOWS EXCAVATION PERIMETER BORINGS.
2. SOIL DISPOSAL PRE-CHARACTERIZATION BORINGS NOT SHOWN. WILL BE INSTALLED IN GRID ACROSS EXCAVATION AREA TO COVER 1 SAMPLE PER 500 yd^3.
3. APPROXIMATE DEPTHS OF VISIBLE IMPACTS NOTED ON FIGURE 2-2.

SOURCE:

BASE MAP SITE SURVEY DATA PROVIDED BY KEYSPAN ENERGY SURVEY DIVISION. APPROXIMATE LOCATIONS OF FORMER MGP STRUCTURES BASED ON: 1916 SITE PLAN (DWG 2907); 1915 SURVEY BY THE TITLE GUARANTEE & TRUST CO. OF N.Y. (DWG 2290); AND SANBORN MAPS; SAG HARBOR FORMER MGP SITE DRAFT FINAL REMEDIAL INVESTIGATION REPORT, PREPARED BY DVIRKA & BARTILUCCI, DATED DECEMBER 2002.

KEYSPAN CORPORATION SAG HARBOR FORMER MGP SITE SAG HARBOR, NEW YORK	PERIMETER DELINEATION BORINGS AND GEOTECH BORINGS
DATE: 03/28/07 DRWN: RCW/CON	FIGURE 3-1

Appendix F

PDI CAMP Results (CD Format)

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: Sag Harbor, NY
Date: JULY 17TH 07

RETEC

Clear skies, ~85°F, filters placed on PIDs.

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700					
DN	700					
UP	715					
DN	715					
UP	730					
DN	730					
UP	745					
DN	745					
UP	800	0.0	.042		Precleaning SB	
DN	800	0.1	.038		232	
UP	815	.036	.02			
DN	815	.2	.033			
UP	830	0.0	.039		zeroed upwind	
DN	830	0.3	.035			
UP	845	0.2	.046		moving to SB	
DN	845	0.3	.037		233	
UP	900	0.3	.031	GK 7/17/07		
DN	900	0.6	.037			
UP	915	0	.038			
DN	915			did not record		
UP	930	0	.021			
DN	930	.4	.034			
UP	945	0	.040		moving to SB	
DN	945	.3	.031		234	
UP	1000	0	.021			
DN	1000	.3	.031			
UP	1015	0	.049			
DN	1015	.3	.031			
UP	1030	0	.027			
DN	1030	.3	.026			
UP	1045	0	.042		moving to SB	
DN	1045	.3	.029		235	
UP	1100	0	.034			
DN	1100	.3	.029			
UP	1115	~~.3~~	~~.031~~ GK 7/17/07			
DN	1115					
UP	1130	0	.031			
DN	1130	.3	.031			
UP	1145				DRILLERS ON LUNCH	
DN	1145					
UP	1200					
DN	1200					
UP	1215					
DN	1215					
UP	1230	0	.031		STARTED PRECLEARING	
DN	1230	.2	.023		SB 236	
UP	1245	0	.038			
DN	1245	.1	.034			

placed filter on PID

1 *

2 *

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	1300					
DN	1300					
UP	1315	0.0	0.047			
DN	1315	0.2	0.023		0.0	Drilling
UP	1330					1320-move
DN	1330					across st
UP	1345	0	.040			to SB-237
DN	1345	.1	.034			
UP	1400	0	.027			
DN	1400	.1	.027			
UP	1415					
DN	1415					
UP	1430					
DN	1430					
UP	1445					
DN	1445					
UP	1500					
DN	1500					
UP	1515					
DN	1515					
UP	1530					
DN	1530					
UP	1545					
DN	1545					
UP	1600					
DN	1600					
UP	1615					
DN	1615					
UP	1630					
DN	1630					
UP	1645					
DN	1645					
UP	1700					
DN	1700					
UP	1715					
DN	1715					
UP	1730					
DN	1730					
UP	1745					
DN	1745					
UP	1800					
DN	1800					
UP	1815					
DN	1818					
UP	1830					
DN	1830					
UP	1845					
DN	1845					

Comments:

Monitoring Completed By: G. KIRKWOOD / J. SHACKFORD

NOTE:

UP DT: 11301

PID:

DOWN DT: 11302

1* MOVED CAMP EQUIPMENT ACROSS LONG ISLAND AVE

2* upwind

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results

RETEC

Site: Sag Harbor Former MGP
Date: 7/11/07

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700					
DN	700					
UP	715					
DN	715					
UP	730					
DN	730					
* UP	745	2.6	.02	Pre-clearing 229		
DN	745	0	.024			
UP	800	122	.029	Pre-clearing 230		
DN	800	0	.029			
UP	815	73.6	.033			
DN	815	0	.029			
UP	830	60.9	.069	Drilling @ 230.		
DN	830	0	.026			
UP	845	41.2	.025			
DN	845	0	.023			
UP	900	0	.024			
DN	900	0	.021			
UP	915	0	.024			
DN	915	0	.025			
UP	930	0	.023			
DN	930	0	.027			
UP	945	.3	.031			
DN	945					
UP	1000					
DN	1000					
UP	1015					
DN	1015					
UP	1030					
DN	1030					
UP	1045					
DN	1045					
UP	1100					
DN	1100					
UP	1115					
DN	1115					
UP	1130					
DN	1130					
UP	1145					
DN	1145					
UP	1200					
DN	1200					
UP	1215					
DN	1215					
UP	1230					
DN	1230					
UP	1245					
DN	1245					

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	1300					
DN	1300					
UP	1315					
DN	1315					
UP	1330					
DN	1330					
UP	1345					
DN	1345					
UP	1400					
DN	1400					
UP	1415					
DN	1415					
UP	1430					
DN	1430					
UP	1445					
DN	1445					
UP	1500					
DN	1500					
UP	1515					
DN	1515					
UP	1530					
DN	1530					
UP	1545					
DN	1545					
UP	1600					
DN	1600					
UP	1615					
DN	1615					
UP	1630					
DN	1630					
UP	1645					
DN	1645					
UP	1700					
DN	1700					
UP	1715					
DN	1715					
UP	1730					
DN	1730					
UP	1745					
DN	1745					
UP	1800					
DN	1800					
UP	1815					
DN	1818					
UP	1830					
DN	1830					
UP	1845					
DN	1845					

Comments:

Condition extremely humid.

Monitoring Completed By: G. KIRKWOOD

*1 PID Reading 70.6ppm, no obvious reason (moisture?). Fresh air calibrated.

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: Sag Harbor
Date: 5/9/07

RETEC

Geoprobe (recorded on auger monitors)

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity	Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700						UP	1300					
DN	700						DN	1300					
UP	715						UP	1315					
DN	715						DN	1315					
UP	730						UP	1330					
DN	730						DN	1330					
UP	745						UP	1345					
DN	745						DN	1345					
UP	800						UP	1400					
DN	800						DN	1400					
UP	815						UP	1415					
DN	815						DN	1415					
UP	830	0	.007		PRECLEARING ON L.I. AVE.		UP	1430					
DN	830	0	.010				DN	1430					
UP	845	0	.008				UP	1445					
DN	845	0	.012				DN	1445					
UP	900	0	.007		GEOPROBING		UP	1500					
DN	900	.3	.034				DN	1500					
UP	915	0	.012				UP	1515					
DN	915	.3	.012				DN	1515					
UP	930	0	.018				UP	1530					
DN	930	0	.014				DN	1530					
UP	945		END OF ACTIVITIES				UP	1545					
DN	945						DN	1545					
UP	1000						UP	1600					
DN	1000						DN	1600					
UP	1015						UP	1615					
DN	1015						DN	1615					
UP	1030						UP	1630					
DN	1030						DN	1630					
UP	1045						UP	1645					
DN	1045						DN	1645					
UP	1100						UP	1700					
DN	1100						DN	1700					
UP	1115						UP	1715					
DN	1115						DN	1715					
UP	1130						UP	1730					
DN	1130						DN	1730					
UP	1145						UP	1745					
DN	1145						DN	1745					
UP	1200						UP	1800					
DN	1200						DN	1800					
UP	1215						UP	1815					
DN	1215						DN	1818					
UP	1230						UP	1830					
DN	1230						DN	1830					
UP	1245						UP	1845					
DN	1245						DN	1845					

G.K. 5/9/07

G.K. 5/9/07

G.K. 5/9/07

Comments:

Monitoring Completed By: Gemma Kirkwood

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: Sag Harbor
Date: 5/8/07

RETEC

18:28
20:09

1.30
1.32
1.31

GEOPROBE (RECORDED W/ AUGER MONITORS)

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700					
DN	700					
UP	715					
DN	715					
UP	730					
DN	730					
UP	745					
DN	745					
UP	800				G.K. 5/8/07	
DN	800					
UP	815					
DN	815					
UP	830					
DN	830					
UP	845					
DN	845					
UP	900	0	.006		Precleaning on LI Ave	
DN	900	0	.004			
UP	915	0	.007			
DN	915	.1	.005			
UP	930	.2	.004			
DN	930	.2	.002		Geoprobe West	
UP	945	0	.007		Water Street	
DN	945	.2	.005			
UP	1000	.1	.007		Geoprobing in grid	
DN	1000	.2	.004			
UP	1015	0	.009			
*1 DN	1015	.3	.03			
UP	1030	.1	.007			
DN	1030	.3	.005			
UP	1045	.1	.005			
DN	1045	.3	.009			
UP	1100	.2	.006			
DN	1100	.3	.015			
UP	1115	.1	.007			
DN	1115	.2	.043			
UP	1130	0	.008			
DN	1130	.2	.060			
UP	1145	0	.007			
DN	1145	.1	.004			
UP	1200	0	.007			
DN	1200	.2	.004			
UP	1215	0	.006			
DN	1215	.2	.005			
UP	1230	0	.008			
DN	1230	.2	.007			
UP	1245		DRILLERS AT LUNCH			
DN	1245					

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	1300					
DN	1300			drillers at lunch		
UP	1315					
DN	1315					
UP	1330			END OF ACTIVITIES		
DN	1330					
UP	1345					
DN	1345					
UP	1400					
DN	1400					
UP	1415					
DN	1415					
UP	1430					
DN	1430					
UP	1445					
DN	1445					
UP	1500					
DN	1500					
UP	1515					
DN	1515					
UP	1530					
DN	1530					
UP	1545					
DN	1545					
UP	1600			5/8/07		
DN	1600					
UP	1615					
DN	1615					
UP	1630					
DN	1630		G.K.			
UP	1645					
DN	1645					
UP	1700					
DN	1700					
UP	1715					
DN	1715					
UP	1730					
DN	1730					
UP	1745					
DN	1745					
UP	1800					
DN	1800					
UP	1815					
DN	1818					
UP	1830					
DN	1830					
UP	1845					
DN	1845					

Comments:

Monitoring Completed By: Gemma Kirkwood

*1 From geoprobe exhaust

Note: @ 6:40 am
Geoprobe down 4:56 AM

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: Sag Harbor
Date: 5/7/07

RETEC

GEOPROBE (RECORDED WITH AUGER MONITORS)

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity	Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700						UP	1300	0	.008			
DN	700						DN	1300	.1	.012			
UP	715						UP	1315	0	.009			
DN	715						DN	1315	.2	.011			
UP	730						UP	1330	0	.007			
DN	730						DN	1330	.1	.014			
UP	745						UP	1345	0	.012			
DN	745						DN	1345	.1	.017			
UP	800						UP	1400	0	.006			
DN	800						DN	1400	.1	.018			
UP	815						UP	1415	0	.008			
DN	815						DN	1415	.1	.01			
UP	830						UP	1430	0	.007			
DN	830						DN	1430	.2	.011			
UP	845						UP	1445	0	.006			
DN	845						DN	1445	.2	.021			
UP	900						UP	1500					
DN	900						DN	1500					
UP	915	0	.005	Geoprobe started in			UP	1515					
DN	915	.2	.012	parking lot S of site			DN	1515					
UP	930	0	.004				UP	1530					
DN	930	.3	.011	Geoprobe on bridge ave.			DN	1530					
UP	945	0	.004	Re-fresh air cal.			UP	1545					
DN	945	0	.010				DN	1545					
UP	1000	0	.009				UP	1600					
DN	1000	0	.009				DN	1600					
UP	1015	0	.005				UP	1615					
DN	1015	0	.008	Geoprobe in grid			DN	1615					
UP	1030	0	.005				UP	1630					
DN	1030	.1	.011				DN	1630					
UP	1045	0	.006				UP	1645					
DN	1045	.1	.013				DN	1645					
UP	1100	0	.006				UP	1700					
DN	1100	.1	.013				DN	1700					
UP	1115	0	.011				UP	1715					
DN	1115	.1	.019				DN	1715					
UP	1130	0	.006				UP	1730					
DN	1130	.1	.010				DN	1730					
UP	1145	0	.009				UP	1745					
DN	1145	.2	.021				DN	1745					
UP	1200	GK					UP	1800					
DN	1200			DRILLING AT LUNCH			DN	1800					
UP	1215						UP	1815					
DN	1215						DN	1818					
UP	1230						UP	1830					
DN	1230						DN	1830					
UP	1245	0	.009	GK			UP	1845					
DN	1245	.2	.043				DN	1845					

GK 5/7/07

GK 5/7/07

Comments:

Monitoring Completed By: Gemma Kirkwood

Auger down (06351 PID / 02417 DT)
Auger up (05420 PID / 05594 DT)
1* exhaust from geoprobe
2* PID was reading .3ppm with no activity, thus PID was fresh air calibrated.

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: Sag Harbor
Date: 5/4/07

RETEC

Soil Removal from Test Pit

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700					
DN	700					
UP	715					
DN	715					
UP	730					
DN	730					
UP	745					
DN	745					
UP	800					
DN	800					
UP	815			G.K.		
DN	815			5/4/07		
UP	830					
DN	830					
UP	845					
DN	845					
UP	900					
DN	900					
UP	915		↑			
DN	915					
UP	930					
DN	930	Recorded on Geoprobe (Auger)				
UP	945				Monitors	
DN	945					
UP	1000		↓			
DN	1000					
UP	1015	0	.007			
DN	1015	0	.008			
UP	1030	0	.007			
DN	1030	0	.007 GK			
UP	1045	0	~~.00?~~ .011			
DN	1045	0	.017	DUST FROM	FORKLIFT	
UP	1100	ACTIVITIES		COMPLETED		
DN	1100					
UP	1115					
DN	1115					
UP	1130					
DN	1130					
UP	1145					
DN	1145			G.K.		
UP	1200			5/4/07		
DN	1200					
UP	1215					
DN	1215					
UP	1230					
DN	1230					
UP	1245					
DN	1245					

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	1300					
DN	1300					
UP	1315					
DN	1315					
UP	1330					
DN	1330					
UP	1345					
DN	1345					
UP	1400					
DN	1400					
UP	1415					
DN	1415					
UP	1430					
DN	1430					
UP	1445			G.K.		
DN	1445					
UP	1500					
DN	1500					
UP	1515				5/4/07	
DN	1515					
UP	1530					
DN	1530					
UP	1545					
DN	1545					
UP	1600					
DN	1600					
UP	1615					
DN	1615					
UP	1630					
DN	1630					
UP	1645					
DN	1645					
UP	1700					
DN	1700					
UP	1715					
DN	1715					
UP	1730					
DN	1730					
UP	1745					
DN	1745					
UP	1800					
DN	1800					
UP	1815					
DN	1818					
UP	1830					
DN	1830					
UP	1845					
DN	1845					

Comments:

Monitoring Completed By: Gemma Kirkwood

Geoprobe up 04520 (PID)
no # (DT)

Geoprobe down 03805 (PID)
3761 (DT)

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: Sag Harbor
Date: 5/4/07

Preclear/Geoprobe (recorded with Auger monitors)

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity	Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700						UP	1300					
DN	700						DN	1300					
UP	715						UP	1315					
DN	715						DN	1315					
UP	730						UP	1330					
DN	730						DN	1330					
UP	745						UP	1345					
DN	745			G.K			DN	1345					
UP	800						UP	1400					
DN	800				5/4/07		DN	1400					
UP	815						UP	1415					
DN	815						DN	1415					
UP	830						UP	1430					
DN	830						DN	1430					
UP	845						UP	1445					
DN	845						DN	1445					
UP	900	0	.007	Preclearing on Bridge Ave			UP	1500					
DN	900	0	.010				DN	1500					
UP	915	0	.006				UP	1515					
DN	915	0	.009				DN	1515					
UP	930	0	.006	Geoprobe in lot off bridge ave/soil removal			UP	1530				G.K	
DN	930	0	.006				DN	1530					
UP	945	0	.012				UP	1545				5/4/07	
DN	945	0	.007				DN	1545					
UP	1000	0	.006				UP	1600					
DN	1000	0	.007				DN	1600					
UP	1015	0	.009	JUST GEOPROBE			UP	1615					
DN	1015	.1	.007				DN	1615					
UP	1030	0	.008				UP	1630					
DN	1030	.1	.006				DN	1630					
UP	1045	0	.007				UP	1645					
DN	1045	.1	.007				DN	1645					
UP	1100			Activities Completed			UP	1700					
DN	1100						DN	1700					
UP	1115						UP	1715					
DN	1115						DN	1715					
UP	1130						UP	1730					
DN	1130			G.K			DN	1730					
UP	1145				5/4/07		UP	1745					
DN	1145						DN	1745					
UP	1200						UP	1800					
DN	1200						DN	1800					
UP	1215						UP	1815					
DN	1215						DN	1818					
UP	1230						UP	1830					
DN	1230						DN	1830					
UP	1245						UP	1845					
DN	1245						DN	1845					

put DT in sample mode

Comments:

Monitoring Completed By: Gemma Kirkwood

Auger up 5594 (DT)
05426 (PID)

Auger down 06351 (PID)
02417 (DT)

Preclearing and soil removal are in line with wind direction, so both were monitored with one set of monitors

@10:15 wind direction changed requiring 2 sets monitors. Auger set used for geoprobing

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: Sag Harbor
Date: 5/3/07

RETEC

Geoprobe (Recorded with Auger monitors) See Note Below.

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity	Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700						UP	1300	0	.009			
DN	700						DN	1300	0	.021			
UP	715						UP	1315	.1	.010			
DN	715						DN	1315	0	.024			
UP	730						UP	1330	.1	.009			
DN	730			CK			DN	1330	0	.019			
UP	745				5/3/07		UP	1345	0	.010			
DN	745						DN	1345	0	.020			
UP	800						UP	1400	0	.009			
DN	800						DN	1400	0	.019			
UP	815						UP	1415	0	.009			
DN	815						DN	1415	0	.015			
UP	830						UP	1430	.1	.009			
DN	830	CK		Geoprobe Started			DN	1430	0	.018			
UP	845	0	.006	NE	Onsite pleacher boring		UP	1445					
DN	845	0	.021				DN	1445					
UP	900	0	.007				UP	1500					
DN	900	0	.032				DN	1500					
UP	915	.1	.008				UP	1515					
DN	915	0	.026				DN	1515					
UP	930	~~0~~	~~.007~~	KK			UP	1530					
DN	930	~~0~~	~~.023~~	KK			DN	1530					
UP	945	0	.007				UP	1545					
DN	945	0	.027				DN	1545					
UP	1000	0	.009				UP	1600					
DN	1000	0	.020				DN	1600					
UP	1015	0	.009				UP	1615					
DN	1015	0	.020				DN	1615					
#1 UP	1030	.2	.012				UP	1630					
#2 DN	1030	0	.019				DN	1630					
UP	1045	.2	.009				UP	1645					
DN	1045	0	.018				DN	1645					
UP	1100	0	.010				UP	1700					
DN	1100	0	.027				DN	1700					
UP	1115	.2	.011				UP	1715					
DN	1115	0	.018				DN	1715					
UP	1130	.1	.009				UP	1730					
DN	1130	0	.019				DN	1730					
UP	1145	.1	.010				UP	1745					
DN	1145	0	.020				DN	1745					
UP	1200		Lunch				UP	1800					
DN	1200						DN	1800					
UP	1215			+ setting up			UP	1815					
DN	1215						DN	1818					
UP	1230						UP	1830					
DN	1230						DN	1830					
UP	1245				KK	5/3/07	UP	1845					
DN	1245						DN	1845					

Comments:

Monitoring Completed By: Gemma Kirkwood

Both monitors have correct time, however one of geoprobe PID's time record seemed off in downloaded data

#1 Lawn mowing upwind

#2 dust from geoprob. penetrating cement.

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: SAG HARBOR
Date: 5/2/07

RETEC

GEOPROBE (RECORDED W/ AUGER MONITORS BECAUSE GEOPROBE MON. UNRELIABLE)

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity	Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700						UP	1300	.2	.022	GEOPROBE ACTIVITY		
DN	700						DN	1300	0	.021		RESUMED	
UP	715						UP	1315	2	.011	WIND DIRECTION		
DN	715				5/2/07		DN	1315	0	.021		REVERSED	
UP	730						UP	1330	.2	.009			
DN	730				G.K		DN	1330	0	.019			
UP	745						UP	1345	.4	.012			#
DN	745						DN	1345	0	.021			
UP	800						UP	1400	.3	.013			
DN	800						DN	1400	0	.023			
UP	815		~~.007~~				UP	1415	.2	.012			
DN	815						DN	1415	0	.020			
UP	830	0	.009	GEOPROBE STARTED			UP	1430	.3	.015			*
DN	830	0	.015				DN	1430	0	.026			
UP	845	0	.008				UP	1445	.4	.015			
DN	845	0	.010				DN	1445	0	.027			
UP	900	0	.007				UP	1500			GEOPROBE ACTIVITIES		
DN	900	0	.013				DN	1500			COMPLETE		
UP	915	.1/0	.007				UP	1515					
DN	915	0	.012				DN	1515					
UP	930	.1	.006				UP	1530					
DN	930	0	.011				DN	1530					
UP	945	.2	.006	GEOPROBE OFFSITE			UP	1545					
DN	945	.2	.01	TO GET WATER			DN	1545					
UP	1000	.2	.007				UP	1600					
DN	1000	.1	.01	DRILLERS STILL OFFSITE			DN	1600			G.K		
UP	1015	.2	.006				UP	1615					
DN	1015	.1	.012				DN	1615					
UP	1030	.1	.006				UP	1630				5/2/07	
DN	1030	0	.011	DRILLERS BACK ONSITE			DN	1630					
UP	1045	.1	.01				UP	1645					
DN	1045	0	.03				DN	1645					
UP	1100	.1	.01				UP	1700					
DN	1100	0	.018				DN	1700					
UP	1115	.2	.01				UP	1715					
DN	1115	0	.021				DN	1715					
UP	1130	.2	.008				UP	1730					
DN	1130	0	.017				DN	1730					
UP	1145	.3	.008				UP	1745					
DN	1145	0	.018				DN	1745					
UP	1200			DRILLERS @ LUNCH			UP	1800					
DN	1200						DN	1800					
UP	1215						UP	1815					
DN	1215						DN	1818					
UP	1230						UP	1830					
DN	1230				LUNCH		DN	1830					
UP	1245						UP	1845					
DN	1245						DN	1845					

Comments: Although activity is geoprobing, air monitored with auger monitors because geoprobe up monitor has been turning off unpredictably.

Monitoring Completed By: ______________________

@ 8:30AM calibrated Auger down PID w/ fresh air because it was reading 2.7ppm with no activity.
Auger up PID 05420 / DT 05594
Auger down PID 6351 / DT 2417

@ 13.15 switched locations of up & down due to change in wind direction

#1 There is no reason for such a high ppm reading, check this at next reading.

*2 NO APPARENT SOURCE OF DUST

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: SAG HARBOR
Date: 5/1/07

RETEC

Geoprobe on Long Island Ave (SB-220), Bridge Ave (SB-221), lot west of (SB-222) fenced in area, SB-223.

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity	Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700						UP	1300					
DN	700						DN	1300			LUNCH		
UP	715						UP	1315					
DN	715						DN	1315					
UP	730						UP	1330					
DN	730						DN	1330	fresh air calib		Geoprobe started at 1340		
UP	745						UP	1345	both monitors *			UP (0 PID .019 mg/m3)	DN (0 PID .008 mg/m3)
DN	745			5/1/07			DN	1345	0	.032	78		
UP	800						UP	1400	0	.012			
DN	800		GK				DN	1400	.1	.017			
UP	815						UP	1415	0	.011			
DN	815						DN	1415	.1	.005			
UP	830	.2	.003		Activities Began -		UP	1430	0	.011			
DN	830	0	.004		Drilling		DN	1430	0	.005			
UP	845	.2	.003				UP	1445	0	.01			
DN	845	0	.004		Decon.		DN	1445	.1	.005			
UP	900	.2	.003		Started drilling on		UP	1500		END of GEOPROBE ACTIVITIES			
DN	900	0	.006		Bridge Ave		DN	1500					
UP	915	.2	.003				UP	1515					
DN	915	0	.007				DN	1515					
UP	930	.2	.003		Decon.		UP	1530					
DN	930	0	.006				DN	1530					
UP	945	MOVING TO NEW LOCATION					UP	1545					
DN	945						DN	1545					
UP	1000	Recorded by Auger Monitors					UP	1600					
DN	1000						DN	1600					
UP	1015	Recorded by Auger Monitors					UP	1615					
DN	1015						DN	1615					
UP	1030	Recorded by Auger Monitors					UP	1630					
DN	1030						DN	1630					
UP	1045	Recorded by Auger Monitors					UP	1645			GK		
DN	1045						DN	1645					
UP	1100	Recorded by Auger Monitors					UP	1700					
DN	1100						DN	1700				5/1/07	
UP	1115	Recorded by Auger Monitors					UP	1715					
DN	1115						DN	1715					
UP	1130	NO ACTIVITY					UP	1730					
DN	1130						DN	1730					
UP	1145						UP	1745					
DN	1145						DN	1745					
UP	1200						UP	1800					
DN	1200						DN	1800					
UP	1215						UP	1815					
DN	1215						DN	1818					
UP	1230						UP	1830					
DN	1230			LUNCH			DN	1830					
UP	1245						UP	1845					
DN	1245						DN	1845					

SB-220 Long Isl Ave (830–845)
BRIDGE AVE SB-221 (900–930)
SB-222 (945–1100)
SB 223 (1130–1145)

Comments:

Monitoring Completed By: Gemma Kirkwood

Geoprobe down 03805/3761
Geoprobe up 04520/no #.

@ 9:50 - Auger monitors include SB 222.

@ 1350 - had to replace batteries in 04520 PID

* both monitors were reading .3 and .4 ppm with no activity on site, thus they were fresh air calibrated

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results

RETEC

Site: SAG HARBOR
Date: 5/1/07

Auger in lot to south of fenced in area.

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity	Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700						UP	1300				LUNCH	
DN	700						DN	1300					
UP	715						UP	1315	END OF ACTIVITIES - SEE NOTE				
DN	715						DN	1315					
UP	730						UP	1330					
DN	730						DN	1330					
UP	745						UP	1345					
DN	745						DN	1345					
UP	800						UP	1400					
DN	800						DN	1400					
UP	815						UP	1415					
DN	815						DN	1415					
UP	830	0	.007		Activities begin -		UP	1430					
DN	830	.2	.011		Drilling		DN	1430					
UP	845	0	.006				UP	1445					
DN	845	.3	.015				DN	1445					
UP	900	.1	.005				UP	1500					
DN	900	.3	.021				DN	1500					
UP	915	0	.005				UP	1515					
DN	915	.3	.010				DN	1515					
UP	930	0	.004				UP	1530					
DN	930	.3	.013				DN	1530					
UP	945	0	.005		location of monitor		UP	1545					
~~DN~~	~~945~~	~~[illegible]~~	~~[illegible]~~		was moved		DN	1545					
UP	1000	0	.005				UP	1600					
DN	1000	0.4	.010				DN	1600					
UP	1015	0	.005				UP	1615					
DN	1015	.3	.037		Geoprobe decon		DN	1615					
UP	1030	0	.005		Auger completed /		UP	1630					
DN	1030	.3	.014		drillers coffee break		DN	1630					
UP	1045	0	.005		Drillers off break		UP	1645					
DN	1045	.4	.015				DN	1645					
UP	1100	0	.005		Drillers mixing cement		UP	1700					
DN	1100	.4	.011				DN	1700					
UP	1115	0	.005		Geoprobe @ SB 223		UP	1715					
DN	1115	.5	.029		cement mixing		DN	1715					
UP	1130	0	.005		Geoprobe decon.		UP	1730					
DN	1130	.4	.005		Geoprobe drillers on		DN	1730					
UP	1145	0	.023		lunch		UP	1745					
DN	1145	.4	.009		AUGER WORKING		DN	1745					
UP	1200		MOVED	MONITORS INTO			UP	1800					
DN	1200				GATED AREA		DN	1800					
UP	1215	0	.007		AUGER DECON,		UP	1815					
DN	1215	.5	.009		TRUCKS OFF AUGER SITE		DN	1818					
UP	1230						UP	1830					
DN	1230			LUNCH			DN	1830					
UP	1245						UP	1845					
DN	1245						DN	1845					

Margin marks beside rows: *1 (DN 1000), *2 (DN 1015), 3* (UP 1145), 4* (UP 1215).

Comments:

Monitoring Completed By: Gemma Kirkwood

*1 DUE TO EXHAUST OF HSA RIG

Auger down 06531 / 2417
Auger up 05420 / 5594

9:50am down wind monitor moved north to include SB222 location
upwind monitor moved west so that both auger and geoprobe
rigs intersect line between monitors

*2 NO APPARENT SOURCES OF DUST, VALUE O.K.

11:00am down wind monitor moved west to include SB
*3 PERHAPS PARTICULATE DUE TO HSA RIG EXHAUST.

NOTE: After end of activities PID continued to read. Sam cleaned @1525 / prob air. cal.

4* moved monitors into gated area, however decon was not complete for auger, so monitors moved back into appropriate locations at 12:50am

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: SAG HARBOR
Date: 4/30/07

RETEC

Geoprobe (H6, H5, H4, G4, G5, G6) Auger (Bridge Ave)

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity	Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700					Geoprobe/	UP	1300	LUNCH				
DN	700					Drilling	DN	1300					
UP	715						UP	1315					
DN	715						DN	1315					
UP	730						UP	1330	.1	.021			
DN	730						DN	1330	0.0	.020			
UP	745						UP	1345	.1	.025	GEOPROBE STARTED		
DN	745						DN	1345	0.0	.023			
UP	800						UP	1400	.1	.022			
DN	800						DN	1400	0.0	.022			
UP	815						UP	1415	0.[illegible]	.027			
DN	815						DN	1415	0.0	.02			
UP	830	.2	.004			Geoprobe/	UP	1430	Bat. out	.025			
DN	830	0.0	.009			Drilling	DN	1430	0.0	.022			
* UP	845	0.2	.006				UP	1445	0.0	.027	NEW BATTERY IN UPWIND PID		
DN	845	0.0	.01				DN	1445	0.0	.02			
UP	900	.1	.006				UP	1500	0.0	.024			
DN	900	0.0	.010				DN	1500	0.0	.02			
UP	915	.1	.005				UP	1515	0.0	.023			
DN	915	0.0	.009				DN	1515	0.1	.016	DUE TO GEOPROBE EXHAUST		
UP	930	.1	.005				UP	1530	0.0	.023			
DN	930	0.0	.008				DN	1530	.2	.016			
UP	945	.1	.006				UP	1545	ACTIVITIES ENDED.				
DN	945	0.0	.016				DN	1545					
UP	1000	.1	.005				UP	1600					
DN	1000	0.0	.007				DN	1600					
UP	1015	.1	.006				UP	1615					
DN	1015	0.0	.009				DN	1615					
UP	1030	.1	.009				UP	1630					
DN	1030	0.0	.010				DN	1630					
UP	1045	.1	.011				UP	1645					
DN	1045	0.0	.013			Geoprobe/	DN	1645					
UP	1100	.1	.012			Auger	UP	1700					
DN	1100	0.0	.015			decon	DN	1700					
UP	1115	.1	.015				UP	1715					
DN	1115	0.0	.036		Geoprobe started/	Auger	DN	1715					
UP	1130	.1	.017			truck	UP	1730					
DN	1130	0.0	.021			started	DN	1730					
UP	1145	.2	.016		pump test started		UP	1745					
DN	1145	0.0	.021		geoprobe decon		DN	1745					
UP	1200	.2	.017		geoprobe started		UP	1800					
DN	1200	0.0	.021		geoprobe paused		DN	1800					
2* UP	1215	.2	.018				UP	1815					
DN	1215	0.0	.024				DN	1818					
UP	1230	0.0	.017				UP	1830					
DN	1230	0.0	.018				DN	1830					
UP	1245	0.0	.018				UP	1845					
DN	1245	0.0	.021		auger decon		DN	1845					

C.K. 4/30/07

C.K. 4/30/07

Comments:
- one set of monitors for geoprobe and auger as they are aligned with the wind direction.

Monitoring Completed By: Gemma Kirkwood

* fluctuating between .1 and .2 PPM

10:50AM WIND PICKED UP.

2* there is no reason for PID measuring this high, @ 12:20 calibrated with fresh air.

14:45 - switched upwind PID battery, moved closer to Bridge Ave wall.

* Think this was monitored with Geoprobe up and down instruments

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: Sag Harbor Key Span
Date: 4/27/07

Geoprobe

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity	Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700						UP	1300	0.0	0.024	ON-char. Borings		
DN	700						DN	1300	0.6	0.047			
UP	715						UP	1315	0.0	0.028			
DN	715						DN	1315	0.6	0.031			
UP	730						UP	1330	0.0	0.023	End of activities		
DN	730						DN	1330	0.6	0.021	clean up.		
UP	745						UP	1345					
DN	745						DN	1345					
UP	800						UP	1400					
DN	800						DN	1400					
UP	815						UP	1415					
DN	815						DN	1415					
UP	830						UP	1430					
DN	830						DN	1430					
UP	845						UP	1445					
DN	845						DN	1445					
UP	900						UP	1500					
DN	900						DN	1500					
UP	915						UP	1515					
DN	915						DN	1515					
UP	930						UP	1530					
DN	930						DN	1530					
UP	945						UP	1545					
DN	945						DN	1545					
UP	1000						UP	1600					
DN	1000						DN	1600					
UP	1015						UP	1615					
DN	1015						DN	1615					
UP	1030						UP	1630					
DN	1030						DN	1630					
UP	1045						UP	1645					
DN	1045						DN	1645					
UP	1100						UP	1700					
DN	1100						DN	1700					
UP	1115						UP	1715					
DN	1115						DN	1715					
UP	1130						UP	1730					
DN	1130						DN	1730					
UP	1145						UP	1745					
DN	1145						DN	1745					
UP	1200						UP	1800					
DN	1200						DN	1800					
UP	1215						UP	1815					
DN	1215						DN	1818					
UP	1230						UP	1830					
DN	1230						DN	1830					
UP	1245						UP	1845					
DN	1245						DN	1845					

DM 4/27/07

Comments:
1st half of day monitored jointly w/ auger area

Monitoring Completed By: ______________________

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: KeySpan Sag Harbor
Date: 4/27/07

RETEC

Auger (Hand clearing)

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700					
DN	700					
UP	715					
DN	715					
UP	730					
DN	730					
UP	745					
DN	745					
UP	800					
DN	800					
UP	815					
DN	815					
UP	830					
DN	830					
UP	845					
DN	845					
UP	900					
DN	900					
UP	915					
DN	915					
UP	930					
DN	930					
UP	945					
DN	945					
UP	1000					
DN	1000					
UP	1015					
DN	1015					
UP	1030					
DN	1030					
UP	1045					
DN	1045					
UP	1100					
DN	1100					
UP	1115					
DN	1115					
UP	1130					
DN	1130					
UP	1145					
DN	1145					
UP	1200					
DN	1200					
UP	1215					
DN	1215					
UP	1230					
DN	1230					
UP	1245					
DN	1245					

DNS 4/27/07

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	1300	0.0	0.030	Hand	clearing	
DN	1300	0.5	0.048		borings	
UP	1315	0.0	0.031	"	"	
DN	1315	0.0	0.050	"	"	
UP	1330	0.0	0.013	"	"	
DN	1330	0.0	0.031	"	"	
UP	1345	end	of		Day	
DN	1345					
UP	1400					
DN	1400					
UP	1415					
DN	1415					
UP	1430					
DN	1430					
UP	1445					
DN	1445					
UP	1500					
DN	1500					
UP	1515					
DN	1515					
UP	1530					
DN	1530					
UP	1545					
DN	1545					
UP	1600					
DN	1600					
UP	1615					
DN	1615					
UP	1630					
DN	1630					
UP	1645					
DN	1645					
UP	1700					
DN	1700					
UP	1715					
DN	1715					
UP	1730					
DN	1730					
UP	1745					
DN	1745					
UP	1800					
DN	1800					
UP	1815					
DN	1818					
UP	1830					
DN	1830					
UP	1845					
DN	1845					

DNS 4/27/07

Comments: 1st 1/2 of day monitored jointly w/ geoprobe

Monitoring Completed By: Dennis Sero

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results

RETEC

Site: Key Span Sag Harbor
Date: 4/23/08

"auger" (auger + geoprobe)

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700					
DN	700					
UP	715					
DN	715					
UP	730					
DN	730					
UP	745					
DN	745					
UP	800					
DN	800					
UP	815					
DN	815					
UP	830	0.0	0.069	Drilling SS-205	geoprobe	
DN	830	1.8	0.031	@ pre-char	[illegible]	
UP	845	0.0	0.018	"	"	
DN	845	0.2	0.033	"	"	
UP	900	0.0	0.045	"	"	
DN	900	0.7	0.035	Rain for [illegible]	noise [illegible]	
UP	915	0.0	0.033	[illegible] ka.		
DN	915	1.0	0.037	"	"	
UP	930	0.0	0.052	"	"	
DN	930	1.0	0.040	"	"	
UP	945	0.0	0.048	Rain for near	offsite	
DN	945	1.0	0.044	around	SB-208	
UP	1000	0.0	0.076	Wind change,	move	
DN	1000	0.9	0.056	stations	RAIN	
UP	1015	0.0	0.020	Lt Rain		
DN	1015	1.2	0.113			
UP	1030	0.0	0.015	Lt Rain		
DN	1030	1.1	0.034			
UP	1045	0.0	0.030	Rm augers,	Rain	
DN	1045	1.1	0.037			
UP	1100	0.0	0.020	Demob	from SB-208.	
DN	1100	1.4	0.071			
UP	1115	0.0	0.017			
DN	1115	1.1	0.032			
UP	1130	0.0	0.017			
DN	1130	1.0	0.035			
UP	1145	0.0	0.023			
DN	1145	Moving		Stations		
UP	1200					
DN	1200	Lunch				
UP	1215					
DN	1215					
UP	1230			DMS		
DN	1230					
UP	1245					
DN	1245					

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	1300					
DN	1300					
UP	1315					
DN	1315					
UP	1330					
DN	1330					
UP	1345					
DN	1345					
UP	1400					
DN	1400					
UP	1415					
DN	1415					
UP	1430					
DN	1430					
UP	1445					
DN	1445					
UP	1500					
DN	1500					
UP	1515		DMS			
DN	1515					
UP	1530					
DN	1530					
UP	1545					
DN	1545					
UP	1600					
DN	1600					
UP	1615					
DN	1615					
UP	1630					
DN	1630					
UP	1645					
DN	1645					
UP	1700					
DN	1700					
UP	1715					
DN	1715					
UP	1730					
DN	1730					
UP	1745					
DN	1745					
UP	1800					
DN	1800					
UP	1815					
DN	1818					
UP	1830					
DN	1830					
UP	1845					
DN	1845					

Comments:
One set of monitors for auger + geoprobe as they are working close to each other. Light to heavy rain throughout the day.

Monitoring Completed By: Denise Sosa

1016 1.4 0.057 - Diesel exhaust from moving drill rig

1300 - after lunch, geoprobe continued to work & auger crew split off to hand clear. Separate sheets will be used for remainder of day

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results

Site: Key Span - Sag Harbor
Date: 4/26/07

Auger

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700					
DN	700					
UP	715					
DN	715					
UP	730					
DN	730					
UP	745					
DN	745					
UP	800					
DN	800					
UP	815	0.0	0.019	set up @ SB-204		
DN	815	0.5	0.038	"	"	
UP	830	0.0	0.018	Drill @ SB-204		
DN	830	0.6	0.066			
UP	845	0.0	0.024			
DN	845	0.6	0.025			
UP	900	0.1	0.019			
DN	900	0.0	0.114			
UP	915	0.0	0.029			
DN	915	0.0	0.096			
UP	930	0.0	0.023			
DN	930	0.0	0.038			
UP	945	0.1	0.021			
DN	945	0.0	0.013			
UP	1000	0.1	0.020			
DN	1000	0.0	0.039			
UP	1015	0.0	0.019			
DN	1015	0.0	0.041			
UP	1030	0.0	0.017	Grout SB-204		
DN	1030	0.0	0.023	paving co sealing pavement in area		
UP	1045	0.1	0.017			
DN	1045	0.0	0.011			
UP	1100	0.0	0.016			
DN	1100	0.0	0.072	Grout SB-204, some dust		
UP	1115	0.0	0.022	briefly generated while mixing		
DN	1115	0.0	0.048	grout.		
UP	1130	0.0	0.021			
DN	1130	0.0	0.034			
UP	1145	0.1	0.018	Demob SB-204		
DN	1145	0.0	0.055			
UP	1200	0.0	0.031	Demob SB-204		
DN	1200	0.0	0.038			
UP	1215	Lunch				
DN	1215					
UP	1230					
DN	1230					
UP	1245					
DN	1245					

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	1300	Lunch				
DN	1300					
UP	1315					
DN	1315					
UP	1330					
DN	1330	set up air stations				
UP	1345	0.0	0.014	Hand clear SB-206		
DN	1345	0.0	0.005	"	"	
UP	1400	0.0	0.012	Drill @ SB-206		
DN	1400	0.0	0.002	"	"	
UP	1415	0.1	0.012			
DN	1415	0.0	0.001	"	"	
UP	1430	0.1	0.026	"	"	
DN	1430	0.0	0.009	"	"	
UP	1445	0.0	0.016			
DN	1445	0.0	0.007			
UP	1500	0.0	0.012	Demob for day		
DN	1500	0.0	0.010	"	"	
UP	1515					
DN	1515					
UP	1530					
DN	1530					
UP	1545					
DN	1545					
UP	1600					
DN	1600					
UP	1615					
DN	1615					
UP	1630					
DN	1630					
UP	1645					
DN	1645					
UP	1700					
DN	1700					
UP	1715					
DN	1715					
UP	1730					
DN	1730					
UP	1745					
DN	1745					
UP	1800					
DN	1800					
UP	1815					
DN	1818					
UP	1830					
DN	1830					
UP	1845					
DN	1845					

Comments:
901 - Dust = 0.039
1046 - Dust = 0.053

Monitoring Completed By:

The RETEC Group, Inc.
CAMP Station Real Time Air Monitoring Results
Site: Sag Harbor KeySpan
Date: 4/26/06

Geoprobe

Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity	Location	Time	PID (ppm)	Particulate (mg/m3)	Wind Direction	Work Area Breathing Zone	Activity
UP	700						UP	1300	Lunch				
DN	700						DN	1300					
UP	715						UP	1315					
DN	715						DN	1315					
UP	730						UP	1330	Set up air station				
DN	730						DN	1330	"	"			
UP	745						UP	1345	0.3	0.017	Pre-characterization borings		
DN	745						DN	1345	0.6	0.016	"	"	
UP	800						UP	1400		0.014	measure out grid for pre-		
DN	800						DN	1400	0.5	0.010	char borings		
UP	815	0.1		SB-211			UP	1415	No	borings - break to replace			
DN	815	0.2	0.021				DN	1415		PID battery			
UP	830	0.1					UP	1430	0.2	0.015	Pre-char Borings		
DN	830	0.3	0.022				DN	1430	0.5	0.009	Continue pre-char borings		
UP	845	0.1					UP	1445	0.3	0.014	"	"	
DN	845	0.4	0.026				DN	1445	0.5	0.010	"	"	
UP	900	0.1					UP	1500	0.7	0.016	Demob for day		
DN	900	0.4	0.025	Mob to SB-209			DN	1500	0.5	0.010	"	"	
UP	915	0.1					UP	1515					
DN	915	0.4	0.029	Hand clear SB 209			DN	1515					
UP	930	0.2					UP	1530					
DN	930	0.4	0.024				DN	1530					
UP	945	0.2		Geoprobe @ SB-209			UP	1545					
DN	945	0.4	0.036				DN	1545					
UP	1000	0.7					UP	1600					
DN	1000	0.5	0.022				DN	1600					
UP	1015	0.7		Demob SB-209			UP	1615					
DN	1015	0.5	0.021				DN	1615					
UP	1030	Move air station to new loc.					UP	1630					
DN	1030						DN	1630					
UP	1045	Car parked on boring location.					UP	1645					
DN	1045						DN	1645					
UP	1100	0.2		Set up @ SB-219			UP	1700					
DN	1100	0.5	0.055	"	"		DN	1700					
UP	1115	0.2		Pre clear SB-219			UP	1715					
DN	1115	0.5	0.021	"	"		DN	1715					
UP	1130	0.2		"	"		UP	1730					
DN	1130	0.5	0.026	"	"		DN	1730					
UP	1145	0.2		Geoprobe SB-219			UP	1745					
DN	1145	0.5	0.038	"	"		DN	1745					
UP	1200	0.2		Demob SB 219			UP	1800					
DN	1200	0.5	0.030	"	"		DN	1800					
UP	1215	Lunch					UP	1815					
DN	1215						DN	1818					
UP	1230						UP	1830					
DN	1230						DN	1830					
UP	1245						UP	1845					
DN	1245						DN	1845					

DS 4/26/06

Comments:
0815 - 1345 no dust monitor - equipment delivery was late.
1400 - PID out of batteries

Monitoring Completed By: Denise Sero (ENSR)

Air Quality Monitoring

Client:____________ **Project No.:**____________
Location:____________ **Site Eng.:**____________
Project Mgr.:____________ **Site H&S Ofcr.:**____________

4/26 Data re-copied to new sheet

Date	Initial	Time	Location	PID/FID PPM	Dust ~~O_2%~~ mg/m3	LEL%	Drager Tubes			Other
4/26	DS	945	Geoprobe up	0.2		Geoprobe @ SB-209				
		945	Geoprobe Down	0.4	0.036	"			"	
		945	Auger up	0.1	0.021	Drill @ SB-204				
		945	Auger Down	0.0	0.023	"		"		
		1000	Geoprobe up	0.2		Geoprobe SB-209				
		1000	Geoprobe Down	0.5	0.022	"		"		
		1000	Auger up	0.1	0.020	Drill @ SB-204				
		1000	Auger Down	0.0	0.039	"		"		
		1015	Geoprobe up	0.2		Demob SB-209				
		1015	Geoprobe Down	0.5	0.021	"		"		
		1015	~~Auger~~ Auger up	0.0	0.049	Drillers taking coffee break				
		1015	Auger Down	0.0	0.041	"		"		
		1030	Geoprobe up	moving air station to SB-219						
		1030	Geoprobe Down	"			"	"		
		1030	auger up	0.0	0.017	Grout SB-204				
		1030	auger Down	0.0	0.023	"		"		
		1045	Geoprobe up	Moving air stations - not ready to set up -						
		1045	Geoprobe Down	car parked in boring loc.						
		1045	~~Auger~~ auger up	0.1	0.017	Grouting SB-204 - Paving co. is				
		1045	Auger Down	0.0	0.111	sealing new pavement in area				
		1046	auger down	0.0	0.053	"			"	
		1100	Geoprobe up	0.2		Set up @ SB-219 ("Step out")				
		1100	Geoprobe Down	0.5	0.055	" " Pavement Sealing in area				
		1100	auger up	0.0	0.016	Grouting SB-204 - some dust observed				
		1100	Auger Down	0.0	0.072	from opening bags of dry grout				

Geoprobe DS

Air Quality Monitoring

Client:
Location:
Project Mgr.:

Project No.:
Site Eng.:
Site H&S Ofcr.:

4/25/07 DS

Auger 4/26 data Re-copied to new sheet

Date	Initial	Time	Location	PID/FID PPM	Dust ~~O_2%~~ mg/m3	LEL%	Drager Tubes			Other
~~1345~~	DS	1345	up	0.0	0.009	Grouting SB-308, hand clear				
~~1345~~		1345	Down	0.0	0.000	+ geoprobe inside site fence.				
		1400	up	0.0	0.010	Demob auger rig, begin				
		1400	down	0.0	0.001	hand clearing, geoprobing				
move station - Hand clearing around SB-211 + Geoprobe along Bridge St.										
for		1445	up	0.0	0.008	Hand clear & geoprobe				
			Down	0.0	0.002	"			"	
		1500	up	0.0	0.007	"			"	
		1500	down	0.1	0.009	"			"	
		1515	up	0.0	0.007	Demob				
		1515	Down	0.0	0.000	"				
				end of Day		D... 4/25/07				
4/26	DS	815	up	0.0	0.019	2-P up @ SB-204				
		815	Down	0.5	0.038	"			"	
		830	up	0.0	0.018	Drill @ SB-204				
		830	Down	0.6	0.066	"		"		
		845	up	0.0	0.024	"		"		
		845	Down	0.6	0.025	"		"		
		900	up	0.1	0.019	"		"		
		900	Down	0.0	0.114	"		"		
		901	Down	0.0	0.039	"		"		
		915	up	0.0	0.029	"		"		
		915	Down	0.0	0.026	"		"		
		930	up	0.0	0.033	"		"		
		930	Down	0.0	0.038	"		"		

auger 08

Air Quality Monitoring

Client:_______________ **Project No.:**_______________
Location:_______________ **Site Eng.:**_______________
Project Mgr.:_______________ **Site H&S Ofcr.:**_______________

Date	Initial	Time	Location	PID/FID PPM	Dust ~~O%~~ mg/m3	LEL%	Drager Tubes			Other
4/25/07	DS	945	Down	0.4	0.008	Geoprobe in SB-205 area,				
		1000	up	0.0	0.008	auger on L.I. Ave.				
		1000	Down	0.3	0.006	"				"
		1015	up	0.0	0.020	"			"	
		1015	Down	0.4	0.006	"			"	
		1030	up	0.0	0.015	Hand clear / probe @ SB-211				
		1030	Down	0.4	0.007	auger @ SB-203				
		1045	up	0.0	0.014	mob geoprobe to SB-207 & 205				
		1045	Down	0.5	0.020	auger @ SB-203				
		1100	up	0.0	0.009	"			"	
		1100	Down	0.0	0.006	"			"	
		1115	up	0.0	0.012	Geoprobe/hand clear SB 207 & 205				
		1115	Down	0.0	0.007	auger SB-203				
		1130	up	0.0	0.010	"			"	
		1130	Down	0.0	0.008	"			"	
		1145	up	0.0	0.015	Geoprobe/hand clear SB207/SB205				
		1145	Down	0.0	0.003	Finish up SB-203, grout after lunch				
			Break	for	lunch - upwind unit in car					
		1300	up	0.0	0.013	Grout SB-203, hand clear				
		1300	Down	0.0	0.003	+ geoprobe inside site fence				
		1315	up	0.0	0.010	"			"	
		1315	Down	0.0	0.004	"			"	
		1330	up	0.0	0.008	"			"	
		1330	Down	0.0	0.003	"			"	
								DMS	4/25/07	

cont'd.

Geoprobe

Air Quality Monitoring

Client:
Location:
Project Mgr.:

Project No.:
Site Eng.:
Site H&S Ofcr.:

Date	Initial	Time	Location	PID/FID PPM	Dust ~~O_2%~~ mg/m³	LEL%	Drager Tubes			Other
4/24	DS	1345	up	0.0	0.031	Geoprobe @ SB-202				
			Down	0.2	0.013					
		1355	up	0.0	0.018	Demob SB-202.				
			Down	0.1	0.01					
		1915	up	0.0	0.015	Probe @ SB-200				
		1915	Down	0.1	0.010	"		"		
		1430	up	0.0	0.014	"		"		
		1430	Down	0.1	0.008	"		"		
		1445	up	0.0	0.023	Demob SB-200				
		1445	Down	0.2	0.011	"		"		
		1500	up	0.0	0.015	Demob	site ~~cleanup~~ DS			
		1500	Down	0.1	0.017		Set up Drill @ 217			
		1530	up	0.0	0.015	Demob				
		1530	Down	0.2	0.007	"		"		
						End of day DMS 4/24/07				
4/26		815	up	0.1		SB-211		no dust equip has not arrived		
		815	Down	0.2	0.021	"	"			
		830	up	0.1		"	"			
		830	Down	0.3	0.022	"	"			
		845	up	0.1		"	"			
		845	Down	0.4	0.026	"	"			
		900	up	0.1		Mob to		SB-209		
		900	down	0.4	0.005	"		"		
		915	up	0.1		Hand clear		SB-209		
		915	Down	0.4	0.029	"	"			
		930	up	0.2		"		"		
		930	Down	0.4	0.024					

4/26 data recopied to new sheet

Auger Rig Air Monitoring

Air Quality Monitoring

Client:
Location:
Project Mgr.:

Project No.:
Site Eng.:
Site H&S Ofcr.:

Date	Initial	Time	Location	PID/FID PPM	Dust ~~O_2%~~	LEL%	Drager Tubes			Other
4/24	NV	1115	up	0.2	0.026	Grouting + Demob SB-201				
	NV	1115	down	0.6	0.063	Paving in area				
	DS	1130	up	0.2	0.022	"			"	
	DS	1130	Down	0.6	0.055	"			"	
End SB-201										
SB-208										
	DS	1345	Down	0.0	0.030	Drilling @ SB-208				
	DS	1400	Down	0.0	0.014					
	DS	1415	Down	0.1	0.01	"			"	
	DS	1430	Down	0.1	0.064	"			"	
		1445	Down	0.0	0.016	"			"	
		1500	Down							
Finish drilling SB-208, grout tomorrow ~~DS 4/24/07~~										
4/25	DS	815	up	0.0	0.011	grouting SB-208				
			Down	0.2	0.025	grouting SB-208				
Due to equipment malfunction, one upwind & one downwind station will operate until new equip. arrives.										
4/25	DS	900	Down	0.2	0.041	Geoprobe @ SB-213, demob				
			Up	0.1	0.020	auger rig from SB-208				
		915	up	0.0	0.011	Mob to auger loc on L.I. Ave				
		915	Down	0.3	0.012	probe @ SB-215 area				
		930	up	0.0	0.011	"			"	
		930	Down	0.3	0.018					
		945	up	0.0	0.013	"			"	

Cont'd.

Air Quality Monitoring

Client:
Location:
Project Mgr.:
Project No.:
Site Eng.:
Site H&S Ofcr.:

Date	Initial	Time	Location	PID/FID PPM	Dust mg/m2 ~~O2%~~	~~LEL%~~	Drager Tubes			Other
4/24	DS	830	up	0.2	0.097	Set up @ SB 201 - paving + exc.				
		830	Down	0.6	0.238	in street				
		845	up	0.4	0.047	Set up @ SB 201 - Paving +				
		845	Down	0.6	0.109	excavation in street.				
		900	up	0.2	0.048	"			"	
		900	Dwn	0.6	0.112	"			"	
Begin SB-201										
		915	up	0.2	0.048	Drilling @ SB-201, paving				
		915	Down	0.6	0.090	in street, truck next to downwind				
		920	up	0.2	0.052	SB-201, Paving near up loc.				
		920	Down	0.6	0.099	"			"	
		930	up	0.2	0.068	"			"	
		930	Down	0.6	0.112	"			"	
		945	up	0.3	0.052	"			"	
		945	Dwn	0.7	0.116	"			"	
		1000	up	0.4	0.051	SB-201, paving near up + down				
		1000	Dwn	0.7	0.083	"			" + removing pavement	
		1015	up	0.3	0.052	Pull augers/grout SB-201, paving				
		1015	Dwn	0.7	0.105	continues in area				
		1030	up	0.3	0.049	Grout SB-201, paving in				
		1030	Down	0.6	0.076	area				
		1045	up	0.2	0.040	"			"	
		1045	Down	0.6	0.127	"			"	
		1100	up	0.3	0.031	"			"	
		1100	Down	0.6	0.058					

Air Quality Monitoring

Client: ____________________ **Project No.:** ____________________
Location: ____________________ **Site Eng.:** ____________________
Project Mgr.: ____________________ **Site H&S Ofcr.:** ____________________

Date	Initial	Time	Location	PID/FID PPM	Dust ~~O_2%~~ mg/m³	LEL%	Drager Tubes			Other
04/23	SNP	1145	UP	0.0	0.023	Demob / Backfill SB-202 Snng				
		1145	DOWN	0.0	0.035		''			
		1200	UP	0.0	0.025		''			
		1200	DOWN	0.6	0.036		''			
					COMPLETED SB-202					
12:00 Lunch										
~~1345~~	DMS	1345	Down	0.2	0.040	clear SB-215				
4/23/07	DMS	1345	up	0.0	0.030	''		''		
		1400	up	0.0	0.029	''	''			
		1400	Down	0.2	0.040	''	''			
		1415	up	0.0	0.029	Clear SB-217				
		1415	Down	0.1	0.040	clear SB-217 - pavement cutting on LI Ave				
		1430	up	0.0	0.030	''		''		''
		1430	Down	0.1	0.042	''		''		''
		1439	up	0.0	0.030	Mob to SB-216, jackhammer				
		1439	down	0.1	0.044	note diesel fumes rel to jackhammer				
		1445	up	0.0	0.035	clearing SB-216 end jackhammer				
		1445	Down	0.1	0.047	''		''		
		1500	up	0.0	0.032	Demob from SB-216 - backfill + patch				
		1500	Down	0.1	0.041	''		''	still	working on L.I. Ave.
		1507	up	0.0	0.029	Demob from SB-216, cal Dust - Down				
		1507	Down	0.1	0.040	''				''
					DMS					
4/24	DMS	815	up	0.2	0.041	Mob to SB 202				Paving in Street
			Down	0.5	0.085	''			''	

Air Quality Monitoring

Client:______________________ **Project No.:**______________________

Location:______________________ **Site Eng.:**______________________

Project Mgr.:______________________ **Site H&S Ofcr.:**______________________

Date	Initial	Time	Location	PID/FID PPM	mg/m³ ~~O_2%~~ Dust	LEL%	Drager Tubes			Other
04/23	SNP	1000	UP	0.0	0.029					SB-204 Mob
			DOWN	0.0	0.034					
		1015	UP	0.0	0.023					Start
		1016	DOWN	0.0	0.031					
		1030	UP	0.0	0.024					Backfilling
			DOWN	0.0	0.042					
			COMPLETED			SB-204				
04/23	SNP	1040	DOWN	0.0	0.034					Mobing SB-203
		1041	UP	0.0	0.022					
		1045	DOWN	0.1	4.0					Jackhammering
		1046	DOWN	0.1	1.9					"
		1046	DOWN	0.0	3.4					"
		1047	DOWN	0.1	1.6					"
		1047	DOWN	0.0	0.13					Excavation
		1048	DOWN	0.0	0.045					"
		1048	UP	0.0	0.024					"
		1100	DOWN	0.0	0.03					"
		1102	UP	0.0	0.023					"
			COMPLETED			SB-203				
04/23	SNP	1117	UP	0.0	0.027	Mobing to SB-202				[illegible]
			DOWN	0.0	0.047					"
		1120	DOWN	0.0	3.4	Jack Hammering SB-202				
		1121	DOWN	0.2	3.27	"		"		
		1122	DOWN	0.0	0.2	"		"		"
		1122	"	0.1	3.1	"		"		
		1123	"	0.0	0.4	"		"		
		1123	"	0.1	1.1	"		"		
		1124	"	0.2	0.2	Excavation				
		1125	"	0.1	0.070	Excavation				
		1125	"	0.0	0.025	Excavation				

Air Quality Monitoring

Client: ____________________ **Project No.:** ____________________

Location: ____________________ **Site Eng.:** ____________________

Project Mgr.: ____________________ **Site H&S Ofcr.:** ____________________

Date	Initial	Time	Location	PID/FID PPM	mg/m³ ~~O_2%~~ Dust	LEL%	Drager Tubes			Other
							____	____	____	
04/20/07	SNP	0921	DOWN	0.0	0.027					SB-218 Sunny
		0935	UP	0.0	0.013					
		0936	DOWN	0.0	0.017					
		1000	UP	0.0	0.017					
		1001	DOWN	0.0	0.010					
		1015	UP	0.0	0.014					
		* 1015	DOWN	0.1	0.010					
		1040	UP	0.0	0.015					
		1040	DOWN	0.1	0.009					
		1120	UP	0.0	0.014					
		1120	DOWN	0.1	0.008					
		1140	UP	0.0	0.010					
		1141	DOWN	0.1	0.021					
				lunch						
		1250	UP	0.0	0.014					Spouting
		1251	DOWN	0.1	0.010					
		1315	UP	0.1	0.013					
		1316	DOWN	0.1	0.014					
		1340	UP	0.0	0.010					
		1343	DOWN	0.1	0.011					
		1410	UP	0.0	0.014					DEMOB
		1411	DOWN	0.1	0.008					
		1422	UP							NO WORK
		1423	DOWN	0.2	0.013					
		1424	UP	0.0	0.013					

* Drilling stopped from 10:20 to 10:40 due to machine maintenance.

Air Quality Monitoring

Client: KeySpan
Location: Sag Harbor Former MGP
Project Mgr.: Shail Pandya

Project No.: ICE D04-20183-002
Site Eng.: Shail Pandya
Site H&S Ofcr.: Kevin Kochel

Date	Initial	Time	Location	PID/FID PPM	mg/m³ ~~O_2%~~ Dust	LEL%	Drager Tubes			Other
04/19/07	SNP	10:20	UP	0.0	0.006					SB-214
		10:35	DOWN	0.3	0.12					
		10:37	UP	0.0	0.005					
		10:57	DOWN	0.5	0.054					
		10:58	UP	0.1	0.005					
		11:10	DOWN	0.5	0.02					
		11:10	UP	0.0	0.006					Sunny
		11:27	DOWN	0.4	0.016					
		11:28	UP	0.1	0.006					
		11:45	DOWN	0.3	0.026					
		11:46	UP	0.0	0.006					
		12:01	DOWN	0.3	0.028					
		12:01	UP	0.2	0.006					
		12:10	— LUNCH							
		12:50	Down	0.3	0.025					
		12:50	UP	0.0	0.008					Sunny/Grouting
		1410	Down	0.3	0.020					Finished Grouting
		1410	UP	0.2	0.012					
04/20/07	SNP	0840	DOWN	0.0	0.024					Mobilization
		0848	UP	0.0	0.007					"
		0854	DOWN	0.0	0.012					" Sunny
		0858	DOWN	0.0	0.016					DRILLING
		0901	UP	0.0	0.017					"
		0920	UP	0.0	0.014					"

Air Quality Monitoring

Client:______________________________ **Project No.:**______________________

Location:____________________________ **Site Eng.:**________________________

Project Mgr.:_________________________ **Site H&S Ofcr.:**____________________

Date	Initial	Time	Location	PID/FID PPM	~~O_2%~~ Dust	LEL%	Drager Tubes			Other
							_____	_____	_____	
4/18/07	SNP	1315	UP	0	0.003					
		1316	DOWN	0.05	0.04					
		1330	UP	0	0.003					
		1331	DOWN	0.4	0.003					
		1345	UP	0	0.004					
		1346	DOWN	0.5	0.009					location moved to adjust for test pitting (downgradient)
		1400	UP	0	0.004					
		1401	DOWN	0.4	0.004					
		1415	UP	0	0.004					
		1416	DOWN	0.3	0.003					
		1430	UP	0.0	0.004					
		1431	DOWN	0.2	0.013					
		1445	UP	0.0	0.004					
		1446	DOWN	0.0	0.004					
		1500	UP	0.0	0.005					
		1501	DOWN	0.0	0.004					
4/19/07	SNP	0905	* DOWN	0.0	0.020					SB-214 light drizzle
		0907	UP	0.1	0.006					
		0915	DOWN	0.0	0.011					
		0916	UP	0.0	0.006					
		0945	DOWN	0.2	0.002					
		0948	UP	0.0	0.006					
		10:03	DOWN	0.3	0.006					
		10:04	UP	0.0	0.005					
		10:19	DOWN	0.3	0.05					

* Downgradient CAM set-up @ side of road. High readings possible due to non source emissions i.e., traffic

Air Quality Monitoring

Client: KeySpan
Location: Sag Harbor Former MGP
Project Mgr.: Shail Pandya
Project No.: KED04-20183-002
Site Eng.: Shail Pandya
Site H&S Ofcr.: KEVIN KACHEL

Date	Initial	Time	Location	PID/FID PPM	~~O_2%~~ Dust	LEL%	Drager Tubes			Other
04/17	SNP	1431	DOWN	0·3	0·003					SB-212
		1445	UP	0·1	0·003					
		1446	DOWN	0·0	0·004					
		1455	UP	0·2	0·003					Light Rain
		1456	DOWN	0·0	0·007					
04/18	SNP	1000	UP	0·0	0·001					SB-212 NO DRILLING
		1001	DOWN	0·2	0·07					
		1015	UP	0·0	0·003					
		1016	DOWN	0·1	0·32/	1017 0·15/0·	1020 04/0·	1021 03/		
		1030	UP	0·0	0·003					
		1031	DOWN	0·1	0·05					
		1045	UP	0·0	0·005					Annex loading Truck next to CAMP (down)
		1046	DOWN	0·1	0·05					
		1100	UP	0·0	0·003					
		1101	DOWN	0·0	0·09					
		1115	UP	0·0	0·003					
		1116	DOWN	0·1	0·042					
		1130	UP	0·0	0·005					
		1131	DOWN	0·1	0·03					
		1145	UP	0·0	0·005					
		1146	DOWN	0·3	0·03					
		1200	UP	0·0	0·003					
		1201	DOWN	0·3	0·0037					
		1300	UP	0·0	0·001					
		1301	DOWN	0·2	0·03					

Air Quality Monitoring

Client: KeySpan **Project No.:** KED04-20183-002
Location: Sag Harbor Former MGP **Site Eng.:** Shail Pandya
Project Mgr.: Shail Pandya **Site H&S Ofcr.:** KEVIN KACHEL

Date	Initial	Time	Location	PID/FID PPM	mg/m^3 ~~O_2%~~ DUST	LEL%	Drager Tubes			Other
04/17	SNP	1040	DOWN GRADIENT	0.1	0.003					SB-
		1041	UP	0.0	0.001					
		1045	DOWN	0.3	0.003					
		1046	UP	0.0	0.010					
		1100	DOWN	0.2	0.002					
		1101	UP	0.0	0.020					
		1130	UP	0.0	0.004					SB-200
		1131	DOWN	0.0	0.002					SB-200
		1145	UP	0.0	0.005					
		1146	DOWN	0.2	0.005					
		1200	UP	0.0	0.001					
		1201	DOWN	0.2	0.006					
		1300	UP	0.0	0.004					SB-201
		1301	DOWN	0.0	0.03					
		1315	UP	0.0	0.003					
		1316	DOWN	0.0	0.011					
		1330	UP	0.0	0.01					
		1331	DOWN	0.1	0.018					
		1345	UP	0.0	0.003					SB-214
		1346	DOWN	1.0	0.015					SB-214
		1400	UP	0.0	0.004					
		1401	DOWN	0.0	0.010					
		1415	UP	0.1	0.006					
		1416	DOWN	0.0	0.015					
		1430	UP	0.0	0.009					SB-212

lighter sand High moisture @ in PID.

Field Equipment Calibration/Maintenance Log

Client: KED
Location: Sag Harbor, NY
Project Mgr.: Roger Hathaway

Project No.: KED04- 20183-002
Site Eng.:
Site H&S Ofcr.: K. Kachel

Date	Type of Equipment[1]	Equipment ID Number	Procedure[2]	Reference Standards[3]	Initials of Individual	Company	Calibration OK Yes/No
5-1-07	~~37~~ 5/1/07 GK DT	3761	zero	air	G.K	RETEC	y
↓	DT	04787	zero	air	G.K.	RETEC	y
↓	DT	02417	zero	air	G.K.	RETEC	y
5-2-07	PID	06351	fresh/span	air/iso	G.K.	RETEC	y
↓	PID	04357	fresh/span	air/iso	G.K.	RETEC	y
↓	PID	05420	fresh/span	air/iso	G.K.	RETEC	y
↓	DT	02417	zero	air	G.K.	RETEC	y
↓	DT	5594	zero	air	G.K	RETEC	y
5-3-07	PID	05420	fresh/span	air/iso	G.K.	RETEC	y
↓	PID	06351	fresh/span	air/iso	G.K	RETEC	y
↓	PID	04357	fresh/span	air/iso	G.K.	RETEC	y
↓	DT	05594	~~fresh/span~~ zero GK	~~air/iso~~ air GK	G.K.	RETEC	y
↓	DT	02417	zero	air	G.K.	RETEC	y
5-4-07	PID	03805	zero/span	air/iso	G.K	RETEC	y
↓	PID	04520	zero/span	air/iso	G.K	RETEC	y
↓	PID	05420	zero/span	air/iso	G.K	RETEC	y
↓	PID	06351	zero/span	air/iso	G.K	RETEC	y

Maintenance Required/Procedures:

[1]Certifications or statements of manufacturer calibration can be obtained from ThermoRetec office files.

[2] Use space below if necessary

[3] Type of calibration gas used and concentration; buffer solutions, etc.

Field Equipment Calibration/Maintenance Log

Client: KEO
Location: Sag Harbor, N.Y.
Project Mgr.: Roger Hathaway

Project No.: KED04-20183-002
Site Eng.:
Site H&S Ofcr.: ~~[illegible]~~ K. Kachel

Date	Type of Equipment[1]	Equipment ID Number	Procedure[2]	Reference Standards[3]	Initials of Individual	Company	Calibration OK Yes/No
4-30-07	PID	04520	fresh/span	air/iso	G.K.	RETEC	y
	PID	03805	fresh/span	air/iso	G.K.	RETEC	y
	PID	06271	fresh/span	air/iso	G.K	RETEC	y
	PID	05420	fresh/span	air/iso	G.K.	RETEC	y
	PID	06351	fresh/span	air/iso	G.K	RETEC	y
	PID	04359	fresh/span	air/iso	G.K	RETEC	y
	DT	05594	zero	air	G.K.	RETEC	y
	DT	3761	zero	air	G.K	RETEC	y
	DT	04787	zero	air	G.K	RETEC	y
	DT	02417	zero	air	G.K	RETEC	y
5-1-07	PID	04520	fresh/span	air/iso	G.K.	RETEC	y
	PID	03805	fresh/span	air/iso	G.K.	RETEC	y
	PID	06271	fresh/span	air/iso	G.K.	RETEC	y
	PID	05420	fresh/span	air/iso	G.K.	RETEC	y
	PID	06351	fresh/span	air/iso	G.K.	RETEC	y
	PID	04359	fresh/span	air/iso	G.K.	RETEC	y
	DT	05594	zero	air	G.K.	RETEC	y

Maintenance Required/Procedures:

[1] Certifications or statements of manufacturer calibration can be obtained from ThermoRetec office files.

[2] Use space below if necessary

[3] Type of calibration gas used and concentration; buffer solutions, etc.

Field Equipment Calibration/Maintenance Log

Client: KED
Location: Sag Harbor NY
Project Mgr.: Roger Hathaway

Project No.: KED 04- 20183-002
Site Eng.:
Site H&S Ofcr.: R. Kachel.

Date	Type of Equipment[1]	Equipment ID Number	Procedure[2]	Reference Standards[3]	Initials of Individual	Company	Calibration OK Yes/No
5-4-07	PID	~~04351~~ 04355	zero/span	air/iso	G.K.	RETEC	y
↓	DT	05594	zero	air	G.K.	RETEC	y
↓	DT	02417	zero	air	G.K.	RETEC	y
↓	DT	3761	zero	air	G.K.	RETEC	y
↓	DT	4787	zero	air	G.K.	RETEC	y
5/7/07	DT	02417	zero	air	G.K.	RETEC	y
↓	DT	05594	zero	air	G.K.	RETEC	y
↓	PID	05420	zero/span	air/iso	G.K.	RETEC	y
↓	PID	06351	zero/span	air/iso	G.K.	RETEC	y
↓	PID	06271	zero/span	air/iso	G.K.	RETEC	y
↓	PID	04520	zero/span	air/iso	G.K.	RETEC	y
5/8/07	PID	05420	zero/span	air/iso	G.K.	RETEC	y
↓	PID	06271	zero/span	air/iso	G.K.	RETEC	y
↓	DT	05594	zero	air	G.K.	RETEC	y
↓	DT	02417	zero	air	G.K.	RETEC	y
↓	PID	06351	zero/span	air/iso	G.K.	RETEC	y
↓	PID	03805	zero/span	air/iso	G.K.	RETEC	y

Maintenance Required/Procedures:

[1]Certifications or statements of manufacturer calibration can be obtained from ThermoRetec office files.

[2] Use space below if necessary

[3] Type of calibration gas used and concentration; buffer solutions, etc.

Field Equipment Calibration/Maintenance Log

Client: Keyspan Energy Delivery
Location: Sag Harbor, NY
Project Mgr.: Roger Hathaway

Project No.: KED04-20183-002
Site Eng.:
Site H&S Ofcr.: K. Kachel

Date	Type of Equipment[1]	Equipment ID Number	Procedure[2]	Reference Standards[3]	Initials of Individual	Company	Calibration OK Yes/No
5/8/07	PID	04520	zero/span	air/iso	G.K.	RETEC	y
5/9/07	PID	06351	zero/span	air/iso	G.K.	RETEC	y
	PID	05420	zero/span	air/iso	G.K.	RETEC	y
	PID	04520	zero/span	air/iso	G.K.	RETEC	y
	DT	02417	zero	air	G.K.	RETEC	y
	DT	05420	zero	air	G.K.	RETEC	y
	PID	03805	zero/span	air/iso	G.K.	RETEC	y

Maintenance Required/Procedures:

[1]Certifications or statements of manufacturer calibration can be obtained from ThermoRetec office files.

[2] Use space below if necessary

[3] Type of calibration gas used and concentration; buffer solutions, etc.

Up Wind Aerosol Exceedence Validation - CAMP
Pre-Design Investigation
Sag Harbor Former MGP Site
Sag Harbor, New York

Date & Time	Upwind Aerosols (ug/m^3)	Duration of Exceedance	Comments
4/17/2007 11:37:47	295	3 minutes	Possibly due to humidity
4/17/2007 11:38:47	218		
4/17/2007 11:39:47	113		
4/17/2007 13:43:47	201	< 1 minute	Possibly due to traffic emissions
4/17/2007 13:46:47	191	< 1 minute	Possibly due to traffic emissions
4/18/2007 10:07:50	184	< 1 minute	Possibly due to traffic emissions
4/18/2007 10:15:50	505	2 minutes	Possibly due to traffic emissions
4/18/2007 10:16:50	133		
4/18/2007 10:18:50	170	3 minutes	Possibly due to traffic emissions
4/18/2007 10:19:50	113		
4/18/2007 10:20:50	100		
4/18/2007 10:23:50	138	2 minutes	Possibly due to traffic emissions
4/18/2007 10:24:50	132		
4/18/2007 10:28:50	159	3 minutes	Possibly due to traffic emissions
4/18/2007 10:29:50	150		
4/18/2007 10:30:50	109		
4/18/2007 10:38:50	123	< 1 minute	Possibly due to traffic emissions
4/18/2007 10:46:50	153	2 minutes	Possibly due to traffic emissions
4/18/2007 10:47:50	134		
4/18/2007 11:04:50	217	2 minutes	Possibly due to traffic emissions
4/18/2007 11:05:50	120		
4/18/2007 11:11:50	117	2 minutes	Possibly due to traffic emissions
4/18/2007 11:12:50	164		
4/18/2007 11:20:50	201	2 minutes	Possibly due to traffic emissions
4/18/2007 11:21:50	138		
4/18/2007 11:29:50	100	< 1 minute	Possibly due to traffic emissions
4/18/2007 11:31:50	112	3 minutes	Possibly due to traffic emissions
4/18/2007 11:32:50	120		
4/18/2007 11:33:50	131		
4/18/2007 11:39:50	135	2 minutes	Possibly due to traffic emissions
4/18/2007 11:40:50	135		
4/18/2007 11:42:50	102	< 1 minute	Possibly due to traffic emissions
4/18/2007 11:47:50	108	5 minutes	Possibly due to traffic emissions
4/18/2007 11:48:50	114		
4/18/2007 11:49:50	142		
4/18/2007 11:50:50	138		
4/18/2007 11:51:50	117		

Up Wind Aerosol Exceedence Validation - CAMP
Pre-Design Investigation
Sag Harbor Former MGP Site
Sag Harbor, New York

Date & Time	Upwind Aerosols (ug/m^3)	Duration of Exceedance	Comments
4/18/2007 12:55:50	118	5 minutes	Possibly drilling at SB-212
4/18/2007 12:56:50	226		
4/18/2007 12:57:50	156		
4/18/2007 12:58:50	181		
4/18/2007 12:59:50	120		
4/18/2007 13:02:50	100	< 1 minute	Possibly drilling at SB-212
4/18/2007 13:08:50	143	< 1 minute	Possibly drilling at SB-212
4/18/2007 13:11:50	105	< 1 minute	Excavation
4/18/2007 13:13:50	150	5 minutes	Excavation
4/18/2007 13:14:50	119		
4/18/2007 13:15:50	123		
4/18/2007 13:16:50	229		
4/18/2007 13:17:50	111		
4/18/2007 13:19:50	118	< 1 minute	Excavation
4/18/2007 13:22:50	134	< 1 minute	Excavation
4/18/2007 13:24:50	108	3 minutes	Excavation
4/18/2007 13:25:50	134		
4/18/2007 13:26:50	115		
4/18/2007 13:30:50	115	2 minutes	Excavation
4/18/2007 13:31:50	152		
4/18/2007 13:33:50	209	< 1 minute	Excavation
4/18/2007 13:35:50	148	2 minutes	Excavation
4/18/2007 13:36:50	134		
4/23/2007 9:59:28	340	< 1 minute	Backfilling at SB-212
4/23/2007 12:05:28	398	< 1 minute	Backfilling at SB-202
4/23/2007 13:03:28	1508	< 1 minute	Possibly grouting of MW-6S
4/24/2007 8:10:08	252	< 1 minute	Paving next to SB-201
4/24/2007 9:37:08	107	6 minutes	Paving next to SB-201
4/24/2007 9:38:08	266		
4/24/2007 9:39:08	299		
4/24/2007 9:40:08	196		
4/24/2007 9:41:08	189		
4/24/2007 9:42:08	547		
4/24/2007 10:07:08	126	< 1 minute	Paving next to SB-201
4/24/2007 11:41:08	180	< 1 minute	Grouting at SB-201
4/24/2007 12:58:08	208	2 minutes	Possibly drilling at SB-208
4/24/2007 12:59:08	107		
4/24/2007 13:31:08	239	< 1 minute	Possibly drilling at SB-208
4/25/2007 7:38:39	103	< 1 minute	Grouting at SB-208
4/25/2007 9:19:39	188	3 minutes	Drilling at SB-203
4/25/2007 9:20:39	148		
4/25/2007 9:21:39	1034		

Up Wind Aerosol Exceedence Validation - CAMP
Pre-Design Investigation
Sag Harbor Former MGP Site
Sag Harbor, New York

Date & Time	Upwind Aerosols (ug/m^3)	Duration of Exceedance	Comments
4/25/2007 11:46:39	100	< 1 minute	Traffic emissions
4/25/2007 13:10:39	121	< 1 minute	Grouting at SB-203
4/26/2007 11:57:35	403	4 minutes	Grouting at SB-204
4/26/2007 11:58:35	381		
4/26/2007 11:59:35	284		
4/26/2007 12:00:35	149		
4/26/2007 12:02:35	386	3 minutes	Grouting at SB-204
4/26/2007 12:03:35	434		
4/26/2007 12:04:35	262		
4/26/2007 13:12:35	134	< 1 minute	Lunch break - no field activity
4/26/2007 14:20:35	126	< 1 minute	Drilling at SB-206
4/27/2007 9:36:37	107	< 1 minute	Grouting at SB-206
4/27/2007 9:43:37	202	< 1 minute	Grouting at SB-206
5/4/2007 8:42:48	147	< 1 minute	Possibly drilling at SB-220
5/4/2007 8:53:48	240	< 1 minute	Possibly drilling at SB-220
5/9/2007 8:33:00	158	< 1 minute	Drilling of asphalt at SB-228
5/9/2007 9:38:00	706	< 1 minute	Cause not recorded
7/17/2007 9:01:39	151	1 second	Possibly pre-clearing SB-233
7/17/2007 9:15:10	180	1 second	Cause not recorded
7/17/2007 9:20:43	118	1 second	Cause not recorded
7/17/2007 9:21:35	212	1 second	Cause not recorded
7/17/2007 9:22:38	106	1 second	Cause not recorded
7/17/2007 9:26:36	248	1 second	Cause not recorded
7/17/2007 9:56:47	1560	1 second	Possibly drilling at SB-234
7/17/2007 10:12:38	107	1 second	Possibly drilling at SB-234
7/17/2007 10:20:13	109	1 second	Possibly drilling at SB-234
7/17/2007 10:27:02	244	1 second	Possibly drilling at SB-234
7/17/2007 10:50:04	149	1 second	Possibly drilling at SB-235
7/17/2007 11:04:07	179	2 seconds	Possibly drilling at SB-235
7/17/2007 11:04:08	267		
7/17/2007 11:29:32	107	1 second	Traffic emissions

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4/19/2007 9:09:56	105	< 1 minute	Light digging, traffic emissions
4/19/2007 9:57:56	266	< 1 minute	Light digging, traffic emissions
4/19/2007 10:17:56	160	< 1 minute	Light digging, traffic emissions
4/19/2007 10:25:56	140	< 1 minute	Light digging, traffic emissions
4/19/2007 10:32:56	126	< 2 minutes	Light digging, traffic emissions
4/19/2007 10:33:56	112	< 2 minutes	Light digging, traffic emissions
4/19/2007 10:42:56	131	< 1 minute	Light digging, traffic emissions
4/19/2007 10:53:56	143	< 1 minute	Light digging, traffic emissions
4/19/2007 10:57:56	102	< 1 minute	Light digging, traffic emissions
4/19/2007 11:23:56	146	< 1 minute	Light digging, traffic emissions
4/19/2007 11:37:56	104	< 2 minutes	Light digging, traffic emissions
4/19/2007 11:38:56	104	< 2 minutes	Light digging, traffic emissions
4/19/2007 11:49:56	123	< 2 minutes	Light digging, traffic emissions
4/19/2007 11:50:56	111	< 2 minutes	Light digging, traffic emissions
4/19/2007 11:52:56	103	< 1 minute	Light digging, traffic emissions
4/19/2007 11:56:56	129	< 1 minute	Light digging, traffic emissions
4/19/2007 12:06:56	168	< 1 minute	Light digging, traffic emissions
4/19/2007 13:09:56	109	< 2 minutes	Light digging, traffic emissions
4/19/2007 13:10:56	125	< 2 minutes	Light digging, traffic emissions
4/19/2007 13:46:56	156	< 1 minute	Light digging, traffic emissions
4/23/2007 10:36:34	105	6 minutes	Backfilling at SB-204
4/23/2007 10:37:34	1096	6 minutes	Backfilling at SB-204
4/23/2007 10:38:34	1119	6 minutes	Backfilling at SB-204
4/23/2007 10:39:34	2475	6 minutes	Backfilling at SB-204
4/23/2007 10:40:34	1972	6 minutes	Backfilling at SB-204
4/23/2007 10:41:34	148	6 minutes	Backfilling at SB-204
4/23/2007 11:00:34	109	< 1 minute	Excavation at SB-203
4/23/2007 11:16:34	138	6 minutes	Jackhammering at SB-202
4/23/2007 11:17:34	2299	6 minutes	Jackhammering at SB-202
4/23/2007 11:18:34	2265	6 minutes	Jackhammering at SB-202
4/23/2007 11:19:34	1934	6 minutes	Jackhammering at SB-202
4/23/2007 11:20:34	4387	6 minutes	Jackhammering at SB-202
4/23/2007 11:21:34	618	6 minutes	Jackhammering at SB-202
4/23/2007 14:15:34	133	< 1 minute	Pavement cutting
4/23/2007 14:41:34	255	< 1 minute	Jackhammering at SB-216
4/23/2007 14:49:34	107	< 1 minute	Jackhammering at SB-216
4/24/2007 7:40:43	100	< 1 minute	No notes - perhaps traffic (JS 7.25.07)
4/24/2007 7:42:43	101	< 1 minute	No notes - perhaps traffic (JS 7.25.07)
4/24/2007 8:21:43	114	< 1 minute	Street paving going on
4/24/2007 8:25:43	141	< 1 minute	Street paving going on
4/24/2007 8:27:43	203	< 1 minute	Street paving going on
4/24/2007 8:30:43	102	6 minutes	Paving and Excavation at SB-201
4/24/2007 8:31:43	101	6 minutes	Paving and Excavation at SB-201
4/24/2007 8:32:43	105	6 minutes	Paving and Excavation at SB-201
4/24/2007 8:33:43	161	6 minutes	Paving and Excavation at SB-201
4/24/2007 8:34:43	343	6 minutes	Paving and Excavation at SB-201
4/24/2007 8:35:43	122	6 minutes	Paving and Excavation at SB-201

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4/24/2007 8:37:43	203	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:38:43	262	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:39:43	111	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:40:43	143	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:41:43	116	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:42:43	130	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:43:43	135	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:44:43	112	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:45:43	126	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:46:43	131	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:47:43	141	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:48:43	146	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:49:43	188	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:50:43	173	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:51:43	144	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:52:43	141	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:53:43	244	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:54:43	152	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:55:43	146	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:56:43	117	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:57:43	160	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:58:43	136	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 8:59:43	135	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:00:43	115	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:01:43	108	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:02:43	139	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:03:43	127	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:04:43	108	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:05:43	114	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:06:43	145	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:07:43	183	31 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:09:43	103	< 1 minute	Paving, Drilling, Excavation at SB-201
4/24/2007 9:11:43	169	< 2 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:12:43	116	< 2 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:15:43	150	< 1 minute	Paving, Drilling, Excavation at SB-201
4/24/2007 9:17:43	131	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:18:43	117	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:19:43	122	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:20:43	104	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:21:43	143	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:22:43	133	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:23:43	136	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:24:43	214	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:25:43	118	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:26:43	106	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:27:43	102	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:28:43	116	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:29:43	123	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:30:43	204	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:31:43	197	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:32:43	107	17 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:33:43	131	17 minutes	Paving, Drilling, Excavation at SB-201

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4/24/2007 9:35:43	100	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:36:43	182	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:37:43	123	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:38:43	117	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:39:43	131	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:40:43	127	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:41:43	148	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:42:43	141	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:43:43	131	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:44:43	148	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:45:43	135	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:46:43	128	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:47:43	137	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:48:43	129	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:49:43	186	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:50:43	201	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:51:43	185	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:52:43	121	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:53:43	186	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:54:43	219	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:55:43	112	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:56:43	127	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:57:43	117	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:58:43	169	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 9:59:43	128	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:00:43	98	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:01:43	133	26 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:05:43	109	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:06:43	121	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:07:43	139	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:08:43	105	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:09:43	104	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:11:43	103	< 2 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:12:43	122	< 2 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:14:43	102	7 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:15:43	120	7 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:16:43	121	7 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:17:43	134	7 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:18:43	110	7 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:19:43	103	7 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:20:43	110	7 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:21:43	108	7 minutes	Paving, Drilling, Excavation at SB-201

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4/24/2007 10:24:43	119	4 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:25:43	103	4 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:26:43	131	4 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:27:43	102	4 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:30:43	100	3 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:31:43	175	3 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:32:43	111	3 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:35:43	134	4 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:36:43	150	4 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:37:43	451	4 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:38:43	104	4 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:43:43	101	< 1 minute	Paving, Drilling, Excavation at SB-201
4/24/2007 10:45:43	129	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:46:43	322	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:47:43	186	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:48:43	150	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:49:43	136	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:55:43	149	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:56:43	477	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:57:43	135	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:58:43	102	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 10:59:43	115	5 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 11:18:43	429	< 2 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 11:19:43	383	< 2 minutes	Paving, Drilling, Excavation at SB-201
4/24/2007 11:39:43	103	< 1 minute	Paving, Drilling, Excavation at SB-201
4/24/2007 11:41:43	116	< 1 minute	Paving, Drilling, Excavation at SB-201
4/24/2007 12:03:43	122	< 1 minute	No notes - perhaps traffic (JS 7.25.07)
4/24/2007 13:08:43	226	< 1 minute	No notes - perhaps traffic (JS 7.25.07)
4/24/2007 13:10:43	164	< 1 minute	No notes - perhaps traffic (JS 7.25.07)
4/24/2007 13:52:43	168	< 1 minute	Drilling at SB-208
4/24/2007 13:43:19	353	< 1 second	Geoprobe at SB-202
4/24/2007 13:44:14	359	< 1 second	Geoprobe at SB-202
4/24/2007 13:44:28	183	< 2 seconds	Geoprobe at SB-202
4/24/2007 13:44:29	156	< 2 seconds	Geoprobe at SB-202
4/24/2007 13:48:26	379	< 2 seconds	Geoprobe at SB-202
4/24/2007 13:48:27	122	< 2 seconds	Geoprobe at SB-202
4/24/2007 13:48:43	18728	< 1 second	Geoprobe at SB-202
4/24/2007 13:48:54	320	< 1 second	Geoprobe at SB-202
4/24/2007 14:02:53	103	< 1 second	Geoprobe at SB-208
4/24/2007 15:35:18	109	< 1 second	Demob
4/24/2007 15:35:20	292	< 2 seconds	Demob
4/24/2007 15:35:21	186	< 2 seconds	Demob
4/24/2007 15:38:13	111	< 1 second	Demob
4/24/2007 15:45:39	328	< 2 seconds	Demob
4/24/2007 15:45:40	225	< 2 seconds	Demob
4/24/2007 15:53:23	104	< 1 second	Demob
4/24/2007 15:59:12	106	< 1 second	Demob
4/24/2007 16:07:26	117	< 1 second	No notes
4/25/2007 7:53:06	167	< 1 minute	No notes
4/25/2007 8:27:06	143	3 minutes	No notes
4/25/2007 8:28:06	162	3 minutes	No notes
4/25/2007 8:29:06	123	3 minutes	No notes

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4/25/2007 8:35:06	194	< 1 minute	No notes
4/26/2007 14:01:22	318	< 1 minute	Measuring out grid for pre-char borings
4/26/2007 15:55:22	127	< 1 minute	No notes
4/27/2007 9:53:04	130	< 2 minutes	No notes
4/27/2007 9:54:04	105	< 2 minutes	No notes
4/27/2007 10:05:04	123	< 1 minute	Rain and drilling
4/27/2007 10:10:04	116	< 1 minute	Rain and drilling
4/27/2007 10:12:04	100	3 minutes	Rain and drilling
4/27/2007 10:13:04	107	3 minutes	Rain and drilling
4/27/2007 10:14:04	151	3 minutes	Rain and drilling
4/27/2007 10:18:04	102	< 1 minute	Rain and drilling
4/27/2007 10:21:04	119	3 minutes	Rain and drilling
4/27/2007 10:22:04	176	3 minutes	Rain and drilling
4/27/2007 10:23:04	167	3 minutes	Rain and drilling
4/27/2007 10:25:04	126	3 minutes	Rain and drilling
4/27/2007 10:26:04	123	3 minutes	Rain and drilling
4/27/2007 10:27:04	107	3 minutes	Rain and drilling
4/27/2007 10:33:04	164	< 1 minute	Rain and drilling
4/27/2007 10:37:04	114	< 1 minute	Rain and drilling
4/27/2007 13:15:04	138	< 1 minute	Hand clearing boring location
4/27/2007 13:22:04	700	< 2 minutes	Hand clearing boring location
4/27/2007 13:23:04	488	< 2 minutes	Hand clearing boring location
5/1/2007 8:24:27	389	< 2 minutes	HSA Drilling
5/1/2007 8:25:27	147	< 2 minutes	HSA Drilling
5/1/2007 9:57:27	114	< 1 minute	Monitor being moved
5/1/2007 10:52:27	117	< 1 minute	Monitor being moved
5/1/2007 12:28:27	149	< 1 minute	Lunch break - no field activity creating dust
5/1/2007 13:12:27	292	< 1 minute	Geoprobe at SB-223
5/1/2007 13:26:27	463	< 1 minute	Geoprobe at SB-223
5/4/2007 8:53:48	240	< 1 minute	No notes
5/7/2007 9:27:33	160	< 1 minute	Geoprobe on parking
7/11/2007 9:52:31	112	< 2 seconds	Geoprobe at SB-230
7/11/2007 9:52:32	201	< 2 seconds	Geoprobe at SB-230
7/11/2007 10:08:59	100	< 1 second	Geoprobe at SB-232
7/17/2007 13:27:50	118	<1 second	Moving setup across the street

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7/11/2007 7:38	0.6	70 minutes	Humidity and excess moisture
7/11/2007 7:39	2.4		
7/11/2007 7:40	5.3		
7/11/2007 7:41	10.9		
7/11/2007 7:42	20		
7/11/2007 7:43	31.2		
7/11/2007 7:44	42.7		
7/11/2007 7:45	55.7		
7/11/2007 7:46	66.6		
7/11/2007 7:47	76.8		
7/11/2007 7:48	86.4		
7/11/2007 7:49	89.6		
7/11/2007 7:50	94.2		
7/11/2007 7:51	24.1		
7/11/2007 7:52	24.1		
7/11/2007 7:53	28.1		
7/11/2007 7:54	30.6		
7/11/2007 7:55	30.7		
7/11/2007 7:56	34.4		
7/11/2007 7:57	43.3		
7/11/2007 7:58	53.7		
7/11/2007 7:59	61.8		
7/11/2007 8:00	69.6		
7/11/2007 8:01	116.8		
7/11/2007 8:02	127.1		
7/11/2007 8:03	24.7		
7/11/2007 8:04	33.9		
7/11/2007 8:05	38.1		
7/11/2007 8:06	47.2		
7/11/2007 8:07	51.1		
7/11/2007 8:08	60.3		
7/11/2007 8:09	64.1		
7/11/2007 8:10	66.5		
7/11/2007 8:11	70.3		
7/11/2007 8:12	74		
7/11/2007 8:13	79.5		

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7/11/2007 8:14	68.1		
7/11/2007 8:15	58.1		
7/11/2007 8:16	50.6		
7/11/2007 8:17	52.6		
7/11/2007 8:18	51.8		
7/11/2007 8:19	42.3		
7/11/2007 8:20	37.5		
7/11/2007 8:21	41.4		
7/11/2007 8:22	45.5		
7/11/2007 8:23	48.7		
7/11/2007 8:24	51.5		
7/11/2007 8:25	57.3		
7/11/2007 8:26	63.9		
7/11/2007 8:27	77.9		
7/11/2007 8:28	80.6		
7/11/2007 8:29	66.3		
7/11/2007 8:30	67.6		
7/11/2007 8:31	61.3		
7/11/2007 8:32	59.3		
7/11/2007 8:33	62.9		
7/11/2007 8:34	45.6		
7/11/2007 8:35	24.6		
7/11/2007 8:36	19.4		
7/11/2007 8:37	31.4		
7/11/2007 8:38	39.7		
7/11/2007 8:39	29.3		
7/11/2007 8:40	25.2		
7/11/2007 8:41	25.6		
7/11/2007 8:42	17.8		
7/11/2007 8:43	12.1		
7/11/2007 8:44	13.8		
7/11/2007 8:45	17		
7/11/2007 8:46	19.1		
7/11/2007 8:47	12		
7/11/2007 8:48	2		
7/11/2007 9:31	15	5 minutes	Humidity and excess moisture
7/11/2007 9:32	17.1		
7/11/2007 9:33	39.1		
7/11/2007 9:34	17.9		
7/11/2007 9:35	10.8		
7/17/2007 8:32	1	< 1 minute	Humidity and excess moisture
7/11/2007 9:31	15	5 minutes	Humidity and excess moisture
7/11/2007 9:32	17.1		
7/11/2007 9:33	39.1		
7/11/2007 9:34	17.9		
7/11/2007 9:35	10.8		
7/17/2007 8:32	1	< 1 minute	Humidity and excess moisture

Down Wind VOCs Exceedence Validation - CAMP
Pre-Design Investigation
Sag Harbor Former MGP Site
Sag Harbor, New York

Date & Time	Downwind PID (ppm)	Duration of Exceedance	Comments
4/17/2007 13:45:00	1.1	3 minutes	Humidity and excess moisture
4/17/2007 13:46:00	1.9		
4/17/2007 13:47:00	1.8		
4/23/2007 12:31:00	1	28 minutes	Grouting MW-06S
4/23/2007 12:32:00	1		
4/23/2007 12:33:00	1.1		
4/23/2007 12:34:00	1.2		
4/23/2007 12:35:00	1.2		
4/23/2007 12:36:00	1.3		
4/23/2007 12:37:00	1.4		
4/23/2007 12:38:00	1.4		
4/23/2007 12:39:00	1.4		
4/23/2007 12:40:00	1.5		
4/23/2007 12:41:00	1.5		
4/23/2007 12:42:00	1.5		
4/23/2007 12:43:00	1.6		
4/23/2007 12:44:00	1.6		
4/23/2007 12:45:00	1.6		
4/23/2007 12:46:00	1.6		
4/23/2007 12:47:00	1.6		
4/23/2007 12:48:00	1.7		
4/23/2007 12:49:00	1.7		
4/23/2007 12:50:00	1.7		
4/23/2007 12:51:00	1.7		
4/23/2007 12:52:00	1.7		
4/23/2007 12:53:00	1.7		
4/23/2007 12:54:00	1.8		
4/23/2007 12:55:00	1.8		
4/23/2007 12:56:00	1.8		
4/23/2007 12:57:00	1.3		
4/23/2007 12:58:00	1		
4/27/2007 8:36:00	1.4	6 minutes	Drilling at SB-206
4/27/2007 8:37:00	1.5		
4/27/2007 8:38:00	1.5		
4/27/2007 8:39:00	1.6		
4/27/2007 8:40:00	1.7		
4/27/2007 8:41:00	1.8		
4/27/2007 9:15:00	1	< 1 minute	Possibly drilling at SB-206
4/27/2007 9:17:00	1	5 minutes	Possibly drilling at SB-206
4/27/2007 9:18:00	1		
4/27/2007 9:19:00	1		
4/27/2007 9:20:00	1		
4/27/2007 9:21:00	1		
4/27/2007 9:30:00	1	5 minutes	Grouting at SB-206
4/27/2007 9:31:00	1		
4/27/2007 9:32:00	1		
4/27/2007 9:33:00	1		
4/27/2007 9:34:00	1		
4/27/2007 9:44:00	1	5 minutes	Grouting at SB-206
4/27/2007 9:45:00	1		
4/27/2007 9:46:00	1		
4/27/2007 9:47:00	1		
4/27/2007 9:48:00	1		
4/27/2007 9:49:00	1.1		
4/27/2007 9:50:00	1.1		
4/27/2007 10:05:00	1	< 1 minute	Grouting at SB-206

Down Wind VOCs Exceedence Validation - CAMP
Pre-Design Investigation
Sag Harbor Former MGP Site
Sag Harbor, New York

Date & Time	Downwind PID (ppm)	Duration of Exceedance	Comments
4/27/2007 10:10:00	1	73 minutes	Traffic emissions
4/27/2007 10:11:00	1.1		
4/27/2007 10:12:00	1.2		
4/27/2007 10:13:00	1.2		
4/27/2007 10:14:00	1.1		
4/27/2007 10:15:00	1.1		
4/27/2007 10:16:00	1.1		
4/27/2007 10:17:00	1		
4/27/2007 10:18:00	1.1		Humidity and excess moisture
4/27/2007 10:19:00	1.1		
4/27/2007 10:20:00	1.4		
4/27/2007 10:21:00	1.4		
4/27/2007 10:22:00	1.3		
4/27/2007 10:23:00	1.2		
4/27/2007 10:24:00	1.1		
4/27/2007 10:25:00	1.1		
4/27/2007 10:26:00	1.1		
4/27/2007 10:27:00	1.2		
4/27/2007 10:28:00	1.1		
4/27/2007 10:29:00	1.2		
4/27/2007 10:30:00	1.1		
4/27/2007 10:31:00	1.2		
4/27/2007 10:32:00	1		
4/27/2007 10:33:00	1		
4/27/2007 10:34:00	1		
4/27/2007 10:35:00	1.1		
4/27/2007 10:36:00	1.1		
4/27/2007 10:37:00	1.1		
4/27/2007 10:38:00	1.1		
4/27/2007 10:39:00	1.1		
4/27/2007 10:40:00	1.2		
4/27/2007 10:41:00	1.3		
4/27/2007 10:42:00	1.3		
4/27/2007 10:43:00	1.4		
4/27/2007 10:44:00	1.3		
4/27/2007 10:45:00	1.3		
4/27/2007 10:46:00	1.2		
4/27/2007 10:47:00	1.1		
4/27/2007 10:48:00	1.2		
4/27/2007 10:49:00	1.2		
4/27/2007 10:50:00	1.3		
4/27/2007 10:51:00	1.3		
4/27/2007 10:52:00	1.3		
4/27/2007 10:53:00	1.3		
4/27/2007 10:54:00	1.2		
4/27/2007 10:55:00	1.2		
4/27/2007 10:56:00	1.2		
4/27/2007 10:57:00	1.3		
4/27/2007 10:58:00	1.3		
4/27/2007 10:59:00	1.4		
4/27/2007 11:00:00	1.5		
4/27/2007 11:01:00	1.5		
4/27/2007 11:02:00	1.4		
4/27/2007 11:03:00	1.4		
4/27/2007 11:04:00	1.4		
4/27/2007 11:05:00	1.5		
4/27/2007 11:06:00	1.5		
4/27/2007 11:07:00	1.4		
4/27/2007 11:08:00	1.6		
4/27/2007 11:09:00	1.8		
4/27/2007 11:10:00	1.7		
4/27/2007 11:11:00	1.6		

Down Wind VOCs Exceedence Validation - CAMP
Pre-Design Investigation
Sag Harbor Former MGP Site
Sag Harbor, New York

Date & Time	Downwind PID (ppm)	Duration of Exceedance	Comments
4/27/2007 11:12:00	1.5		
4/27/2007 11:13:00	1.6		
4/27/2007 11:14:00	1.6		
4/27/2007 11:15:00	1.6		
4/27/2007 11:16:00	1.6		
4/27/2007 11:17:00	1.5		
4/27/2007 11:18:00	1.4		
4/27/2007 11:19:00	1.6		
4/27/2007 11:20:00	1.6		
4/27/2007 11:21:00	1.4		
4/27/2007 11:22:00	1.3		
4/27/2007 11:23:00	1		
4/27/2007 11:27:00	1	11 minutes	Cause not recorded
4/27/2007 11:28:00	1		
4/27/2007 11:29:00	1.1		
4/27/2007 11:30:00	1		
4/27/2007 11:31:00	1		
4/27/2007 11:32:00	1.1		
4/27/2007 11:33:00	1		
4/27/2007 11:34:00	1		
4/27/2007 11:35:00	1.2		
4/27/2007 11:36:00	1.1		
4/27/2007 11:37:00	1		
4/27/2007 11:41:00	1	< 1 minute	Cause not recorded
4/27/2007 11:44:00	1	5 minutes	Cause not recorded
4/27/2007 11:45:00	1.1		
4/27/2007 11:46:00	1.1		
4/27/2007 11:47:00	1.1		
4/27/2007 11:48:00	1		
5/1/2007 13:24:00	1	2 minutes	No obvious reason
5/1/2007 13:25:00	2.8	2 minutes	
4/27/2007 11:30:00	1	11 minutes	Cause not recorded
4/27/2007 11:31:00	1		
4/27/2007 11:32:00	1.1		
4/27/2007 11:33:00	1		
4/27/2007 11:34:00	1		
4/27/2007 11:35:00	1.2		
4/27/2007 11:36:00	1.1		
4/27/2007 11:37:00	1		
4/27/2007 11:41:00	1	< 1 minute	Cause not recorded
4/27/2007 11:44:00	1	5 minutes	Cause not recorded
4/27/2007 11:45:00	1.1		
4/27/2007 11:46:00	1.1		
4/27/2007 11:47:00	1.1		
4/27/2007 11:48:00	1		
5/1/2007 13:24:00	1	2 minutes	Cause not recorded
5/1/2007 13:25:00	2.8		

Please see the hard copy of the *Remedial Design/Remedial Action Work Plan, Sag Harbor Former MGP Site, Sag Harbor, New York*, submitted to NYSDEC by National Grid and dated August 13, 2008 for the CAMP Data.
The hard copy includes:

- **CAMP Up Wind VOCs DATA Collected During the Pre-Design Investigation Activities**
- **CAMP Down Wind VOCs DATA Collected During the Pre-Design Investigation Activities**
- **CAMP Up Wind Particulate (Aerosol) DATA Collected During the Pre-Design Investigation Activities**
- **CAMP Down Wind Particulate (Aerosol) DATA Collected During the Pre-Design Investigation Activities**

Appendix G

HASP

THE CONSTRUCTION HASP WILL BE SUBMITTED UNDER A SEPARATE COVER BY NATIONAL GRID AT A LATER DATE FOLLOWING THE SELECTION OF A REMEDIAL CONTRACTOR

Appendix H

Traffic Control Study & Transportation Plan

The RETEC Group, Inc.
78 Main Street, Suite 3, Nyack, NY 10960
T **845.348.1520** F **845.348.1190** www.ensr.aecom.com

Memorandum

Date: October 12, 2007

To: Ted Leissing - KeySpan

From: Dave Work, P.E.

Subject: Trucking Demonstration and Vibration Monitoring, KeySpan Former MGP Site, Sag Harbor, NY

Distribution: Roger Hathaway Shail Pandya File

On behalf of KeySpan Energy (KeySpan) and at the request of the Village of Sag Harbor, NY (Village), ENSR Corporation (ENSR) undertook a trucking demonstration and route analysis to evaluate the impact of trucking traffic from the upcoming KeySpan Manufactured Gas Plant Remediation. Data collection for a structural impact analysis was also completed via vibration monitoring of the streets along the truck route.

The Village of Sag Harbor had three representatives present for the work, Ed Deyermond, Rich Warren and Police Chief Thomas Fabiano. KeySpan personnel included Ted Leissing and Terri Kelly. ENSR personnel included Dave Work and Shail Pandya. KeySpan's traffic engineer Greg Boulanger from Nelson and Pope was also present. The demonstration was completed between the hours of 9:00 AM and 5:00 PM on Thursday, September 6, 2007. The trucking demonstration and analysis was completed in two phases. The first phase consisted of a demonstration of the trucking routes for Village representatives including analysis of turning radius of the truck and impact on Village traffic. The second phase consisted of vibration monitoring of the streets and buildings (suggested by the Village) along the trucking routes.

Trucking Demonstration

In order to stimulate actual project conditions, a full loaded tri-axel truck (loaded with 26 tons of clean gravel and soil) similar to what will be employed for the bulk of soil transportation was used for the demonstration. Additionally, to present a worst-case condition (most conservative), the week immediately following labor day was proposed since the volume of traffic on Village streets would be at an elevated level in comparison with the proposed trucking schedule (winter).

The test truck repeatedly drove the routes indicated on the attached Figures 1 and 2. The Village, KeySpan, ENSR, and the traffic engineer personnel were present for demonstration. Sensitive areas

The RETEC Group, Inc.
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and potentially tight turns were evaluated and photographed as the test progressed. It was successfully demonstrated that the impact from trucking along the proposed routes were minimal . Additionally, the following consensus was reached:

- Trucks coming to the project site should enter by the route indicated on Figure 1, i.e., down Main Street, left on Bridge Street.
- Trucks leaving the project site will exit by the route on Figure 2, i.e., exit the site on Long Island Avenue, left on Glover Street, right on Main.
- Traffic flag men will be necessary for trucks turning off and turning on to Main Street.
- No complaints from residents or businesses are known to be received during the course of the demonstration and subsequent vibration monitoring where the equivalent of twenty roundtrip truck trips were taken thru the Village along the proposed trucking routes, without incident or impact to Village traffic.

Photos from the trucking route are included in Appendix A.

Vibration Monitoring

Following the completion of the trucking demonstration, the test truck was then used to monitor the effect of trucking on structures along the route. KeySpan's vibration monitoring consultant, DMJM Harris, monitored vibrations during trucking activities at several points along the proposed routes during active truck and during background conditions. The vibration monitoring was completed under conservative conditions which included fully loaded vehicles, traveling at the Village speed limit of 30 MPH, with monitoring in close proximity to the road way and at sensitive locations. A conservative monitoring scheme was employed by undertaking the following:

- Vibration monitoring was completed during heavy traffic conditions
- Vibrations were monitored along the most vibration sensitive areas, i.e., along road cracks, pot hole covers, structural deficiencies of the road (bumps, etc.)
- Vibrations were monitored approximately 5-feet from the street to maximize vibration effects.

The vibration monitoring confirmed that the vibrations resulting from the truck traffic will be significantly below levels known to cause structural or cosmetic damage over long periods. The results of the vibration monitoring and analysis are included in Appendix B.

Figures

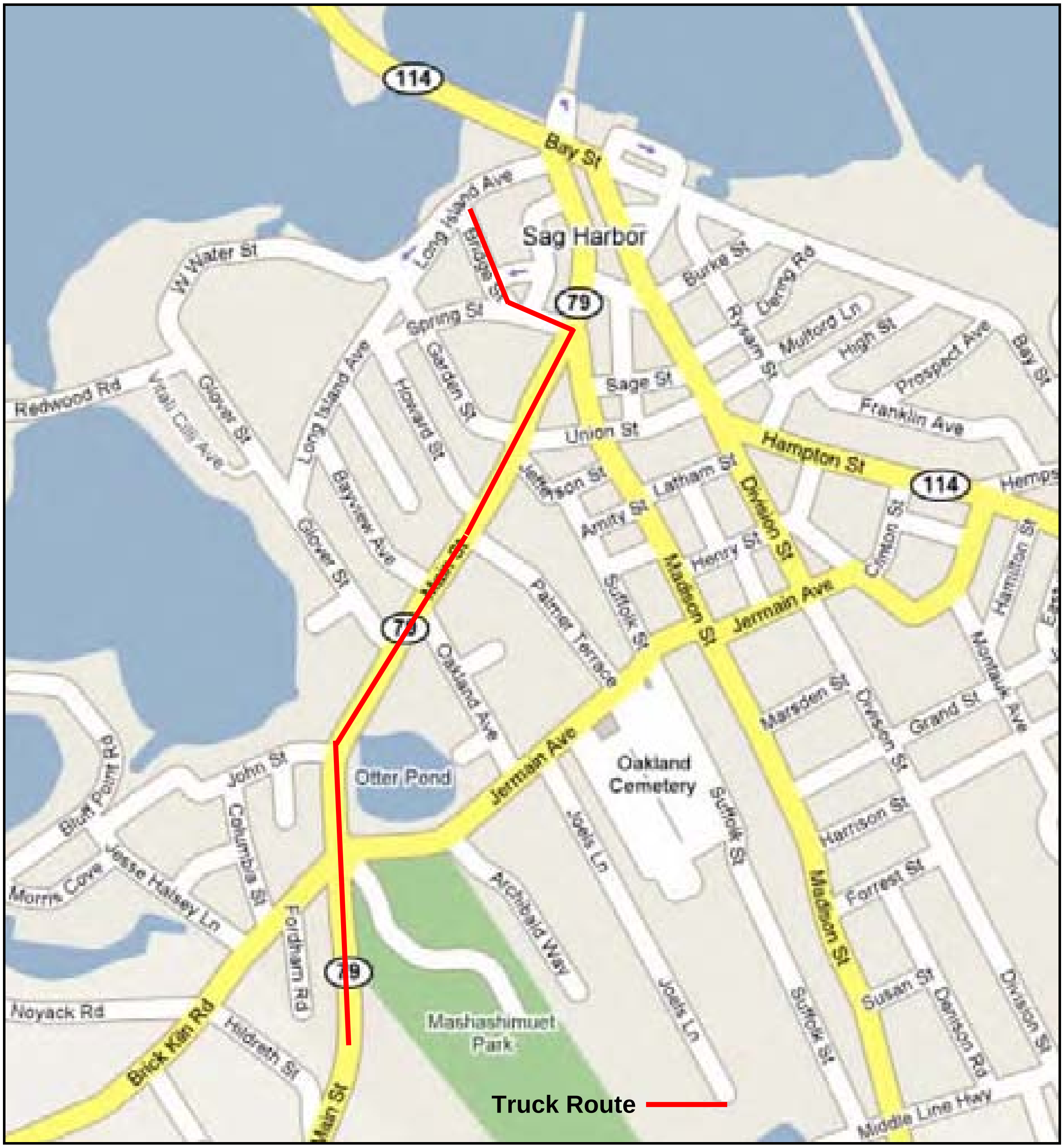

Figure 1: Entry Truck Route

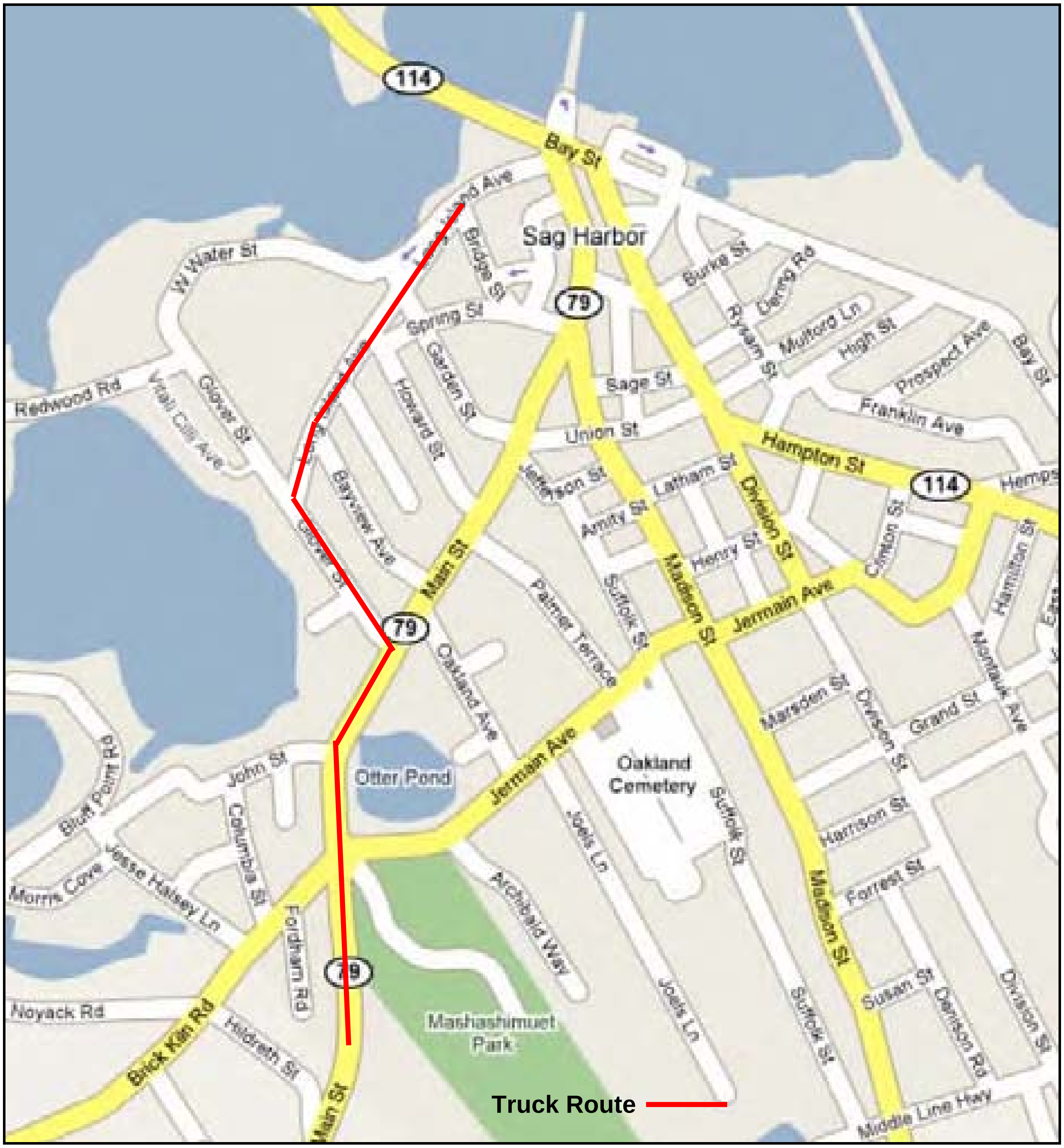

Figure 2: Exit Trucking Route

Appendix A

Photo 1: Truck on Site

Photo 2: Truck Turning Left onto Glover Street

Photo 3: Truck on Glover Street

Photo 4: Truck on Glover Street

Photo 5: Truck on Glover Street

Photo 6: Truck on Long Island Avenue

Photo 7: Truck at Long Island Avenue and Glover Street Intersection

Photo 8: Truck at Long Island Avenue and Glover Street Intersection

Photo 9: Truck on Glover Street

Photo 10: Truck Exiting Site

Appendix B

SAG HARBOR REMEDIATION STUDY: TEST TRUCK PASSBYS

Vibration Monitoring Report

Prepared for:
KeySpan Corporation

Prepared by:
DMJM Harris
New York, NY

October 9, 2007

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List of Tables

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Executive Summary

- As part of the proposed remediation of the KeySpan property (formerly known as the "gas ball") located at the junction of West Water Street and Bridge Street, a vibration monitoring program was conducted to determine the potential for impacts from dump truck passbys removing spoils from the site at sensitive buildings along the egress routes.
- Ground-borne vibration levels were measured at several sensitive receptor locations to gauge the potential for cosmetic building damage due to the future truck passbys. The sensitive receptor locations selected by a committee of representatives from the Village of Sag Harbor include the following sites:

  1. Residences along Long Island Avenue;
  2. Residences along Glover Street;
  3. The John Jermain Memorial Library at 201 Main Street; and,
  4. The Sag Harbor Whaling & Historical Museum at 200 Main Street.
- The measurement program included a fully laden truck with a gross vehicle weight of over 26 tons traveling at the maximum Village speed limit of 30 miles per hour along the proposed egress routes including Long Island Avenue, Glover Street and Main Street.
- Ground-borne vibration measurements were conducted using a tri-axial transducer to capture and record maximum peak particle velocity (PPV) levels in inches per second (ips) in the longitudinal, transverse and vertical axes. The vibration transducer is a device that produces an electric signal that replicates the vibratory motion it is subjected to.
- Measured ground-borne vibration levels from the dump trucks traveling at 15-30 mph along the local access routes from the site range from 0.010 ips to 0.101 ips at residences along Long Island Avenue and Glover Street. Similarly, measured vibration levels from truck passbys along Main Street range from 0.010 ips to 0.101 ips at the Library and from 0.010 ips to 0.101 ips at the Whaling Museum. The lower levels recorded at the Museum are due to the larger offset between the building façade and the road travel lanes.
- All of the measured vibration levels from the fully-laden truck passbys traveling at the maximum allowable speed are well below the threshold for damage of 0.20 ips at each of the identified sensitive receptors along the selected egress routes.
- Therefore, ground-borne vibration from dump trucks leaving the KeySpan site on Bridge Street are not expected to cause even minor cosmetic damage at any of the residences or institutional receptors identified along the selected egress routes. As the measured results indicate, vibration levels from the dump trucks are well below the damage criteria due primarily to the slower travel speeds, rubber tires and damped suspension.

1.0 Introduction

This report summarizes the vibration monitoring results for the test truck passbys recorded in September 2007 in Sag Harbor, NY. Ambient measurements were conducted to document ground-borne vibration levels from a fully-laden dump truck traveling along local streets in the Village of Sag Harbor. These test results are intended to demonstrate the future impacts on the local community from the spoils removal as part of the site remediation activities at the former manufactured gas site. The vibration monitoring also included additional measurements in the community, such as ambient background levels and building demolition work along Long Island Avenue.

2.0 Human Perception of Vibration

Ground-borne vibration associated with vehicle movements is usually the result of uneven interactions between the tire and the road surface. Examples of such interactions (and subsequent vibrations) include motor vehicle wheels hitting a pothole, a manhole cover or any other uneven surface. Traffic-induced vibration travels through the ground to adjacent receivers in a source-path-receiver scenario. The source of vibration is characterized by several factors including:

- Vehicle weight and suspension (typical truck suspensions are firmer than automobiles thereby more “coupled” to the roadway surface);
- Vehicle speed (higher speeds create higher downward force on tires and the pavement);
- Pavement type and surface condition (smooth asphalt vs. uneven pavement);
- The structure of the pavement/sub-grade; and,
- The alignment of the roadway relative to the receiver.

The assessment of traffic-induced vibration is a very site-specific problem due to the variability of these factors at the source. Other factors may also affect the vibration level at a building including construction materials (masonry vs. non-engineered timber), footings and other geological properties surrounding the receptor building. Therefore, vibration propagation may be more or less efficient. For example, buildings with a solid foundation set in bedrock are “coupled” more efficiently to the surrounding ground and experience relatively higher vibration levels than those buildings located in sandier soil. However, traffic-induced vibration decreases with increasing distance away from the roadway.

Vibration induced by vehicle passbys can generally be discussed in terms of displacement, velocity, or acceleration. However, human responses and responses by monitoring instruments and building structures are more accurately described with velocity. Velocity, a measure of the energy carried by vibration, is the preferred unit for assessing any potential risk of damage to buildings. Studies indicate that sensitivity to vibration is relatively independent of frequency above approximately 8-12 Hz. Because of the general preference for velocity as a measure of both annoyance and building damage, vibration criteria and measured vibration data are presented in terms of overall vibration velocity levels.

Unlike human response to vibration, the peak particle velocity (PPV) is used to describe the potential for damage in buildings since it is related to the stresses that are experienced by structures. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration signal.

3.0 Vibration Damage Criteria

Several criteria were evaluated for applicability to truck passbys including those from the International Standards Organization (ISO), the Acoustical Society of America (ASA), the Federal Transit Administration (FTA) and the US Bureau of Mines. However, the criteria applicable to building damage are very different from human annoyance, which is evaluated using root mean square velocity levels rather than the peak particle velocity levels. Therefore, the building damage criteria shown in **Table 1** were selected to evaluate impacts from construction and demolition activities and trucks hauling spoils from the site. Without knowing the condition of each building along the proposed egress routes, the most stringent criterion of 0.12 ips was selected to gauge impact from the trucks.

Table 1: Results of the Vibration Monitoring Program (ips)

Category	Building Description	Criteria
1	Reinforced-concrete, steel or timber (no plaster)	0.50
2	Engineered concrete and masonry (no plaster)	0.30
3	Non-engineered timber and masonry buildings	0.20
4	Buildings extremely susceptible to vibration damage	0.12

Source: *Transit Noise and Vibration Impact Assessment*, Federal Transit Administration, Washington, DC, May 2006.

4.0 Monitoring Methodology

The vibration monitoring was conducted in accordance with the US Bureau of Mines and the Federal Transit Administration for motor vehicle passbys. Specifically, peak vibration levels were measured from fully-laden test truck passbys at representative receptor locations along the proposed project travel routes. Ground-borne vibration levels were measured at several sensitive receptor locations to gauge the potential for cosmetic building damage due to the future truck passbys. The sensitive receptor locations selected by a committee of representatives from the Village of Sag Harbor are shown in **Figure 1** include the following sites:

- Residences along Long Island Avenue;
- Residences along Glover Street;
- The John Jermain Memorial Library at 201 Main Street; and,
- The Sag Harbor Whaling & Historical Museum at 200 Main Street.

The measurement program included a fully laden truck with a gross vehicle weight of over 26 tons traveling at the maximum Village speed limit of 30 miles per hour (mph) along the proposed egress routes including Long Island Avenue, Glover Street and Main Street. Receptor sites along long Island Avenue and Glover Street were selected to be representative of uneven pavement types to demonstrate worst-case or highest potential vibration levels.

Ground-borne vibration measurements were conducted using a tri-axial transducer to capture and record maximum PPV levels in inches per second (ips) in the longitudinal, transverse and vertical axes. The vibration transducer is a device that produces an electric signal that replicates the vibratory motion it is subjected to.

5.0 Monitoring Results

As summarized in **Table 2**, measured ground-borne vibration levels from the test dump truck traveling at speeds up to 30 mph range from 0.010 ips to 0.025 ips at residences along Long Island Avenue, and from 0.015 ips to 0.050 ips at residences along Glover Street. Similarly, measured vibration levels from truck passbys along Main Street range from 0.005 ips to 0.010 ips at the Library and from 0.003 ips to 0.007 ips at the Whaling Museum. The lower levels recorded at the Museum are due to the larger offset between the building façade and the road travel lanes compared to the Library.

All of the measured vibration levels from the fully-laden truck passbys traveling at the maximum allowable speed are well below the threshold for damage of 0.120 ips at each of the identified sensitive receptors along the selected egress routes.

Table 2: Results of the Vibration Monitoring Program (ips)

ID	Measurement Location	Test Truck	Background	Criteria
M1	Residences, Long Island Avenue	0.010 – 0.025	0.005 – 0.010	0.120
M2	Residences, Glover Street	0.015 – 0.050	0.005 – 0.010	0.120
M3	The John Jermain Memorial Library, 201 Main Street	0.005 – 0.010	0.005 – 0.010	0.120
M4	Whaling & Historical Museum, 200 Main Street	0.003 – 0.007	0.005 – 0.010	0.120

Source: DMJM Harris, New York, NY, September 2007.

Therefore, ground-borne vibration from dump trucks leaving the KeySpan site on Bridge Street are not expected to cause even minor cosmetic damage at any of the residences or institutional receptors identified along the selected egress routes. As the measured results indicate, vibration levels from the dump trucks are well below the damage criteria due primarily to the slower travel speeds, rubber tires and damped suspension.

Existing background ambient vibration levels due to unidentifiable sources in the community ranged from 0.005 ips to 0.010 ips at all selected receptor locations. Nearby demolition activities along Long Island Avenue as measured at the adjacent Baron's Cove motel were considerably higher than from the test truck passbys. Vibration levels measured at the Baron's Cove Inn at 31 West Water Street ranged from approximately 0.020 ips to 0.100 ips. As indicated by the significantly higher vibration levels, the observed levels are very noticeable and led to several complaints from the motel guests.

Figure 1: Ground-Borne Vibration Monitoring Locations

NB: Aerial base map provided by Google Inc.
Source: DMJM Harris, New York, NY, October 2007.

Prepared for:
KeySpan Energy Delivery – Long Island
175 East Old Country Road, Hicksville, NY 11801

Transportation Plan

Sag Harbor Former Manufactured Gas Plant Remediation

Draft

ENSR Corporation
January 2008
Document No.: 01765-066

Prepared for:
KeySpan Energy Delivery – Long Island
175 East Old Country Road, Hicksville, NY 11801

Transportation Plan

Sag Harbor Former Manufactured Gas Plant Remediation

Draft

____
Prepared By Aimee Fitzpatrick, P.E., Civil Engineer

____
Reviewed By Shail Pandya, Project Manager

ENSR Corporation
January 2008
Document No.: 01765-066

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Appendix

1.0 Introduction

KeySpan Corporation (KeySpan) is responsible for the remediation of the former manufactured gas plant (MGP) site located on Long Island Avenue in the Village of Sag Harbor, New York (Figure 1). The remediation is to be performed in two phases. Phase 1 of the remediation, to be performed in 2008, involves the installation of a soil mix wall around the site. Phase 2, to be performed in 2009, involves excavation and off-site disposal of contaminated soil.

The remediation work will require the transport of the following materials (amounts are approximate):

Phase 1:

- Export 1,850 tons of impacted soil mix wall spoils
- Export 300 tons of debris
- Import 1,400 tons of clean backfill
- Mobilize and demobilize remedial equipment

Phase 2:

- Export 28,600 tons of impacted soil
- Import 28,600 tons of clean backfill
- Mobilize and demobilize remedial equipment

Transportation required for this work will be performed in accordance with all local, state, and federal laws, as well as with the Project Specifications. Additionally, transportation must meet the requirements described in this document. These requirements include truck selection (Section 2), truck loading (Section 3), transportation routes (Section 4), and transportation management (Section 5).

2.0 Truck selection

Either 18-wheel trailer dumps or tri-axel dump trucks will be used dependent upon site conditions and availability. Trailer dumps typically have an empty weight of 34,000 to 35,000 pounds and may legally have a Gross Vehicle Weight (GVW) of 80,000 pounds. This would allow a dump trailer to carry up to 23 tons of soil (13.5 cubic yards (cy) of soil volume at a bulk density of 1.7 tons per cy). Under some circumstances, trucks traveling within New York State may obtain permits to carry up to 30 tons of soil (17.6 cy of soil volume at a bulk density of 1.7 tons per cy).

Tri-axel dump trucks typically have an empty weight of 23,600 pounds to 31,000 pounds and normally carry a GVW of 58,400 pounds. This would allow a tri-axle dump trailer to haul up to 17.5 tons of soil per load (11 cy of soil volume at a bulk density of 1.7 tons per cy). Under some circumstances, trucks traveling within New York State may obtain permits to carry up to 24 tons of soil (14 cy of soil volume at a bulk density of 1.7 tons per cy).

The truck capacities described in this section are from similar past projects. The Contractor shall verify all allowable truck weights for this project.

All trucks will have the required licenses and permits, including 6 NYCRR Part 364 Waste Transporter Permits.

3.0 Truck loading

The soil that will be removed from the site will be excavated and loaded in a manner that minimizes the release of odors. During Phase 2, excavation will be partially performed under a temporary fabric structure with an air handling and treatment system. In areas where excavation is required and use of a structure is not feasible and contaminant concentrations are low, soils excavated outside of a containment structure will be monitored and managed using other odor control methods, such as the application of odor-control foam. In keeping with this plan, the loading and shipping of impacted soils will also need to be performed in a manner that minimizes the potential for the release of odors.

The impacted soil will be loaded with a conventional excavator or front-end loader onto trucks. Each truck will be lined with 6-mil-thick polyethylene sheeting prior to loading by the on-site remediation contractor. Use of the liner minimizes the need for decontamination of the truck after contaminated soil is dumped at the disposal or treatment facility, and provides containment for any residual liquids which may be associated with wet soils. The plastic liner is also wrapped over loaded soils to minimize odors during transport.

Note that soils with free liquids will not be shipped from the site. Saturated soils, if any, will be allowed to drain before being loaded onto trucks for shipping.

The trucks will be loaded directly from excavations, or from an on-site stockpile area to ensure impacted material is not spread throughout the site. When excavations are performed inside of the fabric containment structure, the trucks will enter the structure for loading to prevent the release of odors. When excavation and loading is performed outside the containment structure, odor-suppressing foam will be applied to the excavations, stockpiles, and the material on the dump trailers, when necessary. If necessary, an odor-masking agent may also be applied to the impacted soil while loading and stockpiling activities are ongoing, to reduce nuisance odors.

All trucks will be covered with a tarpaulin supplied by the trucking firm prior to leaving the site to ensure that no material is blown off the truck during transportation and to minimize the release of odors. Each truck will be dispatched from the site with the appropriate bill-of-lading or manifest, and will follow the prescribed transportation route to its destination. The local noise ordinance will be in effect for the site remediation, therefore, loading can only take place on weekdays from 8:00 am to 5:00 pm, unless otherwise approved.

After loading, all trucks will enter a decontamination pad where all residual soil will be removed from the truck body, wheels, and tires to ensure that impacted soil from the site is not tracked onto the streets of Sag Harbor. Tracking, dropping, or depositing of soil or any other material onto local, county, or state roadways or paved parking areas by or from any vehicle is prohibited. Any inadvertently spilled material shall be cleaned immediately by the contractor.

4.0 Transportation routes

Trucks will be required to enter and exit the site via County Route 79 in Sag Harbor. The entry and exit trucking routes shown on Figures 1 and 2 have been discussed with and approved by officials of the Village of Sag Harbor.

The entry truck route (Figure 1) shall be as follows:

- Traveling north on County Route 79
- Left onto Bridge Street.
- Right onto Long Island Avenue
- Right off of Long Island Avenue into the site.

The exit trucking route (Figure 2) shall be:

- Left out of site onto Long Island Avenue
- Left onto Glover Street
- Right onto County Route 79

Note that during a portion of the Phase 2 work, Bridge Street will be closed due to excavation work to be performed in the street. During this period of time, trucks will be required to access the site by using the truck exit route shown on Figure 2.

5.0 Transportation management

Truck traffic will be managed in a way to minimize any impact on the vehicular and pedestrian traffic in the Village of Sag Harbor.

5.1 Truck staging

An off-site staging area (to be determined) will be identified for trucks waiting to be loaded or to deliver, due to a lack of space for staging at the site. Trucks cannot be staged on the streets adjoining the site, or in other residential areas due to their narrowness and the residential and commercial nature of the neighborhood.

Drivers will be responsible for communicating with on-site staff to ensure that the site is ready to accept them. When applicable, trucks will collect at the off-site staging area and travel to the site together in convoys of 5 trucks. Likewise, conveys of 5 trucks will travel together when exiting the site.

A total of 20 trucks per day will be allowed to enter and exit the site.

5.2 Traffic control

Due to the narrow nature of the surrounding streets and the limited maneuverability of trailer/ tri-axel dump rigs, there will need to be DOT-certified flaggers present whenever trucks enter or exit the site and whenever trucks enter or exit Main Street (County Route 79). All flaggers will be equipped with the appropriate signage or flags.

Extreme caution must be taken when entering and existing the site, as it is in close proximity to local shops, and there is likely to be both vehicular and pedestrian traffic very close to the work area.

5.3 Driver code of conduct

All truck drivers are expected to adhere to the following code of conduct:

- Drivers must treat safety as a top priority at all times
- Drivers must obey all applicable laws (no speeding, no double parking, etc.)
- Drivers must act in a professional manner (no spitting, no cursing, etc.)

5.4 Traffic accidents and releases

In the event that a loaded truck is involved in an incident that results in a release of the transported materials, the cleanup shall follow local and State Department of Transportation spill response procedures. The remediation contractor will contact all involved parties immediately, including ENSR and KeySpan representatives. The remediation Contractor and/or transporter will be responsible for the cleanup of any releases which may occur during transport to the disposal facility. It will be the responsibility of the remediation contractor to keep all haul routes and public rights-of-way free of any site materials due to transportation operations.

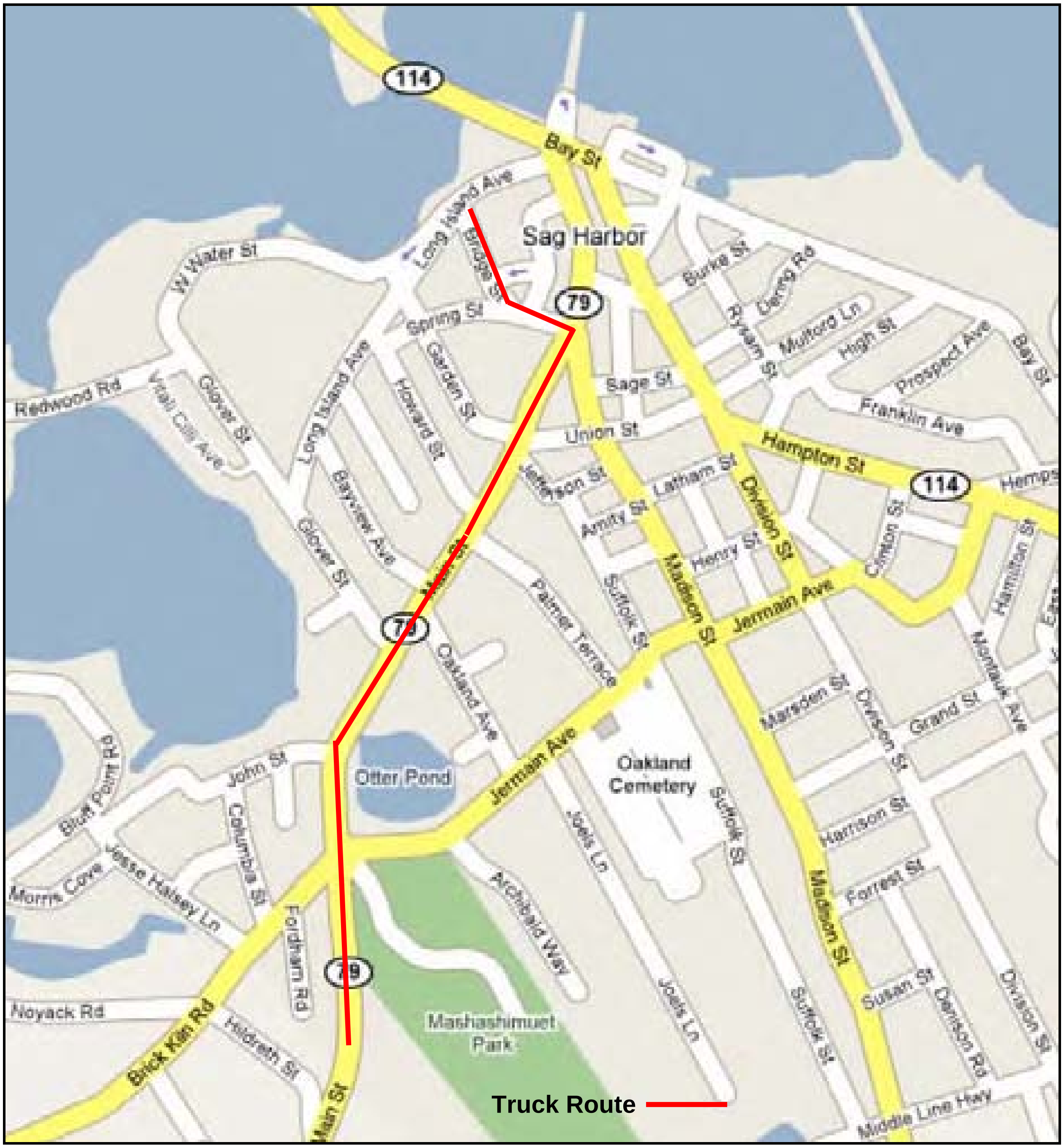

Figure 1: Entry Truck Route

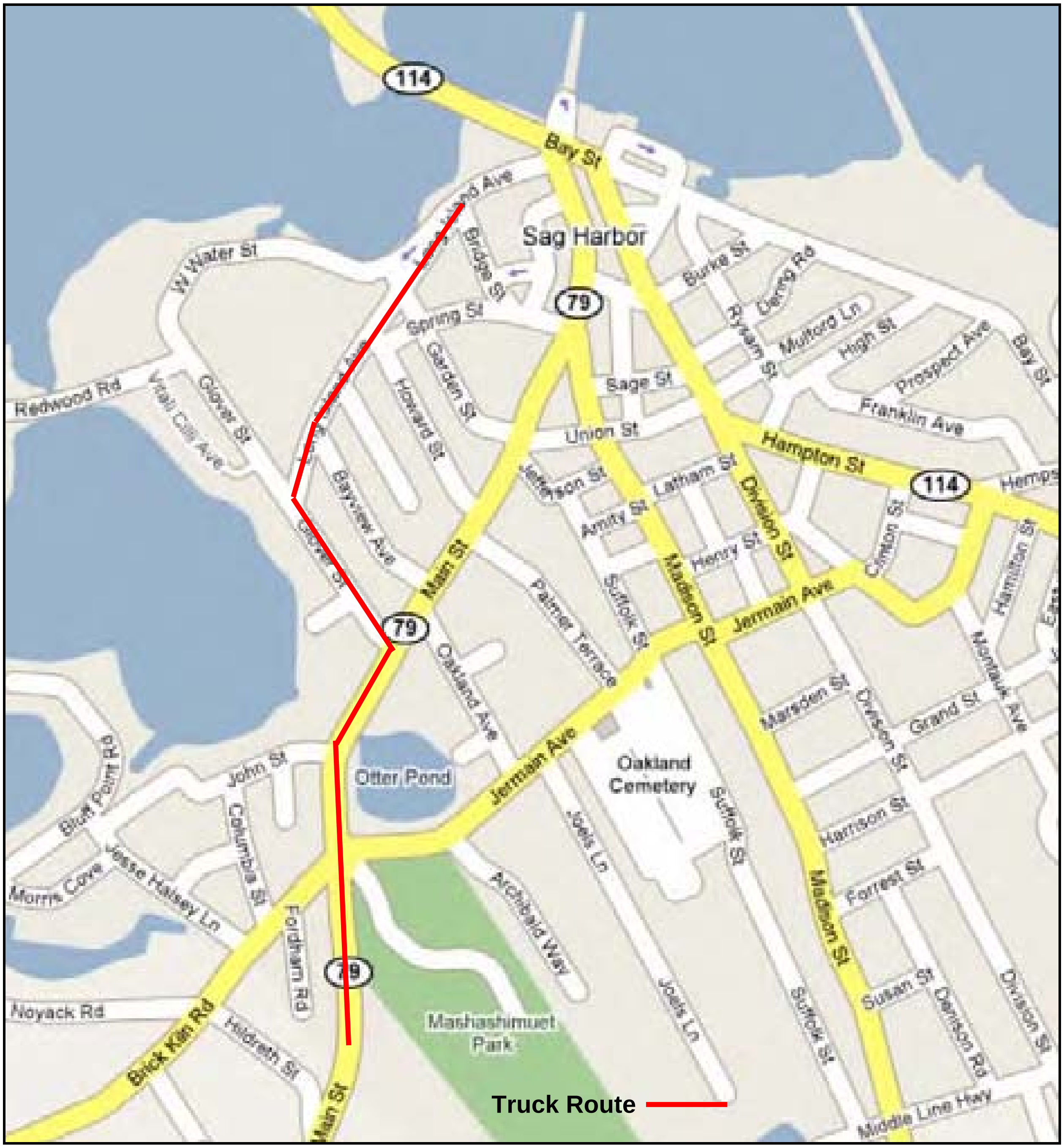

Figure 2: Exit Trucking Route

Appendix A – Instruction to truckers

Sag Harbor Former Manufactured Gas Plant Remediation

Guidelines for Truck Drivers

1. All truckers must provide permits at the staging area.
2. Trucks are not allowed onsite before **8:00am** for any reason. Loading can only take place on weekdays from 8:00 am until 5:00 pm. Trucks must offload at facility the same day truck is loaded.
3. Trucks will be required to enter and exit the site via County Route 79 in Sag Harbor.
4. The entry truck route (Figure 1) shall be as follows:
   - Traveling north on County Route 79
   - Left onto Bridge Street.
   - Right onto Long Island Avenue
   - Right off of Long Island Avenue into the Site.

   The exit trucking route (Figure 2) shall be:
   - Left out of Site onto Long Island Avenue
   - Left onto Glover Street
   - Right onto County Route 79
   - An **off-site staging area** (to be determined) will be identified for trucks waiting to be loaded or to deliver, due to a lack of space for staging at the site. Trucks must **remain** in staging area until radioed by contractor.
5. Stay in cab during loading, shut off the truck once in loading position.
6. Each truck will be lined with 6-mil-thick polyethylene sheeting prior to loading.
7. All trucks will be covered with a tarpaulin supplied by the trucking firm prior to leaving the site.
8. After loading, all trucks will enter a decontamination pad where all residual soil will be removed from the truck body, wheels, and tires.
9. Trucks must off load at the disposal facility the same day they are loaded, must leave site with enough time before facility closes.
10. All trucking traffic must obey Village of Sag Harbor traffic regulations. In the event of a violation, immediate action up to and including permanent driver dismissal from the project will be taken. Particular care must be taken in sensitive areas, along residential streets, and near historic structures.
11. In the event that a loaded truck is involved in an incident that results in a release of the transported materials, the cleanup shall follow local and State Department of Transportation spill response procedures and Site Contractor shall be notified immediately. Truck must remain at the scene of the accident or spill until clean up is complete. **Contractor Contact Number (XXX) XXX-XXXX**

Appendix I

Salinity Modeling Results

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DRAFT REPORT

TITLE:

Validation of Hydrodynamic Model and Simulation of Treated Water Discharge, Sag Harbor, NY

AUTHOR(S):

Tatsu Isaji, Chris Galagan, Craig Swanson

CLIENT:

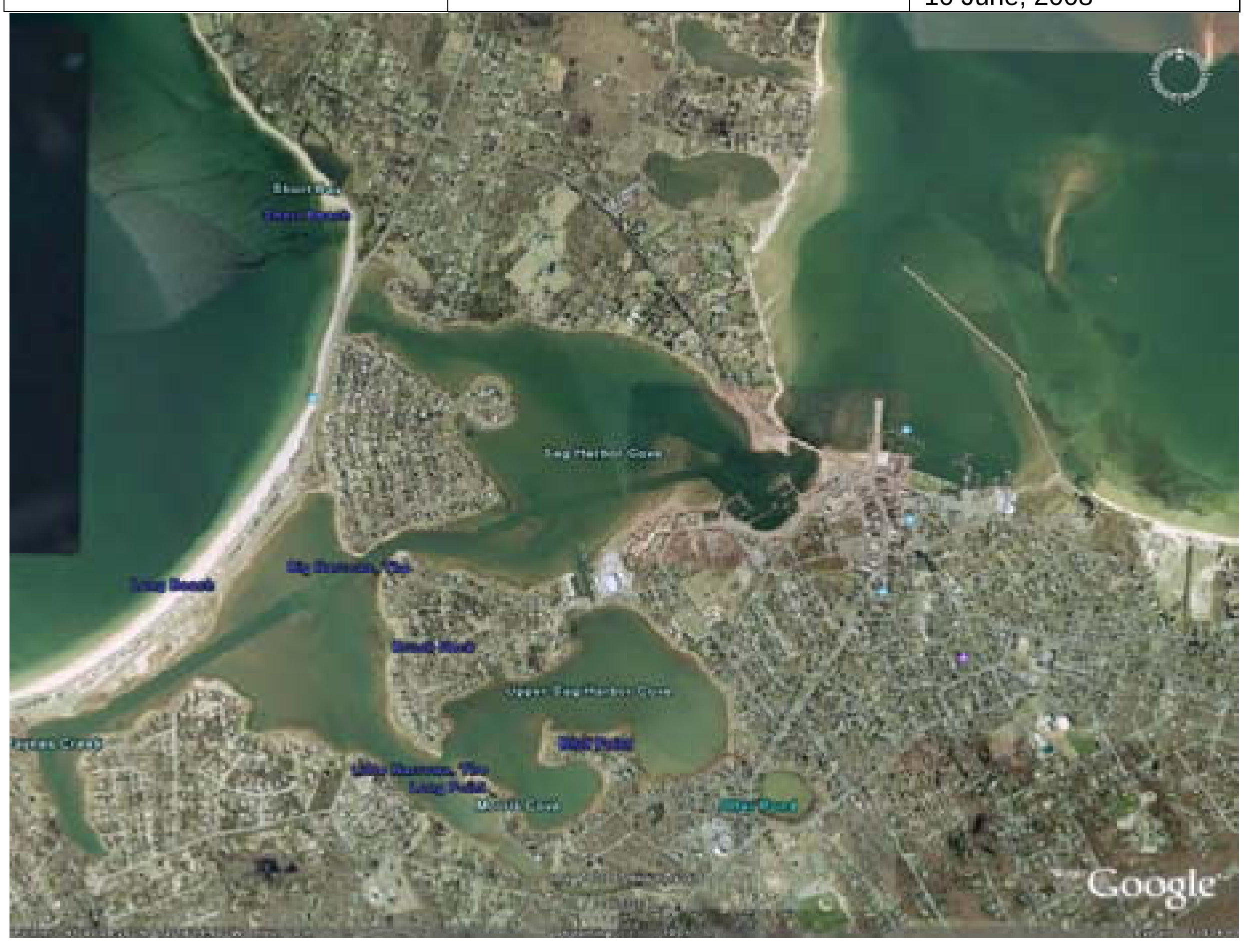
ENSR

ASA PROJECT NUMBER:

2007-145

DATE:

10 June, 2008



Executive Summary

ASA has completed a modeling study supported by an extensive field program to analyze the effects from the discharge of treated water into the waters of Sag Harbor, NY. The purpose of the analysis is to estimate the resulting salinity levels expected from this discharge into the estuary. The results provide both Keyspan and the Village of Sag Harbor with an evaluation of the extent of the freshwater distribution resulting from the discharge.

A field survey begun in the spring of 2008 provides a characterization of the salinity variation and currents within the Sag Harbor estuarine environment. Two sets of ADCP observations were made; 1) bottom mounted ADCP current meter in the outer harbor, and; 2) boat mounted ADCP transects at the bridge. The bottom mounted ADCP provided nearly 15 days of current measurements. The transect observations were carried out three times focusing on capturing spring and neap tide conditions. Salinity surveys produced multiple sets of observations consisting of long-term measurements at three fixed stations, and measurements at multiple stations from hand-held instruments on fixed dates.

The ADCP current and water level measurements were used to verify circulation aspects of the 3D baroclinic hydrodynamic model. A 50-day tidal hydrodynamic simulation for the approximately 2 month period of the spring field survey was carried out and the results compared with the ADCP observations. The hydrodynamic model compares well with the NOAA tide predictions from Sag Harbor for tidal current amplitude and phase. The current data collected by the bottom and boat mounted ADCP instruments as part of the field survey is in reasonably good agreement with the model prediction of the hydrodynamics. The salinity measurements were used to characterize the salinity structure and variability in the waters of Sag Harbor and Great Pond.

The model was employed to simulate the distribution and extent of salinity reduction from two sets of simulations: 1) 4-month discharge with actual tidal flow, including neap, normal, and spring phases, and; 2) 10-day discharge with normal tide flow with various surface wind stresses.

Model predicted reduction in the average salinity ranges from 3.2 PSU at the outfall to 0.14 PSU at monitoring station A22 in Upper Sag Harbor Cove. Average salinity reduction of 1 PSU is predicted to extend less than 100 meters from the outfall in all directions.

When winds of varying speeds are blown over the Harbor area from the north, the model predicts that the area experiencing salinity reduction will decrease in size.

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List of Figures

Introduction

ASA was retained by ENSR to provide an analysis of the discharge of treated water from a remediation site located in Sag Harbor, NY. The purpose of the analysis is to estimate, using computer modeling, the resulting salinity levels expected from this discharge into the estuary. This analysis is to provide both Keyspan and the Village of Sag Harbor with an evaluation of the extent of the freshwater distribution resulting from the discharge located at various potential sites.

Hydrodynamic and salinity modeling in Sag Harbor has proceeded in phases over the previous year starting with the application of a two-dimensional model of Sag Harbor Cove, the outer harbor, Gardiners and Peconic Bays, and the calculation of freshwater effluent dilution at proposed outfall locations. Two locations were selected for discharge of freshwater effluent: the headwall across the street from the project site and at the end of the breakwater in the outer harbor. Preliminary estimates of the minimum and maximum effects on salinity in the Harbor area were determined by the model.

Subsequently a third location northeast of the northern abutment of the highway bridge crossing the entrance to Sag Harbor Cove was added to the earlier two locations and used with the two-dimensional model application. A time series data set of salinity measurements was obtained from the Suffolk County Department of Health Services for two stations, one inside the Cove and one outside, covering the period from October 1994 to December 2005. The salinity data were compared to the results of model simulations at the three proposed discharge sites using two different discharge rates.

The largest salinity changes from the ambient level occurred in Sag Harbor Cove as a result of the peak 1.5 mgd discharge at the headwall. The breakwater discharge location with a peak flow of 1.5 mgd showed the minimum salinity in the Cove to be above 27.5 ppt. The bridge discharge location with a peak flow of 1.5 mgd showed a minimum salinity in the Cove to be between 27 and 27.5 ppt. At a more typical flow of 1 mgd the minimum salinity in the Cove rose somewhat with the inner reaches above 27.5 ppt. The model predicted maximum reduction in the Cove salinity of approximately 1.5 ppt for the headwall discharge and 0.5 ppt for the bridge discharge were less than the natural range of 4.4 ppt found in the salinity data.

A subsequent phase of modeling was proposed that would extend the model to include Great Pond, incorporate three-dimensional baroclinic hydrodynamics driven by ocean salinity outside the harbor and by freshwater discharge inside the cove. An extensive field program was also proposed to collect salinity data at multiple sites within the area as well as current and water elevation data in the outer harbor and currents adjacent to the highway bridge.

Field Program and Data

A field survey begun in the spring of 2008 provides a characterization of the salinity variation and currents within the Sag Harbor estuarine environment. Two sets of ADCP observations were made; 1) bottom mounted ADCP current meter in the outer harbor, and; 2) boat mounted ADCP transects at the bridge (Figure 1 shows locations). The bottom mounted ADCP provided nearly 15 days of current measurements. The transect observations were carried out three times focusing on capturing spring and neap tide conditions. The salinity survey produced two sets of observations; 1) long-term measurements at three fixed stations, and; 2) measurements at multiple stations from hand-held instruments on fixed dates.

The ADCP current and water level measurements were used to verify circulation aspects of the 3D baroclinic hydrodynamic model developed in Phase I and II. Initial modeling efforts focused on calibration using the multiyear (1974-2007) salinity observations obtained from the Suffolk County Department of Health Services (SCDHS) for mean tide conditions. Figure 2 shows salinity observations both from the spring 2008 survey (colored lines) and SCDHS (points and lines). SCDHS observations cover the years from 1974 to 2007, but are plotted against days of the year to show the seasonal trend trend. Although SCDHS observations show higher salinity variability, their averaged value compares remarkably well with the data collected as part of this study. It is apparent that the observations from the spring 2008 survey reflect the specific period of the year (March to April), and SCDHS observations are more applicable to characterize salinity conditions of Sag Harbor cove in general.

Figure 1. Location of the Sag Harbor estuary system. Green circles indicate salinity monitoring stations visited by boat. Orange triangles show the location of the fixed salinity monitoring stations. The blue circle is the bottom mounted ADCP deployment site.

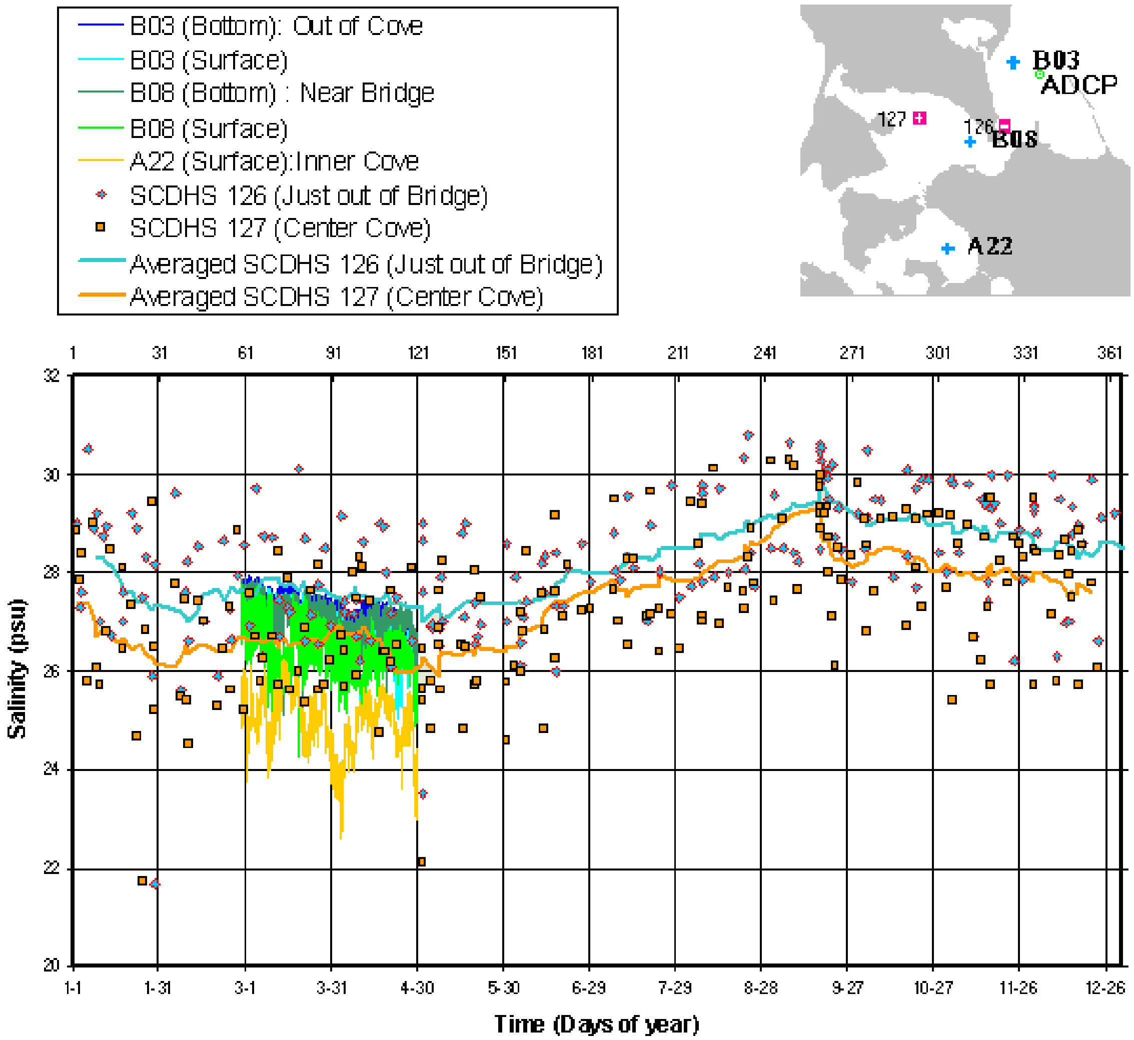


Figure 2. Observed salinity time series in Sag Harbor Cove. The high frequency curves show salinity data from the spring 2008 field survey conducted for this project. Data from the Suffolk County Department of Health Services (SCDHS) are plotted as points from two locations with curves indicating average values from these data.

Verification of WQMAP Hydrodynamic Model

The model open boundary was modified to include real astronomic conditions (ability to simulate spring and neap tides). A 50-day tidal hydrodynamic simulation for the approximately 2 month period of the spring field survey was carried out and the results compared with the ADCP observations. No wind forcing was used for this simulation.

In Figure 3, the top plot compares water elevations from the ADCP pressure sensor (red), NOAA harmonic predictions (green) and the hydrodynamic model (blue). The NOAA prediction and model prediction match well, as expected, as both are based on astronomic harmonics. The ADCP elevation deviates from the NOAA and model elevations at times as it reflects real (non-tidal, mostly atmospheric wind stress) hydrodynamic forces. The second and third plots in Figure 3 show vertically averaged current velocity comparing the ADCP observations (red) with the model predictions (blue) at the site of the bottom mounted ADCP (see Figure 1). Directions and magnitudes of both currents are in general agreement. Currents from the ADCP appear to have higher frequency (noisy) components while the model simulations are smoother, a reflection of purely tidal forcing. The fourth plot in Figure 3 shows current directions and magnitudes at the site of the ADCP transect survey at the bridge. Figure 4 shows the same data as Figure 3, but for a shorter time window coinciding with the period of spring tide.

Figures 5, 6, and 7 show comparisons of the ADCP transect survey versus the model predicted currents correspond to the field survey dates; February 29 (neap tide), March 29 (neap tide), and April 7 (spring tide), respectively. Again, there is general agreement between the measurements and the model predicted directions and magnitudes.

Measurements obtained from the boat mounted and bottom mounted ADCP are in general noisy. The data collected from the boat are particularly noisy reflecting operationally difficult conditions. High frequency components in the data are difficult to distinguish form noise.

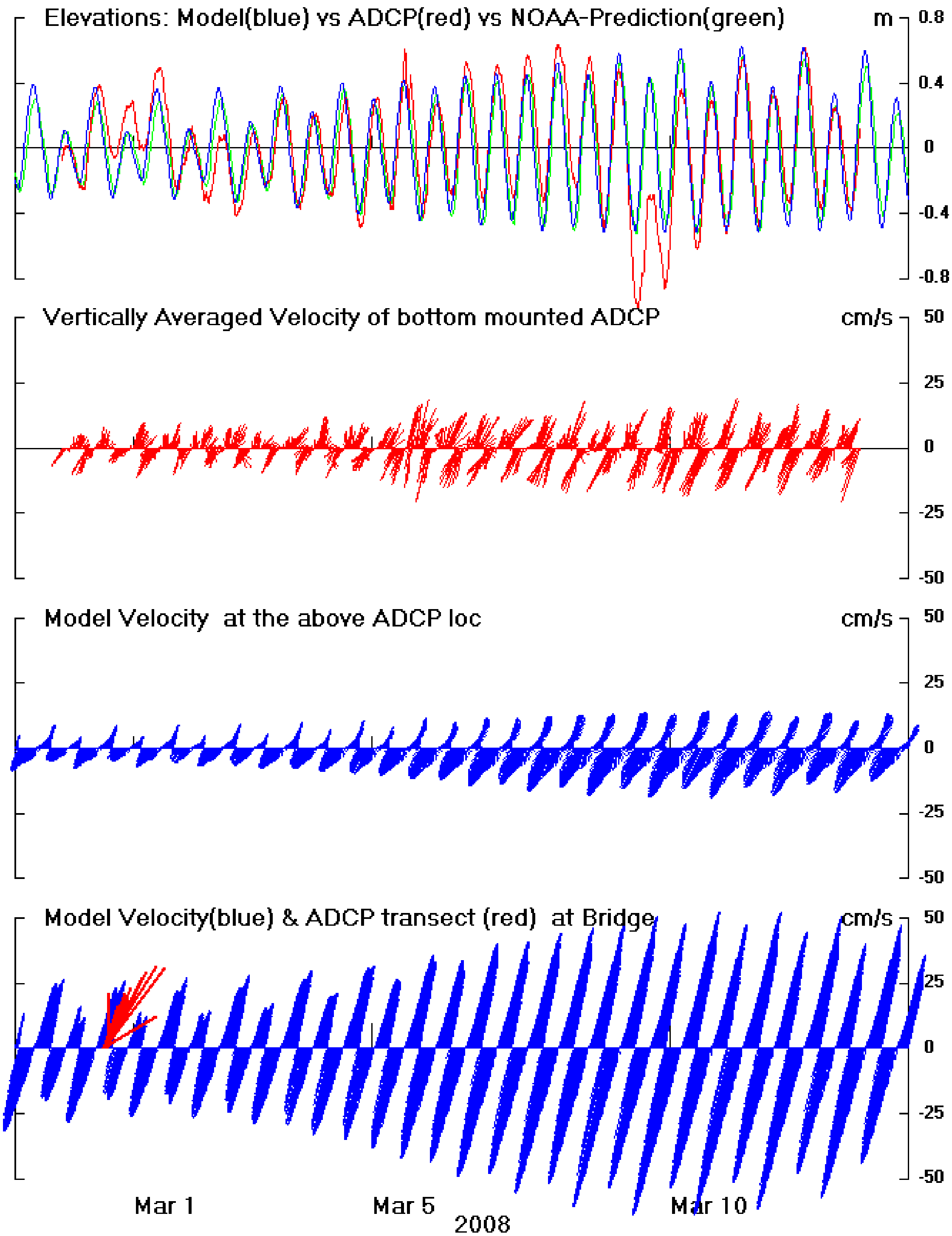


Figure 3. Comparisons of ADCP currents and model predictions. The time period coincides with the entire period of the bottom mounted ADCP deployment.

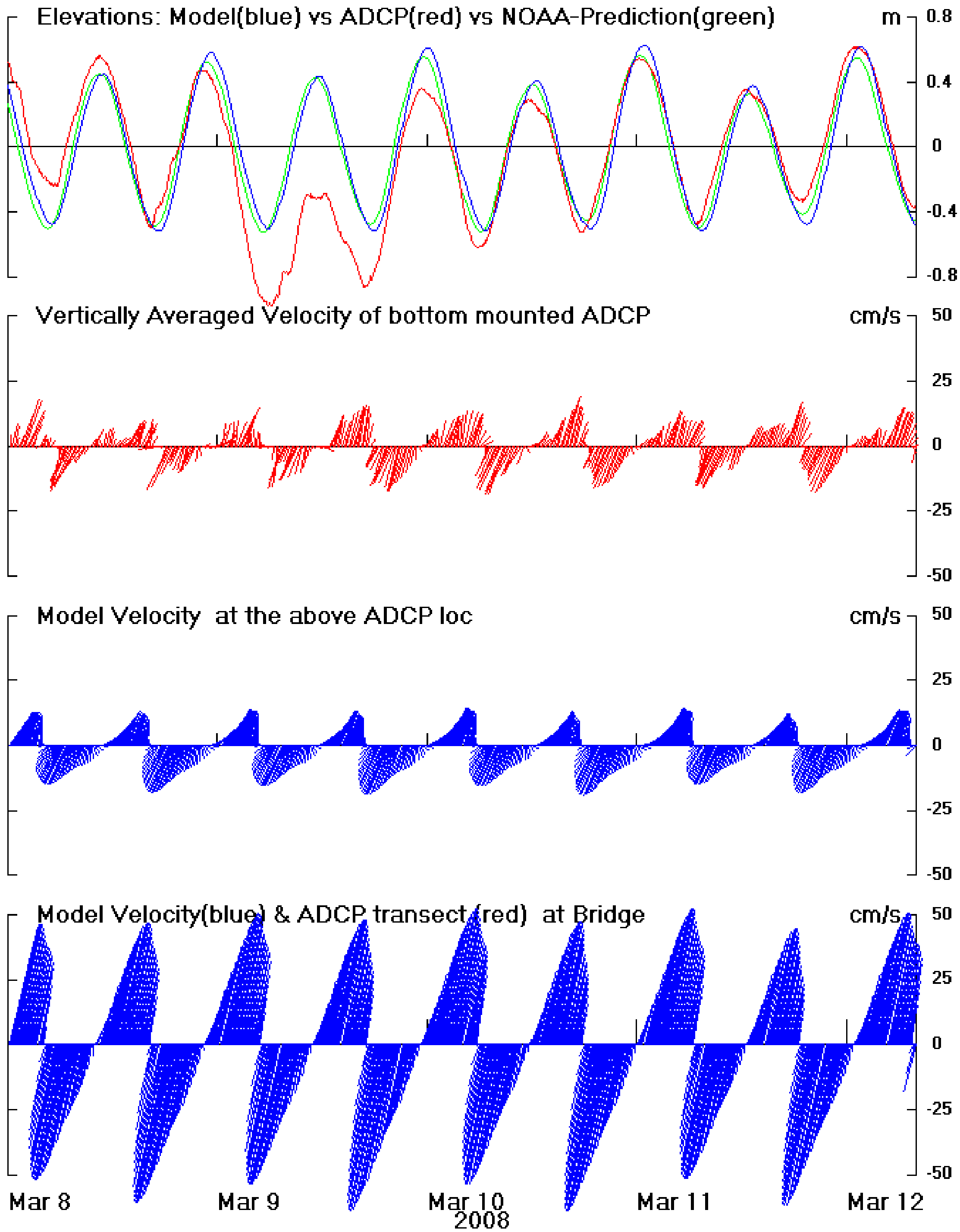


Figure 4. Comparisons of ADCP current observations and model predictions. The time period covers several days near the spring tide.

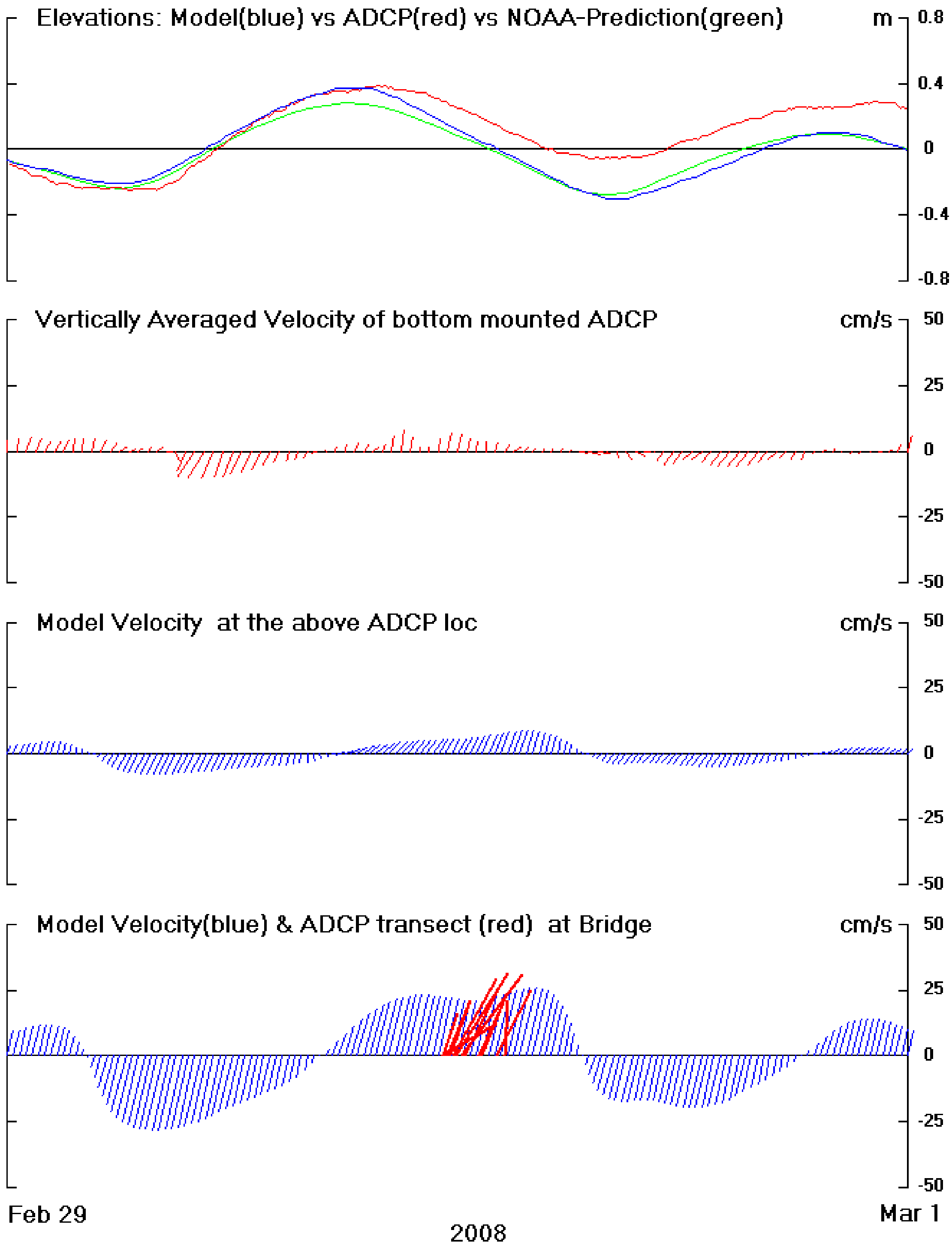


Figure 5. Comparisons of ADCP currents and model predictions. Time period corresponds to the first ADCP transect survey at the bridge.

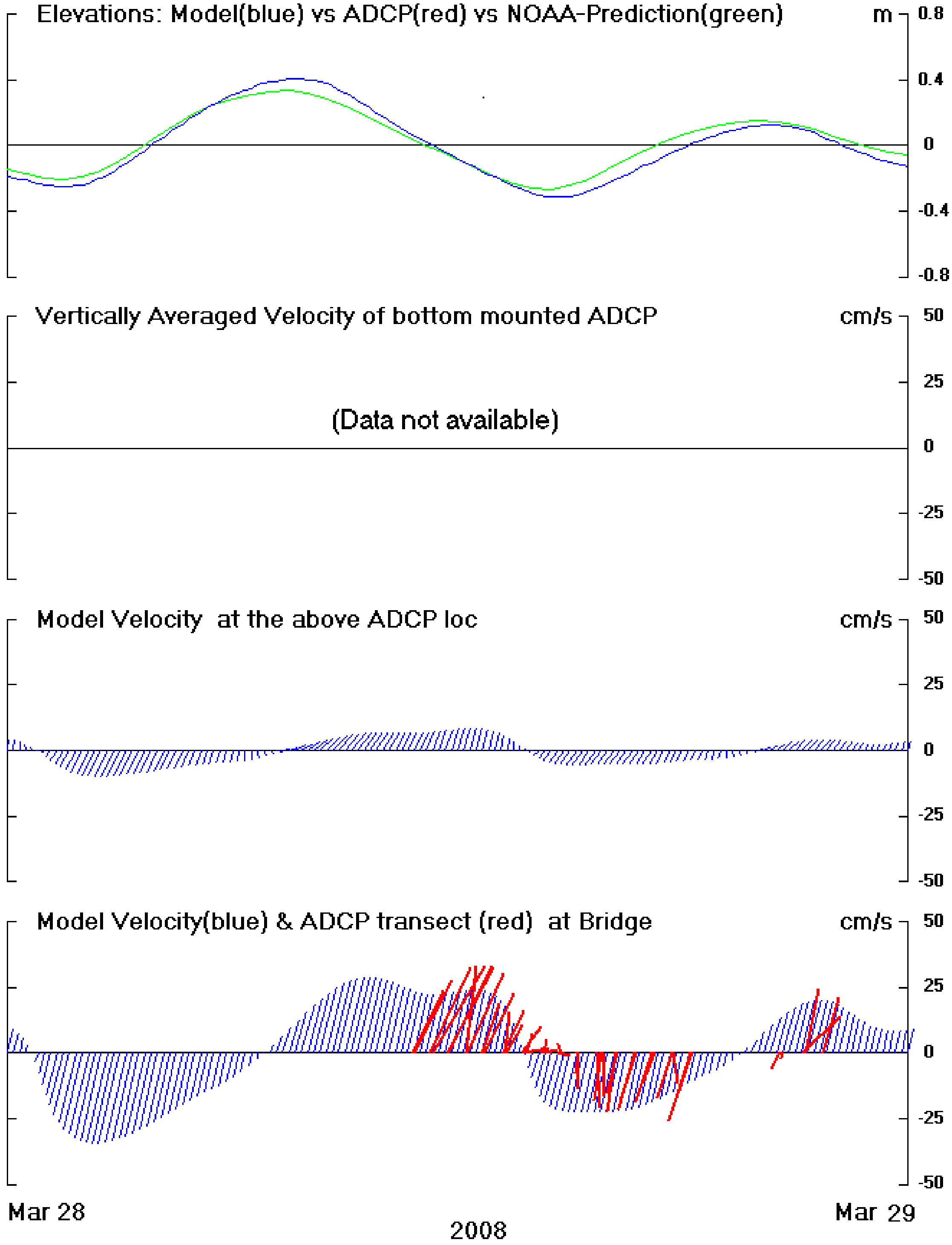


Figure 6. Comparisons of ADCP currents and model predictions. Time is focused on 2008 Mar 29, the second ADCP transect survey at the bridge.

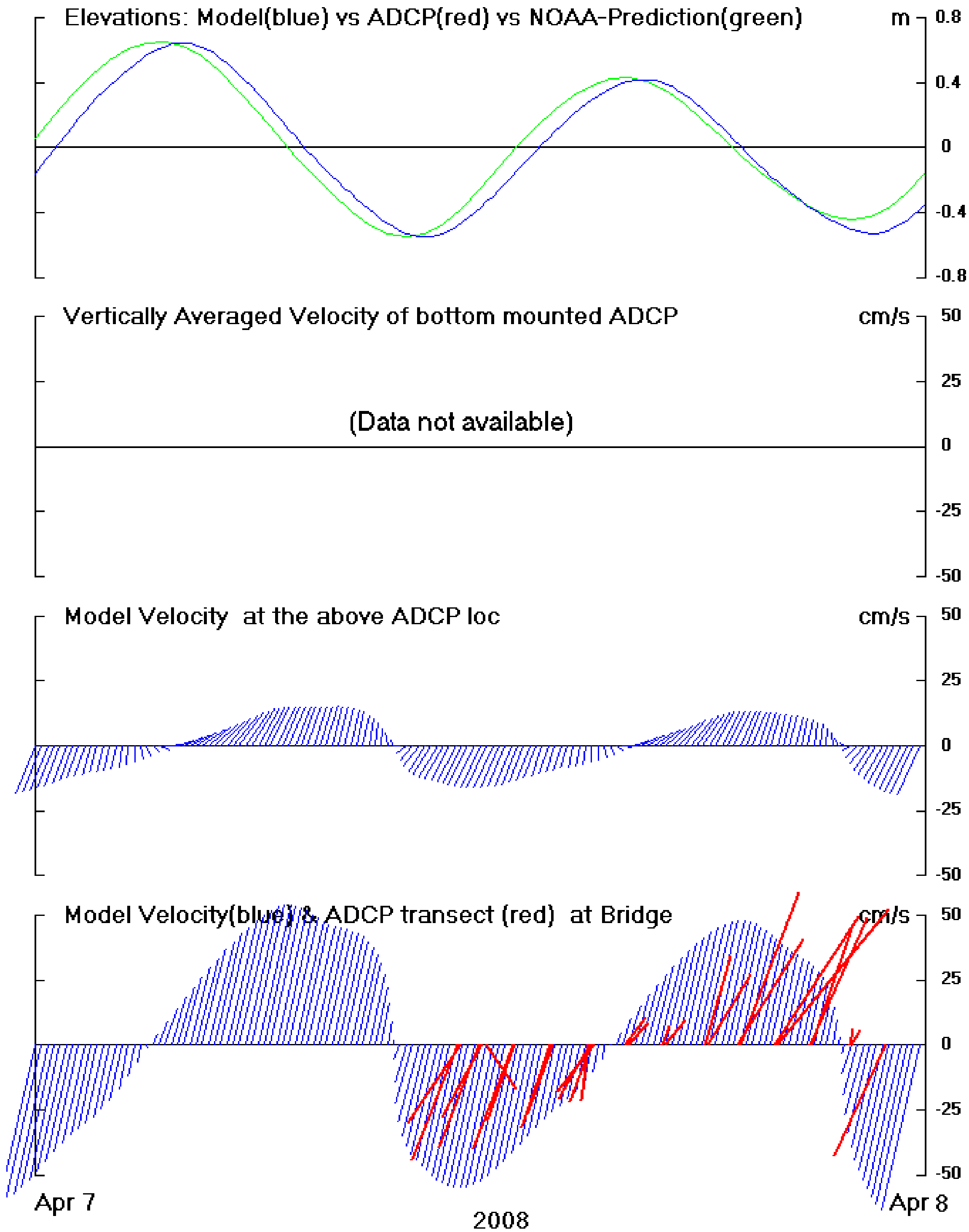


Figure 7. Comparisons of ADCP currents and model predictions. Time is focused on 2008 Apr 7, the third ADCP transect survey at the bridge.

Results from Simulations of Treated Water Discharge

The proposed outfall location is shown in figure 8. A pipeline will be laid from the MGP excavation site to outside Sag Harbor cove (~724m or 2380ft north form the bridge and ~116m or 280ft from the Great Pond shore) where approximately 1.5 million gallons per day (mgd) of treated water will be discharged at the water surface for a duration of approximately four months.

Figure 8. Outfall location of the proposed treated water. Treated water is discharged at the northern end of the pipeline (solid purple line).

As the treated water is nearly fresh and the receiving water has a higher salinity, the operation will create a plume of lower salinity near the discharge site. The model discussed in the previous section was employed to simulate the distribution and extent of salinity reductions. Two sets of simulations were performed: 1) 4-month discharge with actual tidal flow, including neap, normal, and spring phases, and; 2) 10-day discharge with normal tide with various surface wind stresses.

Figure 9 shows time series plots of model predicted salinity reduction due to the treated water discharge of 1.5mgd for selected locations. Figure 9 also shows the water surface elevation depicting cycles of spring and neap tides. Table 1 lists average salinity reductions at the corresponding locations shown in Figure 10.

As the treated water discharge starts, salinity reductions propagate away from the vicinity of the outfall. Locations close to the outfall (within the tidal excursion distance of ~500m) develop a quasi-steady tidal pattern in which high and low reductions oscillate back and forth. Figure 11 depicts a typical hourly succession of one such pattern. As distance from the outfall increases this tidal variance is significantly reduced, with a longer-term change becoming apparent. This time response is on the order of 15 days in Great Pond and approximately 40 days in the cove. In most locations, salinity reductions are less than 1.0 PSU, except at the immediate vicinity of the outfall where the salinity reduction exceeds ~10 PSU. This value reflects the size of the model computational grid cell that initially receives discharge water; the larger the cell size, the smaller the initial salinity reduction. A much finer grid cell size would result in a larger salinity reduction, but that reduction would be limited to small area.

Figure 12 shows the model predicted salinity reduction over the area after 120 days of freshwater discharge. A salinity reduction of <0.2 PSU extends from the outfall and well into the cove. The northern extent of the reduction is limited as the higher flows beyond the breakwater transport and dilute the discharge, providing a very effective flushing mechanism.

Locations	**Average Salinity Reduction (psu)**
Outfall	3.218
100m south	0.335
200m south	0.209
300m south	0.192
400m south	0.170
500m south	0.148
600m south	0.140
Great Pond	0.259
Cove (Ctr)	0.137
Cove (M6)	0.139
Cove (A22)	0.144
100m north	0.200
200m north	0.103
300m north	0.069

Table 1. Model predicted average salinity reductions at varying distances from the outfall from a treated water discharge of 1.5 mgd.

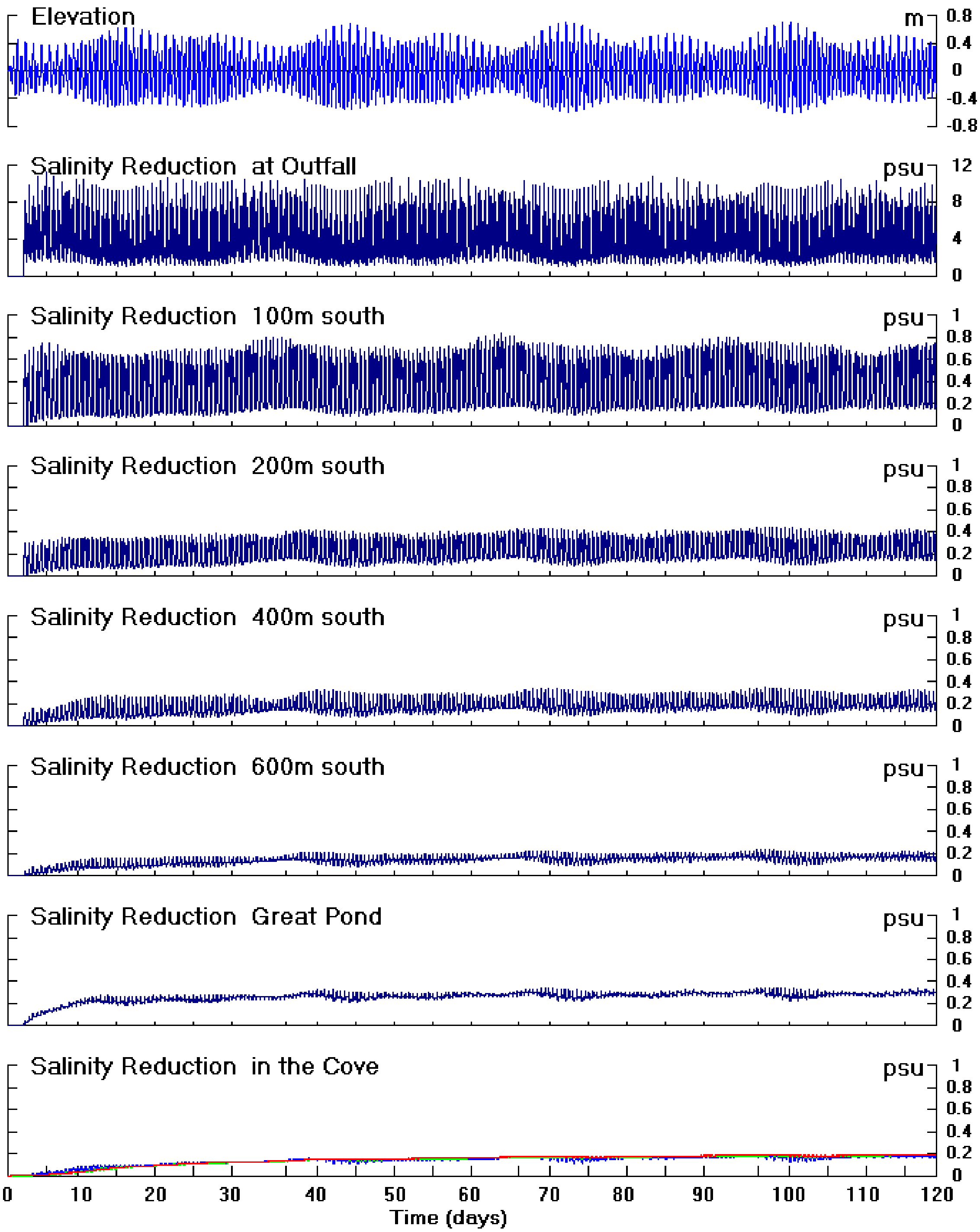


Figure 9. Salinity reductions at various locations resulting from a 1.5 mgd treated water discharge.

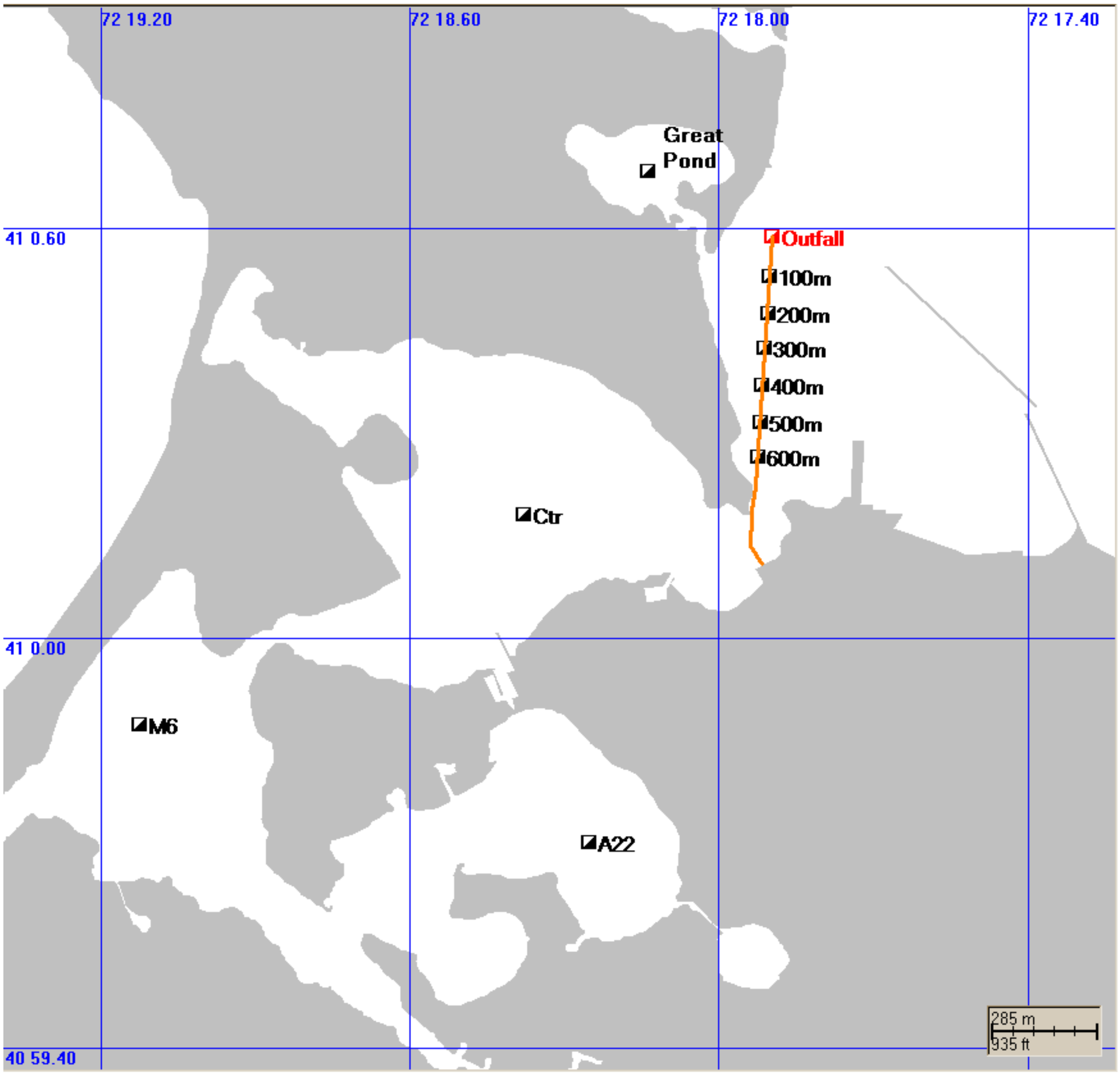


Figure 10. Locations of time series points shown in Figure 9 and listed in Table 1.

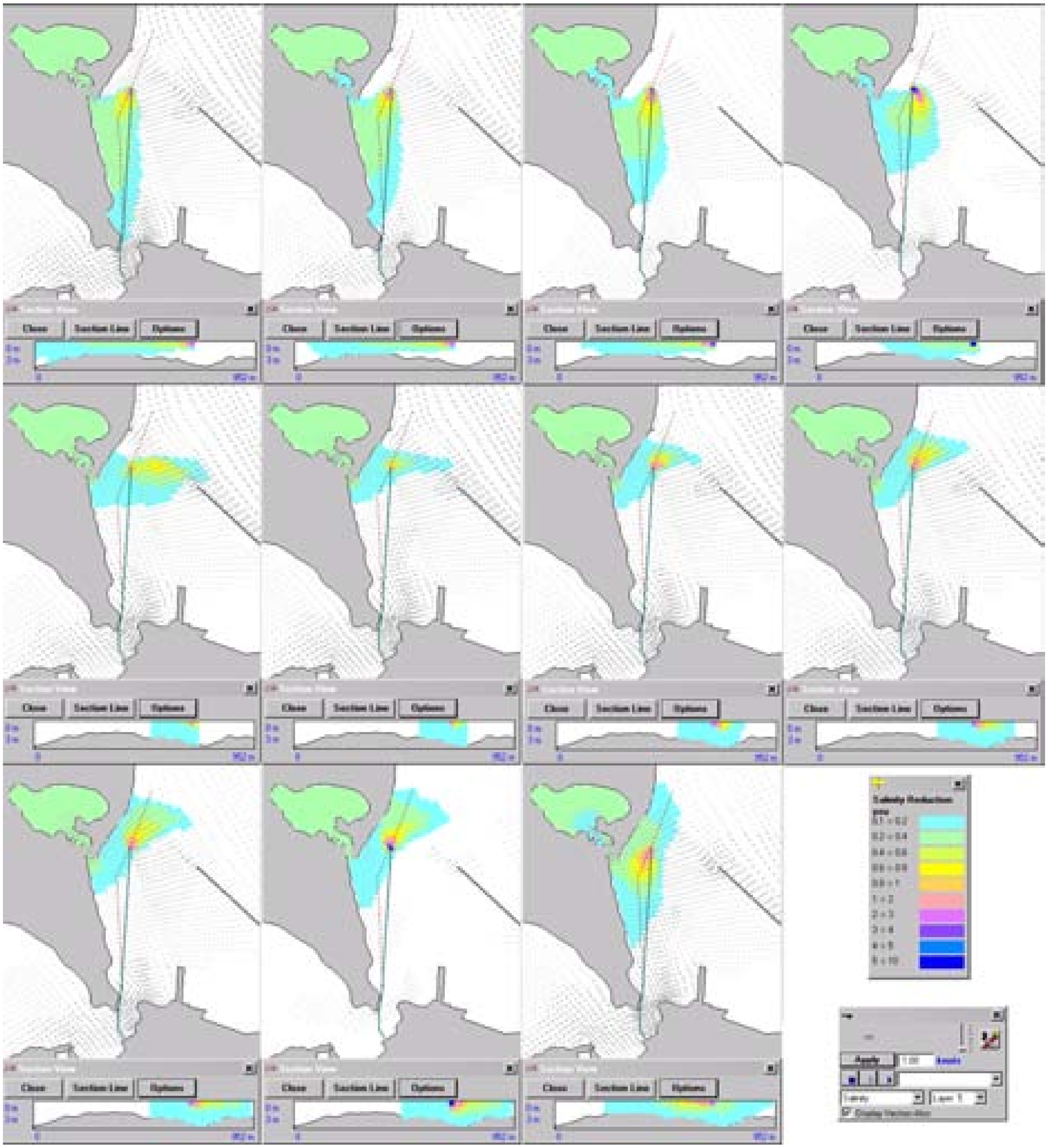


Figure 11. Distribution of salinity reduction near the discharge outfall through one tidal cycle.

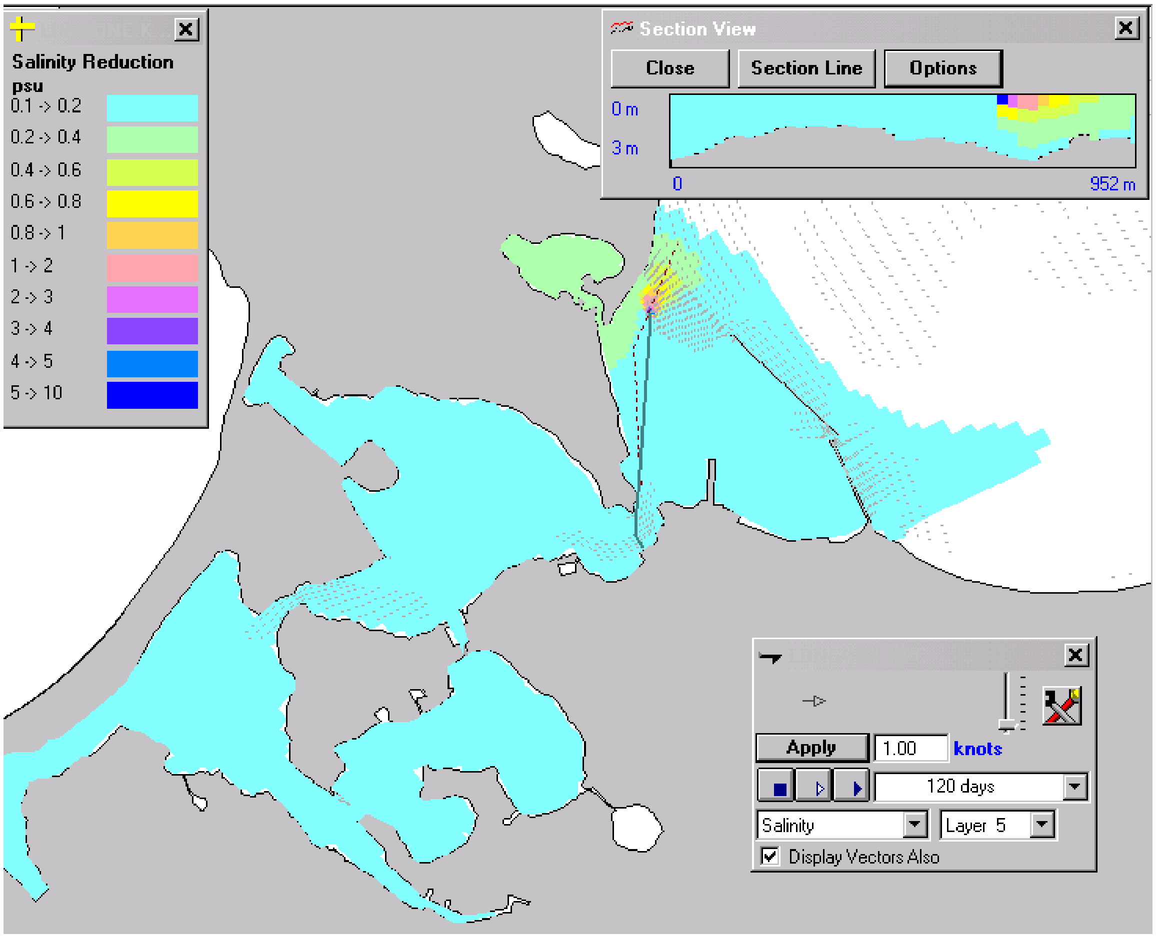
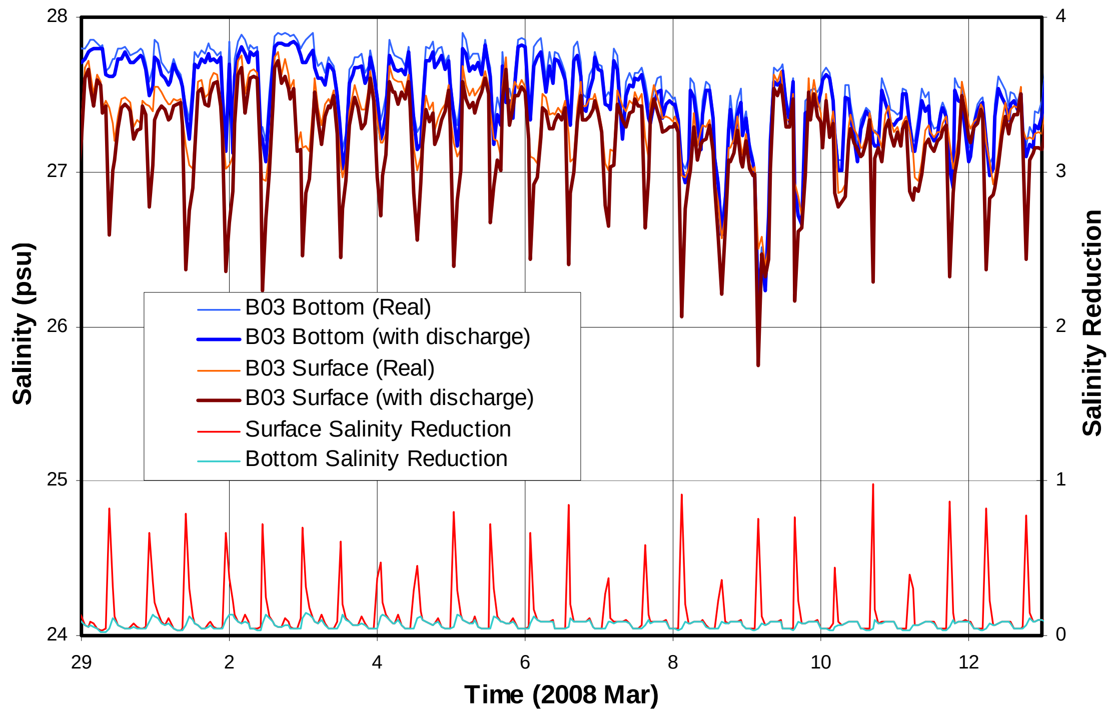


Figure 12. Distribution of salinity reduction 120 days since start of the discharge.

Station B03 will see the maximum salinity reduction as it is closest to the discharge. Monitoring locations B08 and A22 would she less salinity reduction as a result or the discharge. Figures 13, 14 and 15 show the measured salinity at each of the three monitoring sites compared with the model predicted salinity at each site. The data plotted in these figures are for two periods: 29 February to 12 March, 2008, and 1 through 30 April, 2008.



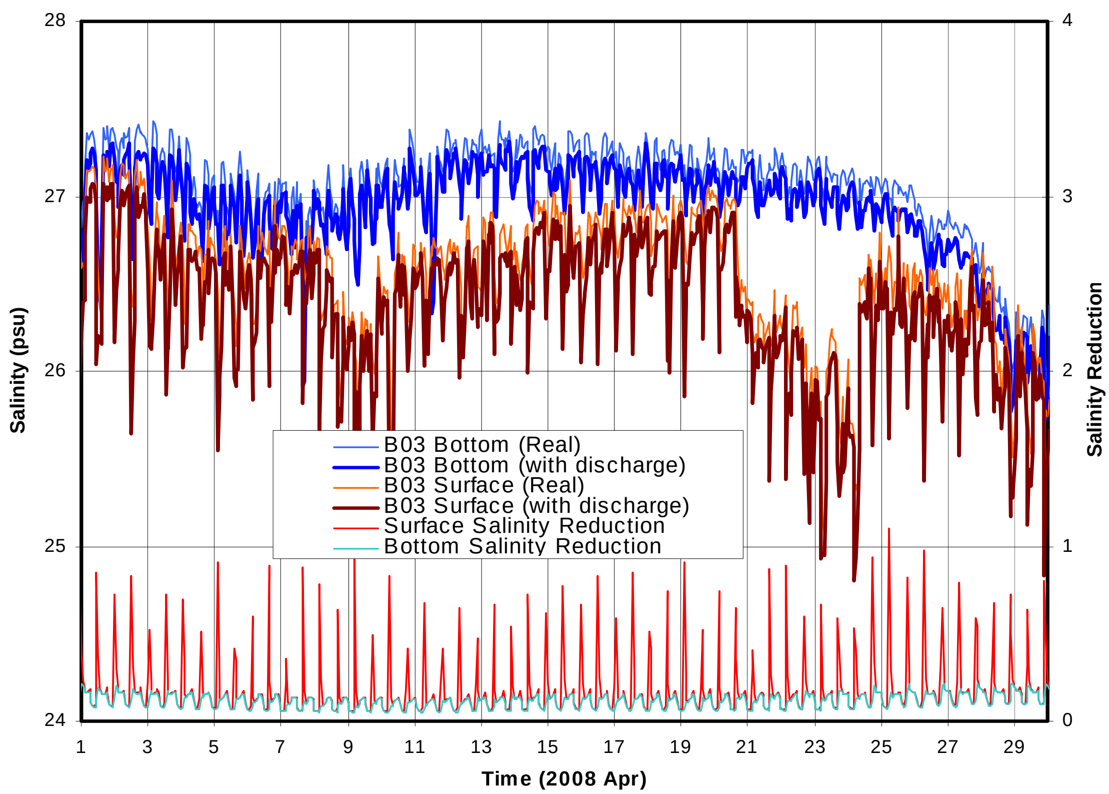
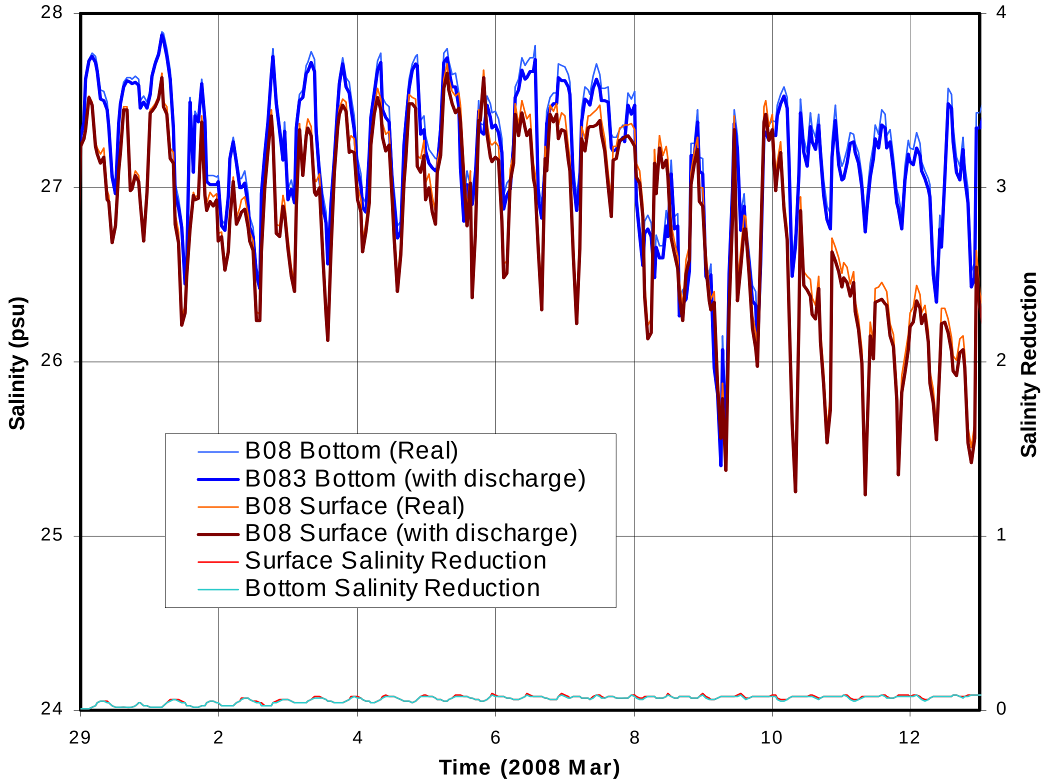


Figure 13. Salinity time series at station B03 recorded by the fixed AquaTroll for the periods February 29 – March 12, 2008 (top graph), and March 1-30, 2008 (bottom graph). The top of each plot shows the salinity (psu) recorded by the instrument, and the predicted salinity based on the modeling of the freshwater discharge for both the surface and bottom water. At the bottom of each plot are the salinity reduction values predicted by the model resulting from the freshwater discharge.



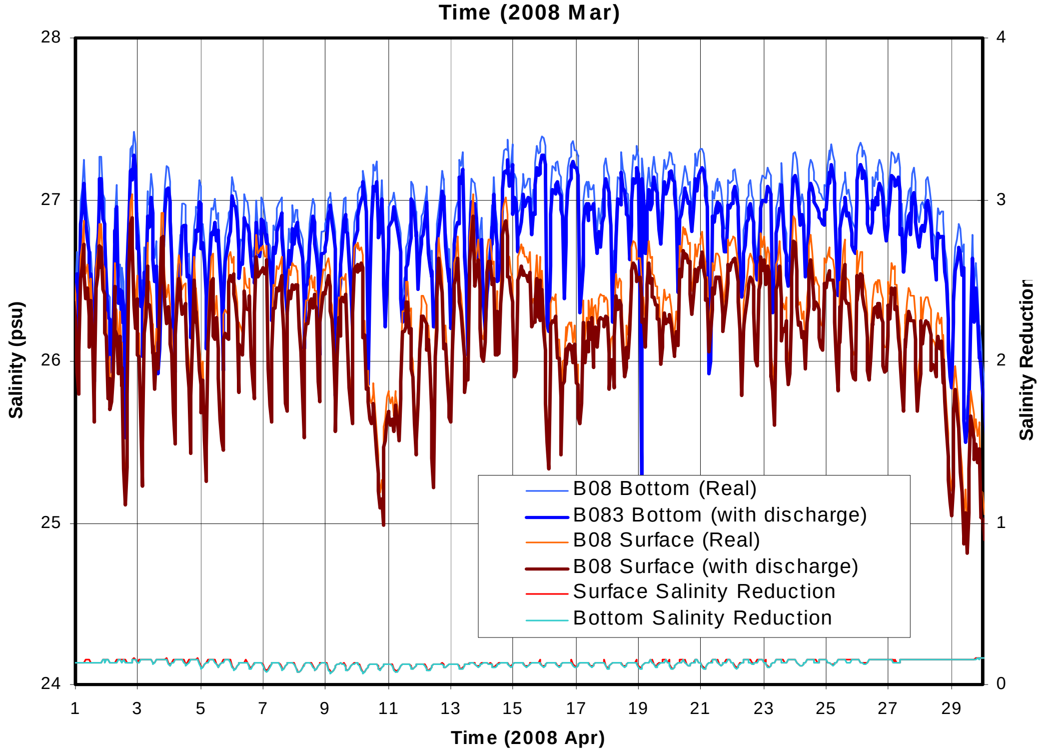
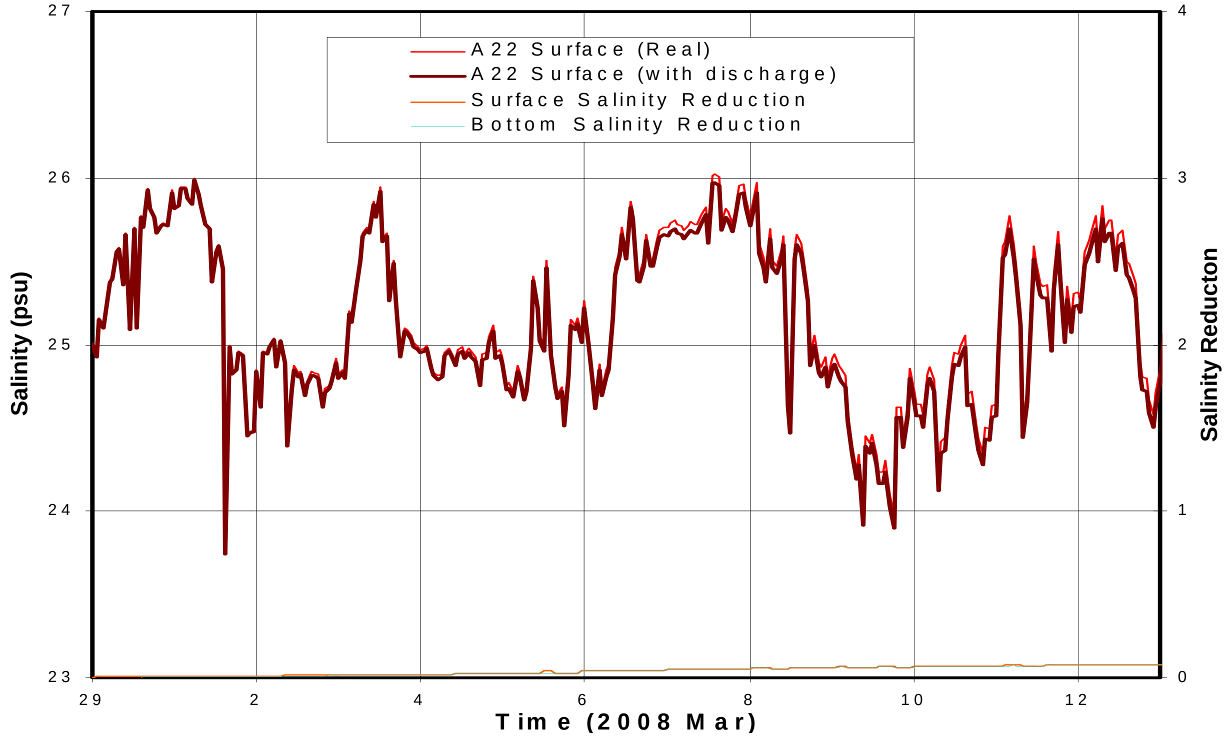


Figure 14. Salinity time series at station B08 recorded by the fixed AquaTroll for the periods February 29 – March 12, 2008 (top graph), and March 1-30, 2008 (bottom graph). The top of each plot shows the salinity (psu) recorded by the instrument, and the predicted salinity based on the modeling of the freshwater discharge for both the surface and bottom water. At the bottom of each plot are the salinity reduction values predicted by the model resulting from the freshwater discharge.



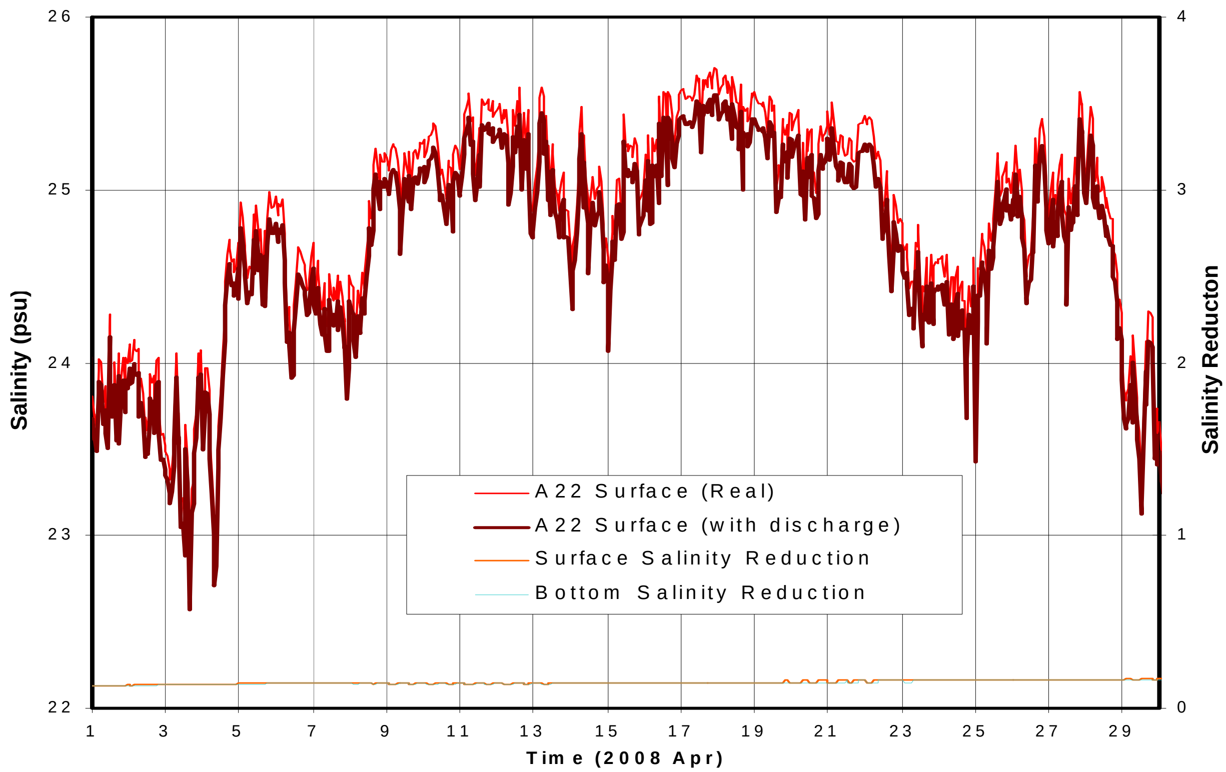


Figure 15. Salinity time series at station A22 recorded by the fixed AquaTroll for the periods February 29 – March 12, 2008 (top graph), and March 1-30, 2008 (bottom graph). The top of each plot shows the salinity (psu) recorded by the instrument, and the predicted salinity based on the modeling of the freshwater discharge for the surface water. At the bottom of each plot are the salinity reduction values predicted by the model resulting from the freshwater discharge.

The proximity of the outfall location to the inlet to Great Pond suggests that some of the discharge water may enter the pond. Salinity data from a monitoring station inside the Pond from 15 to 29 April, 2008 are compared to model predicted salinity for the same period. Figure 16 shows the measured salinity in the Pond compared with the model predicted salinity.

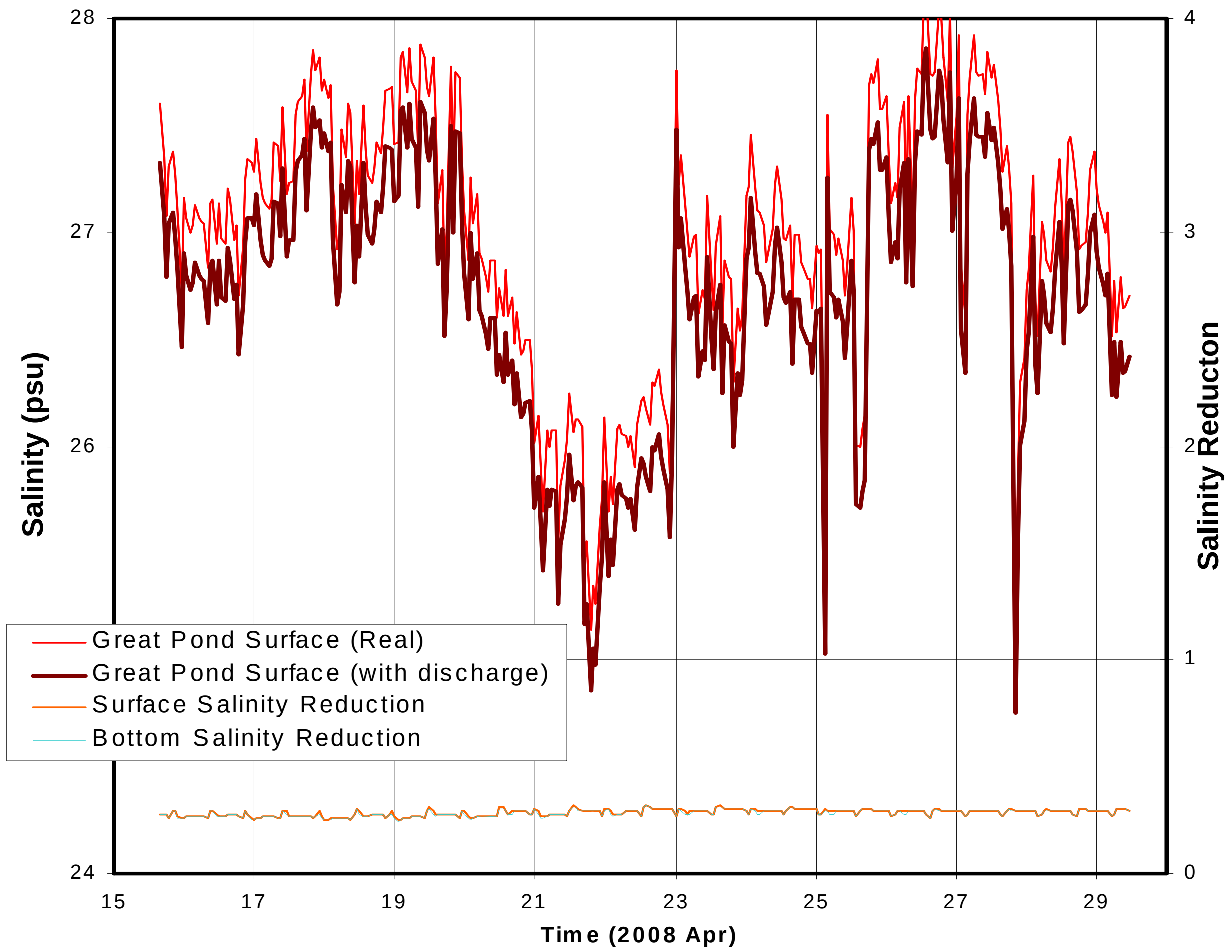


Figure 16. Salinity time series at monitoring station inside Great Pond recorded by fixed AquaTroll for the period 15 to 29 April, 2008. The top of each plot shows the salinity (PSU) recorded by the instrument, and the predicted salinity based on the modeling of the freshwater discharge. At the bottom of each plot are the salinity reduction values predicted by the model resulting from the freshwater discharge.

Figure 17 is a map view of the average salinity at the water surface based on data collected during the February 29, 2008 field survey. Salinity values are shown in practical salinity units (PSU) and a clear gradient from higher to lower salinity concentration is seen in the Sag Harbor system. In order to see the effect of the freshwater discharge on salinity, a map of the reduction in salinity predicted by the model was generated. Shown in Figure 18, this map shows the reduction in salinity, in PSU, predicted by the model at the end of a 120 day simulation.

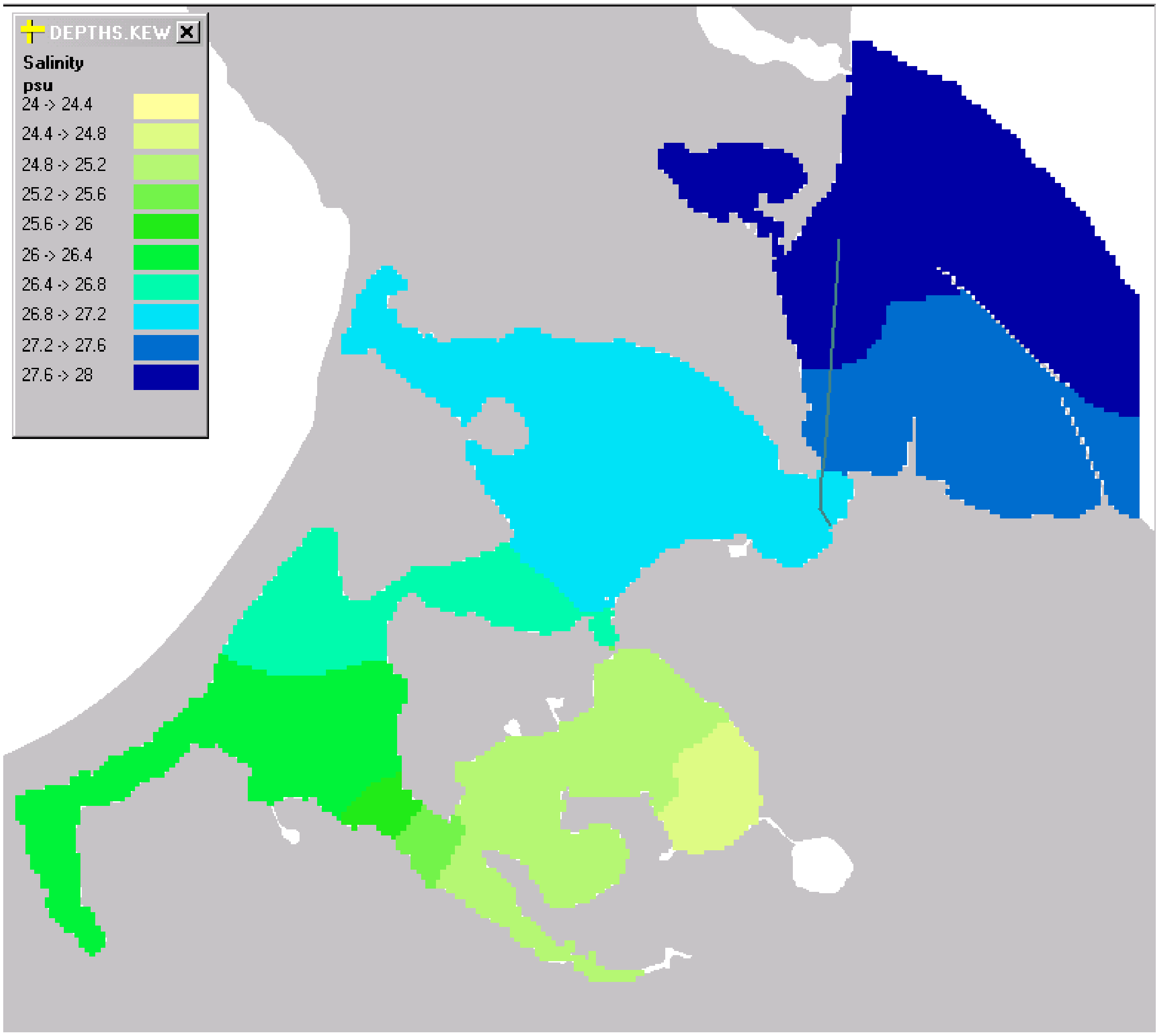


Figure 17. Map view of the average salinity at the water surface based on data collected during the February 29, 2008 field survey.

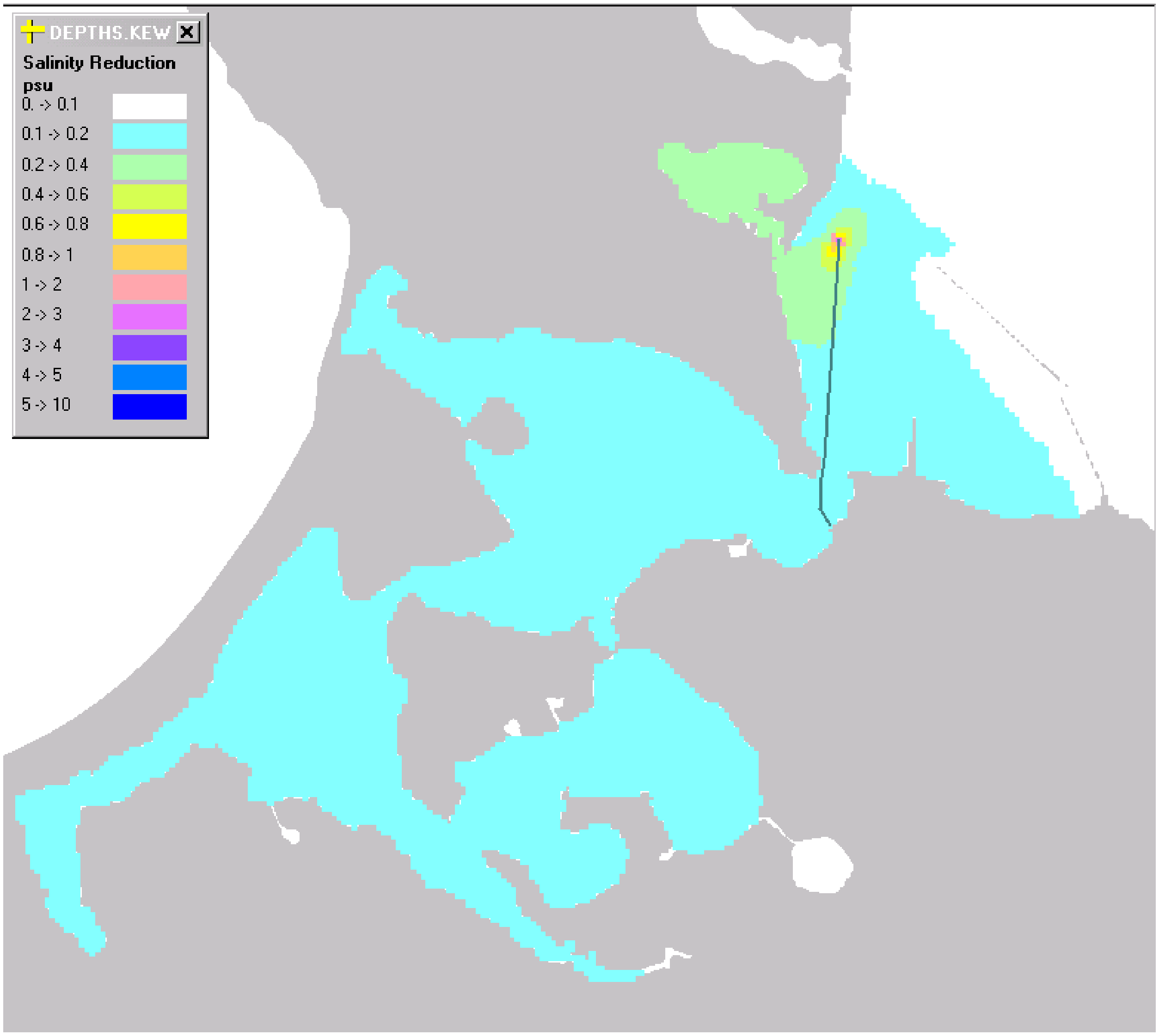


Figure 18. Model predicted average surface salinity reduction after 120-day simulation.

By subtracting the model predicted salinity reduction over the Sag Harbor system (Figure 18) from the salinity measured during the 29 February, 2008 field survey (Figure 17), a prediction of the salinity that may be expected during the operation of the discharge is generated. Figure 19 shows a map of the average surface salinity from the February 29, 2008 survey minus the model predicted average surface salinity reduction.

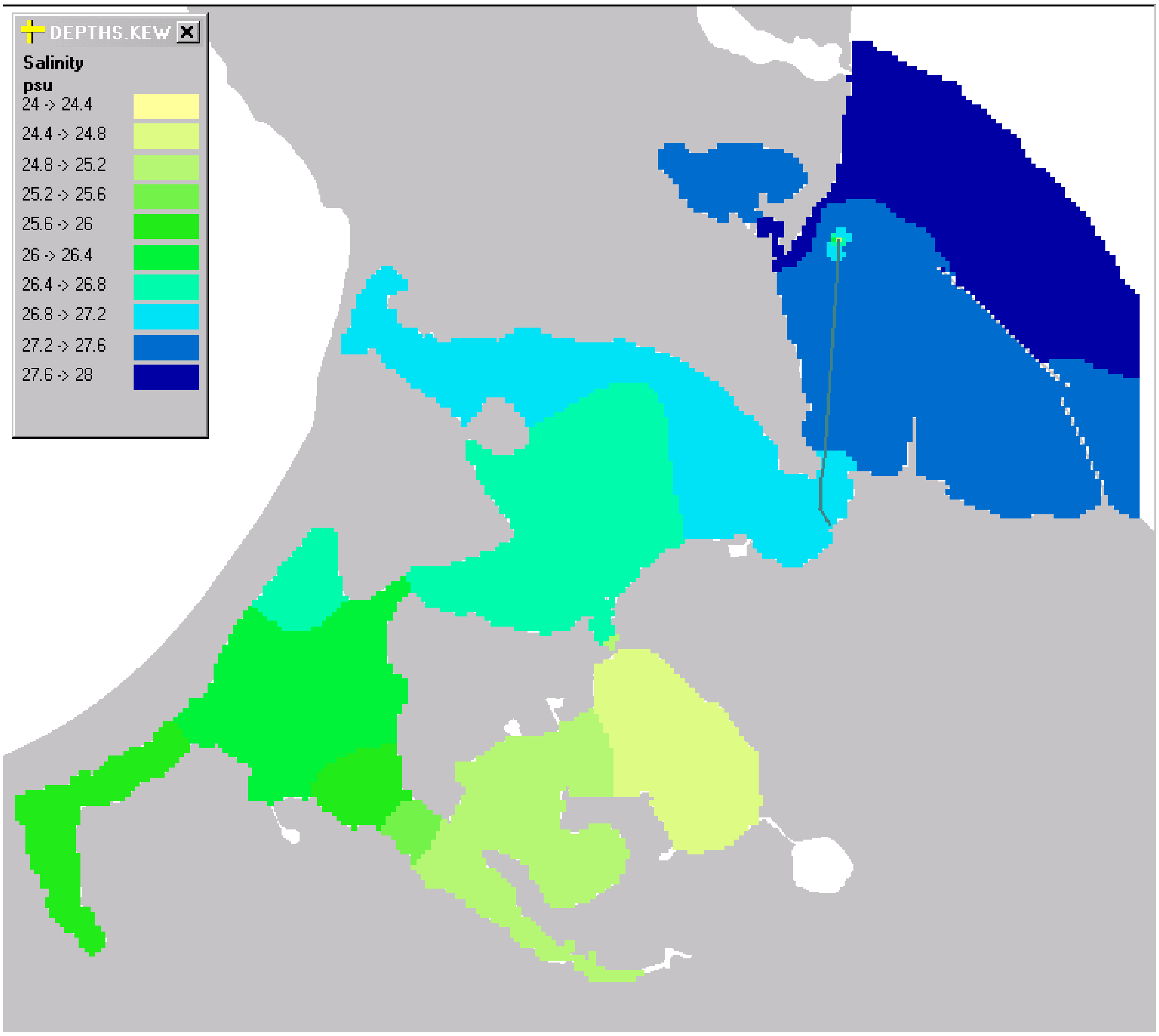


Figure 19. Average surface salinity from the February 29, 2008 survey minus the model predicted average surface salinity reduction (Figure 17 - Figure 18).

Wind Effect

Simulations were performed to investigate the effect of wind driven flow on the discharge. Each simulation was run with normal tidal condition and a constant wind speed from the north of 0, 10 20, 30 and 50 knots (0, 5, 10, 15 and 26 m/s) for 10 days. Figure 20 shows the salinity reduction distribution after 10 days. The results from the wind forced model simulations show that the wind effect reduces the area covered by the salinity reduction. Several reasons are thought to contribute to this outcome:

1) The wind driven flow prevents formation of a slack pool.
2) The receiving water travels progressively faster with higher wind speed, so proportionally less discharge water enters into the water body.
3) Higher vertical dispersion develops due to wind stress.
4) Wind driven flow generates a gyre that carries discharge water out of the cove mouth.

Reasons 1 to 3 essentially “thin out” the discharge in effective ways. As the same amount of discharge enters the system, diluted discharge may travel a much greater distance. As the cove and harbor geometry constrain the flow, it is inevitable for gyres to form. A counter-clockwise gyre is seen developing along the shore in the 50 knot wind case. The main passage of the discharge progressively moves to the east away from the cove mouth, and becomes entrained in the return flow which carries the discharge out of the harbor.

The general implication of the wind effect on the treated water discharge is that winds reduce the salinity reduction impact. These simulations looked only at a wind from the north. In summer, winds are more commonly from the southwest, and if they were strong and persistent enough, a clockwise gyre would develop and the overall direction of the discharge would likely reverse.

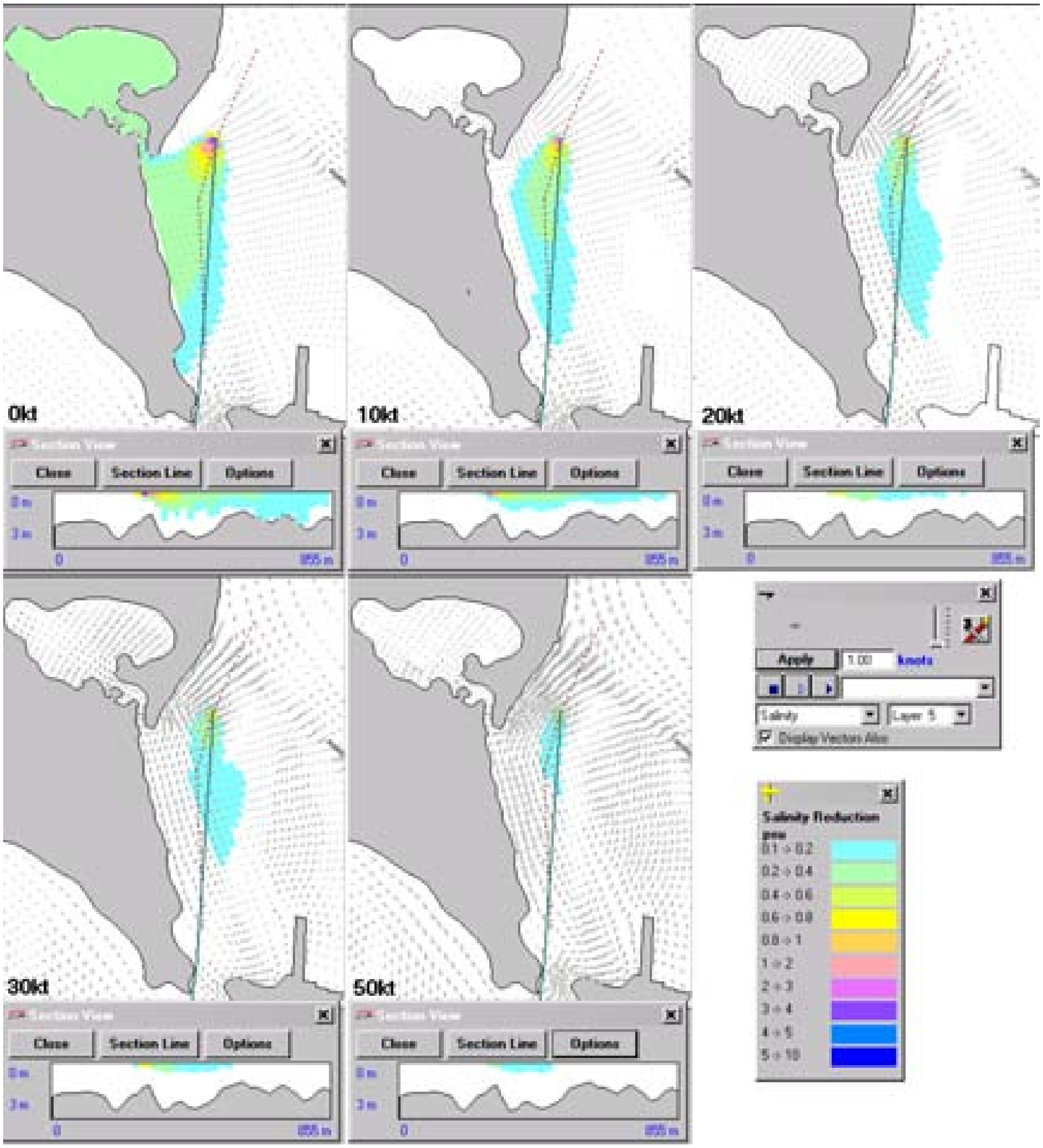


Figure 20. Effect of surface winds on salinity reduction distributions.

Conclusions

The hydrodynamic model compares well with the NOAA tide predictions from Sag Harbor for tidal current amplitude and phase. The current data collected by the bottom and boat mounted ADCP instruments as part of the field survey is noisy but in reasonably good agreement with the model prediction of the hydrodynamics.

Model predicted reduction in the average salinity ranges from 3.2 PSU at the outfall to 0.14 PSU at monitoring station A22 in Upper Sag Harbor Cove. Average salinity reduction of 1 PSU is predicted to extend less than 100 meters from the outfall in all directions.

When winds of varying speeds are blown over the Harbor area from the north, the model predicts that the area experiencing salinity reduction decreases in size.

Appendix J

Biosurvey Results

ENSR | AECOM

ENSR
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Memo

Date:	6/13/2008
To:	Lee Weishar, Woods Hole Group
From:	Capt. Alek Modjeski, Senior Marine Ecologist – ENSR | AECOM
Subject:	Sag Harbor Biological Survey Memorandum
Distribution:	T. Leissing (KeySpan) S. Pandya (ENSR) R. Hathaway (ENSR)

Summary

ENSR|AECOM (ENSR) conducted various types of visual biological surveys within Great Pond and at the proposed Keyspan Energy pipe discharge area in Sag Harbor Bay, Sag Harbor New York on May 29, 2008 (Figures 1 and 2). The visual survey was performed to physically verify information given in the January 7, 2008 desktop study conducted by Applied Science Associates, Inc. (ASA). The objectives of the survey were to better characterize the estuarine and shoreline habitats at and/or adjacent to the proposed Keyspan pipe discharge location and in Great Pond, document encountered estuarine, marine, and avian species, record the presence of eelgrass or other submerged vegetation, describe types and locations of habitat, and determine substrate. The surveys were performed during flood and ebb tides and included the following types of sampling techniques: Braun-Blanquet survey using a snorkel and mask, shoreline surveys, a substrate characterization survey using a one (1) meter by one (1) meter quadrat, and kayak/boat-based visual surveys.

Attachments include two (2) figures identifying sample station location and proposed pipe discharge area, a copy of the field logbook (Identification # - SAG01765066LB01), and sample site photographs. Table 1 summarizes period of survey, type of equipment used, field team members, logbook ID, vessel/navigation equipment, and weather/conditions during sampling effort.

Table 1: Field Sampling Summary

Mobilization	28 May 2008 – 30 May 2008
Demobilization	30 May 2008
Equipment Used	Snorkel and mask, 1m x 1m quadrat sampler, chest waders, 2-person kayak, oars
Field Team	Capt. Alek Modjeski (ENSR|AECOM), Jennifer Koch (ENSR|AECOM)
Logbook ID	SAG01765066LB01
Vessel and Navigation	20' dual console Sea Hunt -150 hp outboard, VHF w/antenna, handheld Garmin eTrex Vista GPS unit, NOAA Nautical Chart 12358
Weather/Conditions	Clear and Sunny; Air Temp 58-65°F, Winds S to SSE approx. 5 mph, Seas less than 6 inches.

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Sag Harbor Bay Overview and Site Description

The Sag Harbor Complex, located within the Peconic Estuary in Long Island, New York, consists of several small coves, embayments, coastal ponds, and tributaries. The study area includes a portion of Sag Harbor Bay located along the eastern shore between North Road and South Harbor Drive to approximately 500 feet seaward, the northern most portion of Sag Harbor Cove near the bridge and marina, the inlet to Great Pond, and Great Pond.

Site Assessment Methodology

Prior to field investigations, ENSR representatives coordinated with Dr. Lee Weishar of the Woods Hole Group to ensure survey design coincided with survey objectives. In addition, the ENSR field team reviewed the January 7, 2008 ASA Memorandum entitled *Biological Impacts of a Treated Discharge into Sag Harbor Waters from Dewatering a Former Manufactured Gas Plant Site*.

As stated previously, a Braun-Blanquet survey using a snorkel and mask, shoreline surveys, a substrate characterization survey using a one (1) meter by one (1) meter quadrat, and kayak/boat-based visual surveys were performed to determine habitat types, substrate, presence/absence of eelgrass, identification of species observed, and to provide a better understanding of the effects of the proposed discharge. Survey transects and locations are shown in Figures 1 and 2 (Attachment A). The following briefly describes each method used:

Braun-Blanquet Survey: A Braun-Blanquet survey or swim-through was performed by snorkel and encompassed an area 250-300 feet diameter around a central position located at 41° 00.637' North and 072° 17.855' West. The snorkel survey was performed at high tide to better observe species that may transit/forage with the incoming tide.

Shoreline Survey(s): Land-based surveys were performed on foot along the front back of the beach located on the eastern shore of sag Harbor Bay (Figures 1 and 2). Beach morphology was observed and species encountered were recorded.

Substrate Characterization Transect Survey: A one (1) meter by one (1) PVC quadrat was used to estimate representative substrate composition within and adjacent to the proposed discharge area based on visual observation. Percent coverage per meter within each survey station was determined by visually comparing each quadrat in relation to the crown density scale developed for estimating crown cover of forest trees from aerial photography (Orth et al, 2001; Paine, 1981). The survey was performed perpendicular to the eastern shore of the study area at low tide to a distance of 66 meters offshore. In addition to the quadrat survey, a walk-through survey in chest waders was performed parallel and adjacent to the eastern shoreline out to approximately 200 feet offshore to ensure the transect survey was representative of the substrate for the entire Sag Harbor Bay study area. The walk-through consisted of visually assessing the substrate and photo-documenting a random location.

Kayak/Boat-Based Survey: The kayak/boat based survey was performed within Great Pond and along the shoreline between the Sag Harbor Cove Yacht Club Marina to the Route 114 Bridge (Figure 2). The survey included visually assessing the surrounding habitat and recording observed species.

Field Investigations and Findings

The field team evaluated three separate locations within the Sag Harbor Complex to determine presence/absence of eelgrass, record habitat characteristics, substrate type, and species; and to characterize existing conditions within the estuary (Figures 1 and 2, Attachment A). Surveys were

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performed in Sag Harbor Bay at and adjacent to the proposed discharge area, within Sag Harbor Cove from the Sag Harbor Cove Yacht Club Marina to the Route 114 Bridge, along the inlet connecting Great Pond to Sag Harbor Bay, and within Great Pond. A field all-weather notebook (Attachment B) was used to record weather conditions; adjacent land use; observed species, substrate type, habitat composition, water depth, tides, tidal flow, presence/absence of eelgrass, and survey events. A copy of the survey photographs are given in Attachment C.

The following is based on findings from the initial site assessment:

- Live species observed during the high tide survey within Sag Harbor Bay included: green fleece (*Codium fragile*) rockweed (*Fucus vesiculosus*), (numerous common slippershells (Crepidula fornicata), one (1) male blue crab (*Callinectes sapidus*), one (1) calico crab (*Ovalipes ocellatus*), one (1) female horseshoe crab (*Limulus polyphemus*), a school of Atlantic silversides (*Menidia menidia*), one (1) blue fish ((*Pomatomus saltatrix*), two (2) double-crested cormorants (*Phalacrocorax auritus*), least terns (*Sterna antillarum*), common tern (*Sterna hirundo*), mute swans (*Cygnus olor*), and osprey (*Pandion haliaetus*). In addition, moon snail egg cases were observed periodically on the substrate. Overall, species encountered are mostly euryhaline and can tolerate changes in salinity or have the ability to avoid the area.

- Substrate within the Sag Harbor Bay study site lacked structure, rock, and vegetation that would be used by species for protection and nursery grounds. Though turbidity was low and light penetration was to the substrate, eelgrass was not present.

- Representative habitat in the Sag Harbor Bay study site consisted of sandy substrate with the occasional small diameter rock or empty knobbed whelk shell with either rockweed or green fleece attached.

- Shoreline habitat within the Sag Harbor Bay study site consisted of cobble, rock and shell 50 to 75 feet seaward of the mean high water mark. There was no shoreline submerged vegetation present and substrate was not conducive to eelgrass establishment.

- No bay scallops were observed and it is anticipated that they are not present in the open water area at or adjacent to the proposed discharge location (Lewis and Rivara, 1998).

- Species observed within Great Pond and along the backshore of bay beach include various green (*Enteromorpha spp.),* brown (possibly *Sphaerotrichia divaricata*), and red seaweeds (possibly *Gracilaria sp.),* smooth cordgrass (*Spartina alterniflora)*, eelgrass (*Zostera marina*), widgeon-grass (*Ruppia maritima*), common periwinkle (*Littorina littorea*), dog whelk (*Nassarius sp*.) ribbed mussel (*Geukensia demissa*), black-fingered mud crabs (*Neopanopeus sayi*), long-clawed hermit crab (*Pagurus longicarpus*), little skate (*Raja erinacea),* killifish (*Fundulus sp.),* ruddy turnstone (*Arenaria interpres*), great egret (*Ardea alba*), tree swallow (Tachycineta bicolor), and osprey ((*Pandion haliaetus*).

- The inlet(s) consisted of gravel, cobble, rock, algae, and coarse-grained sediment whereas the majority of the Pond consisted of finer sediment representative of less mixed water. May be a potential for hypersaline conditions.

- Salinity at time of survey (ebb tide) was recorded at an in-situ monitor as 27 ppt. The water depth at the salinity monitor (located at the end of the northern inlet in Great Pond) was approximately 6 inches.

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- The majority of the substrate within the Pond was sand (with some detritus) with a layer of fine silt. The silt, along with epiphytic brown algae, seemed to coat the majority of submerged vegetation. Submerged vegetation was not noticeable in the shallow areas, at first, due to blade coloration and presence of the silt/algae. Eelgrass was less dominant than widgeon-grass in the majority of the pond and blades appeared small (less than 4" in height) in most areas. Many of the plants were brown possibly associated with wasting disease.

- The substrate in Great Pond is approximately 75% covered with submerged vegetation and algae, but only some portions consisted of green blades. The presence of the epiphytic brown algae in conjunction with the number of black and brown blades of eelgrass in Great Pond is indicative of an area experiencing nutrient loading.

- No bay scallops or other bivalves were observed within Great Pond.

Overall, the species, substrate, and habitats encountered are representative of a typical estuarine system and coastal pond with the Peconic Estuary System. The majority of the species encountered have the ability to move and can tolerate or avoid changes in salinity. The presence of submerged vegetation was limited to Great Pond, but general condition of vegetation was indicative to nutrient loading.

References

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Orth, R. J., D. J. Wilcox, L. S. Nagey, J. R. Whiting, and J. R. Fishman. 2001. *2000 Distribution of Submerged Aquatic Vegetation in the Chesapeake Bay and Coastal Bays.* VIMS Special Scientific Report Number 142. Final report to U.S. EPA, Chesapeake Bay Program, Annapolis, MD. Grant No. CB993777-02-0, http://www.vims.edu/bio/sav/sav00.

Paine, David P. 1981. *Aerial Photography and Image Interpretation for Resource Management.* John Wiley & Sons, Inc., New York City, NY. 571 pp.

Attachment A
Figures

Sag Harbor MGP Site
KeySpan Energy
Figure 1: Biological Survey - May 29, 2008 High and Low Tide
Rocks
South Harbor Drive
North Road
Ferry Road
Kayak Based Survey Transect
Snorkel/Boat Based Survey
Wading Survey Transect
Quadrant Survey
Shoreline Walk based Survey
Image © 2008 DigitalGlobe
© 2008 Tele Atlas
Pointer 41°00'37.02" N 72°17'58.41" W
Streaming |||||||||| 100%
Eye alt 2824 ft


Sag Harbor MGP Site
KeySpan Energy
Figure 2: Biological Survey - May 29, 2008
High and Low Tide
Kayak-Based Survey
Wader/Snorkel/Boat-Based Survey
Conceptual Discharge Pipeline
Quadrat Transect
Shoreline Boat-Based Survey
Marina/Bridge Boat-Based Survey
North Harbor Drive
Ferry Road
O Road
114
Wharf Street
Long Island Avenue
Bay Street
© 2008 Tele Atlas
Image © 2008 DigitalGlobe
©2007 Google™

Attachment B
Field Logbook

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

Name Cpt Al Modjeski

Address 20 NEW ENGLAND AVE
PISCATAWAY NJ 08854

Phone 732-981-0200

Project 01765-066-730

CONTENTS

PAGE	REFERENCE	DATE
	LOGBOOK ID	
	SAG-01765-066-LB01	

CREW: AL MODJESKI (CAPT)
Jennifer Koch (MATE)

5/28/08

1424 - A.M. ARRIVES AT SAG HARBOR
CHECKED IN HOTEL
1500 - CALLED JK to check STATUS
ON ARRIVAL. Getting ON 27E
1507 - TALKED TO BEAU OF PVT
SAG HARBOR YACHT CLUB TO
SEE IF WE COULD DOCK
AT FACILITY IN SAG HARBOR
HE SAID yes.
1530 - Called JK to MEET AT
BOAT RENTAL MARINA
IN RIVERHEAD.
1541 - AM DEPART FOR RIVERHEAD
MARINA.
1643 - AM ARRIVE AT STRONG
MARINA, WENT AND GOT
BOAT, RECEIVED CHECKLIST
FM BOAT MARINA, checked
SAFETY gear and got new
fire extinguisher
1655 - JK ARRIVE. SAFETY briefing
reviewed NAV charts.
Depart MARINA

1900 - Arrive Sag Harbor. Vessel secured. Breaker switch off and key removed.

1905 AM JK offsite to review tomorrow events

PM

29 MAY 08

0640 - AT VESSEL AT PVT DOCK. WHILE AT DOCK, WALKED PARKING LOT W OF BEACON ACROSS FM MGP SITE AND SAW SEVERAL Horseshoe Crab nests and one pair (♂♀) laying eggs. Substrate relatively sandy and slope minimal. Nests were located right next to a FW outfall pipe which was discharging at time spawning pair observed. No apparent behavioral impact observed.

CREW: Cpt. AL MOOJESKI
Jennifer Koch

WEATHER - SUNNY - 58°F, CALM AND CLEAR - A FINE DAY FOR SURVEYING.

JK NOTES:

OBJECTIVE: CONDUCT BIOLOGICAL SURVEY OF 200' DIAMETER AREA WHERE DISCHARGE PIPE END WOULD BE AND OF GREAT POND. ALSO DOWNLOAD DATA FROM SALINITY MONITORING POINT GP-051508. SURVEY TO BE CONDUCTED @ HIGH + LOW TIDE.

SAG HARBOR 29 May 08

HIGH TIDE @ 0658.

WIND S, 5 mpH

0715 HEALTH + SAFETY BRIEFING.

0718 LEAVE DOCK AREA @

0725 STOP BOAT, ANCHOR

depth 4.1'

USING GPS UNIT: etrex Vista

GPS coordinates:

N 41° 00.637'

W 072° 17.855'

W/ accuracy of 21'

0729 unvegetated, blue crab, and sand lances?? both very ~~euryhatian~~ euryhaline organisms. 50' out (or silversides)

270' W to North survey.

blue snale 8 paces every 5-10' or so.

100' unchanged, 200' (shore) unchanged.

0735 50' from shore horseshoe crab tracks

very sparse every now + then a patch of rock weed

2 cormorants

moved in 50' increments to shore 200'

Sag Harbor 29 May 08.

0740

300' W to N 200'

sparse, knobbed ~~shells~~ whelks (dead), rocks no more than 6" in diameter with rock weeds, desolate, sandy bottom. G

pos

Blue Fish ~24" long on starboard side of boat. ~~euryhatian~~ euryhaline

S → 150' unchanged

~100' from moring balls.

50' out E deeper, observe blue Fish, no eel grass, turn back due to dept.

0750 observe small ~~turn~~ tern (bird)

0755 pull anchor, head towards turns feeding.

0800 drop anchor 200' south of 1st

mostly sand, shell mix, gravel

80-90% sand.

rock weed.

0805 slipper shells

observe a number of birds feeding mostly ~~turns~~. least terns

Sag Harbor 29 MAY 08.

0805 observe 2 species of rock weed.
Harbor side of Great Pond.
WATER IS CALM.
CLOSE TO SHORE from where we are
turns into cobble beach itself
no conducive to horseshoe crab
- lady crab/calico crab observed
0810 ~~10'~~ below water line Cobbles
- 2 swans heading to Great Pond
quandrant
100' from shore, 1 meter from boat.
1 Trans ⊥ to shore line ~200'
out to better describe
substrate.
• female HS crab w/ wire weed,
slippershells
• Note all observations by A. Modyeski.
Layout via wading
~100 meter visual coverage.
1- 100% sand
2 - 95% sand, 5% shell, rock weed
3- 90% sand, 1% shell.
4/99% S, 1% SF
5- 98% S, 1% SF, 1% algae

Sag harbor 29 May 08

PHOTO LOG

photo 1 0740 due west osprey nest with 1 osprey observed.
photo 2 0800 200' S of point 1 discharge point
photo 3 0800 SAA
photo 4 rock weed 0805
photo 5 > female horseshoe crab.
photo 6
photo 7 - worm from anchor 830
w

6-100% S
7-100% S
8-100% S
9- 75% S, 25% brow Algae w/ SF
10- 99% S, 1% SF
11- 98% S, 2% SF w/ Rockweed.
12- 98% S, 2% SF w/ rock weed.
13- 99% S, 1% SF
14/15 100% S (2)
16 99% S, 1% SF
17 98% S, 2% SF + rock
18 96% S, 4% SF, brown algae + rock
19 95% S; 5% rock w/ attached rock weed

SAG HARBOR 29 May 08

20	95% S, 1% SF w/ RW
21	100% S
22	98% S, 2% SF rock algae
23 100% S	97% S, 3% SF, cobble, algae
24, 25	98% S, 2% SF
26	100% S
27	100% S
28	100% S
29	100% S
30	99% S, 1% SF
31	100% S
32	98% S, 2% bA w/ SF
33	100% S
34	100% S
35	96% S, 4% SF brown algae cobb
36	100% S
37	100% S
38	100% S
39	99% S, 1% SF, bA.
40	100% S
41	100% S
42	100% S
43	100% S
44	100% S

SAG HARBOR 29 May 08

45	100% S
46	100% S
47	100% S
48	100% S
49	100% S
50	100% S
51	100% S
52	100% S
53	100% S
54	100% S
55	99% S, 1% small SF, bA
56	100% S
57	99% S, 1% SF
58	98% S, 1% SF, 1% cobble
59	100% S
60	100% S
61	80% S, 20% rock cobble w/ RW algae
62	25% S, 75% cobble.
63	100% cobble.
64	100% cobble.
65	100% cobble.
66	100% cobble.

66 meters

Sag Harbor 5/9/08.

0830 - broad blanket
parallel to shore to see if
any change in substrate.
any change.

60 meters from shore due W
large grey house ~200'
from ~~furth~~ Northern most
moring ball. due west
of 1st osprey nest.

observe worm from anchor.
0830 pull anchor.
- observe ruddy turnstone (bird)
close to harbor ~~+ egret~~ (1).
0830 Tides dropped ~2' since start.
between 5' + 8' contours.
200' visual diameter
depth 3'
300' parallel from shore.
210° heading towards S.H. bridge
9' depth - deeper to moring balls.
100' from MB, 10' depth, 210°
Northern parameter.

SAG Harbor
boat base survey. May 28, 2008
0840 off location
0850 dock boat, bumper, 4 tie
offs, breaker off.
- worm - polychete that was
attached @ anchor previously
- green fleece and rock weed
observed previously.
- least tern (not turn) observed
- no shellfish observed.
0915-0930 Talk to Bo @ dock obtain
double kayak.
1005 off dock.
marina to boat : boat visual -
will conduct on way back.
To Great Pond, via boat, kayak.
Bridge m both side rip rap,
Sandy beach.
Low Tide to be @ 1210 pm.
1030 Inlet to great pond
main channel ~1' deep
tide flow mod to fast
thalweg channel : cobble mg
covered w/ karpidula

Sag Harbor May 29, 2008

other species observed:
green fleece
rock weed
red beard sponge
horse shoe crab
South bank of inlet
vegetation ~~with~~
North side
unvegetated, cobble, sand.
As walking in:
macro algae along southern shoreline.
substrate still mixed w/ sand, cobbles.
- egret
- 4 photos W, N, E, S of inlet.
- live mussels.
- fiddler crab burrows.
- marsh periwinkle.
- osprey nests to west and NE. (1 each).
one to the west is a perch - no nest observed
substrate changing as

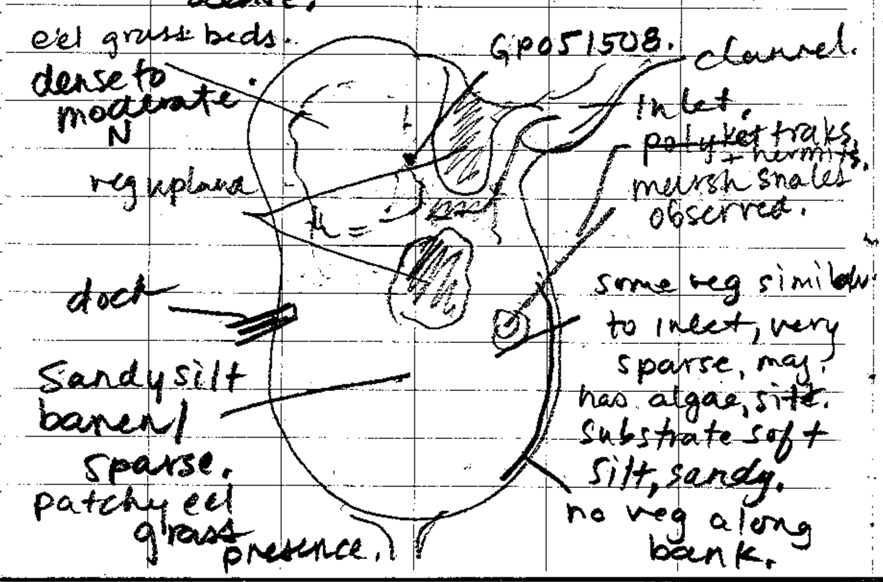
Sag Harbor May 29, 2008

moving in ward to pond to gravel and sand, shells, shell fragments.
- pile of bricks on SW bank.
salt marsh and open water out of channel.
photos 5 - S, W, NW, ~~N~~, E.
↳ sediment soft up to 6" + gravelly sand, some mud.
↳ photo 4 - worm - suspect saltwater leech.
walking more inland
↳ killi fish.
open pond area
↳ sediments soft in fallet
↳ 6" or less depth
↳ photos 4 S, W, N, E
1055 prep to download salinity dat from GP-081508.
- download S

Eastern
Eel grass present
Green shoots are coupl inches high, green.
3-4 blads, 3-4" high
coverage variable.
75% blades silted over.
density moving off of GP051508 to North bottom is 20-60% eel grass. heavily silted.
some eel grass mixed in with what looks like tangle weed.
further north eel grass observed sparse, but blades taller. ~60' North of GP051508
↳ patchy beds maybe of 5 m - 10 m.
substrate changing
water depth pretty shallow
eel grass more sparse.
everything sparse substrate ~1' deep.
100' off of GP051508
abundant tangle weed and

some blades of eel grass
60% eel grass, 40% tangle weed
eel grass covered with silt and algae
some new shoots observed
blade length 6-8"
↳ submerged vegetation, silt covered.
bottom vegetated.
1125 E-W Transect visual
mixed veg of seaweed, vascular plants
point: gray houses to south + North
dock to west bare veg. spot observed.
substrate sand silt, mud.
- hermit crab near GP051508.
Winds - from the west.
- observe couple shoots of eelgrass.
1000' E of harbor due W
50/50 eel grass + tangle weed.
blades are longer ~1'
bottom veg variable
eggs attached to ~~grass~~ eel grass

- mixed, heavily vegetated in spots
  bottom 100% covered.
  depth of water ~1 1/2'
continue West.
  Some green, some brown blades.
~1000 from West edge of pond.
  ↳ little skat.
  not as dense, blade length
  not tal, eel grass not as
  dominent, More dominent is
  suspect ruppia - not as dense
  taller eel grass absent, sand
  evident, tangle weed not as
  dense.



SW quadrant
  ↳ sparse veg, not much of
  eel grass largest pach seen
  observed ~6" diameter
15' { closer to shore tangle weed, sand,
  from shore in on SW bank.
heading East along south shore
  have not observed bay scallops
  sparitana along shores
- no vegetation closer to channel.
- hermit crab and dogwell tracks
  observed.
1155 end survey of GP.
1200 low tide habitat
  assessment off shore.
  inlet area to North 200'
  wading observations.
photos 4 - N, E, S, W
  representative substrate
  no veg, 70% sand, 25%, ~~rocks~~,
  pebbles, 5% shell fragments.
  walk North 100' parallel to shore
~100' from inlet, 100' from shore
  representative all around

substrate is sand some shell fragments.
sparse ~~rock~~ green fleece
photos 4 - N, E, S, W represent
atire.
~~Walk North~~
~ 150' from inlet 100' from shore.
observe 1 grass plant 3 blades
length ~ 1' (photo facing North
walk North
unchange observations to
~ 50' past eastern osprey nest/
earsten end of great pond.
Transect E-N
~ 100' to ~50' East to shore of great
pond harbor side unchange as
N-S transect.
~ 50' substrate sand, cobbles, some
shell fragments. ~40% green
fleece, rock weed. ~~sam~~
unchange to ~25' In.
~25' - ~ shore is cobbles prominent
with little sand abundant
algae ~70%.
~ ~~sho~~ water/shore line ~35' in

from high tide - note adjusted
distances for this
photos 4 of cost N, E, S, W
- along edge of water snails
(photo facing N)
- algae photo facing east @
shore water line.
- @ furthest point away from
shore/water line 3' depth
unable to go further do to
depth
EW transect from water
edge to Northern most mooring
SHYV43 unchanged
walked from moring south
inlet
1225 all on board
1315 at dock, unload
~~gust~~ returning kayak sag
harbor cove boat dock ~ 10'
from dock, ~~prop~~ self-shearing
prop, lost 1 blade, docked,
raised unit, inspect damage,
1 blade missing relatively easy

fix, called boat marina to com
on site and fix.

- photos 3, at outfall, N, NW
  pictures of outfall pipe with
  water entering harbor, low tide,
  horseshoe nests observed and
  horseshoe crabs, spawning observed.
  ↳ contact S. Pandya (EASR) and
  provide update
- the horseshoe crabs were observed
  in the morning prior to the high
  tide departure
- pictures of broken prop blade

1400 TALKED w/ MARINA & with
YACHT CLUB ABOUT prop blade.
Blades cost @ $30 a piece.
for composite. Rental uses
cheap composites to protect
blades

1530 Went back to YACHT CLUB TO
check status of vessel. Marina

has come to evaluate. Will
change at prop blades and
take boat back to Rockland
tomorrow.

1630 Went back to YACHT Club
and thanked Dockmaster
for all help.

END

Attachment C
Site Photographs

Photo 1: High tide facing west from proposed pipeline discharge area showing the shoreline that separates Sag Harbor from Great Pond. An occupied osprey nest is in the foreground.

Photo 2: Female horseshoe crab that was encountered during the low tide quadrat survey and released. The low tide quadrat survey was performed perpendicular to the eastern shoreline of Sag Harbor (Figure 1). A small boat dock surrounded by a few larger rocks is in the background.

Photo 3: Representative seaweeds observed within the Sag Harbor site included rockweed and green fleece. Spatial distribution along the substrate was sparse with the majority of sediment consisting of sand.

Photo 4: Eastern shoreline adjacent to proposed discharge area in Sag Harbor Bay at low tide facing north from inlet entrance to Great Pond. Substrate was mostly cobble and gravel and lacked vegetation.

Photo 5: Eastern shoreline of Sag Harbor Bay adjacent to proposed discharge area at Low tide facing south towards inlet to Great Pond. A mooring area is located to the left of the photograph. Substrate remains predominantly cobble/rock, gravel up to 50 feet from high water line.

Photo 6: Representative barren, sandy substrate located seaward (west) of cobble shoreline to the outer limits of the study area. Substrate lacked vegetation and structural habitat.

Photo 7: Another representative picture of substrate adjacent to proposed discharge area visible at low tide. Majority of substrate consisted of sand with the occasional small rock or shell. No "live" shellfish were observed.

Photo 8: Low tide looking north towards the mooring area. Shoreline is sandy beach with maritime forest.


Photo 9: Low tide looking east from northern area of survey showing moored vessels in deeper water and the breakwater located along the western edge of Sag Harbor Bay. Substrate consisted of cobble close to shoreline and then was mainly sand.


Photo 10: Southwest side of inlet to Great Pond during an ebb tide showing ribbed mussels nestled amidst *Spartina* and a substrate of sand, cobble, and gravel.

Photo 11: Closer view of ribbed mussels on southwest side of inlet to Great Pond.

Photo 11: Unused osprey nest located on the southern shore of Great Pond. Photo was taken at low tide form the inlet facing west and shows representative shoreline. Northern shoreline was more developed.

Photo 12: A rock encrusted with sponge and various seaweeds and macroalgae located at the entrance of Great Pond. Substrate coarse and consisted of cobble, gravel, and shell fragments.

Photo 13: An exposed gravel deposition that bisects the inlet to Great Pond. Photograph was taken at low tide facing north from main channel of inlet. Finer sediment deposits were observed beyond the gravel bar.

Photo 14: The Great Pond inlet at low tide facing south from the depositional gravel/shell bar located at inner most point of inlet. Majority of substrate was cobble with finer sediment located outside the thalweg. Dominant shellfish was slipper shell.

Photo 15: Southeast bank of Great Pond at low tide showing depositional bar. Substrate composed of sand with a silty layer. Submerged vegetation (eel grass) was evident but sparse and many of the blades were coated with epiphytic brown algae.

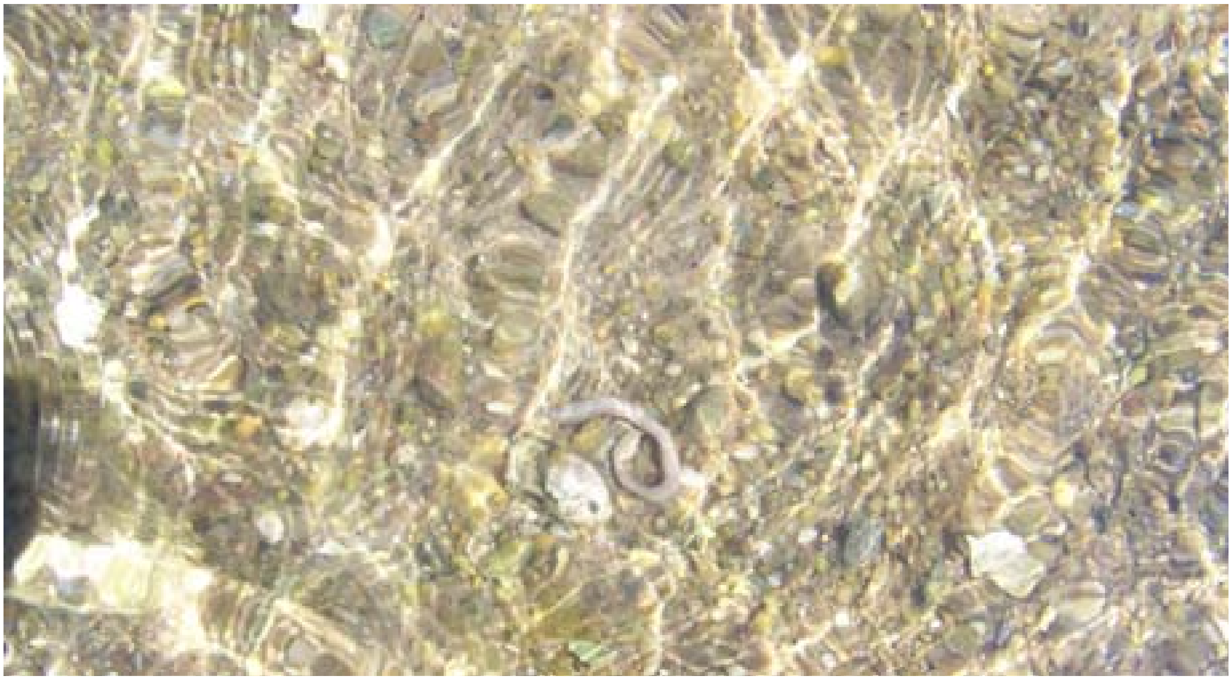


Photo 16: Representative substrate within the thalweg of the inlet Great Pond observed at low tide. An unknown polychaete is located in the center of the photograph.

Photo 17: Great Pond facing west form a central location within the waterbody. Majority of the substrate consisted of brown algae, red algae, widgeon grass, and some eelgrass. Seaweeds and vegetation were coated with silt and epiphytic algae.

Photo 18: Backside of beach located within Sag harbor Bay and along the western side of the inlet to Great Pond at low tide. The occupied osprey nest is evident to the northeast.

Appendix K

Odor Vapor and Dust Control Plan

Prepared for:
KeySpan Energy Delivery – Long Island
175 East Old Country Road, Hicksville, NY 11801

Odor, Vapor, and Dust Management Plan

Former Manufactured Gas Plant Site
Sag Harbor, New York
Draft

The RETEC Group, Inc.
December 2007
Project No.: 01765-066

Merged with ENSR in 2007

Prepared for:
KeySpan Energy Delivery – Long Island
175 East Old Country Road, Hicksville, NY 1180

Odor, Vapor, and Dust Management Plan

Former Manufactured Gas Plant Site
Sag Harbor, New York

Prepared By: Darin Payne, Environmental Scientist

Reviewed By: Shail Pandya, Project Engineer

The RETEC Group, Inc.
December 2007
Project No.: 01765-066

Merged with ENSR in 2007

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Executive Summary

[Click here to begin text]

1.0 Introduction

This Odor, Vapor, and Dust Management Plan (Plan) has been prepared to provide a summary of potential impact mitigation options that could be implemented to control, reduce and minimize the effects of potential odor, vapor, and dust resulting from the remedial activities at the former KeySpan Energy Delivery – Long Island (KeySpan) Manufactured Gas Plant (MGP) site located in Sag Harbor, New York. The remedial activities will be implemented according to the New York State Department of Environmental Conservation (NYSDEC) Record of Document (ROD) to address the residuals left behind from the former MGP operations. The implementation of the Plan will control fugitive emissions ensuring that the community and workers are not exposed to constituents of interest (COIs) at levels greater than federal, state, and local health-based guidelines.

The information presented in the Plan is designed to provide the construction management team with a summary of typical control options and guidance in their implementation. As such, the Plan identifies construction activities that might be potential sources of fugitive emissions, potential distinctive impacts of odor or dust, and the corresponding measures. Additionally, the possible mitigation measures have been ranked into three control levels, according to the degree to which exceedance occurs and the type of offending construction activity.

The potential sources of fugitive emissions are listed in Section 2 while the typical control options are discussed in Section 3. A summary of potential receptors is provided in Section 4. This FEMP does not preclude the use of other mitigation technologies, or techniques designated in other design documents.

2.0 Potential sources of fugitive emissions

The following section details the potential sources of odor, vapor, and dust resulting from the implementation of remedial activities at the site. Fugitive emissions can be generated from a variety of activities including the remediation processes themselves and/or from the temporary staging of materials for characterization, consolidation, and scheduling for transportation.

Due to the COIs associated with the remedial activities at former MGP sites; fugitive emissions can take the form of volatile organic compounds (VOC's), odor, and/or dust. Dust can be entrained with low levels of high molecular weight constituents, while VOC's can volatilize into ambient air. Odor emissions will result from the atmospheric exposure of impacted media. Impacts will be present in soils and may be present in excavation groundwater. The potential for odor generation from groundwater is less than that from solids. Therefore, odor generation will be generally limited to activities involving excavation, soil mix wall installation, and stockpiling, loading, and hauling impacted soils. The constituent concentrations associated with these odors are typically less then the levels that potentially pose a health risk as the odor threshold of COI's are typically less than health based action levels.

2.1 Remediation processes

Remedial activities can generate fugitive emissions through the disturbance of impacted media, exposure of impacted areas, and/or the transfer/transport of materials. The following sections provide an overview of these processes and the associated emissions.

2.1.1 Excavation

Excavation activities will be performed in the majority of the site. Excavated soils will be directly loaded into trucks when practicable or they may be stockpiled until they can be transported to the facility. Potential sources of emissions are active excavations, disturbed soil surfaces, and stockpiles of excavated material. The majority of the excavation will be performed beneath a Temporary Fabric Structure (TFS) which is detailed in the next section. The TFS provides a physical barrier for the minimization of vapor, odor, and dust emissions.

Past project experience suggests that fugitive dust from excavation activities will not generally pose a significant problem and that the intensity of VOC/odor emissions will be highly variable, with the greatest impact occurring when impacted areas are disturbed/exposed. In areas that cannot be covered by the TFS, an odor suppressant foam (or similar agent) will be utilized as described in the next section.

2.1.2 Soil Mix Wall Installation

A soil mix wall will be installed around the perimeter of the excavation as a part of the remedial activities. The process involves injecting a grout mix into the subsurface in overlapping columns by a mixing auger that will be 3 to 5 feet in diameter. Potential emissions include cement or bentonite dust (not MGP related) generated from the operation of the grout plant.

The agitation of media caused by mixing soil can also be a potential source of VOC/odor emissions. The liquid nature of the grout will generally suppress dust emissions. The surface of the completed columns may also provide a potential source for VOC/odor emissions because the curing process is exothermic in nature. Although the mixed columns typically solidify within a period of 24 hours, the curing process continues beyond this point and the solidified material has the potential to be a continuing source of odors.

2.1.3 Transfer and loading of material

The principal source of potential emissions associated with this activity will be the stockpiling or manual loading of impacted soils for disposal. The delivery/transfer of solidification reagents (bulk cement, bentonite) can also provide short-term, intense periods of dust emissions. Additional consolidation or size reduction of material should be avoided to minimize the source of emissions.

2.1.4 Water Treatment

Construction water (including groundwater, surface run-off, and decontamination water) generated during dewatering activities of the remediation process will require temporary storage, treatment, and disposal. Odors and vapors might be emitted during the transfer, storage, and treatment of impacted water. No fugitive emissions are expected from water handling activities following treatment. Most of the water treatment activity is anticipated to be performed under a TFS,

2.2 Storage operations

The remediation processes of the site will require the temporary storage of impacted material, soil and grout mixture while curing, and material designated for off-site disposal. Although on-site storage activities do not involve the active disturbance of impacted material, they may be significant as a potential passive source of emissions for an extended period of time (days or weeks).

2.2.1 Spoils

The addition of grout to the subsurface will cause the volume of the soil to increase by approximately 25 percent. The extra material will be present at the ground surface as a mixture of grout and soil and is commonly referred to as “swell” or “spoils”. The spoils will be removed from the processing area to facilitate the movement of the soil mix rig. The spoils will be moved to a temporary area to partially cure to the consistency of granular soil. The material will then be transferred to a designated stockpile for characterization analysis, if necessary, and off-site transportation and disposal. Movement of this material is commonly accomplished by an excavator bucket and can present a source of potential VOC/odor emissions.

2.2.2 Stockpiles

Contingent upon work activities and rate of production, it will be necessary to stockpile impacted material for consolidation, characterization, or scheduling of transport. This material has the potential to be a significant emission source, and will be limited outside of the Temporary Fabric Structure. To the extent practicable, the majority of the soils will be direct loaded into trucks for off-site disposal.

3.0 Site controls

This section describes site controls that will be implemented during the remedial activities for the minimization and control of fugitive emissions and to ensure that ambient concentrations of COI's remain below federal, state, and local health based guidelines. The mitigation options have been classified into levels to be implemented based on site-specific action levels delineated in the *Community Air Monitoring Plan,* ENSR, December 2007. The actual mitigation measures will be determined in the field by the on-site Construction Manager, who may also choose to implement mitigation measures to avoid reaching the site-specific action levels.

A three-tiered set of controls are proposed for this Plan:

- Level I - Built into the design of the Plan and includes proactive measures to minimize the effect of fugitive emissions. Level 1 includes air monitoring to ensure that levels of VOC's and dust are under site-specific action levels.
- Level II – Procedures that are implemented in response to specific increases in fugitive emissions, but are not likely to have a significant impact in the schedule of site activities.
- Level III – More aggressive procedures, also initiated in response to specific increases in fugitive emissions that are likely to have a more significant impact on production schedule and site activities.

The Construction Manager is required to progressively implement these options until emission sources are controlled and ambient concentrations no longer have the potential to pose a health risk. A summary of the proposed controls for processes and storage activities are provided in Tables 3-1.

3.1 Level 1 controls

Level 1 Controls are built into the design of the remedial activities and involve physical controls, site layout, and scheduling.

3.1.1 Physical controls

The simplest form of physical control is the use of visual barrier cloth on the site perimeter fencing. The resistance caused by the visual barrier will elevate the discharge point of emissions leaving the site to the top of the perimeter fence and will promote better mixing and dispersion. Another form of simple physical control is the required use of tarps on trucks that move or transport impacted material.

All stockpiles of impacted material should be covered, if left inactive for a period of more than 2 hours.

All trucks used for off-site transport should have tarps in place to cover impacted material. On-site haul routes should be routinely wetted to control dust using a hose, sprinkler, or dedicated water truck.

Temporary fabric structure

The most noticeable control used will be the Temporary Fabric Structure (TFS). A TFS is an aluminum framed structure with a polyethylene fabric skin, much resembling a tent. The TFS will be placed over areas of the site where practicable during excavation. The TFS will contain VOCs, dust, and odor during excavation of impacted materials. The air contained within the TFS is removed from the structure with 20,000 cubic feet per meter blowers and rigid ductwork and treated through activated carbon vessels prior to discharge to the atmosphere. The discharge from the carbon beds will be monitored daily for VOCs to confirm that the treatment system is working properly. The exterior of the TFS will be monitored for odor as the work is performed. The TFS may be moved from one location of the site to another on the site as the excavation and subsequent backfill operation progresses. Some areas may require excavation where a TFS cannot be constructed due to site constraints, in those areas odor suppressant foam (or similar) will be aggressively used to mitigate odor and vapors as detailed below.

3.1.2 Site layout

The dispersion of fugitive emissions is controlled by meteorological conditions and their impact generally decreases with distance from the source. If possible, transfer/storage areas will be placed either downwind or significantly upwind of off-site receptors. The batch plant for soil mix wall will be located in the middle of the site as to reduce the potential for cement and bentonite dust to reach the perimeter fence line. Additionally, the batch plant may be covered with a tent-like structure (similar to a TFS) to contain dust, if deemed necessary.

The height of the stockpiles should be lower than the top of the perimeter fencing (8 feet) to utilize the benefit of the barrier cloth. If stockpiles must be staged near the fence line (within 100 feet), they should be less than 8-feet in height.

3.1.3 Scheduling

Every effort should be made to minimize the amount of time that impacted material is stored on-site. Appropriate strategies involve the in-place precharacterization of soils to be excavated and the sampling of spoils as soon as they are cured. Prior to mobilization, a full site pre-characterization investigation was performed in summer 2007 including sampling and analysis of soils, and approval from the facility for disposal. Therefore stockpiling for sampling will be limited to areas that were not previously accessible or in the case of the spoils that were not previously generated. This will allow for direct loading where practicable and the minimization of stockpiling. Efficient scheduling/coordination of operations can also limit the impact of active emission sources. Close coordination of excavation and solidification activities can decrease the surface area of disturbed material, thereby reducing the size of the emission source. A smaller source area can facilitate the implementation of additional controls, if required.

3.2 Level II controls

Air monitoring will routinely be performed at the fence line of the site as delineated in the Community Air Monitoring Plan during all work activities. The results will be compared to site-specific action levels for VOC's and total particulates. These presumptive action levels are provided in Table 3-1.

If the action levels are exceeded, additional monitoring will be conducted to confirm the result. Level II controls will be enacted if the exceedance is confirmed. The Construction Manager must then work through the applicable list of site controls until the fence line monitoring results for all parameters are determined to be less that their associated action levels. Specific Level II controls are discussed below.

3.2.1 Suppressing agents

Several agents that can be applied over emissions sources have been determined to be effective in controlling emissions. These include odor suppressant foam for VOC mitigation and water spray for dust suppression.

The following suppressing agents have been identified for use but additional agents may be used or substituted for other proven agents such as odex, hydromulch, or ecosorb.

Odor suppressant foam

Odor suppressant foam has been successfully utilized on similar sites. It is presented in this plan as an option.

Odor suppressant foam can provide immediate, localized control of VOC and odor emissions. The foam is created by the injection of air into a foam concentrate/water mixture using a Pneumatic Foam Unit. The foam is applied via a hose to cover source areas to a depth of 3 to 6 inches. Foam (Rusmar AC-600 or equivalent) is a short term remedy and can be actively used to control VOC and odor emissions from active excavations/stockpiles, and during the loading of trucks. It is shipped as a concentrate and diluted with water at the site. Under normal conditions, this foam can last for several hours. However, it has been observed to degrade quickly in direct sunlight or precipitation so it must be applied liberally and frequently to all areas that require odor control.

Information regarding the foam and application units is provided in Appendix A.

Water spray

A spray of water can be used to minimize the amount of dust created. A water hose is effective for controlling dust over a small area, while lawn sprinklers or a dedicated water truck may be more efficient for extended control of large areas or on-site haul routes.

3.2.2 Tarps

Tarps can provide effective control for source areas that are likely to be inactive for extended periods of time. To be effective, the size of the source area should be controlled such that it can be covered using a single tarp. Rolls of 6-mil polyethylene will be used to cover inactive stockpiles outside of the TFS. Tarps will also be used for covering exposed soils loaded into trucks. All trucks will be lined with 6 mil polyethylene sheeting, the liners will be large enough to overlap and fully cover the top of the load. Additional automatic mesh tarps will be used to secure the liners.

3.3 Level III controls

Level III controls are to be implemented when Level II controls have been exhausted and ambient concentrations of emissions continue to exceed the site-specific action levels. Each of the control options listed in this subsection has the potential to significantly affect the schedule/production rate of site activities. These delays may be required periodically to ensure that acceptable levels of fugitive emissions are maintained, and are preferable to a complete work cessation to control an emission event.

3.3.1 Production/schedule

It may be necessary to reduce the excavation rate to reduce the surface area of disturbed media or slow the generation rate of stockpiles. These activities would result in smaller source areas that could be more effectively controlled using Level II techniques. These controls may be required outside of the TFS but are not likely for operations beneath the TFS.

3.3.2 Meteorological conditions

It may be necessary to limit certain activities to those periods when preferred meteorological conditions exist, such as wind direction or low temperatures are present. Most of the work for the project will be performed in the winter months, therefore reducing the potential for volatilization.

3.3.3 Relocation of activities

Another option is cease work and move the remedial activities to lesser-impacted areas until adequate control measures can be implemented or more favorable meteorological conditions return.

Also, it may be beneficial to temporarily relocate material loading and transfer activity areas to other areas of the site or within subsurface excavations to utilize the natural dispersion of emissions in the atmosphere, or shelter from the wind.

4.0 Off-Site receptors

The use of site controls will ensure that there is not a significant risk associated with fugitive emissions. The remedial activities will be likely to generate distinctive odors similar to asphalt sealer that is detectable within several hundred meters of the site, and may be bothersome to sensitive individuals.

The former MGP site is bordered by Long Island Ave and Bridge Street, and consists of approximately 1.3 acres. The primary potential receptors are as follows:

- United States Postal Service owned property to the East
- Condominium Complexes to the North and Southwest
- Commercial establishments to the South

The potential receptor locations are residential and commercial in nature (office, storage, retail, manufacturing, condominiums) and will have managers/supervisors that can serve as useful points of contact.

Theses contacts will also be provided with copies of the fact sheet including:

- Schedule of remediation
- Nature of contaminant
- Potential for odors/evaluation of risk
- Site contact information

Tables

Table 3-1: Levels and Response Actions
OVD Control Plan
Former MGP Site
Sag Harbor, New York

Site Condition	Response Action
Operational Level: Normal or ambient air-conditions where all target concentrations are less than the Alert Limits (75 percent of the Action Limit)	• Normal Site Operations – No Response Action Required
Alert Level: Concentration of at least one target is equal to or greater than Alert Limit (75 percent of the Action Limit), but less than the Action Limit	• Establish trend of data and determine if evaluation/wait period is warranted • Temporarily stop work • Temporarily relocate work to an area with potentially lower emission levels • Apply water to area of activity or haul roads to minimize dust levels • Reschedule work activities • Cover all or part of the excavation area • Apply VOC emission suppressant foam over open excavation areas • Slow the pace of construction activities • Change construction process or equipment that minimize air emissions
Action Level: of at least one target is equal to or greater than the Action Limit	• Assess work activity modifications • Cease construction activities • Re-evaluate air monitoring work plan
Notes: The bulleted response actions specified under each site condition can be implemented in any order that is most appropriate under the existing site conditions.	

Target Compounds	Alert Limit
TVOCs (15-minute average concentration)*	3.7 ppm greater than background**
Respirable Particulate Matter (RPM_{10}) (15-min avg)*	100 µg/m^3 greater than background**

Target Compounds	Action Limit
TVOCs (15-minute average concentration)	5 ppm greater than background**
TVOCs (15 minute average concentration)	25 ppm greater than background**
Respirable Particulate Matter (RPM_{10}) (15-min conc)	150 µg/m^3 greater than background**
Odor (n-butanol scale) (15-minute sustained)	3 (Verified related to construction)
Odor (nuisance)	Public complaints that are verified to be related to construction
Hydrogen cyanide	1 ppmv

ppmv - parts per million volume

µg/m^3 - micrograms per meter cubed

* 15-minute average concentrations updated every 1 minute

** Background is defined as the current upwind 15-minute average concentration.

Appendix A

Material Safety Data Sheet, AC-645
Material Safety Data Sheet, AC-900 Series
Equipment (PFUs)

PRODUCT DATA SHEET

LONG DURATION FOAM AC-645

GENERAL DESCRIPTION

AC-645 Long Duration Foam is a patented product which produces a thick, long-lasting, viscous foam barrier for immediate control of dust, odors and volatile organic compounds (VOCs). AC-645 is designed for use with Rusmar Pneumatic Foam Units.

AC-645 foam is recognized by the Environmental Protection Agency and the U.S. Army Corps of Engineers as providing superior emission control for a period up to 17 hours. AC-645 has been specified for use at Superfund and other hazardous waste sites across the United States and Canada.

FEATURES

- Biodegradable
- Will not add to treatment costs
- No ambient temperature limitations
- Easy to use
- More effective than tarps
- Non-reactive
- Non-hazardous
- Safe for workers and the environment
- Requires only water dilution
- No clean up necessary
- Non-combustible
- Covers any contamination source

APPLICATIONS

The primary application for AC-645 is control of odors, VOCs and dust during active excavation and for overnight coverage of contaminated soils at hazardous waste sites. AC-645 can also be applied on top of liquid surfaces.

SPECIAL ODOR CONTROL PROBLEMS

The remediation of hazardous waste sites often includes excavation of soil contaminated with odorous compounds. AC-645 has little or no odor itself, although a pleasant wintergreen or vanilla scent can be added. It forms a barrier between contaminants and the atmosphere and can be applied during active excavation to provide an immediate and effective barrier to minimize odors. It is completely biodegradable and poses no threat to workers, neighboring residents or ground water. AC-645 will not add to soil volume or treatment costs.

RUSMAR INCORPORATED • 216 Garfield Avenue • West Chester, PA 19380
Toll Free: 1.800.SEE.FOAM • P: 610.436.4314 • F: 610.436.8436 • www.rusmarinc.com

PRODUCT DATA SHEET

LONG DURATION FOAM AC-645

AC-645 can also be applied on top of trucks for emission control during transport of materials such as contaminated soils or sewage sludge. Ammonia tests performed on trucks containing sewage sludge resulted in a drop of concentration levels from 170 ppm prior to foaming down to 6 ppm after coverage with AC-645.

- Minimizes worker exposure
- Maintains fence-line odor and VOC emission limits
- Works on lagoon and pond closures
- Can be applied to near vertical or liquid surfaces

FUGITIVE DUST

At hazardous waste sites, fugitive dust can present a health hazard. AC-645 can be applied on top of the dusty material to prevent any wind-borne emissions. There is no need to mobilize equipment to immediately cover with soil or tarps. The Pneumatic Foam Unit can be filled and placed at the site to be used at a moment's notice.

EMERGENCY SPILL CLEAN UP

In emergency spills, odor and VOC control is often difficult because of the terrain and accident conditions. AC-645 Long Duration Foam can be applied to any shaped object, as well as steep slopes, water, mud, snow and ice. It is non-flammable and non-reactive - difficult spill problems can be accommodated.

METHOD OF APPLICATION

AC-645 Long Duration Foam is supplied in either 450 pound (55 gal.) drums or by bulk load (approximately 46,000 pounds). Bulk shipments can be stored outside in a Rusmar Bulk Storage-Dilution System. The Bulk Storage and Dilution system is comprised of a 7000 gallon heated and stirred chemical storage tank and a microprocessor to accurately dilute and transfer the chemical. AC-645 is designed to be applied with a Rusmar Pneumatic Foam Unit. The Pneumatic Foam Units are available in a variety of sizes to accommodate a range of site conditions and application needs.

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MATERIAL SAFETY DATA SHEET

LONG DURATION FOAM AC-645

SECTION I: GENERAL INFORMATION

- Manufacturer's Name: RUSMAR INCORPORATED
- Manufacturer's Address: 216 Garfield Avenue • West Chester, PA 19380
- Manufacturer's Phone No.: 610-436-4314
- Chemical Family: Aqueous anionic surfactant mixture
- Trade Name: RUSMAR AC-645

SECTION II: HAZARDOUS INGREDIENTS

- Paints, Preservatives, and Solvents - None
- Alloys and Metallic Coatings - None
- Hazardous Mixtures and Other Materials - None

SECTION III: PHYSICAL DATA

- Boiling Point: 100° C
- Vapor Pressure: 25mm Hg at 25° C
- Vapor Density (Air = 1): N/A
- Water Solubility: Complete
- Appearance/Odor: Translucent, white, milk-like, odorless, viscous liquid
- Specific Gravity: 1.01 to 1.06
- % Volatile, By Volume: None
- Evaporation Rate: N/A

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

- Flash Point (Method): Nonflammable
- Flammable Limits: N/A
- Extinguishing Media: N/A
- Special Fire Fighting Procedures: None
- Unusual Fire and/or Explosion Hazards: None

SECTION V: HEALTH HAZARD DATA

- Threshold Limit Value: Not Determined
- Effects of Overexposure: This material is not expected to present an inhalation or ingestion hazard. It may cause an eye or skin irritation upon direct contact.
- Emergency and First Aid Procedures: Wash thoroughly with clean water

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RUSMAR FOAM TECHNOLOGY

MATERIAL SAFETY DATA SHEET

LONG DURATION FOAM AC-645

SECTION VI: REACTIVITY DATA

- Material is stable
- No material incompatibility
- Hazardous Decomposition Products: Low levels of sulfur oxides on exposure to high temperatures (concentrate). Foam is non-combustible.
- Polymerization will not occur

SECTION VII: SPILL OR LEAK PROCEDURES

- Steps to be taken in case material is released or spilled: If spilled indoors on a hard surface, the spill area may be slippery and should be thoroughly washed with water. Contain spill and absorb material with dirt or other appropriate absorbent.
- Waste Disposal Method: This material is completely biodegradable and can be disposed of in a sanitary landfill according to local regulations.

SECTION VIII: SPECIAL PROTECTION INFORMATION

- Respiratory Protection: None required for normal operations
- Ventilation: No special requirements
- Protective Gloves: Not required, but recommended
- Eye Protection: Not required, but recommended
- Other Protective Equipment: None

SECTION IX: SPECIAL PRECAUTIONS

- Storing/Handling Precautions: Avoid excessive heat. Material will freeze, but thawing will not cause changes in the product.
- Other Precautions: None

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PRODUCT DATA SHEET

LONG DURATION FOAM AC-900 SERIES

GENERAL DESCRIPTION

The AC-900 Series Long Duration Foam products produce an impermeable, flexible membrane that seals a surface to prevent emissions. AC-900 Series foam products utilize foam as a distribution method for latex. After the foam has been applied, the air bubbles begin to collapse and the latex coagulates to form a continuous flexible membrane that adheres to the substrate. AC-900 Series products are designed for use with Rusmar Pneumatic Foam Units.

AC-900 Series foams are recognized by the Environmental Protection Agency and the U.S. Army Corps of Engineers as providing superior emission control for periods up to 6 months. AC-900 Series foams have been specified for use at Superfund and other hazardous waste sites across the United States and Canada.

FEATURES

- Adheres to vertical and irregular surfaces
- Completely controls odors & VOCs
- Prevents erosion
- Easy to use, no mixing necessary
- Available in black, red, green or brown
- Non-hazardous
- Controls dusting
- Repels water
- No temperature limitations
- More effective than tarps

APPLICATIONS

AC-900 Series foams are the technology of choice when conditions demand superior coverage for periods up to 6 months. Some of the more common uses are:

ODOR AND VOC CONTROL

As a medium for controlling odors and VOCs, AC-900 Series has proven to be very effective with diverse applications.

- Can be left in place or disposed of with soil - will not interfere with thermal or bioremediation process
- Extended odor & VOC control of open excavations or exposed trash
- Extended odor & VOC control of stockpiled soils or debris
- Special odor control problems, such as sewage sludge
- Baled trash cover – the membrane seals the surface completely

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PRODUCT DATA SHEET

LONG DURATION FOAM AC-900 SERIES

FUGITIVE DUST

Exposed soil can often become a dust problem in windy locations, presenting a potential health hazard. Hazardous waste sites, receiving periodic shipments of dusty materials, can prevent windborne dust by immediately applying AC-900 Series foam.

- No need to mobilize equipment to immediately cover with soil or tarps. The Pneumatic Foam Unit can be filled and placed at the site to be used at a moment's notice.
- Extended dust control of stockpiled soils or debris

EROSION CONTROL

Graded areas can be covered with AC-900 Series Membrane reducing erosion damage caused by rain, melting snow or ice and wind.

- On outside slopes of the landfill – prevents trash from being exposed
- On landfill caps - prevents erosion before growth of new vegetation
- Stockpiles

SEALING HIGH PERCOLATION SOILS

Sand and other high percolation soils do not effectively repel rain water or melting snow and ice. Covering areas with AC-900 Series foam dramatically reduces soil permeability.

- Improved run-off from inside surfaces of the landfill
- Reduced leachate generation

WASTE TRANSPORTATION

Trucks or railcars transporting trash, odorous or dusty materials can be quickly covered with AC-900 Series foam to form a complete barrier between emissions and the atmosphere.

- No wind blown losses
- Produces a better visual appearance

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METHOD OF APPLICATION

AC-900 Series Long Duration Foam products are supplied in either 450 pound (55 gal.) drums or by bulk load (approximately 46,000 pounds). Bulk shipments can be stored outside in a Rusmar Bulk Storage-Dilution System. The Bulk Storage and Dilution system is comprised of a 7000 gallon heated and stirred chemical storage tank and a microprocessor to accurately transfer the chemical.

AC-900 Series products are designed to be applied with a Rusmar Pneumatic Foam Unit. The Pneumatic Foam Units are available in a variety of sizes to accommodate a range of site conditions and application needs.

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MATERIAL SAFETY DATA SHEET

LONG DURATION FOAM AC-900 SERIES

SECTION I: GENERAL INFORMATION

- Manufacturer's Name: RUSMAR INCORPORATED
- Manufacturer's Address: 216 Garfield Avenue • West Chester, PA 19380
- Manufacturer's Phone No.: 610-436-4314
- Chemical Family: Aqueous anionic surfactant, polymer latex mixture
- Trade Name: RUSMAR AC-900

SECTION II: HAZARDOUS INGREDIENTS

- Paints, Preservatives, and Solvents - None
- Alloys and Metallic Coatings - None
- Hazardous Mixtures and Other Materials - None

SECTION III: PHYSICAL DATA

- Boiling Point: 100° C
- Vapor Pressure: 25mm Hg at 25° C
- Vapor Density (Air = 1): N/A
- Water Solubility: Complete
- Appearance/Odor: Opaque, gray, viscous liquid
- Specific Gravity: 1.01 to 1.06
- % Volatile, By Volume: None
- Evaporation Rate: N/A

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

- Flash Point (Method): Nonflammable
- Flammable Limits: N/A
- Extinguishing Media: N/A
- Special Fire Fighting Procedures: None
- Unusual Fire and/or Explosion Hazards: None

SECTION V: HEALTH HAZARD DATA

- Threshold Limit Value: Not Determined
- Effects of Overexposure: This material is not expected to present an inhalation or ingestion hazard. It may cause an eye or skin irritation upon direct contact.
- Emergency and First Aid Procedures: Wash thoroughly with clean water

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SECTION VI: REACTIVITY DATA

- Stability: Material is stable. This material will likely coagulate if frozen.
- Incompatibility: Addition of other materials may cause coagulation
- Hazardous Decomposition Products: Low levels of sulfur oxides on combustion and dense, black smoke
- Polymerization will not occur

SECTION VII: SPILL OR LEAK PROCEDURES

- Steps to be taken in case material is released or spilled: If spilled indoors on a hard surface, the spill area may be slippery and should be thoroughly washed with water. Contain spill and absorb material with dirt of other appropriate absorbent.
- Waste Disposal Method: This material has only a modest BOD and can be deposited in sewers. However, it should be flushed with copious amounts of water. The material can be disposed of in approved landfill; dried waste may be incinerated.

SECTION VIII: SPECIAL PROTECTION INFORMATION

- Respiratory Protection: None required for normal operations
- Ventilation: No special requirements
- Protective Gloves: Not required, but recommended
- Eye Protection: Not required, but recommended
- Other Protective Equipment: None

SECTION IX: SPECIAL PRECAUTIONS

- Storing/Handling Precautions: Avoid excessive heat. Material will freeze, thawing will NOT return product to usable form.
- Other Precautions: None

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REMEDIATION PRODUCT DATA SHEET

PNEUMATIC FOAM UNIT 400/25

A completely self-contained and portable foam generating system designed to withstand the rugged demands and harsh elements found at remediation sites. Quick start-up time means that emission control is available when you need it. Recommended for small to medium size remediation projects, dredging operations and hazardous waste sites.
Can be towed around site with a pick-up truck. Foam is applied using a hand-line.

System includes air compressor, pump, hoses, nozzles, solution storage tank and proprietary foam generating technology. Unit has freeze protection for outdoor storage year-round.

FEATURES

- Simple to operate
- Durable, rugged construction
- No clean-up necessary
- Can be filled and placed aside until needed

SPECIFICATIONS

Solution Storage Tank...........400 Gallons
Coverage Rate........................270 Sq. Ft./Min. @3" depth
Coverage Area per fill............2,000 - 6,000 Sq. Ft.
Size..16'8” L x 8'6” W x 7'8” H
Dry Weight.............................6,880 Pounds
Hose...................................... 200 Feet of 1-1/2" Diameter
Products................................All Long Duration and Soil Equivalent Foam Products
Freeze Protection System......120V or 230V, 30 amp, single phase

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REMEDIATION PRODUCT DATA SHEET

PNEUMATIC FOAM UNIT 1600/40

A completely self-contained and portable foam generating system designed to withstand the rugged demands and harsh elements found at remediation sites. Quick start-up time means that emission control is available when you need it. Recommended for medium to large size remediation projects, dredging operations and hazardous waste sites. Can be towed around site with a back-hoe or other large vehicle. Typically, foam is applied using a hand-line.

System includes air compressor, pump, hoses, nozzles, solution storage tank and proprietary foam generating technology. Unit has freeze protection for outdoor storage year-round.

FEATURES

- Simple to operate
- Durable, rugged construction
- No clean-up necessary
- Can be filled and placed aside until needed

SPECIFICATIONS

Solution Storage Tank...........1600 Gallons
Coverage Rate........................430 Sq. Ft./Min. @3" depth
Coverage Area........................18,000 - 22,000 Sq. Ft.
Size...24' L x 8' W x 8'6" H
Weight...................................17,000 Pounds
Hose......................................200 Feet of 1-1/2" Diameter
Products................................All Long Duration and Soil Equivalent Foam Products
Freeze Protection System......120V or 230V, 30 amp, single phase

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Appendix L

QAPP

THE QAPP WILL BE SUBMITTED UNDER A SEPARATE COVER BY NATIONAL GRID AT A LATER DATE FOLLOWING THE SELECTION OF A REMEDIAL CONTRACTOR