GEI Consultants

Geotechnical
Environmental and
Water Resources
Engineering

Marinas and Docks Interim Remedial Measure Work Plan

Paerdegat Basin

City of New York,
Kings County, New York
NYSDEC Site No. 224167

Submitted to:
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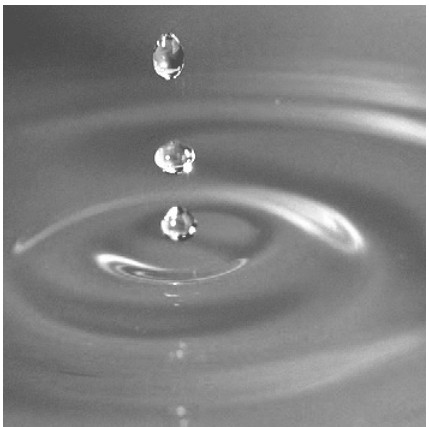

Matt O'Neil, P.E.
Engineer of Record

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Abbreviations and Acronyms

CAMP	Community Air Monitoring Plan
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CRZ	Contamination Reduction Zone
DER	Department of Environmental Remediation
DER-10	Department of Environmental Remediation Technical Guidance for Site Investigation and Remediation
EZ	Exclusion Zone
FDNY	New York City Fire Department
GEI	GEI Consultants, Inc., P.C.
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
NTUs	Nephelometric Turbidity Units
NWP	Nationwide Permit
NYCDEP	New York City Department of Environmental Protection
NYC Parks	New York City Department of Parks and Recreation
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOS	New York State Department of State
OSHA	Occupational Safety and Health Administration
PCBs	Polychlorinated Biphenyls
PODF	Performance-Based Organic Decontamination Fluid
PPE	Personal Protective Equipment
SARA	Superfund Amendments and Reauthorization Act
SZ	Support Zone
TSCA	Toxic Substances Control Act
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
WP	Work Plan

MEASUREMENTS

cm^2	centimeters squared
mg/kg	milligrams per kilogram (equivalent to parts per million in solids)
ppm	parts per million (equivalent to milligrams per kilogram in solids)
µg	micrograms
$\mu g/m^3$	micrograms per cubic meter

Engineer's Certification

In accordance with NYSDEC DER-10 Section 1.5 (b) 2,

I, Matt O'Neil, certify that I am currently a New York State registered professional engineer and that this Interim Remedial Measure Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

9/19/14
Date

Matthew J. O'Neil, PE
GEI Consultants, Inc., P.C.

1. Introduction

GEI Consultants, Inc., P.C. (GEI) has prepared this Marinas and Docks Interim Remedial Measure (IRM) Work Plan (WP) on behalf of National Grid to address polychlorinated biphenyls (PCBs) detected in the dock and pier structures located in Paerdegat Basin, as a result of a release of gas condensate. The site is shown in **Figure 1**.

This IRM WP has been prepared in response to the New York State Department of Environmental Conservation's (NYSDEC) request in a letter dated July 18, 2013 for National Grid to submit an Interim Remedial Measures Work Plan detailing the cleanup of the impacted marinas and floating docks. A copy of this letter is provided in Appendix A. This IRM WP was prepared to be consistent with the factors set forth in Title 6 of the New York Code of Rules and Regulations Part 375 (NYCRR) for interim remedial measures, and guidance in NYSDEC *Draft DER-10* [Department of Environmental Remediation] *Technical Guidance for Site Investigation and Remediation* (DER-10).

This IRM WP describes the remedial action goals and objectives as well as the techniques used for documentation sampling, material handling, waste characterization, processing, transportation, and disposal of the PCB-impacted material.

1.1 Interim Remedial Measure Work Plan Organization

This IRM WP has been organized as follows.

- Section 1 – Introduction
- Section 2 – Nature and Extent
- Section 3 – Remedial Action Goals and Objectives
- Section 4 – Remedial Summary
- Section 5 – Vapor/Odor Management
- Section 6 – Health and Safety
- Section 7 – Surface Water Quality Monitoring
- Section 8 – Site Security Plan
- Section 9 – Decontamination Plan
- Section 10 – Waste Management Plan
- Section 11 – Sample Collection and Analysis Plan
- Section 12 – Traffic Control Plan
- Section 13 – Completion of IRM Activities
- Section 14 – IRM Completion Report
- Section 15 – Schedule

1.2 Site Description and History

On September 27, 2012, in the process of decommissioning and retiring twin 24-inch-diameter gas transmission pipelines by filling them with a grout mixture, National Grid discharged natural gas condensate. The New York City Fire Department ("FDNY") responded to odor complaints resulting from the gas condensate. After the FDNY opened hydrants to flush the gas condensate, a portion of the gas condensate was released into Paerdegat Basin.

Upon being notified of the release, National Grid notified the NYSDEC and the National Response Center (NRC; Incident Report # 1025830). Emergency response activities were conducted under the direct supervision of the United States Coast Guard (USCG), and NYSDEC. The New York City Department of Environmental Protection (NYCDEP), New York City Fire Department, and New York City Parks Department were notified and responded to the release by sending representatives to the site. Extensive emergency spill response efforts have been completed to recover the material released and work is ongoing to address residual impacts in upland areas.

The discharge point for the gas condensate release into the basin was a stormwater pipe outfall located at the approximate center of the northeast basin shoreline. An oil-like sheen was visible on the surface water of Paerdegat Basin following the release of gas condensate. Sheen transport was observed on surface water in most areas in the basin including the area of fixed and free-standing structures in the water (i.e., boats, docks, piers, and bulkheads). Wind action was observed to cause the sheen to spread primarily toward the headwaters of the basin from the release point. During immediate response actions following the release, boat hulls were cleaned and wipe-tested for PCBs.

A site characterization investigation was performed at the site in April 2013 with the objective of evaluating whether residues from the gas condensate release were present in docks, piers, and bulkheads, sediment, surface water, and/or biota. Sediment, surface water, mussel tissue, and structure samples were collected and analyzed for PCBs and physical parameters such as grain size, total organic carbon for sediments, percent moisture and percent lipids for tissue, and percent moisture for porous structure samples. A subset of nine sediment samples was analyzed for volatile organic compounds (VOCs). Sediment, tissue, and porous material samples were archived for potential PCB congener and forensics analysis. META Environmental, Inc. conducted forensic analysis of select samples. The gas condensate was in the pipelines was determined to be Aroclor 1242.

1.3 IRM Design Objectives

This IRM will be conducted in accordance with the requirements of Order on Consent and Administrative Settlement, Index # R2-0811-13-08. The objectives of this IRM are:

- To present a summary of the results of the site characterization activities.
- To describe the methods and procedures that will be used to complete the removal of PCB-impacted dock and pier structures.
- To identify the project plans (Community Air Monitoring Plan and Health and Safety Plan) that will be used during the construction activities.

1.4 Project Organizational Structure and Responsibility

National Grid will coordinate with NYSDEC, New York State Department of Health (NYSDOH), NYCDEP, New York City Department of Parks and Recreation (NYC Parks) and other local regulatory agencies to conduct the IRM at the site. It is anticipated that these agencies will have representatives at the site periodically during the IRM.

National Grid will have final responsibility and authority for all aspects of the IRM activities at the site. The remediation Contractor will work directly for National Grid and National Grid will be responsible for approval and authorization of work done by the remediation Contractor. A National Grid representative will be on site or accessible via phone during the IRM activities. When the National Grid representative is off site, the Engineer (GEI) will act as National Grid's representative. National Grid will be responsible for all communication with regulatory agencies, members of the surrounding community and the press.

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

The Engineer (GEI), under contract to National Grid, will serve as the Engineer of Record for the IRM and act as National Grid's representative on site. As such, the Engineer will be responsible for oversight of the Contractor to ensure compliance with the work plan scope of work, implementation of the Community Air Monitoring Plan (CAMP), collection of waste characterization samples, and maintenance of site sampling and activity logs. The Engineer will not direct the Contractor on specific means and methods to perform the work; however, the Engineer will advise the Contractor of non-compliance with the scope of work and identify required corrective action.

Representatives of NYSDEC and other regulatory agencies will be invited to attend all regular job progress meetings, including pre-construction meetings. NYC Parks, as the owner of the marina properties, will assist in the coordination of IRM activities with the marina operators.

The following are the key personnel or agencies involved with IRM activities at the site:

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2. Nature and Extent

2.1 Site Characterization Investigation

A site characterization field investigation was conducted at the Paerdegat Basin by GEI on behalf of National Grid. The purpose of the investigation was to determine if Aroclor 1242 PCB residues associated with a gas condensate release were present in sediment, surface water, biota, and porous dock and pier structures.

The field work was conducted in accordance with the April 2, 2013 New York State Department of Environmental Conservation (NYSDEC)-approved site characterization Work Plan between April 13 and 18, 2013 and included the following tasks:

- Conducting a shoreline survey,
- Sampling intertidal and subtidal sediments,
- Sampling surface water,
- Sampling mussel tissue, and
- Sampling porous structures including piles, docks, and bulkheads, and the wall of the NYCDEP combined sewer outfall at the head of the basin.

The draft Site Characterization Data Summary Report, dated June 2013and prepared by GEI provides a full summary of the analytical results of samples collected and analyzed. This report has previously been submitted to the NYSDEC. For the purpose of this IRM Work Plan, only the results of analysis of samples from porous materials from marina docks and piers are discussed below.

2.2 Porous Structure Results

Forty-two samples of wood and one Styrofoam sample were collected from piers and docks at six marinas (**Figure 2**) using United States Environmental Protection Agency (USEPA) sampling protocols for collection of porous materials for PCB analysis (USEPA, May 2011). A handheld rotary drill with a corer attachment was used to collect surface samples from the porous material. The depth of sampling did not exceed 1/2 inch into the surface sampled. The Styrofoam dock material sample was collected and analyzed as a discrete sample. Samples collected from wooden piers exposed to daily tidal fluctuations, were composed of a composite of three subsamples collected during low tide from three locations representative of low tide, mid tide, and high tide elevations. Samples of dock material were collected from the side wall of the dock while kneeling on the dock surface (**Figure 2**).

Table 1 provides the individual compound results and the sum of PCB Aroclors for porous material samples from the marinas. Detected compounds are shown in bold font, and the type of structure sampled is noted for each sample location.

PCBs were detected in 37 of the 42 marina porous substrate samples. Detected total PCB Aroclor concentrations ranged from 0.023 milligrams per kilogram (mg/kg) at PB-PS-HR009 to 316 mg/kg at PB-PS-MS008 (the wood sample collected from a piling at the Midget Squadron marina). The lowest concentrations were in samples collected from pilings in the Hudson River Yacht club.

PCB Aroclors 1242, 1248, 1260, and 1268 were detected in porous structure samples. PCB 1268 was only detected at one location, PB-PS-CA003. PCB Aroclor 1242 was only detected at 4 of 42 sample stations, specifically at two locations in the Midget Squadron Marina and both locations at the Paerdegat Squadron Marina. PCB Aroclor 1260 was detected at 27 stations, while PCB Aroclor 1248 was detected at 36 stations. The condensate released contained Aroclor 1242.

3. Remedial Action Goal and Objectives

3.1 Remedial Action Goal

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

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

Where restoration to pre-disposal conditions is not feasible, the NYSDEC may approve an alternative criteria based on the site conditions (6 NYCRR Sub-Part 375-2-8(b)(1)). This could include the application of one of the soil cleanup objectives listed in Table 375-6.8(a) (Unrestricted Use) or Table 375-6.8(b) (Restricted Use). The NYSDEC, in a letter dated October 4, 2013, indicated that it had determined the appropriate cleanup objective for the wooden, steel and Styrofoam elements of the marinas, floating docks and piers is less than 1 mg/kg of total PCBs. A copy of this letter is provided in Appendix A.

Based on these criteria, the goal for this IRM is to remove the PCB-impacted dock and pier structures to the extent practicable. PCB-impacted dock and pier structures are defined as dock and pier structures (or portions of structures) that contain total PCB concentrations at or greater than 1 mg/kg.

Remediation action goals have also been established to meet the USEPA requirements regarding PCBs in 40 CFR 761. Specifically, the remedial action object for all porous material is less than or equal to 1 mg/kg and for all non-porous materials is less than or equal to 10 micrograms (µg)/100 centimeters squared (cm^2).

4. Remedial Summary

The IRM proposed for the PCB-impacted dock and pier structures will include:

- **Structure Removal:** PCB-impacted dock and pier structures will be removed and shipped off-site for disposal.
- **Structure Decontamination:** Non-porous structures or structure components may be decontaminated rather than removed, if feasible.

All PCB-impacted material will be removed; therefore, there will not be a need for any institutional controls or a site management plan.

4.1 Remedy Execution

The proposed remedy includes the removal and off-site disposal of PCB-impacted dock and pier structures with concentrations of total PCBs equal to or greater than 1 mg/kg. The limits of PCB-impacted materials are indicated in **Figure 3**. Materials within these limits that have not had any contact with surface water and therefore are not potentially PCB impacted, such as gangways and land-based structures, will not be removed or will be temporarily removed to facilitate removal of impacted materials and replaced. Impacted material will be transported off-site for disposal at an appropriately permitted facility approved by National Grid. All PCB-impacted materials removed will be disposed of at a Toxic Substances Control Act (TSCA) approved disposal facility. Turbidity controls and absorbent booms will be used to contain any sediment that is suspended during piling removal activities.

It is anticipated that the removed pilings will have some amount of sediment on them. Sediment will be cleaned off the pilings within the turbidity curtains and absorbent booms before they are placed on a barge or on land. If collection of fluids becomes necessary during the removal, then any liquids will be disposed of off-site along with any decontamination liquids generated. Wastewater will be pumped into tank(s) and stored at a designated location within the project limits. Solid materials at the bottom of the tanks will be combined with the impacted material being removed and disposed of off-site. The Contractor will be responsible for operation and maintenance of the wastewater storage tank(s) and its components. Any wastewater generated will be sampled prior to off-site disposal.

Site work will commence at 0730 Monday through Friday with no heavy truck traffic until 0800. All work will be completed and the site secured for the evening at 1700 unless otherwise authorized by National Grid and the NYC Parks Department.

During working hours, the Contractor will make every effort to minimize potential nuisance community impacts. These include, but are not limited to, noise and traffic concerns associated with the execution of the remedy. Site work will not be conducted on weekends without prior approval and coordination of National Grid and the marinas.

4.2 Mobilization, Permits, and Site Access

The Contractor or National Grid will apply for and obtain all necessary Federal, State, and local permits associated with the IRM. There is an exemption from obtaining permits and other authorizations issued by NYSDEC which meet the criteria in DER-10 for activities such as are proposed in this IRM that are a part of a remedial program and are being conducted pursuant to an oversight document. Remedial activities must be conducted in accordance with all substantive requirements of these NYSDEC permit programs even though a permit is not required. In addition there is United States Army Corps of Engineers (USACE) nationwide permit (NWP 28) that covers modifications of exiting marinas.

Applicable permits may include, but are not limited to:

- Coast Zone Management Consistency Review – New York Department of State (NYSDOS)
    - The project is located within Coastal Zone jurisdiction. The NYSDOS concurs with the USACE consistency determination for NWP 28 and a project-specific consistency determination is not required.

- USACE
    - Based on e-mail and phone correspondence with USACE this project is authorized under NWP 28. This NWP permit is for modification of existing marinas and is limited to previously authorized marina areas. Preconstruction notice is not required. NWP 28 does not authorize dredging, additional slips, dock spaces, or expansion. Since a preconstruction notice is not required for NWP 28 no in-water work restrictions are required.

- State Historic Preservation Office Memorandum of Understanding – New York State Historic Preservation Office
    - A memorandum of agreement between the USACE, the New York State Historic Preservation Office, and National Grid will be completed for the IRM. The memorandum of understanding will govern the recovery of any significant archeological information from the removal activities.

- NYSDEC
  - The project, if it was not being done under a remedial program pursuant to an oversight document would require the submittal of an application and supporting documents to NYSDEC. Even though a permit is not required, remedial activities must be conducted in accordance with all substantive requirements of these NYSDEC permit programs. These permit programs include the Protection of Waters Program (Article 15), Water Quality Certification Program (Section 401 of the Clean Water Act), and Tidal Wetlands (Article 25). The NYSDEC has issued a blanket Section 401 Water Quality Certification for activities under NWP 28.

- New York City Department of Planning.
  - The project will require the submittal of a NYC Coastal Assessment Form and supporting documents to NYC Department of Planning.

NYC Parks is providing and coordinating all access.

The Contractor will contact New York City 811 to request that all utilities on the site are located and marked. The Contractor will work with the marinas to identify all of their utilities. The Contractor will remove or protect, as applicable all utilities.

The Engineer will conduct a pre-construction site meeting, after the project is awarded, with the Contractor, National Grid, NYC Parks and NYSDEC prior to the commencement of IRM implementation. The meeting will be conducted to review specified construction requirements and schedules, as well as to review the responsibilities of the Contractor, the Engineer, and National Grid with respect to the IRM implementation.

Prior to the start of work, the Contractor will conduct an external pre-construction survey and inspection of adjacent properties to document existing conditions. The condition of all structures, fences, drainage structures and ground cover e.g. pavement, grass, shrubs, etc. will be observed. The survey will be conducted under the oversight of the Engineer and the findings reviewed and approved by the Engineer and National Grid prior to mobilization.

The Contractor will mobilize all necessary labor, equipment, supplies and materials to complete the remediation work upon approval by National Grid. The appropriate exclusion zone(s) and contaminant reduction zone(s) will be established to conduct the planned activities safely and effectively.

4.3 Site Preparation

The Contractor will be responsible for preparing the site for the remedy. Site preparation

activities necessary to provide support for the work, include at a minimum the establishment of work zones, support facilities, decontamination facilities, turbidity control measures, and installation of temporary security fencing around the work area and roll-off box staging area.

The Contractor will be responsible for preserving existing trees, fences, and structures, and appurtenances during the work. If any of these items need to be removed or temporarily removed to implement the remedy, such work will be coordinated with and approved by the marina operator and NYC Parks.

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

Turbidity control measures will be installed prior to pier removal activities and maintained throughout the project and monitored in accordance with the procedures in Section 7. The turbidity controls will be placed around and near the piers to be removed.

The existing fencing at the marina(s) will be repaired, reinforced, and/or completed, where required, to create a complete enclosure of the area. Areas where remedial equipment or waste is being stored, including, but not limited to: roll-off containers, decontamination fluids, tools, will be demarcated using snow fence and appropriate signage.

4.4 Dock and Pier Structure Removal

4.4.1 Remediation

The remedial actions include the following:

- Removal and off-site disposal of PCB-impacted dock and pier structures within the limits indicated in **Figure 3**. Materials within these limits that have not had any contact with surface water and, therefore, are not potentially PCB impacted, such as gangways and land-based structures, will not be removed.
- The actual methods of removal will be determined by the Contractor. The piers will most likely be removed with a grapple mounted on a hydraulic excavator or crane. A vibratory hammer may be used along with the grapple to vibrate out the piers. It is anticipated that the docks and piers removed will either be floated to shore or placed on a barge and shipped to shore. The materials will then be placed into roll-off containers. Any cutting of the docks and piers so that they fit into the roll-off containers will be done over the containers or over a containment structure to collect chips and dust from the cutting.

- Cleaning of sediment from piers within the turbidity curtains and absorbent booms.
- Decontamination of non-porous materials. Some non-porous materials such as hard plastic may be decontaminated and reused rather than disposed of. These materials will be decontaminated in accordance with the procedures described in Section 9.1.2.

All PCB-impacted material will be removed; therefore, there will not be a need for any institutional controls or a site management plan.

4.4.2 Material Handling

Due to the nature of the site and IRM, it is anticipated that the removal activities will not be conducted as a direct load operation. All removed material will be placed in roll-off containers that will be staged within the exclusion zone. Once a roll-off is filled with removed dock and pier materials, a solid truck tarp will then be employed over roll-off and secured on all sides. A plastic tarp may be used in the event that solid covers are not available. The full roll-off containers will be transported directly to the designated treatment, storage and disposal facility. All roll-off containers will have liners to prevent seepage from wet materials leaking onto public streets.

Storage of removed materials will be authorized within the exclusion zone within the roll-off containers as long as the roll-off containers are properly covered at the end of each day.

4.4.3 Odor and Fugitive Dust Control

Odors and fugitive dusts are not anticipated to be a concern based on the nature of the materials. The only times potential fugitive dusts are anticipated are when the structural materials are being cut to fit into the roll-off containers. Further details about the management of the odor and fugitive dust are presented in Section 5.

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

4.5 Site Restoration

Upon completion of the remedial activities, the site will be returned to the pre-construction conditions, and the removed docks and piers will be replaced with new construction.

Restoration actions shall include, but may not be limited to:

- Demobilization of the CAMP equipment.
- Demobilization of removal equipment.
- Removal of the decontamination pads.
- Removal of fencing improvements.

4.6 Construction Oversight

A representative of National Grid, or his or her designee, will be on site during all IRM activities. The Engineer will be responsible for remediation oversight and conformance with the scope of work for the approved remedial actions. The specific responsibilities of the Engineer, Contractor, and National Grid are discussed in subsection 1.3.

Representatives of the NYSDEC, NYSDOH, NYC Parks or other regulatory agencies may be present during construction and restoration activities.

5. Dust and Odor Management

Removal activities at remediation sites typically generate airborne dust that has the potential to migrate off site. In recognition of this potential hazard, the NYSDOH has promulgated CAMP regulations that establish action levels of respirable dust and potential site contaminants that are protective of the surrounding community. The requirements of the CAMP are contained in Appendix 1A and 1B of the NYSDEC DER-10 document (2010) which are included as **Appendix B** of this report. The CAMP is intended to supplement, but be discrete from the air-monitoring program implemented by the Contractor for purposes of evaluating site worker health and safety.

The Contractor will be responsible for preparing and implementing a monitoring program for the protection of their employees and subcontractors within the work zone. In addition, the Contractor will perform air monitoring at the perimeter of the work zone for the protection of the public. Air monitoring will include both real-time air monitoring and the collection and laboratory analysis of ambient air samples.

The current IRM will occur under wet conditions and is targeted at removal of PCBs infused in the wood or semipermeable products. Therefore, VOC monitoring is not required. The NYSDEC DER-10 requires particulate monitoring in the form of a Fugitive Dust/Particulate Monitoring Program in the waste handling areas where the wooden piers may be broken/cut for off-site disposal. That is the only potential exposure to PCBs in the dust that may be generated from that work.

The Contractor will maintain strict dust control at all times to prevent dust particles with PCB attached from becoming airborne. During excavation activities, work practices and engineering controls, such as water mist spray, will be used for dust control as needed. Real time monitoring of dust will be performed within the work area to ensure that dust levels do not exceed 150 micrograms per cubic meter ($\mu g/m^3$). Dust monitoring will be performed using a pDR (personal DataRAM) meeting requirements of the NYSDEC DER-10. Based on the maximum PCB level detected in the docks and piers (316 mg/kg), PCB levels will be far below occupational exposure limits even if the specified dust level is exceeded. The maximum PCB level detected in the docks and piers to be removed is 316 mg/kg. Based on this concentration, the worst case PCB concentration in air with a dust level of 150 $\mu g/m^3$ is 0.05 ug/m^3.

5.1 Work Zone Air Monitoring

Work zone air monitoring will be performed by the Contractor during the remedy. The monitoring of the work zone will be conducted in accordance with all applicable health and safety regulations for the protection of workers.

During remedial activities and material handling, the air in the work zone will be monitored periodically for the presence of total VOCs using a photoionization detector and for respirable dust using a DustTrak™ (or equivalent) unit. Work zone air monitoring may be conducted more frequently if air quality measurements approach response levels, as defined in **Table 5-1**. Measurements will be monitored from the breathing zone (4 to 5 feet above the ground) at worker locations to evaluate working conditions, and to determine whether there is a need to implement engineering controls, or change the level of worker protection.

5.2 CAMP Summary

The CAMP is designed to provide monitoring procedures, alert limits, action limits, and contingency measures if action limits are approached. An alert limit is a contaminant concentration or odor intensity that triggers contingent measures. An alert limit does not suggest the existence of a health hazard, but serves instead as a screening tool to trigger contingent measures if necessary, to assist in minimizing off-site transport of contaminants and odors during remedial activities. An action limit is a contaminant concentration or odor intensity that triggers work stoppage.

During times of activities that have the potential to produce air emissions, primarily the waste handling areas where the wooden piers may be broken/cut for off-site disposal, fence line perimeter air monitoring will be conducted using a combination of real-time (continuous and almost instantaneous) air monitoring at fixed locations and walk-around supplemental monitoring using hand-held instruments on an as-needed basis. The CAMP includes a Contingency Plan that defines Alert Levels, Action Levels, and specific response activities to be implemented during working hours if an Alert Limit or Action Limit for a measured compound is exceeded. The response actions, potentially including work stoppage, are intended to prevent or significantly reduce the migration of airborne contaminants from the site.

If the real-time perimeter Action Limits are exceeded or significant nuisance odors are noted, National Grid, the Engineer, and the Contractor will consult to determine what type of emission control action is appropriate.

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

5.3 Fugitive Dust Control

Construction activities will be performed so as to limit the potential for fugitive dust

emissions. Fugitive dusts are not anticipated to be a concern based on the nature of the materials and site conditions (water-based activities). The only times potential fugitive dusts are anticipated are when the structural materials are being cut to fit into the roll-off containers.

Heavily traveled truck routes within the exclusion and support zones will be continuously monitored for excessive dirt or dust.

5.4 Action Levels and Responses

Response levels and associated mitigating actions for particulates are presented in Table 5-1 below.

Table 5-1. Air Monitoring Response Levels and Actions

Particulates	
Response Level	**Actions**
>100 µg/m^3 above background for 15-minute average or visual dust observed leaving the site	• Apply dust suppression • Continue monitoring • Continue work if downwind PM-10 particulate levels are <150 µg/m^3 above upwind levels and no visual dust leaving site
>150 µg/m^3 above background for 15-minute average	• Stop work • Notify the National Grid and on site NYSDEC representatives • Re-evaluate activities • Continue monitoring • Continue work if downwind PM-10 particulate levels are <150 µg/m^3 above upwind levels and no visual dust leaving site

Sources:

- NYSDOH Community Air Monitoring Plan, December 2009, as published in NYSDEC DER-10, Appendix 1A, 2010.
- Fugitive Dust and Particulate Monitoring, NYSDEC DER-10, Appendix 1B, 2010.
- Special Requirements for Work within 20 Feet of Potentially Exposed Individuals or Structures, NYSDOH.

All air monitoring data will be downloaded to the on-site computer on a daily basis, saved for review, and compiled into reports for presentation and discussion at status meetings. The data will be provided to the NYSDEC and/or the NYSDOH.

If particulate action levels are observed to have been exceeded during the work day, the event, the source, and corrective actions taken will be recorded in the CAMP daily log and reported to the on-site NYSDEC representative.

5.5 Odor Monitoring

National Grid or its representative, i.e., the Engineer, will monitor and record observations of odors generated during the performance of the remedy. When odors attributable to the

exposure of impacted media are generated in the work area during intrusive activities, such as removal of piles, observations will be made at the downwind portion of the site perimeter. The observations will be made to assess the potential for significant odors reaching off-site receptors. Objectionable odors are not anticipated.

Upon detection of odors at the site perimeter, the Engineer will instruct the Contractor to implement some, or all, of the following control measures:

- Reduce the rate of activities that the odors are from.
- Minimize the amount of time that impacted material is exposed to air.

The goal of odor mitigation is to minimize, where practicable, the off-site migration of odors. Due to the short distances between any work area on the site and the property line, odor controls will be implemented proactively when they are detected in the work area. There are no action levels specified for odors, however, if persistent nuisance odors at the site perimeter are noted and/or complaints are reported from abutters, the odor condition will be discussed with the Contractor, National Grid, and NYSDEC project managers.

6. Health and Safety

GEI's HASP for the IRM work is provided in **Appendix C**. Reading of and adherence to the HASP is required of all on-site GEI personnel. The Contractor will be required to develop their own HASP, which will be reviewed by the Engineer and National Grid. Any GEI subcontractors for this project will be required to develop their own HASP for protection of their employees, but at a minimum must adhere to applicable requirements set forth in GEI's HASP. Additionally, federal, state and local representatives may be required to sign and adhere to this HASP, depending on the nature of their presence on site during activities conducted by GEI.

The HASP identifies measures to minimize accidents and injuries, which may result from project activities, emergencies, or during adverse weather conditions. Activities performed under this HASP will comply with applicable parts of OSHA Regulations, primarily 29 Code of Federal Regulations (CFR) Parts 1910 and 1926.

7. Surface Water Quality Monitoring

Daily water quality monitoring will be performed during pier removal activities to evaluate the water quality outside the limits of the turbidity curtain that will be put in place while the removal action is being performed. The configuration of the environmental controls may vary slightly during the performance of the remedy, depending on the means and methods selected by the remedial contractor.

A daily field log will be kept by the Engineer while removal activities are ongoing to document visual observations of water quality outside of the turbidity curtain; additionally, National Grid will perform turbidity monitoring as discussed in the following section. All instruments used to record water quality measurements will be calibrated daily as per the manufacturer's instructions, prior to a measurement being recorded.

7.1 Turbidity Monitoring

The Engineer, will establish a reference location and a monitoring location outside of the turbidity curtain. The reference location will be approximately 200 feet outside of the turbidity curtain, and the monitoring location will be approximately 15 feet outside the turbidity curtain. The Engineer will measure turbidity at the reference location and the monitoring location using an optical backscatter sensor. The Engineer will perform the turbidity monitoring program during each day that pier removal activities are being performed. When monitoring, the Engineer will measure turbidity at both the reference location and monitoring location prior to the start of removal activities, and periodically throughout the day during pier removal activities.

7.1.1 Establishing the Project Turbidity Standard

The Engineer will collect turbidity measurements from the following three depths at both the reference location and monitoring locations to establish a project turbidity standard:

- Within approximately 1 foot from the water's surface.
- At the approximate mid-point of the water column.
- At approximately 1 foot above the bottom of the water column.

The turbidity values obtained from the three depths will be averaged, such that a single, representative turbidity value is calculated for the reference location, and a single, representative turbidity value is calculated for the monitoring location. The representative value calculated for the reference location will then be added to the permissible turbidity increase shown in Table 7-1, to establish a maximum permissible turbidity for the monitoring location (the project turbidity standard).

Table 7-1. Turbidity Monitoring

Reference Location Turbidity (NTUs)	Permissible Turbidity Increase for the Monitoring Location (NTU)
<10	Reference plus 20 NTUs
11 – 20	Reference plus 15 NTUs
>21	Reference plus 30% of reference

Notes:
1. NTU – Nephlometric Turbidity Unit

7.1.2 Response Actions if the Project Turbidity Standard is Exceeded

If, in two consecutive monitoring events, the average turbidity at the monitoring location exceeds the project turbidity standard by more than the permissible turbidity increase, then the Engineer will collect water samples, composited over the entire water column, from both the monitoring location and the reference location and the NYSDEC site representative will be notified. The composite samples will be analyzed for total PCBs and total suspended solids. A 36-hour turn-around time for sample analysis will be requested from the laboratory. Additionally, the Engineer will direct the Contractor to take corrective measures designed to mitigate the turbidity, such as inspection and repair of the turbidity curtains, deployment of an additional row of turbidity curtain, or other mitigation measures. Turbidity monitoring will continue to be performed at both the monitoring location and the reference location once every 2 hours until compliance with the project turbidity standard is reestablished.

The site is adjacent to multiple marinas and a NYCDEP storm water retention and CSO facility. Turbid conditions may be created near the site from large boats passing through the adjacent portion of the river or a release from the CSO. The Engineer will monitor for turbid conditions caused by off-site factors and record them as part of the daily report. If site turbidity standards are exceeded and are noted as being attributable to non-remedial activity related sources, the turbidity levels will continue to be monitored, but will not initiate water sample collection and laboratory analysis.

If compliance with the project turbidity standard cannot be reestablished within 48-hours, removal activities will cease and National Grid, its contractors, and/or consultants will review the actions undertaken, the results of the analyses of the water samples, and evaluate the biological significance of the available data and determine the requirements for additional mitigation, if any.

7.2 Visible Sheen Monitoring

The Contractor will setup a boom system in conjunction with the turbidity curtain to protect the water column outside the site perimeter during the remedy. The Engineer will inspect for

visible sheen beyond the turbidity curtain and boom system during each day when removal activities are being performed as follows:

- Make visual observations on the basin side of the turbidity curtain and boom system protected area prior to the start of removal activities, and once every 2 hours, thereafter, during pier removal activities.
- If, during inspection, visible sheen that is attributable to the remedy is observed beyond the boomed area, the Engineer will alert the Contractor, National Grid, and the NYSDEC site representative. The Engineer will then direct the Contractor to take action to limit sheen travel, such as inspection and repair of the oil absorbent booms, deployment of additional booms, or other mitigation measures.
- The Engineer and the Contractor will write separate daily reports during the remedy that will include a section summarizing the inspections of the boom system. The daily reports will note any discrepancies found, corrective actions taken, or routine maintenance performed on the booms.

If visible sheen cannot be contained within 24 hours, removal activities will cease and the Engineer will direct the Contractor to implement additional mitigation measures prior to restarting removal activities.

8. Site Security Plan

The objectives of the site security plan at the site are to prevent the vandalism and destruction of construction equipment, stored waste materials and to prevent access and minimize health and safety concerns for the surrounding residential neighborhood.

8.1 Perimeter Security

The existing fencing at the marina(s) will be repaired, reinforced, and/or completed, where required, to create a complete enclosure of the area. Areas where remedial equipment or waste is being stored, including, but not limited to: roll-off containers, decontamination fluids, tools, will be demarcated using snow fence and appropriate signage.

8.2 Equipment Security

All vehicles and equipment left in the work area will be secured at the end of each working day. In addition, vehicles and equipment must remain inside the perimeter fence, or at a remote secured area if left on-site overnight or during non-work days. No vehicles or equipment may be left overnight in an unsecured location. It is the responsibility of the Contractor to ensure that all non-essential equipment is de-energized when left on-site and not in use to prevent electrical/fire/explosive hazards. No equipment will run overnight or on non-working days.

9. Decontamination Plan

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

Primarily, the site will be divided into three primary zones: the exclusion zone (EZ), the contamination reduction zone (CRZ), and the support zone (SZ) during the implementation of remedial activities. These locations will be further defined in the field based on work activities being conducted in an individual area. Activities will be coordinated with each marina operator.

9.1 Decontamination Procedures

The Contractor will establish decontamination areas for the following activities.

- Personnel decontamination
- Equipment decontamination

9.1.1 Personnel Decontamination Station

Personnel field decontamination/cleanup will take place at the exit of the established EZs in CRZs and will consist primarily of removal of personal protective equipment (PPE). Once removed, disposable PPE will be collected at the field decontamination site in a drum or large plastic bag. The drum or plastic bag will be secured to prevent the accidental spread of contamination. Disposable PPE that has been worn in an EZ will be removed and placed in the disposal container before leaving the CRZ. Additional details for personnel decontamination are presented in the HASP contained in **Appendix C**.

The designated personnel field decontamination area will be equipped with basins for water and detergent, and trash bags or cans for containing disposable PPE and discarded materials. Personnel should wash and rinse gloves, and wash and rinse hands and face with potable water. Disinfecting hand wipes will also be available for wiping hands and face.

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

9.1.2 Equipment Decontamination Station

Decontamination of chemically-contaminated equipment and hand tools will be performed. Decontamination shall take place on a decontamination pad and all liquids used in the decontamination procedure will be collected. Any equipment that has contacted PCB-impacted materials will be treated as contaminated, and will be decontaminated prior to removal. All liquids used in the decontamination procedure will be stored at a secure location identified by National Grid in lined rolls or drums and then disposed of at an approved facility in accordance with federal, state and local regulations. Personnel performing this task will wear the proper PPE as prescribed in Section 4.

The first step in equipment decontamination will be accomplished using high -pressure steam, damp mopping with water and/or dry decontaminated with brushes and shovels. The equipment, if it has come into contact with PCBs, will then be rinsed with a performance-based organic decontamination fluid (PODF) to meet the applicable decontamination standards in 40 CFR 761.79(c), or if it is believed not to be contaminated, it will be wipe tested for PCBs. This decontamination fluid will be collected and disposed of based on its as-found concentrations. If PCB-impacted material is not rinsed with a PODF, GEI will collect wipe samples per 40 CFR 761 Subpart P from the equipment decontaminated to verify that decontamination is complete per 40 CFR 761.79(b)(3)(i)(A), i.e., PCB wipe samples results are less than 10 µg/100 cm^2. This process will be repeated if necessary.

9.2 Decontamination Equipment

The Contractor will be responsible for maintaining a sufficient supply of materials and equipment required to implement decontamination procedures, including, but not limited to, the following items:

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

10. Waste Management Plan

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

10.1 Disposal Record Keeping

All manifests and/or bills of lading for all shipments will be submitted to the Engineer prior to any vehicle departing the site. The manifest form and/or bills of lading will be signed by an approved agent for National Grid and the truck driver before the material leaves the site; and by a representative of disposal facility when the load is received. A copy of the signed Manifest will be maintained on file by the Engineer (GEI). Upon arrival at the disposal facility, the Manifest will be signed and a copy returned to the Engineer, complete with all applicable signatures as proof of delivery. The returned manifests will be cross checked and matched with the original copy of the manifest already on file.

A log of all shipments and copies of all manifests and/or bills of lading will be maintained by the Engineer on-site. Upon completion of the remedy, National Grid will receive all logs and manifests and/or bills of lading. The logs, manifests, and bills of lading will be included in the IRM Completion Report following completion of the remedy to create a permanent record of disposal.

10.2 Material Shipping and Disposal Procedures

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

The selected Contractor will coordinate with the transport and disposal facilities to schedule an appropriate amount of transport trucks and to schedule deliveries of materials to the disposal facilities. Trucks will be scheduled in a manner that will minimize the amount of trucks waiting to pick up roll-off containers.

The roll-off containers will be lined with plastic truck liners prior to material being placed in the bed. A solid tarp will be affixed to the roll-off containers to prevent volatilization or fugitive dust emissions during transit to the disposal facility.

Sediment removed with the piles will be rinsed off of the piles within the turbidity curtains. As such, it is anticipated that there will not be a sediment waste stream to dispose of.

Individual waste streams will be handled as follows.

10.2.1 PCB-Impacted Material

All removed PCB-impacted material will be placed directly into roll-offs and transported to an appropriately-licensed National Grid-approved disposal facility that is a Toxic Substances Control Act (TSCA)-approved PCB disposal facility.

10.2.2 Uncontaminated Bulky Waste

Uncontaminated bulky waste (e.g. uncontaminated dock structures exhibiting total PCB concentrations less than 1 mg/kg) will not be removed. However, if it is necessary to remove these structures to facilitate the removal of PCB-impacted materials, they will be segregated from impacted materials, immediately placed in a roll-off container or temporarily placed on the site for future loading, and transported for disposal as construction debris at an approved solid waste landfill.

10.2.3 Impacted Water

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

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

Certain materials may be segregated and tested for PCBs. These materials will be disposed of at a solid waste disposal area if PCB concentrations are less than 1 mg/kg. In addition, samples will be collected from PCB-impacted materials for disposal and analyzed in accordance with the receiving facilities' guidelines.

The Engineer will be responsible for collecting and analyzing disposal characterization samples as required for acceptance by the receiving facility. The Contractor will provide the Engineer the selected receiving facilities' guidelines prior to sampling. The Contractor shall utilize these results to select appropriate and acceptable primary and backup appropriately licensed National Grid-approved disposal facilities. If the selected facility or facilities require additional disposal characterization data, it is the responsibility of the Contractor to coordinate with National Grid and obtain the appropriate samples prior to the start of excavation activities. The Contractor shall provide the Engineer the results of all analyses immediately upon receipt.

11. Sample Collection and Analysis Plan

The sample collection and analysis plan for the site has been designed to support the requirements of the remedy. The remedy includes the removal of PCB-impacted dock and pier structures. This plan describes the sampling and analysis procedures for collecting representative samples of dock and pier materials, and wastewater for disposal.

All analytical testing will be performed by a laboratory that holds a current NYSDOH Environmental Laboratory Approval Program certification. A copy of the documentation sampling data will be maintained by the Engineer's during the remedial activities.

11.1 Dock and Pier Materials

Some materials to be disposed of may be segregated and tested to see if they are PCB impacted. For these materials a composite sample will be collected and analyzed for PCBs by USEPA Method 8082. A minimum of one composite sample will be collected from each 30 cubic yards of material.

In addition, all materials to be disposed will be sampled by the Engineer in accordance with the conditions of the receiving facility for off-site disposal and the results provided to National Grid.

11.2 Decontamination/Wastewater Sampling

All wastewaters will be sampled by the Engineer in accordance with the conditions of the receiving facility for off-site disposal and the results provided to National Grid.

12. Traffic Control Plan

The objectives of the traffic plan at the site are to minimize adverse impacts from project-related traffic. The Traffic Control Plan indicates the traffic routes to and from the site for:

- Trucking bulky waste off site.
- Liquid waste hauler offloading decontamination and wastewater liquids.
- Contractor access and parking.
- Equipment access and storage.

Vehicles for hauling of contaminated materials and supplies shall enter the Brooklyn area from the Gowanus Expressway/Brooklyn-Queens Expressway (Route 278). The vehicles shall follow appropriate surface streets to reach the site.

The proposed traffic routing pattern to the site is presented below:

- Vehicles will leave the site and turn onto E 80th Street.
- Vehicles will then take a left onto Flatlands Avenue.
- Vehicles will then turn slight right to Avenue J.
- Vehicles will then turn left onto Dahill Road.
- Vehicles will then turn slightly right and Dahill Road becomes 21st Avenue.
- Vehicles will then turn right onto 65th Street.
- Vehicles will then enter the Gowanus Expressway/Brooklyn-Queens Expressway (Route 278).
- Vehicles arriving at the site shall retrace the above route to the site.

The vehicles may deviate from the prescribed traffic route so long as the traveled roadways are approved for truck traffic.

To maintain access to the site and to ensure that lines of sight are maintained, the Contractor shall arrange for and coordinate with the appropriate local authorities to ensure that on-street parking nearest to the entrance/exit gate within the lines of sight is limited throughout the duration of the remedial activities.

The Contractor shall provide a detailed traffic route for all vehicles transporting waste materials to the specific disposal facilities.

The Contractor will maintain all signage and traffic controls required for the completion of the project.

13. Completion of Remedial Activities

Upon completion of the remedial activities, the site will be returned to the pre-construction conditions and the removed docks and piers will be replaced with new construction. Restoration actions shall include, but may not be limited to:

- Demobilization of the CAMP equipment.
- Demobilization of equipment.
- Removal of the decontamination pads.

14. IRM Completion Report

Following completion of the IRM activities, an IRM Completion Report will be prepared and stamped by an engineer licensed to practice in the State of New York. The IRM Completion Report will include a summary of remedial activities, document any changes to the work proposed in the IRM WP, document the final disposal of waste, and contain a statement that the work was performed in accordance with the IRM WP, any contract documents, and any approved changes to those documents. Specific components of the IRM Completion Report will include:

- Record drawings.
- The actual volumes of removed material.
- The results of documentation analyses.
- Other plans and figures (if required), photographs, data summary tables, and appendices that will provide National Grid with an accurate accounting of the remedial measures implemented at the site.
- Approvals and closure documents from NYSDEC.
- Approved permits.
- Summary of construction work, meetings, and changes in work scope.
- Shipping manifests and bills of lading for materials disposed during the project.
- Summary of Air Monitoring Data collected during the remedial activities.
- Certification that material transported off-site was disposed of at a properly licensed National Grid-approved disposal facility or Treatment Storage and/or Disposal Facility.

15. Schedule

A final detailed schedule will be developed after NYSDEC approval of the IRM and coordination with the marina operators and NYC Parks. This schedule will be submitted to NYSDEC and NYC Parks for review. Our current schedule is to do the work during the marinas' off season, which is from approximately November 2014 through March 2015.

Table

Table 1
Porous Structure Analytical Results
Marinas and Docks Interim Remedial Measure Work Plan
Paerdegat Basin
Brooklyn, New York

Validated

Location Name:		PB-PS-CA001	PB-PS-CA002	PB-PS-CA003	PB-PS-CA004	PB-PS-CSO-01	PB-PS-CSO-02	PB-PS-DP001	PB-PS-DP002
Sample Name:		NG-PB-PS-CA001	NG-PB-PS-CA002	NG-PB-PS-CA003	NG-PB-PS-CA004	NG-PB-PS-CSO-01	NG-PB-PS-CSO-02	NG-PB-PS-DP001	NG-PB-PS-DP002
Sample Date:		4/17/2013	4/17/2013	4/17/2013	4/17/2013	4/16/2013	4/16/2013	4/15/2013	4/15/2013
Parent Sample Code:									
Sample Description:	CAS no.	Piling	Piling	Piling	Piling	Concrete	Concrete	Piling	Piling
PCBs (mg/kg)									
Aroclor 1016	12674-11-2	0.58 UJ	0.12 UJ	0.49 UJ	0.82 UJ	0.6 UJ	21 U	0.11 UJ	0.092 U
Aroclor 1221	11104-28-2	0.58 UJ	0.12 U	0.49 U	0.82 U	0.6 UJ	21 U	0.11 UJ	0.092 U
Aroclor 1232	11141-16-5	0.58 UJ	0.12 U	0.49 U	0.82 U	0.6 UJ	21 U	0.11 UJ	0.092 U
Aroclor 1242	53469-21-9	0.58 UJ	0.12 U	0.49 U	0.82 U	0.6 UJ	21 U	0.11 UJ	0.092 U
Aroclor 1248	12672-29-6	**2.7 J**	**0.48 J**	**2**	**7.2**	**7.2 J**	**140**	**0.33 J**	**0.28**
Aroclor 1254	11097-69-1	0.58 UJ	0.12 U	0.49 U	0.82 U	0.6 UJ	21 U	0.11 UJ	0.092 U
Aroclor 1260	11096-82-5	**0.34 J**	**0.077 J**	**0.6**	**0.9**	**0.58 J**	**6.6 J**	**0.028 J**	**0.018 J**
Aroclor 1262	37324-23-5	0.58 UJ	0.12 U	0.49 U	0.82 U	0.6 UJ	21 U	0.11 UJ	0.092 U
Aroclor 1268	11100-14-4	0.58 UJ	0.12 U	**0.8**	0.82 U	0.6 UJ	21 U	0.11 UJ	0.092 U
Total PCB Aroclors	TPCB-AR	**3.04**	**0.557**	**3.4**	**8.1**	**7.78**	**146.6**	**0.358**	**0.298**
Other (percent)									
Percent Solids	SOLIDS	**45.4**	**43.6**	**51.1**	**55.1**	**90.4**	**92.8**	**49**	**56.5**

Table 1
Porous Structure Analytical Results
Marinas and Docks Interim Remedial Measure Work Plan
Paerdegat Basin
Brooklyn, New York

Validated

Location Name:		PB-PS-DP003	PB-PS-DP004	PB-PS-DP005	PB-PS-HR001	PB-PS-HR002	PB-PS-HR003	PB-PS-HR004	PB-PS-HR005
Sample Name:		NG-PB-PS-DP003	NG-PB-PS-DP004	NG-PB-PS-DP005	NG-PB-PS-HR001	NG-PB-PS-HR002	NG-PB-PS-HR003	NG-PB-PS-HR004	NG-PB-PS-HR005
Sample Date:		4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013
Parent Sample Code:									
Sample Description:	CAS no.	Floating Dock	Piling	Piling	Piling	Piling	Piling	Piling	Piling
PCBs (mg/kg)									
Aroclor 1016	12674-11-2	1.5 UJ	2.2 UJ	0.33 UJ	0.069 U	0.071 U	0.13 U	0.065 U	0.067 U
Aroclor 1221	11104-28-2	1.5 UJ	2.2 UJ	0.33 UJ	0.069 U	0.071 U	0.13 U	0.065 U	0.067 U
Aroclor 1232	11141-16-5	1.5 UJ	2.2 UJ	0.33 UJ	0.069 U	0.071 U	0.13 U	0.065 U	0.067 U
Aroclor 1242	53469-21-9	1.5 UJ	2.2 UJ	0.33 UJ	0.069 U	0.071 U	0.13 U	0.065 U	0.067 U
Aroclor 1248	12672-29-6	**14 J**	**20 J**	**3.9 J**	**0.052 J**	**0.068 J**	**0.64**	**0.025 J**	**0.038 J**
Aroclor 1254	11097-69-1	1.5 UJ	2.2 UJ	0.33 UJ	0.069 U	0.071 U	0.13 U	0.065 U	0.067 U
Aroclor 1260	11096-82-5	**1.4 J**	**1.3 J**	**0.26 J**	0.069 U	0.071 U	**0.1 J**	0.065 U	0.067 U
Aroclor 1262	37324-23-5	1.5 UJ	2.2 UJ	0.33 UJ	0.069 U	0.071 U	0.13 U	0.065 U	0.067 U
Aroclor 1268	11100-14-4	1.5 UJ	2.2 UJ	0.33 UJ	0.069 U	0.071 U	0.13 U	0.065 U	0.067 U
Total PCB Aroclors	TPCB-AR	**15.4**	**21.3**	**4.16**	**0.052**	**0.068**	**0.74**	**0.025**	**0.038**
Other (percent)									
Percent Solids	SOLIDS	**33.9**	**47.1**	**46**	**73.8**	**72**	**75.2**	**76.6**	**75.5**

Table 1
Porous Structure Analytical Results
Marinas and Docks Interim Remedial Measure Work Plan
Paerdegat Basin
Brooklyn, New York

Validated

Location Name:		PB-PS-HR006	PB-PS-HR007	PB-PS-HR008	PB-PS-HR009	PB-PS-HR010	PB-PS-KC-001	PB-PS-KC-002	PB-PS-KC-003
Sample Name:		NG-PB-PS-HR006	NG-PB-PS-HR007	NG-PB-PS-HR008	NG-PB-PS-HR009	NG-PB-PS-HR010	NG-PB-PS-KC-001	NG-PB-PS-KC-002	NG-PB-PS-KC-003
Sample Date:		4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/17/2013	4/17/2013	4/17/2013
Parent Sample Code:									
Sample Description:	CAS no.	Piling	Piling	Piling	Piling	Piling	Support Under Pier	Piling	Piling
PCBs (mg/kg)									
Aroclor 1016	12674-11-2	0.067 U	0.069 U	0.073 U	0.092 U	0.085 U	0.51 UJ	15 UJ	14 UJ
Aroclor 1221	11104-28-2	0.067 U	0.069 U	0.073 U	0.092 U	0.085 U	0.51 U	15 UJ	14 UJ
Aroclor 1232	11141-16-5	0.067 U	0.069 U	0.073 U	0.092 U	0.085 U	0.51 U	15 UJ	14 UJ
Aroclor 1242	53469-21-9	0.067 U	0.069 U	0.073 U	0.092 U	0.085 U	0.51 U	15 UJ	14 UJ
Aroclor 1248	12672-29-6	**0.035 J**	**0.035 J**	**0.028 J**	**0.023 J**	0.085 U	**3.2**	**75 J**	**83 J**
Aroclor 1254	11097-69-1	0.067 U	0.069 U	0.073 U	0.092 U	0.085 U	0.51 U	15 UJ	14 UJ
Aroclor 1260	11096-82-5	0.067 U	0.069 U	0.073 U	0.092 U	0.085 U	**0.14 J**	**4.2 J**	**4.7 J**
Aroclor 1262	37324-23-5	0.067 U	0.069 U	0.073 U	0.092 U	0.085 U	0.51 U	15 UJ	14 UJ
Aroclor 1268	11100-14-4	0.067 U	0.069 U	0.073 U	0.092 U	0.085 U	0.51 U	15 UJ	14 UJ
Total PCB Aroclors	TPCB-AR	**0.035**	**0.035**	**0.028**	**0.023**	ND	**3.34**	**79.2**	**87.7**
Other (percent)									
Percent Solids	SOLIDS	**74.2**	**74.1**	**70.7**	**56.7**	**58.2**	**50.7**	**34.3**	**35.2**

Table 1
Porous Structure Analytical Results
Marinas and Docks Interim Remedial Measure Work Plan
Paerdegat Basin
Brooklyn, New York

Validated

Location Name:		PB-PS-MS001	PB-PS-MS002	PB-PS-MS003	PB-PS-MS004	PB-PS-MS005	PB-PS-MS006	PB-PS-MS007	PB-PS-MS008
Sample Name:		NG-PB-PS-MS001	NG-PB-PS-MS002	NG-PB-PS-MS003	NG-PB-PS-MS004	NG-PB-PS-MS005	NG-PB-PS-MS006	NG-PB-PS-MS007	NG-PB-PS-MS008
Sample Date:		4/16/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013
Parent Sample Code:									
Sample Description:	CAS no.	Support Under Pier	Piling	Floating Dock	Floating Dock	Styrofoam	Floating Dock	Floating Dock	Piling
PCBs (mg/kg)									
Aroclor 1016	12674-11-2	0.73 UJ	0.82 UJ	0.68 UJ	0.15 UJ	0.19 UJ	0.27 UJ	1.6 UJ	57 UJ
Aroclor 1221	11104-28-2	0.73 UJ	0.82 UJ	0.68 UJ	0.15 UJ	0.19 UJ	0.27 UJ	1.6 UJ	57 UJ
Aroclor 1232	11141-16-5	0.73 UJ	0.82 UJ	0.68 UJ	0.15 UJ	0.19 UJ	0.27 UJ	1.6 UJ	57 UJ
Aroclor 1242	53469-21-9	0.73 UJ	0.82 UJ	0.68 UJ	0.15 UJ	**1.3 J**	0.27 UJ	1.6 UJ	**300 J**
Aroclor 1248	12672-29-6	**4.6 J**	**11 J**	**7.2 J**	**0.14 J**	0.19 UJ	**3.1 J**	**20 J**	57 UJ
Aroclor 1254	11097-69-1	0.73 UJ	0.82 UJ	0.68 UJ	0.15 UJ	0.19 UJ	0.27 UJ	1.6 UJ	57 UJ
Aroclor 1260	11096-82-5	**0.72 J**	**0.88 J**	**0.27 J**	0.15 UJ	0.19 UJ	**0.12 J**	**1.4 J**	**16 J**
Aroclor 1262	37324-23-5	0.73 UJ	0.82 UJ	0.68 UJ	0.15 UJ	0.19 UJ	0.27 UJ	1.6 UJ	57 UJ
Aroclor 1268	11100-14-4	0.73 UJ	0.82 UJ	0.68 UJ	0.15 UJ	0.19 UJ	0.27 UJ	1.6 UJ	57 UJ
Total PCB Aroclors	TPCB-AR	**5.32**	**11.88**	**7.47**	**0.14**	**1.3**	**3.22**	**21.4**	**316**
Other (percent)									
Percent Solids	SOLIDS	**69**	**33.8**	**37.2**	**35.4**	**25.9**	**33.3**	**31.5**	**44.1**

Table 1
Porous Structure Analytical Results
Marinas and Docks Interim Remedial Measure Work Plan
Paerdegat Basin
Brooklyn, New York

Validated

Location Name:		PB-PS-MS-010	PB-PS-MS-011	PB-PS-MS-012	PB-PS-MS-012	PB-PS-MS-013	PB-PS-MS014	PB-PS-MS015	PB-PS-MS016
Sample Name:		NG-PB-PS-MS-010	NG-PB-PS-MS-011	NG-PB-PS-MS-012	NG-PB-PS-XXX	NG-PB-PS-MS-013	NG-PB-PS-MS014	NG-PB-PS-MS015	NG-PB-PS-MS016
Sample Date:		4/17/2013	4/17/2013	4/17/2013	4/17/2013	4/17/2013	4/15/2013	4/15/2013	4/15/2013
Parent Sample Code:					NG-PB-PS-MS-012				
Sample Description:	CAS no.	Piling	Piling	Piling	Piling	Piling	Piling	Piling	Piling
PCBs (mg/kg)									
Aroclor 1016	12674-11-2	0.083 UJ	0.49 UJ	0.4 UJ	0.15 UJ	1 UJ	0.072 U	0.46 U	1.7 UJ
Aroclor 1221	11104-28-2	0.083 U	0.49 U	0.4 U	0.15 U	1 UJ	0.072 U	0.46 U	1.7 UJ
Aroclor 1232	11141-16-5	0.083 U	0.49 U	0.4 U	0.15 U	1 UJ	0.072 U	0.46 U	1.7 UJ
Aroclor 1242	53469-21-9	0.083 U	0.49 U	0.4 U	0.15 U	1 UJ	0.072 U	0.46 U	1.7 UJ
Aroclor 1248	12672-29-6	**0.2**	**3.3**	**1.8 J**	**0.64 J**	1 UJ	**0.09**	0.46 U	1.7 UJ
Aroclor 1254	11097-69-1	0.083 U	0.49 U	0.4 U	0.15 U	1 UJ	0.072 U	0.46 U	1.7 UJ
Aroclor 1260	11096-82-5	**0.05 J**	**0.14 J**	**0.3 J**	**0.096 J**	1 UJ	0.072 U	0.46 U	1.7 UJ
Aroclor 1262	37324-23-5	0.083 U	0.49 U	0.4 U	0.15 U	1 UJ	0.072 U	0.46 U	1.7 UJ
Aroclor 1268	11100-14-4	0.083 U	0.49 U	0.4 U	0.15 U	1 UJ	0.072 U	0.46 U	1.7 UJ
Total PCB Aroclors	TPCB-AR	**0.25**	**3.44**	**2.1**	**0.736**	ND	**0.09**	ND	ND
Other (percent)									
Percent Solids	SOLIDS	**63.8**	**51.7**	**65.8**	**65.6**	**49.7**	**69.5**	**54.3**	**42.8**

Table 1
Porous Structure Analytical Results
Marinas and Docks Interim Remedial Measure Work Plan
Paerdegat Basin
Brooklyn, New York

Validated

Location Name:		PB-PS-MS017	PB-PS-MS018	PB-PS-PS001	PB-PS-PS002	PB-PS-PS003	PB-PS-PS003	PB-PS-PS004
Sample Name:		NG-PB-PS-MS017	NG-PB-PS-MS018	NG-PB-PS-PS001	NG-PB-PS-PS002	NG-PB-PS-PS003	NG-PB-PS-PSXXX	NG-PB-PS-PS004
Sample Date:		4/16/2013	4/16/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013
Parent Sample Code:							NG-PB-PS-PS003	
Sample Description:	CAS no.	Piling	Piling	Piling	Support Under Pier	Piling	Piling	Piling
PCBs (mg/kg)								
Aroclor 1016	12674-11-2	0.099 UJ	0.16 UJ	0.097 U	0.12 UJ	0.29 U	0.37 UJ	0.54 UJ
Aroclor 1221	11104-28-2	0.099 UJ	0.16 UJ	0.097 U	0.12 UJ	0.29 U	0.37 UJ	0.54 UJ
Aroclor 1232	11141-16-5	0.099 UJ	0.16 UJ	0.097 U	0.12 UJ	0.29 U	0.37 UJ	0.54 UJ
Aroclor 1242	53469-21-9	0.099 UJ	0.16 UJ	0.097 U	0.12 UJ	**1.3 JN**	**1.7 J**	**3.4 J**
Aroclor 1248	12672-29-6	**0.18 J**	0.16 UJ	**0.2**	**1 J**	0.29 U	0.37 UJ	0.54 UJ
Aroclor 1254	11097-69-1	0.099 UJ	0.16 UJ	0.097 U	0.12 UJ	0.29 U	0.37 UJ	0.54 UJ
Aroclor 1260	11096-82-5	**0.053 J**	0.16 UJ	0.097 U	**0.072 JN**	0.29 U	0.37 UJ	**0.27 J**
Aroclor 1262	37324-23-5	0.099 UJ	0.16 UJ	0.097 U	0.12 UJ	0.29 U	0.37 UJ	0.54 UJ
Aroclor 1268	11100-14-4	0.099 UJ	0.16 UJ	0.097 U	0.12 UJ	0.29 U	0.37 UJ	0.54 UJ
Total PCB Aroclors	TPCB-AR	**0.233**	ND	**0.2**	**1.072**	**1.3**	**1.7**	**3.67**
Other (percent)								
Percent Solids	SOLIDS	**52.1**	**31.6**	**54.4**	**40.6**	**51.7**	**36.8**	**49.1**

Table 1
Porous Structure Analytical Results
Marinas and Docks Interim Remedial Measure Work Plan
Paerdegat Basin
Brooklyn, New York

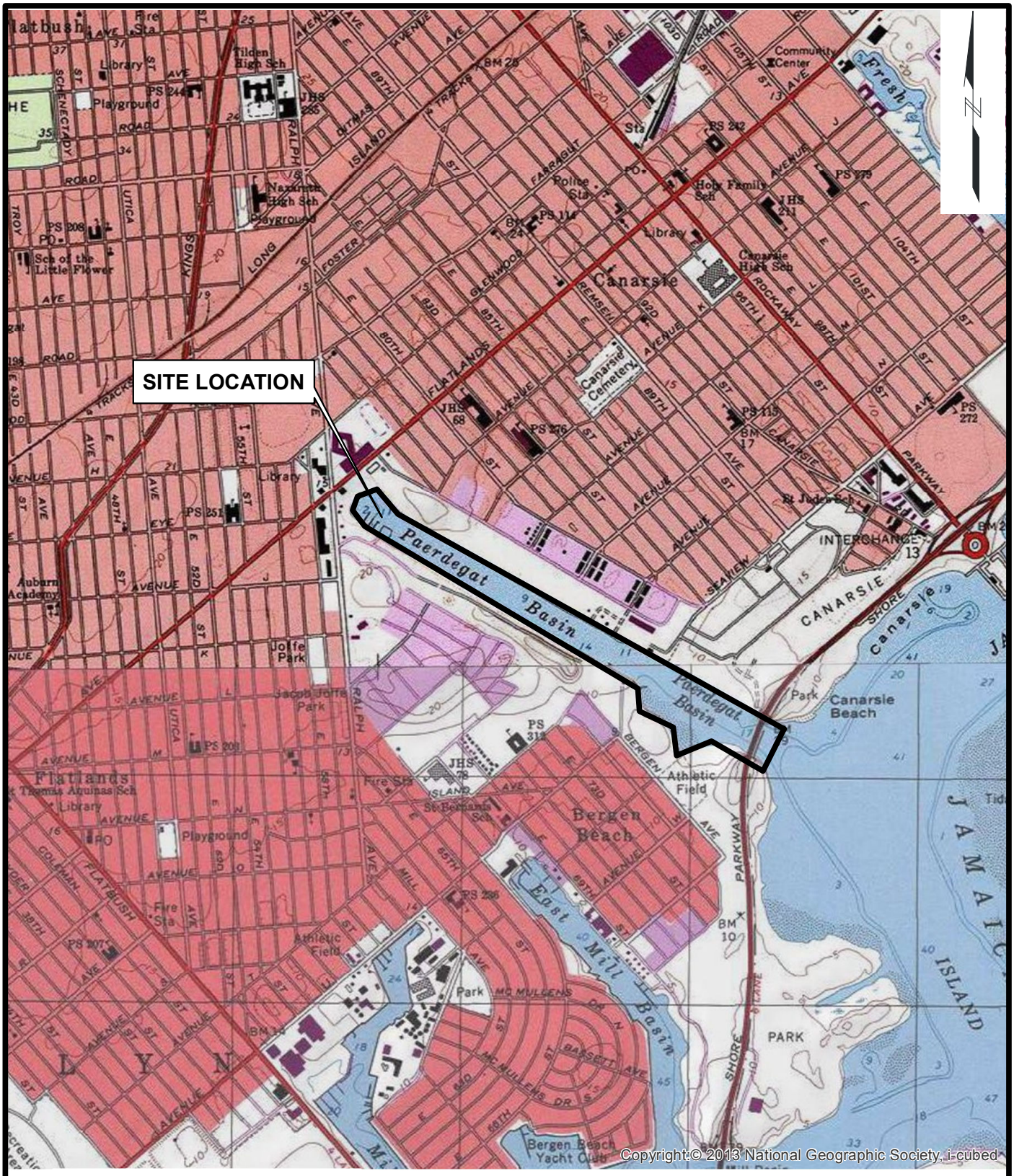
Notes:
mg/kg - milligrams/kilogram or parts per million (ppm)
PCBs - polychlorinated biphenyls

Total PCBs are calculated using detects only

Bolding indicates a detected concentration

Validation Qualifiers:
J - estimated value
JN - analyte is presumptively present at an approximated quantity
U - indicates not detected to the reporting limit
UJ - not detected at or above the reporting limit shown and the reporting limit is estimated

Figures



SOURCE:
1. USGS TOPOGRAPHIC MAP NATIONAL GEOGRPAHIC TOPO! ACCESSED VIA ARCGIS ONLINE.

0 1,000 2,000 4,000
SCALE, FEET

INTERIM REMEDIAL MEASURE WORK PLAN
PAERDEGAT BASIN
BROOKLYN, NEW YORK

nationalgrid

GEI Consultants

SITE LOCATION MAP

Project 129600 | September 2014 | Figure 1

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NOTES:
1. ALL LOCATIONS ARE APPROXIMATE

SOURCES:
1. 2012 IMAGERY, ESRI WORLD IMAGERY

0 100 200 400
SCALE, FEET

INTERIM REMEDIAL MEASURE WORK PLAN
PAERDEGAT BASIN
BROOKLYN, NEW YORK

nationalgrid

GEI Consultants

STRUCTURE (MARINA, DOCKS, AND PIERS) TOTAL PCB AROCLORS

Project 129600 | September 2014 | Figure 2

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NOTES:
1. ALL LOCATIONS ARE APPROXIMATE

SOURCES:
1. 2012 IMAGERY, ESRI WORLD IMAGERY.

0 100 200 400
SCALE, FEET

INTERIM REMEDIAL MEASURE WORK PLAN
PAERDEGAT BASIN
BROOKLYN, NEW YORK

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GEI Consultants

INTERIM REMEDIAL MEASURE SUMMARY

Project 129600 | September 2014 | Figure 3

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Appendix A

NYSDEC Correspondence

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21ST Street, Long Island City, NY 11101-5407
Phone: (718) 482-4995 • **Fax:** (718) 482-6358
Website: www.dec.ny.gov

Joe Martens
Commissioner

July 18, 2013

William J. Ryan
Project Manager - Site Investigation and Remediation Department
National Grid
175 E. Old Country Road
Hicksville, NY 11801

Re: Paerdegat Basin
NYSDEC Site No. 224167
Sampling Work Plan – Initial Analytical Results

Dear Mr. Ryan:

The New York State Department of Environmental Conservation ("NYSDEC"), in consultation with the New York State Department of Health ("NYSDOH"), the United States Environmental Protection Agency ("USEPA") and the New York City Department of Environmental Protection ("NYCDEP"), has completed its review of the above referenced analytical results from the sampling of mussel tissue, sediment, porous material and surface water from Paerdegat Basin. These results were sent by electronic mail on May 7, 2013 in the form of tables and figures prepared by GEI Consultants, Inc. on behalf of National Grid (the Remedial Party).

The data has been fully evaluated by NYSDEC staff, who have concluded that the analytical results strongly implicate the gas condensate spill as the source of contamination identified in the sediment and mussel tissue. Furthermore, the contamination of the porous material identified from samples taken from the marinas and floating docks indicates that such contamination is attributed to the aforementioned spill.

Therefore, NYSDEC has determined that the Remedial Party must proceed with additional sampling as outlined on page 4 of the approved Sampling Work Plan (the Plan) dated March 13, 2013, which states that "…based on review [of the preliminary sampling data, NYSDEC] will determine whether subsequent sampling rounds will be required. The second sampling event (if conducted) will likely include sampling of finfish species (analyzed as standard fillets) which anglers may consume." Upon further evaluation by NYSDEC's Natural Resources program staff, it is recommended that the next round of sampling include killifish (five to seven stations of five samples each) and crabs (eight to ten stations of five samples each) in lieu of fillets from edible finfish.

Within 30 days of this letter, please submit to NYSDEC the following:

- A Sampling Work Plan Addendum providing details on the next round of sampling; and

- A separate Interim Remedial Measure Work Plan detailing the cleanup of the impacted marinas and floating docks.

If there are any questions regarding this letter, please call me at (718) 482-4096.

Sincerely,

Nicholas S. Bollers
Environmental Engineer

ec: J. O'Connell, L. Oliva, W. Richter, S. Zahn, S. Maresca – NYSDEC
A. Forti – NYSDOH
J. Haklar – USEPA
J. Roberts, S. McAtamney – NYCDEP
R. Teetz, T. Leissing, C. Corrado, D. Riccobono – National Grid
B. Giroux – GEI

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21ST Street, Long Island City, NY 11101-5407
Phone: (718) 482-4995 • **Fax:** (718) 482-6358
Website: www.dec.ny.gov

Joe Martens
Commissioner

October 4, 2013

William J. Ryan
Project Manager - Site Investigation and Remediation Department
National Grid
175 E. Old Country Road
Hicksville, NY 11801

Re: Paerdegat Basin
NYSDEC Site No. 224167

Dear Mr. Ryan:

The purpose of this letter is to document result of the August 12, 2013 meeting among the New York State Department of Environmental Conservation ("NYSDEC"), the New York State Department of Health ("NYSDOH") and National Grid, and to provide additional information to address outstanding issues. Following the meeting, the outstanding issues were:

1. Cleanup Standards – NYSDEC has determined that the appropriate cleanup objective for the wooden/steel/Styrofoam elements of the marinas, floating docks and piers is 1 ppm of total PCBs. Therefore, any impacted structure that has been sampled and found to have a PCB concentration of 1 ppm or greater must be remediated. Furthermore, in accordance with 6NYCRR Part 371.4(e), if the concentration of PCBs is 50 ppm or greater the material must be considered a listed hazardous waste and be disposed of as such.

2. Additional Fish Sampling - The NYSDEC and NYSDOH recommend that resident populations of killifish, American eel and blue crab should be analyzed. In addition, transient sportfish such as bluefish, striped bass and weakfish should also be collected and analyzed to further refine the current fish advisory. As noted during the meeting, this sampling may be delayed until after the completion of NYCDEP's planned dredging activities.

3. Feedback from Other Regulatory Agencies - The USEPA has informed the NYSDEC that they will not be providing further feedback unless a formal notification/application to EPA for approval of the PCB cleanup has been submitted. NYCDEP would like to meet with National Grid and NYSDEC concerning the impact to its structures, in particular tide gates and CSO structures, as a result of the spill. NYCDEP would also like to address additional sampling and proposed mitigation of the impact to its infrastructure.

Within 30 days of this letter, please submit to NYSDEC the following:

- A Sampling Work Plan Addendum providing details on the next round of sampling; and
- A separate Interim Remedial Measure Work Plan detailing the cleanup of the impacted marinas and floating docks.

If there are any questions regarding this letter, please call me at (718) 482-4096.

Sincerely,

Digitally signed by Nicholas S. Bollers
Date: 2014.10.01 08:23:14 -04'00'

Nicholas S. Bollers
Environmental Engineer

ec: J. O'Connell, L. Oliva, W. Richter, S. Zahn, S. Maresca – NYSDEC
A. Forti – NYSDOH
J. Roberts, S. McAtamney – NYCDEP
T. Leissing, C. Corrado, D. Riccobono – National Grid
B. Giroux – GEI

Appendix B

Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Appendix C

Health and Safety Plan (electronic only)

GEI Consultants

Geotechnical
Environmental and
Water Resources
Engineering

Health and Safety Plan

Paerdegat Basin – National Grid

Brooklyn, New York

GEI Consultants, Inc.
455 Winding Brook Drive
Suite 201
Glastonbury, Connecticut 06033

October 2012
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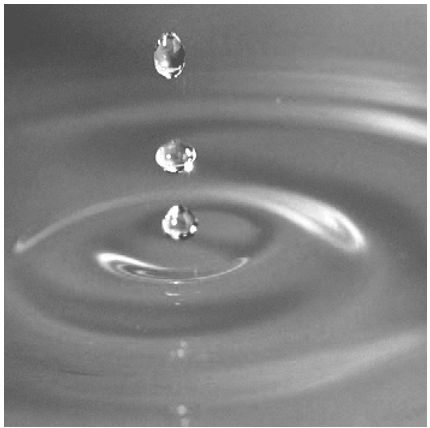

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Abbreviations and Acronyms

ACM	Asbestos containing material
BTEX	Benzene, Toluene, Ethyl benzene, Xylene
CRZ	Contamination Reduction Zone
CFR	Code of Federal Regulations
CHSO	Corporate Health & Safety Officer
EZ	Exclusion Zone
FID	Flame Ionizing Detector
FL	Field Leader
GEI	GEI Consultants, Inc.
GFCI	Ground Fault Circuit Interrupter
HASP	Health and Safety Plan
HEPA	High Efficiency Particulate
IRM	Interim Remedial Measure
MSDS	Material Safety Data Sheet
NYCDEP	New York City Department of Environmental Protection
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PFD	Personal Floatation Device
PID	Photo-Ionization Detector
PODF	Performance-based Organic Decontamination Fluid
PPE	Personal Protective Equipment
ppm	Parts per million (equivalent to milligrams per kilogram in solids)
SCBSO	Self Contained Breathing Apparatus
SOP	Standard Operating Procedures
SSO	Site Safety Officer
SVOCs	Semivolatile Organic Compounds
SZ	Support Zone
TOC	Total Organic Carbon
USCG	United States Coast Guard
µg/L	Micrograms per Liter
WNV	West Nile Virus
VOCs	Volatile Organic Compounds

1. Background

1.1 General

Engineer	GEI Consultants, Inc. (GEI) 455 Winding Brook Drive Suite 201 Glastonbury, Connecticut 06033
Project Name	Paerdegat Basin – National Grid Brooklyn, New York

This Health and Safety Plan (HASP) establishes policies and procedures to protect GEI personnel from the potential hazards posed by remedial and sampling activities at Paerdegat Basin in Brooklyn, New York (see the map in **Appendix A** – Site-Specific Information).

Reading of and adherence to the HASP is required of all on-site GEI personnel. Subcontractors for this project will be required to develop their own HASP for protection of their employees, but at a minimum must adhere to applicable requirements set forth in this HASP. Additionally, federal, state and local representatives may be required to sign and adhere to this HASP, depending on the nature of their presence on site during activities conducted by GEI.

The plan identifies measures to minimize accidents and injuries, which may result from project activities, emergencies, or during adverse weather conditions. Activities performed under this HASP will comply with applicable parts of OSHA Regulations, primarily 29 Code of Federal Regulations (CFR) Parts 1910 and 1926.

Included in **Appendix A** is a route to the nearest medical facility to the site with directions and contact information. **Appendix B** is the Hazard Communication Program. **Appendix C** details the signs, symptoms, care and procedures to both heat and cold stress. And included in **Appendix D** are the GEI standard operating procedures (SOPs) that apply to this project. Material safety data sheets specific to chemicals that may be encountered while working at the site are included in **Appendix E**. **Appendix F** is a blank incident report form.

1.2 Project Description

The project involves the release of a polychlorinated biphenyl (PCB)-contaminated liquid

to Paerdegat Basin on Jamaica Bay in Brooklyn, New York. A gas condensate release was caused when a contractor was abandoning a 24 inch transmission line with flowable fill/concrete. The concrete displaced the condensate liquids from the line and caused a release through a standpipe that pooled on the ground surface and ultimately discharged to the adjacent water body. Reported release volume to the waterway was approximately 1,400 gallons.

Upon being notified of the release, National Grid notified the National Response Center (NRC; Incident Report # 1026163) and the NYSDEC. Emergency response activities were conducted under the direct supervision of the United States Coast Guard (USCG), and NYSDEC. The New York City Department of Environmental Protection (NYCDEP), New York City Fire Department, and New York City Parks Department were notified and responded to the release by sending representatives to the Site. Extensive emergency spill response efforts have been completed to recover the material released and work is ongoing to address residual impacts in upland areas.

The discharge point for the gas condensate release into the basin was a stormwater pipe outfall located at the approximate center of the northeast basin shoreline. An oil-like sheen was visible on the surface water of Paerdegat Basin following the release of gas condensate. Sheen transport was observed on surface water in most areas in the basin including the area of fixed and free-standing structures in the water (i.e., boats, docks, piers, and bulkheads). Wind action was observed to cause the sheen to spread primarily toward the headwaters of the basin from the release point. During immediate response actions following the release, boat hulls were cleaned and wipe-tested for PCBs.

A Site Characterization Investigation was performed at the Site in April 2013 with to objective of evaluating whether residues from the gas condensate release were present in docks, piers, and bulkheads, sediment, surface water, and/or biota. Sediment, surface water, mussel tissue, and structure samples were collected and analyzed for PCBs and physical parameters such as grain size, total organic carbon (TOC) for sediments, percent moisture and percent lipids for tissue, and percent moisture for porous structure samples. A subset of nine sediment samples were analyzed for volatile organic compounds (VOCs). Sediment, tissue, and porous material samples were archived for potential PCB congener and forensics analysis. Forensic analysis of select samples was conducted and the results of this work are summarized in a report prepared by META Environmental, Inc.

National Grid will be conducting an interim remedial measure (IRM) to remove PCB-impacted dock and pier structures. This Health and Safety Plan (HASP) is intended to apply to all remedial removal activities performed by GEI and any additional follow up sampling that may be required. The selected remedial contractor will operated under their own HASP.

2. Statement of Safety and Health Policy

GEI is committed to providing a safe and healthy work environment for its employees. To maintain a safe work environment, GEI has established an organizational structure and a Corporate Health and Safety Program to promote the following objectives:

- Reduce the risk of injury, illness, and loss of life to GEI employees.
- Maintain compliance with federal, state, and other applicable safety regulations; and
- Minimize GEI employees' work exposure to potential physical, chemical, and biological hazards.

3. Hazard/Risk Analysis

Physical hazards associated with heavy equipment and construction operations are present. The heavy equipment associated with this project will include construction and material handling equipment. Some of the hazards associated with this equipment include crushing of limbs, slipping, tripping, or falling, and heavy lifting.

Smoking is prohibited at or in the vicinity of hazardous operations or materials. The hazards for this operation are listed in the following Activity Hazard Analysis and Site Hazards sections.

3.1 Activity Hazard Analysis

The potential hazards for this project have been categorized into site and activity hazards. Site hazards are those hazards associated with site conditions, and activity hazards are associated with GEI on-site activities. The potential hazards and control measures established to reduce the risk of injury or illness are identified in the following tables. Safe operating procedures established for routine hazards and common site conditions are included in the table below, or contained in the GEI Corporate Health and Safety Manual.

Table 3-1 – Activity Hazard Analysis

Activity: Mobilization		
Task	**Potential Hazard**	**Control Measure**
Boarding and launching the boat, placing miscellaneous equipment on vessel. [Vessel will be floating at the pier]	Crushing of limbs between pier and hard objects Drowning Slip/Trip/Fall Submerged objects in water	Keep limbs from between trailer, and vessel. Follow safe work practices, US Coast Guard Safe Boating Practices, and wear flotation vest. Keep traffic areas on boat free of slip/trip/fall hazards. Be familiar with the basin configuration and conditions of the surrounding marine area.
Boat mobilization / Landing at dock	Crushing of limbs between the vessel and the dock, drowning.	Keep limbs inboard. Wear flotation vest.
Activity: Monitoring Activities		
Moving vessel to exploration locations; set up vessel to sample by lowering anchors.	Interaction with other boat traffic. Drowning.	Wear flotation vest. Follow USCG Safe Boating Practices.
Sampling	Contact w/equipment, especially moving parts. Overhead hazard (rods).	Stay alert and maintain suitable clearance from moving and overhead equipment. Do not wear loose clothing, jewelry, or equipment, which could get caught by moving equipment. Inspect equipment daily. Train all personnel on use of

		emergency shutoff switches.
	Weather related equipment hazards (slippage in rain, lightning).	Cease operations prior to and during electrical storms. Cease operations if equipment cannot be operated safely under wet conditions.
	Slip/trip/fall.	Keep trafficked areas on boat or barge free of slip/trip/fall hazards.
	Drowning.	Wear flotation vest.
	Loud noise (outboard motor, generator, VC sampler).	Use hearing protection during the operation of equipment that produces loud noise.
	Contact with contaminated sediments.	Wear protective coveralls (e.g. Tyvek®) with shoe covers, butyl rubber gloves, safety glasses and face shield when handling samples. Dispose of gloves after sampling. If exposed to the sediments or surface waters of the basin, wash the exposed skin immediately with anti-bacterial wipes/ gel and wash with soap and water. PPE will be decontaminated and disposed of in general accordance with Section 4 of this HASP.
	Cuts or abrasions	Wear Kevlar or leather gloves over butyl rubber gloves.
	Loud noise (generator).	Use hearing protection if working near the generator. Stage generator away from work area.
	Weather related equipment hazards (slippage in rain, lightning).	Cease operations prior to and during electrical storms. Cease operations if equipment cannot be operated safely under wet conditions.
	Loud noise (outboard motor, generator).	Use hearing protection during the operation of equipment that produces loud noise.
	Contaminant contact.	Wear protective coveralls (e.g. Tyvek®) with shoe covers, nitrile gloves, safety glasses and face shield when handling samples. Dispose of gloves after sampling. If exposed to the sediments or surface waters of the canal, wash the exposed skin immediately with anti-bacterial wipes/gel and wash with soap and water. PPE will be decontaminated and disposed of in general accordance with Section 4 of this HASP.
Lift and secure anchors. Relocate to next exploration location.	Heavy lifting. Slip/Trip/Fall. Drowning.	Use proper lifting technique. Stay alert to moving or overhead equipment. Keep trafficked areas on boat or barge free of slip/trip/fall hazards. Wear flotation vest Anchoring equipment and boat deck will be rinsed to remove accumulated sediments prior to demobilization from the canal at the end of the day.

Activity: Biota Sampling Activities		
Collection of aquatic organisms	Cuts or abrasions. Drowning	Wear Kevlar or leather gloves over butyl rubber gloves. Wear flotation vest
Activity: Dock and Pier Removal Activities		
Entering Construction Site	Heavy equipment, dust, noise, slip, trip, fall.	Level D clothing including: Hardhat, reflective safety vest, steel-toed/steel-shank boots, safety glasses, leather work gloves, and hearing protection (ear plugs or ear muffs).
Observation of dock and pier removal	Heavy equipment, material handling, direct pulling of piles, breaking of piles during removal, dust, noise, slip, trip, fall, drowning.	Same as the PPE listed above for "Entering Construction Site." Safe distances will need to be established around work areas. Wear flotation device.

3.1.1 Handling Drums and Containers

Regulations for handling drums and containers are specified by OSHA 29 CFR 1910.120(j). Potential hazards associated with handling drums include vapor generation, fire, explosions, and possible physical injury. Handling of drums/containers by GEI employees during the pilot test program is not anticipated. If drum/container handling is necessary, it will be performed in accordance with all applicable regulations.

3.2 Personal Safety

Field activities have the potential to take site workers into areas which may pose a risk to personal safety. The following websites (sources) have been researched to identify potential crime activity in the area of the project:

- www.crimereports.com
- www.cityrating.com/crimestatistics.asp
- www.crimemapping.com

According to the crime statistics shown on www.cityrating.com, New York City is above the national average for violent crimes and rates approximately half of the national average for property crimes.

To protect yourself, take the following precautions:

- Use the buddy system (teams of a minimum of two persons present);
- Let the Site Safety Officer (SSO) know when you begin work in these areas and when you leave;
- Call in regularly;
- Pay attention to what is going on around you; and
- If you arrive in an area and it does not look safe to get out of your vehicle, lock the doors and drive off quickly but safely.

Site workers must not knowingly enter into a situation where there is the potential for physical and violent behaviors to occur. If site workers encounter hostile individuals or a confrontation develops in the work area, suspend work activities, immediately leave the area of concern, and contact local 911 for assistance. Notify the SSO and CHSO of any incidents once you are out of potential danger.

In the event of an emergency, prompt communications with local emergency responders is essential. At least one charged and otherwise functioning cell phone to facilitate emergency communications will be on site. Confirmation of cellular phone operation and site worker safety will be confirmed at the start of each working day. All on-site personnel will be capable of providing their location to a 911 operator in the event of an Emergency.

3.3 Evaluation of Potential Chemical Hazards

The characteristics of compounds at the Site are discussed below in the following subsections for informational purposes. Adherence to the safety and health guidelines in this HASP should reduce the potential for exposure to the compounds discussed below.

3.3.1 Volatile Organic Compounds (VOCs)

Volatile organic chemicals (VOCs), such as benzene, toluene, ethyl benzene, and xylene (BTEX) may be present within Paerdegat Basin. The gas condensate contained BTEX compounds. These compounds generally have a depressant effect on the central nervous system (CNS), may cause chronic liver and kidney damage, and some are suspected human carcinogens. Benzene is a known human carcinogen. Acute exposure may include headache, dizziness, nausea, and skin and eye irritation. The primary route of exposure to VOCs is through inhalation and therefore air monitoring and respiratory protection is the primary control against exposure to VOCs. Air monitoring will be completed as specified in Section 8 to minimize airborne exposures. Exposure through direct contact is possible and will be minimized through the use of personal protective equipment (PPE) as prescribed in Section 4.

3.3.2 Semivolatile Organic Compounds

Semi-volatile organic compounds (SVOCs) are associated with the gas condensate spill. Samples of the condensate that were analyzed contained 2-methylnaphthalene and naphthalene.

These substances may cause contact dermatitis. Direct contact can be irritating to the skin and produce itching, burning, swelling and redness. Direct contact or exposure to the vapors may be irritating to the eyes. Conjunctivitis may result from prolonged exposure. Naphthalene is also an eye and skin irritant and can cause nausea, headache,

fever anemia, liver damage, vomiting convulsions, and coma. Poisoning may occur by ingestion of large doses, inhalation, or skin absorption.

The major route of exposure of SVOCs during work activities to be conducted at this Site is through direct contact. Exposure is most likely when handling sediment, pier and dick materials and water samples. Exposure through direct contact is possible and will be minimized through the use of PPE as prescribed in Section 4. Inhalation of SVOCs may occur when the materials are disturbed or cut causing respirable and nuisance dust particles to become airborne or through the volatilization of naphthalene. Air monitoring will be completed as specified in Section 8 to minimize airborne exposures.

3.3.3 Heavy Metals

Paerdegat Basin sediments may contain elevated levels of metals including: arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, thallium, and zinc; typical of industrialized urban estuaries.

As with SVOCs, the primary route of metal exposure is through inhalation of dust particles when soils or sediments are disturbed and become airborne. The primary route of exposure is through inhalation of dust particles when subsurface soils are disturbed and become airborne. Air monitoring will be completed as specified in Section 8 to minimize airborne exposures during subsurface soil investigations.

3.3.4 Asbestos-Containing Materials

Asbestos containing materials (ACM) can be present at investigation sites in the form of demolition debris, ACM pipe insulation, and asbestos cement pipe. Chronic exposure to asbestos may cause asbestosis and mesothelioma. The primary route of exposure for asbestos is inhalation during the disturbance and/or removal of asbestos from the pipe insulation and cement pipes. Any ACM encountered within sediments will be saturated with water and will likely not be friable and thus should not be a concern for inhalation.

Asbestos is strictly regulated under OSHA 29 CFR 1910.1001/1926.1101. Employees that may be potentially exposed to ACM must participate in a medical surveillance program, have specific training in the hazards and controls of exposure to asbestos and wear respirators with high efficiency particulate (HEPA) filters. All work must be conducted in demarcated regulated areas to minimize the amount of people within the exposure area. Employers must conduct air sampling and provide signs and labels regarding the presence of asbestos.

3.3.5 Polychlorinated Biphenyls

The gas condensate released into Paerdegat Basin is known to contain polychlorinated

biphenyls (PCBs) which may be encountered during sampling activities. PCBs have historically been used from a number of sources including, but not limited to; electrical systems, hydraulic oils, lubricants, cutting oils, printers ink, and asphalt. Exposure to PCBs can occur through unbroken skin without immediate pain or irritation. Acute effects of PCB exposure can include eye, skin, nose, and throat irritation. Chronic effects of PCB exposure can include skin swelling and redness, gastro-intestinal disturbances, and neurological effects such as headache, dizziness, nervousness and numbness of extremities. PCBs are probable human carcinogens that can cause liver cancer. PCBs can accumulate in fatty tissues and result in health effects after the initial exposure has occurred. The primary route of exposure for PCBs is inhalation, dermal contact, and ingestion.

3.3.6 Hydrogen Sulfide

Hydrogen sulfide is a by associated with the breakdown of sewage by bacteria. Exposure to lower concentrations can result in eye irritation, a sore throat and cough, shortness of breath, and fluid in the lungs. These symptoms usually go away in a few weeks. Long-term, low-level exposure may result in fatigue, loss of appetite, headaches, irritability, poor memory, and dizziness. Breathing very high levels (>800 ppm) of hydrogen sulfide can cause death within just a few breaths. The primary route of exposure is through inhalation, and therefore respiratory protection is the primary control against exposure to hydrogen sulfide.

3.3.7 Evaluation of Organic Vapor Exposure

Air monitoring reduces the risk of overexposure by indicating when action levels have been exceeded and when PPE must be upgraded or changed. Action levels for volatile organic compounds and associated contingency plans for the work zone are discussed within Section 8 of this Health and Safety Plan.

Exposure to organic vapors shall be evaluated and/or controlled by:

- Monitoring air concentrations for organic vapors in the breathing zone with a photo-ionization detector (PID) or a flame ionizing detector (FID).
- When possible, engineering control measures will be utilized to suppress the volatile organic vapors. Engineering methods can include utilizing a fan to promote air circulation, utilizing volatile suppressant foam, providing artificial ground cover, or covering up the impacted material with a tarp to mitigate volatile odors.
- When volatile suppression engineering controls are not effective and organic vapor meters indicate concentrations above the action levels, then appropriate

respiratory protection (i.e. air purifying respirator with organic vapor cartridge) will be employed.

3.3.8 Evaluation of Respirable Dust Inhalation

Inhalation of respirable dust containing PCBs, metals, asbestos, and SVOCs is possible while conducting remedial work, or using power tools on surfaces that contain these materials. Contaminated particulate matter (soil, pavement, lead paint, insulation, etc.) becomes suspended in air due to a combination of factors including dry or dusty conditions. Air monitoring reduces the risk of overexposure to respirable dust inhalation by indicating when action levels have been exceeded and when PPE must be upgraded or changed. Action levels for respirable dust and associated contingency plans for the work zone and perimeter of the Site are discussed within Section 8 of this HASP.

Control of respirable dust shall be conducted at this Site as follows:

- When possible, dust control measures will be utilized to suppress the dust. These methods include wetting down the area, providing artificial ground cover, or covering up the material with a tarp.
- When dust suppression is not possible and respirable dust meters indicate concentrations above the action levels, a HEPA Filter must be used to prevent against inhalation of contaminated dusts.

3.3.9 Evaluation of Skin Contact and Absorption

Skin contact by contaminants may be controlled by use of proper hygiene practices, PPE, and good housekeeping procedures. The proper PPE (e.g., Tyvek®, gloves, safety glasses) as described in Section 4 will be worn for all activities where contact with potential contaminated media or materials are expected.

3.3.10 Other Chemical Hazards

Chemicals not identified in this HASP may be used during the constructability investigation activities. Prior to the initiation of any on-site tasks, each subcontractor will provide Material Safety Data Sheets to the SSO for each of the chemicals to be used. The MSDS's will be maintained at the Site by the SSO and all site workers and visitors who may potentially be exposed to the chemicals will be made aware of these hazards and the location of the on-site MSDS's during a hazard briefing session by the SSO. MSDS of commonly used compounds are located in **Appendix E**.

3.4 Physical Hazards

3.4.1 Fire and Explosion

All activities shall conform with all applicable state, federal, and local regulations pertaining to fire and explosion prevention procedures. A fire extinguisher will be located on the boat and in the work zone on land. All fires should be reported to 911 emergency services. In the event of an emergency, staff should attempt to disconnect the power supply to the boat, however if a fire is present staff should immediately evacuate the boat and contact 911. Section 13 contains specific information related to fire response on the boat.

3.4.2 Cold Stress

During the winter months, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia as well as slippery surfaces, brittle equipment, and poor judgment. Additionally, exposure to ocean water during the cold season can result in cold stress and hypothermia. The procedures to be followed regarding the avoidance of cold stress are provided in **Appendix C** - Cold Stress Guidelines.

3.4.3 Heat Stress

Heat stress is a significant potential hazard, which is greatly exacerbated with the use of PPE in hot environments. The potential hazards of working in hot environments include dehydration, cramps, heat rash, heat exhaustion, and heat stroke. A heat stress prevention program will be implemented when ambient temperatures exceed 70ºF for personnel wearing chemical protective clothing. The procedures to be followed are provided in **Appendix C** - Heat Stress Guidelines.

3.4.4 Noise

Noise is a potential hazard associated with the operation of heavy equipment (i.e. winch), pumps and generators. Site workers who will perform suspected or established high noise tasks and operations for short durations (less than 1-hour) shall wear hearing protection. If deemed necessary by the Site Safety Officer (SSO), the Corporate Health & Safety Officer (CHSO) will be consulted on the need for additional hearing protection for site activities. Other workers who do not need to be in proximity of the noise should distance themselves from the equipment generating the noise.

3.4.5 Hand and Power Tools

In order to complete the various tasks for the project, personnel will utilize hand and power tools. The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. Work gloves, safety glasses, and hard hats will be worn by the operating personnel at all times when utilizing hand and power tools and Ground Fault Circuit Interrupter GFCI-equipped circuits will be used for all power tools. Refer to GEI's Hand and Power Tools SOP for more information and guidance.

3.4.6 Slips, Trips, and Falls

Project work will pose slip, trip and fall hazards due to potential slippery surfaces on the boat deck and docks. GEI employees will wear proper footwear (i.e. boots or shoes with appropriate traction for slippery surfaces) and will employ good work practice and housekeeping procedures to minimize the potential for slips, trips, and falls.

3.4.7 Manual Lifting

Manual lifting of objects and equipment may be required. Failure to follow proper lifting technique can result in back injuries and strains. Site workers should use power equipment (winch)to lift heavy loads whenever possible and should evaluate loads before trying to lift them (i.e., they should be able to easily tip the load and then return it to its original position). Carrying heavy loads with a buddy and proper lifting techniques include: 1) make sure footing is solid; 2) make back straight with no curving or slouching; 3) center body over feet; 4) grasp the object firmly and as close to your body as possible; 5) lift with legs; and 6) turn with your feet, don't twist.

3.4.8 Steam, Heat, Splashing

Exposure to steam/heat/splashing hazards can occur during steam cleaning activities. Exposure to steam/heat/splashing can result in scalding/burns, eye injury, and puncture wounds. Proper PPE will be worn during all steam cleaning activities including rain gear or Tyvek®, hardhat equipped with splashguard, and water resistant gloves and boots.

3.4.9 Sun Exposure

Employees are encouraged to liberally apply sunscreen, with a minimum sun protection factor (SPF) of 15, when working outdoors to avoid sunburn and potential skin cancer, which is associated with excessive sun exposure to unprotected skin. Additionally, employees should wear safety glasses that offer protection from UVA/UVB rays.

3.4.10 Boat Safety

Location of boarding will occur at the Midget Squadron marina located at Brooklyn, New York. For retrieving a person overboard see Section 13. The boat will be equipped with an ABC rated fire extinguisher(s). Emergency procedures for fire and man overboard will be reviewed on the first day of operations and any time a change of personnel occurs.

3.4.10.1 Utility Clearance in the Project Area

New York requires that Dig Safe Systems, Inc (Dig Safe) be notified at least three (3) full work days prior to initiation of any subsurface work. The Subcontractor will contact New York 811 Dig Safe (1-800-272-4480) to request a mark-out of subsurface utilities that may be present in the Project Area prior to probing sediments. Work will not begin until the required utility clearances have been performed.

Public utility clearance organizations typically do not mark-out underground utility lines that are located on private property. As such, GEI must exercise due diligence and try to identify the location of any private utilities that may be buried within the Project Area. GEI will fulfill this requirement in several ways, including:

- Obtaining as-built drawings for the areas being investigated from the property owners; and
- Visually reviewing each proposed sediment sampling location with the property owner or knowledgeable site representative.
- If deemed necessary, a private utility markout will be performed by a third party utility locating service.

Due to the limitations associated with utility mark-outs, GEI and/or the subcontractors' staff may meet with utility owners to determine if they have any underground lines located in the Project Area. This information will be reviewed by GEI. If it is determined that underground utilities are located in the sediment sampling areas, the sampling locations will be changed so that no utilities are struck during the proposed investigation.

3.4.10.2 Working on Water

This project presents unique hazards to the GEI personnel when compared to land-based investigation programs. Special attention has been given to the topic of marine safety in this HASP, including the scheduling of a pre-mobilization strategy meeting between GEI and the marine subcontractors to develop the specific safety and emergency communications protocols (based on actual site conditions) to address the hazards of working on the water.

3.4.10.3 Boat Deck

The boat or drilling platform itself presents slip, trip, and fall hazards to GEI personnel due to the accumulation of water on the deck and the accumulation of equipment which inevitably occurs during work from a boat. To the extent possible, accumulated water should be removed from the boat or barge deck to avoid this hazard. If possible, anti-slip matting should be placed on the decks as an additional precaution.

3.4.10.4 Good Housekeeping

Maintaining a work environment that is free from accumulated debris is the key to preventing slip, trip and fall hazards at construction sites. Essential elements of good housekeeping on each boat or drilling barge include:

- Orderly placement of materials, tools, and equipment;
- Placing trash receptacles at appropriate locations for the disposal of miscellaneous rubbish;
- Prompt removal and secure storage of items that are not needed to perform the immediate task at hand; and
- Awareness on the part of all employees to walk around, not over or on, equipment that may be stored in the work area.

3.4.10.5 Boat Capacity

The survey boat shall not be loaded beyond the maximum capacity (number of passengers or the total weight of passengers and gear) as specified on the manufactures capacity plate affixed to the vessel. In addition, consideration will be applied to down rate this capacity (at the discretion of the Boat Captain) so that there is sufficient room, freeboard, and stability to safely perform the intended task given the prevailing weather and river conditions. All equipment shall be properly loaded and secured to prevent shifting and to limit tripping hazards. All personnel shall be evenly distributed on-board and will be instructed to remain seated at all times and wear a personal flotation device (PFD) while the vessel or barge is underway or being moved to the drilling areas.

3.4.10.6 Personal Flotation Devices

All GEI employees working on the water, near the water's edge, or at any other time where there exists the possibility of falling into the water are required to wear a USCG-approved personal flotation device. When selecting the appropriate type and style of PFD, the type of activity being conducted and the required mobility of the user must be considered, because some activities may require a PFD which is less restrictive.

GEI employees will be required to wear a USCG-approved Type III PFD or a Type V

work vest. Although not as effective as a Type I in turning an unconscious wearer face-up in the water, these vests are generally less bulky and restrictive, and are typically the PFDs of choice in a marine work environment. The use of inflatable PFDs is discouraged due to questionable reliability and maintenance requirements.

Prior to and after each use, each PFD shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used. In situations where the water temperature has fallen below 50˚F, a USCG-approved Mustang flotation suit shall be worn in place of the Type III or Type V PFD work vest.

3.4.10.7 Emergency Equipment

All personnel working on boat(s) should be informed of the locations of all on-board safety equipment including first-aid kit, fire extinguishers, throw-ring, marine radio or other suitable communications equipment as applicable to the specific boat being used. Additionally, all personnel shall be instructed as to their individual roles and responsibilities in the event of an on-board emergency (loss of operator, medical emergency, man overboard) prior to the start of any on-water work.

3.5 Biological Hazards

During the course of the project, there is a potential for workers to come into contact with biological hazards such as animals, insects and plants. Workers will be instructed in hazard recognition, health hazards, and control measures during site-specific training.

3.5.1 Animals

During the conduct of site operations, wild animals such as stray dogs or cats, raccoons, and mice may be encountered. Workers shall use discretion and avoid all contact with wild animals.

3.5.2 Marine/Freshwater Organisms

Staff working with surface waters and handling aquatic organisms may experience aquatic dermatitis as a result of exposure to a number of organisms. According to the Suffolk County Health Services Department, aquatic dermatitis "is a skin manifestation, such as a rash or eruption, contracted by bathing in surface waters. A variety of marine and freshwater organisms can be involved, including larval forms of parasitic flatworms, sea anemone or other coelenterate larvae, larval forms of crabs, and jellyfish. The most common conditions reported in Suffolk County waters include "swimmers itch", "sea-bathers eruption" (often referred to as "sea-lice"), and jellyfish envenomations (stings)." While staff will not be entering water to conduct work, exposure is possible due to sampling activities. Staff should also take care when handling any aquatic organisms to

avoid injury from claws, spines, teeth etc. Protective gloves should be worn to avoid injury and a PFD will be worn anytime an employee is near water to collect aquatic organisms.

3.5.3 Insects

Insects, including bees, wasps, hornets, and spiders, may be present at the Site making the chance of a bite possible. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition. Any individuals who have been bitten or stung by an insect should notify the SSO. The following is a list of preventive measures:

- Apply insect repellent prior to performing any field work and as often as needed throughout the work shift
- Wear proper protective clothing (work boots, socks and light colored pants)
- When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible
- Field personnel who may have insect allergies should have bee sting allergy medication on site and should provide this information to the SSO prior to commencing work

3.5.3.1 Lyme Disease

Lyme disease is caused by infection from a deer tick that carries a spirochete. During the painless tick bite, the spirochete may be transmitted into the bloodstream often after feeding on the host for 12 to 24 hours. The ticks that cause the disease are often no bigger than a poppy seed or a comma in newsprint. The peak months for human infection are from May to September.

Symptoms appear in three stages. First symptoms usually appear from 2 days to a few weeks after a person is bitten by an infected tick. Symptoms usually consist of a ring-like red rash on the skin where the tick was attached. The rash is often bulls-eye like with red on the outside and clear in the center. The rash may be warm, itchy, tender, and/or "doughy." Unfortunately, this rash appears in only 60 to 80% of infected persons. An infected person also has flu-like symptoms of a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. These symptoms often disappear after a few weeks. The second stage symptoms, which occur weeks to months later include meningitis, severe headache, drooping of the muscles on the face, called Bell's Pals, encephalitis, numbness, withdrawal and lethargy. These symptoms may last for several weeks to several months. Third stage symptoms, which occur months or years later include arthritis, heart problems, and loss of memory. The third stage symptoms may mimic

multiple sclerosis and Alzheimer's disease.

It is recommended that personnel check themselves when in areas that could harbor deer ticks, wear light color clothing and visually check themselves and their buddy when coming from wooded or vegetated areas. If a tick is found biting an individual, the SSO should be contacted immediately. The tick can be removed by pulling gently at the head with tweezers. If tweezers are not available, cover your fingers (e.g. tissue paper) and use to grasp the tick. It is important to grasp the tick as close to the site of attachment and use a firm steady pull to remove it. Wash hands immediately after with soap and water. The affected area should then be disinfected with an antiseptic wipe. All mouth parts must be removed from the skin. If the tick is removed with breaking off the mouth parts, an irritation or infection may occur. Also, the organism that is causing the disease can still enter the body through the skin. The employee will be offered the option for medical treatment by a physician, which typically involves antibiotics. If personnel feel sick or have signs similar to those above, they should notify the SSO immediately.

Treatment with antibiotics is effective and recovery is usually complete. In the first stage antibiotics are usually given orally. Second and third stage treatment, however is prolonged and recovery may take longer. Antibiotic treatment is usually provided intravenously for second and third stage Lyme disease.

3.5.3.2 West Nile Virus

West Nile Virus (WNV) is a mosquito-borne infection transmitted through the bite of an infected mosquito. The symptoms of WNV can be asymptomatic (no symptoms) or in more serious cases can lead to West Nile fever. West Nile Fever can include fever, headache, tiredness, body ache, an occasional rash on the trunk of the body, and swollen lymph glands, In severe cases, people have developed West Nile encephalitis or meningitis which symptoms include fever, headache, neck stiffness, tremors, coma and in some cases death. The incubation period for the disease is usually 2 to 15 days. The symptoms can range from a few days to several weeks.

Since the initial outbreak in 1999, the virus has spread rapidly throughout New York State. There are about 65 different species of mosquitoes in New York State, but only a small percentage has been associated with the WNV. Most mosquitoes are not infected and the chance of infection from a mosquito bite of an on-site worker is very small. All residents of areas where virus activity has been identified are at risk of getting WNV, but those of the highest risk for becoming seriously ill from WNV are people that are over 50 and individuals with some immunocompromised person (transplant patients).

The following precautions will be used to help reduce the risk of mosquito bites:

- Reduce mosquito-breeding areas by making sure wheelbarrows, buckets, and other containers are turned upside down when not used so that they do not collect standing water.
- Wear shoes, long pants with bottoms tucked into boots or socks, and a long-sleeved shirt when outdoors for long periods of time, or when many mosquitoes are most active (between dawn and dusk).
- Use mosquito repellant according to the manufacturer's directions when outdoors for long periods of time and when mosquitoes are most active.

3.5.3.3 Wasps and Bees

Wasps (hornets and yellow-jackets) and bees (honeybees and bumblebees) are common insects that may pose a potential hazard to the field team if work is performed during spring, summer or fall. Bees normally build their nests in the soil. However, they use other natural holes such as abandoned rodent nests or tree hollows. Wasps make a football-shaped, paper-like nest either below or above the ground. Yellow-jackets tend to build their nests in the ground but hornets tend to build their nests in trees and shrubbery. Bees are generally more mild-mannered than wasps and are less likely to sting. Bees can only sting once while wasps sting multiple times because their stinger is barbless. Wasps sting when they feel threatened. By remaining calm and not annoying wasps by swatting, you lessen the chance of being stung.

Wasps and bees inject a venomous fluid under the skin when they sting. The venom causes a painful swelling that may last for several days. If the stinger is still present, carefully remove it with tweezers. Some people may develop an allergic reaction (i.e. anaphylactic shock) to a wasp or bee sting. If such a reaction develops, seek medical attention at once.

3.5.4 Plants

The potential for contact with poisonous plants exists when performing field work in undeveloped and wooded areas. Poison ivy, sumac, and oak may be present on site. Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison sumac can be present in the form of a flat-topped shrub or tree. It has fern-like leaves, which are velvety dark green on top and pale underneath. The branches of immature trees have a velvety "down." Poison sumac has white, "hairy" berry clusters. Poison oak can be present as a sparingly branched shrub. Poison oak is similar to poison ivy in that it has the same leaflet configuration; however, the leaves have slightly deeper notches. Prophylactic application of Tecnu may prevent the occurrence of exposure symptoms. Post exposure over the counter products

are available and should be identified at the local pharmacy. Susceptible individuals should be identified to the PM.

Contact with poison ivy, sumac, or oak may lead to a skin rash, characterized by reddened, itchy, blistering skin which needs first aid treatment. If a field worker believes they have contacted one of these plants, immediately wash skin thoroughly with soap and water, taking care not to touch your face or other body parts.

3.5.5 Sun Exposure

Employees are encouraged to liberally apply sunscreen, with a minimum sun protection factor (SPF) of 15, when working outdoors to avoid sunburn and potential skin cancer, which is associated with excessive sun exposure to unprotected skin. Additionally, employees should wear safety glasses that offer protection from ultraviolet A and B (UVA/UVB) rays.

3.5.6 Blood Poisoning

Blood poisoning is a term used to indicate a large number of bacteria present in the circulating blood. The most common symptom of blood poisoning is the reddening of skin which advances toward the heart. For example, if the point of contact is the hand, then a red line will appear at the hand and extend up the arm towards the heart.

Signs and symptoms include swelling, stiffness and tenderness in the affect area, fatigue chills and fever, pustules, abscesses. If allowed to progress without treatment, the organisms may multiply and cause an overwhelming infection which can lead to death.

Personal protective equipment shall be worn to prevent direct contact with equipment that may be contaminated with bacteria.

3.5.7 Sewage and Bacterial Impacted Sediments

Paerdegat Basin has served as a combined sewer overflow and consequently has received untreated sanitary sewage from numerous outfalls. Decomposed sewage will potentially be encountered within sediments. Bacteria associated with sewage and can cause illness if ingested or through direct contact. PPE, as specified in Section 4, will be worn to minimize potential exposures. Personnel will use decontamination procedures identified in Section 11.

4. Personal Protective Equipment

The personal protective equipment (PPE) specified in the Table 4-1 represents PPE selection required by 29 CFR 1910.132, and is based on the AHA of Section 3.

The PPE program addresses elements, such as PPE selection based on site hazards; use and limitations; donning and doffing procedures; maintenance and storage; decontamination and disposal; training and proper fitting; inspection procedures prior to, during, and after use; evaluation of the effectiveness of the PPE program; and limitations during temperature extremes, heat stress, and other appropriate medical considerations.

A summary of PPE for each level of protection is as follows:

Table 4-1 - PERSONAL PROTECTIVE EQUIPMENT SELECTION

Safety Equipment	Level A	Level B	Level C	Level D
Tyvek® suit or work overalls				•
Hard hats with splash shields or safety glasses			•	•
Steel-toe boots with over boots			•	•
Chemical-resistant gloves as appropriate for work being performed and materials handled			•	•
Half- or full-face respirators with organic/HEPA cartridges as approved by the SSO			•	
Tyvek® splash-resistant suit			•	
Chemical-resistant clothing		•		
Pressure-demand, full-face SCBA or pressure-demand supplied air respirator with escape SCBA	•	•		
Inner and outer chemical-resistant gloves	•	•		
Chemical-resistant safety boots or shoes	•	•		
Two-way radio	•	•		
Fully encapsulating chemical-resistant suit	•			
Personal Floatation Device	•	•	•	•

PPE requirements for the project consist of Level D. A PFD will also be worn when working on the boat or near water. Butyl rubber gloves and safety glasses will be worn when handling soils/sediments potentially impacted with PCBs. If presence of PCBs in soil is confirmed, a full-face respirator with organic vapor cartridges will be worn.

4.1 OSHA Requirements for PPE

Should any additional PPE be required during the course of this field investigation, it must meet the following OSHA standards (as applicable):

Table 4-2

Type of Protection	Regulation	Source
Eye and Face	29 CFR 1910.133	ANSI Z87.1 1968
Respiratory	29 CFR 1910.134	ANSI Z88.1 1980
Head	29 CFR 1910.135	ANSI Z89.1 1969
Foot	29 CFR 1910.136	ANSI Z41.1 1999 or ASTM F-2412-2005, and ASTM F-2413-2005

CRF = Code of Federal Regulations
ANSI = American National Standards Institute
ASTM = American Society For Testing and Materials

For most work conducted at the Site, Level D PPE will include the items highlighted above in Table 4-1.

Use of Level A or Level B PPE is not anticipated. If conditions indicating the need for Level A or Level B PPE are encountered, personnel will leave the work zone and this HASP will be revised with oversight of the CHSO, GEI personnel will not re-enter the work zone until conditions allow.

Table 4-3 describes the anticipated task-specific PPE. For activities not covered by Table 4-3, SSO/CHSO will revise the hazard assessment and select the PPE using the information provided in Appendix E.

Table 4-3 PERSONAL PROTECTIVE EQUIPMENT ABBREVIATIONS

HEAD PROTECTION HH = Hard Hat HEARING PROTECTION EP = ear plugs	EYE/FACE PROTECTION APR = Full Face Air Purifying Respirator with HEPA filter and organic vapor cartridge or Particulate half face respirator PFS =Plastic Face shield SG = ANSI approved safety glasses with side shields	RESPIRATORY PROTECTION Level D = No respiratory protection required Level C = Full face air purifying respirator with approved cartridges Level B = Full face air supplied respirator with escape bottle
HAND PROTECTION LWG = Leather Work Gloves Nit = Nitrile Gloves Kev = Kevlar Gloves BR = Butyl rubber	BODY PROTECTION Poly = Polyethylene coated Tyvek® coveralls or apron WC = Work clothes PFD=Personal Flotation Device (USCG)	FOOT PROTECTION OB = Over boot STB = Leather work boots with steel toe

Table 4-4 PERSONAL PROTECTIVE EQUIPMENT SELECTION

TASK	HEAD	EYE/ FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR
Mobilization/Demobilization							
Mobilization/ demobilization of equipment and supplies	HH as needed	SG as needed	STB	LWG as needed	WC	EP as needed	Level D
Establishment of site security, work zones and staging area	HH as needed	SG as needed	STB	LWG as needed	WC	EP as needed	Level D
Monitoring Activities							
Sample Collection	HH	SG, PFS, APR as needed	STB, OB	BR	WC, Poly. PFD	EP as needed	Level D initially, Level C-with organic vapor cartridges If action levels exceeded (see Section 8 of HASP)
Sample Pickup/Transfer	HH as needed	SG as needed	STB	LWG as needed	WC, PFD	EP as needed	Level D
Sample Packing and Shipping	HH as needed	SG as needed	STB	LWG and Nit as needed	WC	EP as needed	Level D
Waste Handling	HH	SG	STB, OB as needed	LWG and BR as needed	WC, Poly as needed	EP as needed	Level D initially, Level C with organic vapor cartridges-If action levels exceeded (see Section 8 of HASP)
Biota Collection							
Organism Collection	HH	SG as needed	STB	BR	WC, PFD, Poly as needed	EP as needed	Level D
Dock and Pier Removal Activities							
Entering Construction Site	HH	SG as needed	STB	BR	WC, PFD as needed, Poly as	EP as needed	Level D

TASK	HEAD	EYE/ FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR
					needed		
Observation of dock and pile removal	HH	SG as needed	STB	BR	WC, PFD as needed, Poly as needed	EP as needed	Level D

5. Key Project Personnel/Responsibilities and Lines of Authority

GEI Personnel		
Barry Giroux	Project Manager (PM)	Office: (860) 368-5340 Mobile: (860) 608-9723 bgiroux@geiconsultants.com
Kimberly Bradley	Field Leader/Site Safety Officer (SSO)	Office: (860) 368-5414 Mobile: (860) 917-0670 kbradley@geiconsultants.com
Robin DeHate	Corporate Health and Safety Officer (CHSO)	Office: (813) 774-6564 Mobile: (813) 323-6220 rdehate@geiconsultants.com
Steve Hawkins	Regional Health and Safety Officer	Office: (860) 368-5348 Mobile: (860) 916-4167 shawkins@geiconsultants.com

Lines of Authority will be as follows:

On site – GEI will have responsibility for safety of its employees during the work performed at the site. GEI's field representative will have a cell phone available to contact the appropriate local authorities, in the event of an emergency. The field leader will be available for communication with the SSO and PM and with representatives from National Grid and NYSDEC (if necessary). The field leader (FL) and/or SSO may change due to the nature of work being conducted on site.

All GEI employees have the authority to stop work activities if an unanticipated hazard is encountered or a potential unsafe condition is observed. The GEI employee should contact the Corporate Health and Safety Officer and the Project Manager to discuss the stop work conditions and potential control methods that can be implemented.

5.1 Project Manager (PM)

Responsibilities of the PM include the following:

- Verifies implementation of the HASP
- Conducts periodic inspections and documents these in the field book
- Participates in incident investigations
- Verifies the HASP has all of the required approvals before any site work is conducted

- Verifies that National Grid site manager is informed of project changes, which require modifications of the HASP
- Has overall responsibility for project health and safety
- Acts as the primary point of contact with National Grid for site related activities and coordination with non-project related site operations
- Overseeing of performance of project tasks as outlined in the scope of work
- Plans field work using appropriate safe procedures and equipment
- Verifies and documents current training and medical monitoring clearance for GEI project staff

5.2 Corporate Health and Safety Officer (CHSO)

The CHSO is a qualified health and safety professional with experience in hazardous waste site remediation activities. Responsibilities of the CHSO include the following:

- Provides support for the development and approval of the HASP
- Serves as the primary contact to review health and safety matters that may arise
- Approves revised or new safety protocols for field operations
- Coordinates revisions of this HASP with field personnel
- Coordinates upgrading or downgrading of PPE with the site manager
- Leads the investigation of all accidents/incidents
- Provide the necessary training of GEI field crews in accordance with OSHA regulations and provides proof of training to the SSO prior to GEI personnel entering the site

5.3 Site Safety Officer (SSO)

Responsibilities of the SSO include the following:

- Verifies that the HASP is implemented and that all health and safety activities identified in the HASP are conducted and/or implemented
- Verifies that field work is scheduled with adequate personnel and equipment resources to complete the job safely and enforces site health and safety rules
- Verifies that adequate communications between field crews and emergency response personnel is maintained during emergency situations
- Verifies that field site personnel are adequately trained and qualified to work at the site and that proper PPE is utilized by field teams
- Report all accidents/incidents to the CHSO and PM
- Stop work if necessary
- Identifies operational changes which require modifications to the HASP and ensures that the procedure modifications are implemented and documented through changes to the HASP, with CHSO approval
- Determines upgrades or downgrades of PPE based on site conditions and/or real-time

monitoring results with CHSO approval

- Reports to the CHSO and provides summaries of field operations and progress

5.4 Field Leader (FL)

The FL is responsible for carrying out field work on a daily, weekly, monthly, quarterly, or as-needed basis. Responsibilities of the FL include:

- Conducts routine safety inspection of the work area
- Documenting occurrences of unsafe activity and what actions were taken to rectify the situation
- Reports any unsafe or potentially hazardous conditions to the SSO and PM
- Maintains familiarity of the information, instructions, and emergency response actions contained in the HASP
- Complies with rules, regulations and procedures set forth in the HASP
- Prevents admittance to work site by unauthorized personnel
- Inspects all tools and equipment, including PPE, prior to use and documents inspection on the daily safety meeting form or in the appropriate field book
- Ensures that monitoring instruments are calibrated
- Stops work if necessary.

5.5 Emergency Contact List

Emergency Phone List
Paerdegat Basin Site

Medical Emergencies

Emergency Medical Services (NYC Fire Department)

Emergency	911
All other communications	(718) 999-2000

Nearest Emergency Room (Brookdale University Hospital and Medical Center)	(718) 240-5000

Fire and Rescue Emergencies

Emergency	911
All other communications	(718) 999-2000

Police Emergencies

NYC Police Department (69th Precinct 9720 Foster Avenue)

Emergency	911
All other communications	311
Switchboard	(718) 834-3211

Utility Emergencies

Electric (Con Edison)	
Water/Sewer (NYC Dept of Environmental Protection)	(800) 752-6633
Natural Gas (National Grid)	(718) 643-4050
	(718) 699-9811

National Grid Site Contacts

William Ryan - Project Manager

(516) 545-2586

Underground Utilities (New York City One Call Center)

(800) 272-4480

Spill Incident

New York State Department of Environmental Conservation	(800) 457-7362
National Response Center	(800) 424-8802

National Information Centers

Chemtrec	(800) 424-9300
Poison Control Center	(800) 222-1222

6. Training Program

6.1 HAZWOPER Training

In accordance with 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations unless otherwise noted in the above reference. At a minimum, the training shall have consisted of instruction in the topics outlined in the standard. Personnel who have not met the requirements for initial training shall not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical). Proof of training shall be submitted to the SSO prior to the start of field activities.

6.2 Annual Eight-Hour Refresher Training

Annual eight-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The training will cover a review of 29 CFR 1910.120 requirements and related company programs and procedures. Proof of current 8-hour refresher training shall be submitted to the SSO prior to the start of field activities.

6.3 Supervisor Training

Personnel acting in a supervisory capacity shall have received 8 hours of instruction in addition to the initial 40 hours training.

6.4 Site Safety Officer (SSO)

The SSO shall have completed the following training and work experience prior to the commencement of site activities:

- One year of construction experience
- 40-Hour Hazardous Materials training course

Training specific to work activities (i.e., excavation and trenching activities, lock out/tag out, etc.).

6.5 Project Specific Safety Training

A project safety briefing, given by the Project Manager and/or the SSO, will serve to familiarize on-site personnel with the procedures, requirements, and the provisions of this HASP, and any applicable GEI H&S SOP. Prior to commencement of field activities, the SSO will ensure all field personnel assigned to the project will have completed training that will specifically address

the activities, procedures, monitoring, and equipment used in the site operations. It will include site and facility layout, hazards and emergency services at the Site and will highlight all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity. This training will be documented on the Project Safety Briefing form. The signed form will be forwarded to the Health and Safety Committee at Health&SafetyCommittee@geiconsultants.com. In addition, all GEI personnel shall sign the plan to document that they understand the hazards and control measures presented and agree to comply with the procedures established in the HASP. Personnel that have not received site-specific training will not be allowed on site.

6.6 On-Site Safety Briefings

Project personnel and visitors will be given health and safety briefings daily by the SSO to assist site personnel in safely conducting work activities. The briefings will include information on new operations to be conducted, changes in work practices or changes in the site's environmental conditions, as well as periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety inspections. The meetings will also be an opportunity to periodically update the crews on monitoring results. These briefings will be documented on the GEI Daily Safety Briefing form.

6.7 First Aid and CPR

The SSO will identify individuals certified in first aid and CPR. The training will be consistent with the requirements of the American Red Cross Association and will include training on blood borne pathogens.

6.8 Hazard Communication

Hazard communication training will be provided in accordance with the requirements contained in the Hazard Communication Program in Section 13.

6.9 Boat Operator Training

Vessel operators will have attended a recognized boat operator-training program and documentation of successful completion of training will be on-site.

7. Medical Surveillance Program

GEI maintains a continuous, corporate, medical surveillance program that includes a plan designed specifically for field personnel engaged in work at sites where hazardous or toxic materials may be present. Dr. Robin DeHate is GEI's CHSO and is responsible for the administration and coordination of medical evaluations conducted for GEI's employees at all branch office locations. Comprehensive examinations are given to all GEI field personnel participating in hazardous waste operations on an annual or biennial basis (as determined to be appropriate by the CHSO). The medical results of the examinations aid in determining the overall fitness of employees participating in field activities.

Under the CHSO's supervision, all field personnel undergo a complete initial physical examination, including a detailed medical and occupational history, before they participate in hazardous waste site investigations. Extensive annual/biennial reexaminations are also performed. Upon completion of these tests, personnel are certified by an occupational health physician as to whether they are fit for field work in general, and fit to use all levels of respiratory protection, in particular.

If a GEI employee or other project worker shows symptoms of exposure to a hazardous substance and wishes to be rechecked, he/she will be directed to the nearest area hospital or medical facility.

All GEI subcontractor personnel that will enter any active waste handling or other active non-"clean" area must certify that they are participating in a medical surveillance program that complies with OSHA regulations for hazardous waste operations (i.e., 29 CFR 1910.120 and 29 CFR 1926.65). Proof of medical clearance shall be submitted to the GEI CHSO or her representative prior to the start of field activities.

8. Work Zone Monitoring

Monitoring shall be performed to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of worker protection needed on site.

GEI will conduct work zone monitoring for GEI employees. GEI will monitor and document daily site conditions and operations on National Grid's behalf.

GEI will provide the following equipment for health and safety monitoring of its personnel:

- Photo-ionization Detector (PID), or Flame Ionization Detector (FID),
- Particulate Meter (PM-10 capable)
- Dräger Chip Measurement System (CMS) (or equivalent instrument)

The air monitoring action levels and contingency plan presented within the Table 8-1 below will be implemented by GEI.

TABLE 8-1: Work Zone Air Monitoring Action Levels

Air Monitoring Instrument	Monitoring Location	Action Level	Site Action
PID/FID	Breathing Zone	1.0 ppm	Use Dräger Chip Measurement System (CMS) tube for benzene or to verify if concentration is benzene
PID/FID	Breathing Zone	0 - 50 ppm	No respiratory protection is required
		50 - 100 ppm	Stop work, withdrawal from work area, institute engineering controls, if levels persist Upgrade to Level C
		> 100 ppm	Stop work, withdraw from work area; notify SSO & CHSO
Particulate Meter [Soil Investigation only]	Work Zone	150 µg/m^3	Implement work practices to reduce/minimize airborne dust generation, e.g., spray/misting of soil with water

9. Site Control Measures

9.1 Site Zones

Site zones are intended to control the potential spread of contamination and to assure that only authorized individuals are permitted into potentially hazardous areas. A three-zone approach will be utilized. It shall include an Exclusion Zone (EZ), Contamination Reduction Zone (CRZ) and a Support Zone (SZ). Specific zones shall be established on the work site by the Contractor when operations begin for each task requiring such delineation.

This project is being conducted under the requirements of 29 CFR 1910.120, and any personnel working in an area where the potential for exposure to site contaminants exists, will only be allowed access after proper training and medical documentation.

The following shall be used for guidance in revising these preliminary zone designations, if necessary.

9.1.1 Support Zone (SZ)

The SZ is an uncontaminated area that will be the field support area for most operations. The SZ provides for field team communications and staging for medical emergency. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone.

9.1.2 Contamination Reduction Zone (CRZ)

The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides an area for decontamination of personnel and portable hand-held equipment, tools and heavy equipment. A personnel decontamination area will be prepared at each exclusion zone. The CRZ will be used for Exclusion Zone entry and egress in addition to access for heavy equipment and emergency support services.

9.1.3 Exclusion Zone (EZ)

All activities which may involve exposure to site contaminants, hazardous materials and/or conditions should be considered an exclusion zone. This zone will be clearly delineated by cones, tapes or other means. The Contractor may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the Contractor allowing adequate space for the activity to be completed, field members and emergency equipment.

The Contractor is responsible for constructing, maintaining, and enforcing the zones.

9.2 Buddy System

GEI personnel should be in line-of-site or communication contact with another on-site person. The other on-site personnel should be aware of their role as a "buddy" and be able to provide assistance in the event of an emergency. A copy of this plan shall be given to any person acting as a GEI "buddy" for informational purposes.

9.3 Sanitation for Temporary Work Sites

Temporary sanitary facilities including toilets will be available on site.

9.4 Illumination

Illumination requirements identified by OSHA are directed to work efforts inside buildings and/or during non-daylight hours. All activities planned for the site are anticipated to occur outside during daylight hours. However, if yard areas are used after dark they will be equipped with illumination that meets or exceeds requirements specified in 29 CFR 1926.56, Illumination.

9.5 Utilities

The site may have shallow, buried utilities and overhead utilities in certain areas. It will be necessary for all parties disturbing the existing ground surface and conducting operations with heavy equipment having high clearances to exercise a high degree of caution in performing project-related work with respect to the presence of utilities. Utility companies with active buried lines in the site area will be asked to mark all of their facilities as necessary. In addition, as necessary, a private utility locating service will be retained to located underground utilities. Site workers will use these data to choose apparently safe work locations.

9.5.1 Underground Utilities

No excavating, drilling, boring or other intrusive activities will be performed until a thorough underground utility survey, conducted by knowledgeable persons or agencies, has been made and it is found safe to begin. This survey will identify any underground and in-workplace utilities such as the following:

- Electrical lines and appliances
- Telephone lines
- Cable television lines
- Gas lines
- Pipelines
- Steam lines

- Water lines
- Sewer lines
- Pressurized air lines

The location of any utility that could pose a risk to workers must be communicated to all workers during site safety indoctrination. Utilities should be marked or access otherwise restricted to avoid change of accidental contact.

Even when a utility search has been completed, drilling, boring and excavation should commence with caution until advanced beyond the depth at which such utilities are usually located. All utilities shall be considered "live" or active until reliable sources demonstrate otherwise.

9.5.2 Overhead Utilities

Overhead transmission and distribution lines will be carried on towers and poles which provide adequate safety clearance over roadways and structures. Clearances will be adequate for the safe movement of vehicles and for the operation of construction equipment.

Overhead or above-ground electric lines should be considered active until a reliable source has documented them to be otherwise. Elevated work platforms, ladders, scaffolding, man-lifts, and drill or vehicle superstructures shall be erected a minimum of 20 feet (the actual distance is dependent upon the voltage of the line) from overhead electrical lines until the line is de-energized, grounded or shielded and a competent electrician has certified that arcing cannot occur between the work location or superstructure.

10. Incident Reporting

GEI will report incidents involving GEI personnel or subcontractor personnel, such as lost time injuries, injuries requiring medical attention, near miss incidents, fires, fatalities, accidents involving the public, and property damage. The report shall be made to the GEI PM verbally within 2 hours of the incident. The PM will immediately inform the CHSO, the Director of Human Resources and a project-specific National Grid representative for the incident. An Incident Report Form (see **Appendix D**) will be completed and submitted to the CHSO within 24 hours.

National Grid requires immediate notification of any incident involving injury, illness, or property damage. **A draft Incident Report must be submitted within 6 hours of the incident.**

11. Decontamination Procedures

PPE help prevent the wearer from becoming contaminated or inhaling contaminants, and good work practices help reduce contamination on protective clothing, instruments, and equipment. Even with these safeguards, contamination may occur. Harmful materials can be transferred to clean areas, exposing unprotected personnel. To prevent such occurrences, the following contamination reduction and decontamination procedures have been developed.

11.1 Minimization of Contact with Contaminants

During completion of all site activities, personnel should attempt to minimize the degree of contact with contaminated materials. This involves a conscientious effort to keep "clean" during site activities. All personnel should minimize kneeling, splash generation, and other physical contact with contamination. This may ultimately minimize the degree of decontamination required and the generation of waste materials from site operations.

11.2 Personnel Decontamination

Personnel hygiene, coupled with diligent decontamination, will significantly reduce the potential for exposure. Consideration will be given to prevailing wind directions so that the decontamination line, the support zone, and contamination reduction zone (CRZ) exit is upwind from the exclusion zone (EZ) and the first station of the decontamination line. Decontamination will be performed by removing all PPE used in EZ and placing in drums/trash cans at CRZ. Disinfecting hand wipes shall be available for wiping hands and face. For Level D Decontamination, personnel should wash and rinse gloves, and use anti-bacterial wipes/gel and wash and rinse hands and face with potable water.

For Level C Decontamination, personnel should wash and rinse gloves and over boots, remove boot covers, remove outer gloves, remove Poly-coated suit, wash inner gloves, remove respirator, rinse inner gloves, remove inner gloves and wash and rinse hands and face.

If exposed to the sediments or surface waters of the canal, wash the exposed skin immediately with anti-bacterial wipes/gel and wash with soap and water.

11.3 Emergency Decontamination

If circumstances dictate that contaminated clothing cannot be readily removed, then remove gross contamination; wrap injured personnel with clean garments/blankets to avoid contaminating other personnel or transporting equipment. If the injured person can be moved, he/she will be moved to the exclusion zone boundary and decontaminated by site personnel as

described above before emergency responders handle the victim. If the person cannot be moved because of the extent of the injury (a back or neck injury) provisions shall be made to ensure that emergency response personnel will be able to respond to victim without being exposed to potentially hazardous atmospheric conditions. The only time an injured person should be removed is if the worker's life is threatened to a greater degree than if he/she is left in the spot where the accident occurred. If emergency response personnel have to enter hazardous conditions to respond to victim this should communicated when the emergency call is made and responders can come prepared in appropriate PPE. If the potential for inhalation hazards exist, such as with an open excavation, this area will be covered with plastic sheeting, or similar controls, to eliminate any potential inhalation hazards. All emergency personnel are to be immediately informed of the injured person's condition, potential contaminants, and provided with all pertinent chemical data.

11.4 Hand Held Equipment Decontamination

Hand held equipment includes all monitoring instruments, samples, hand tools, sampling equipment (including the PONAR sampler) and notebooks. The hand held equipment is dropped at the first decontamination station to be decontaminated by one of the decontamination team members. These items must be decontaminated or discarded as waste prior to removal from the exclusion zone.

To aid in decontamination, monitoring instruments can be sealed in plastic bags or wrapped in polyethylene. This will also protect the instruments against contaminants. The instruments will be wiped clean using antibacterial wipes and paper towels if contamination is visually evident.

Decontamination procedures for sampling equipment, hand tools, etc., shall include the use of steam cleaning or a detergent wash, as appropriate for the site conditions. A dilute solution of bleach (approximately 10% solution) will be used first and will be followed by the standard decontamination procedures presented in the Work Plan. After the detergent wash and water rinse each piece of equipment that could potentially be contaminated by PCBs shall be rinsed or swabbed with hexane to meet the applicable decontamination standards in 40 CFR 761.79(c). Hexane is an approved performance-based organic decontamination fluid (PODF) under the self-implementing decontamination standards in 40 CFR 761.79(c). All liquids generated in the decontamination will be stored at a secure location identified by National Grid in lined rolls or drums and then disposed of at an approved facility in accordance with federal, state and local regulations. Personnel performing this task will wear the proper PPE as prescribed in Section 4.

11.5 Equipment Decontamination

Decontamination of chemically or potentially contaminated equipment and hand tools will be performed. Decontamination shall take place on a decontamination pad and all liquids used in the decontamination procedure will be collected. Equipment brought into an exclusion zone will

be treated as contaminated, and will be decontaminated prior to removal. All liquids used in the decontamination procedure will be stored at a secure location identified by National Grid in lined rolls or drums and then disposed of at an approved facility in accordance with federal, state and local regulations. Personnel performing this task will wear the proper PPE as prescribed in Section 4.

The first step in equipment decontamination will be accomplished using high -pressure steam, damp mopped with water and/or dry decontaminated with brushes and shovels. The equipment, if it has come into contact with PCBs, will then be rinsed with a performance-based organic decontamination fluid (PODF) to meet the applicable decontamination standards in 40 CFR 761.79(c). This decontamination fluid will be collected and disposed of based on its as-found concentrations. If PCB-impacted material is not rinsed with a PODF, GEI will collect wipe samples per 40 CFR 761 Subpart P from the equipment decontaminated to verify that decontamination is complete per 40 CFR 761.79(b)(3)(i)(A), i.e. PCB wipe samples results are less than 10 ug/100 cm^2. This process will be repeated if necessary.

12. Medical Support

In case of minor injuries, on site care shall be administered with the Site first aid kit.
For serious injuries, call 911 and request emergency medical assistance. Seriously injured persons should not be moved, unless they are in immediate danger.

Section 5 and **Appendix A** contain detailed emergency information, including directions to the nearest hospital, and a list of emergency services and their telephone numbers. GEI field personnel will carry a cellular telephone.

13. Supplemental Contingency Plan Procedures

13.1 Hazard Communication Plan

GEI personnel have received hazard communication training as part of their annual HAZWOPER refresher training. All hazardous materials used on the Site will be properly labeled, stored, and handled. MSDS will be available to on-site staff.

13.2 Fire

In the event of a fire at sea, the captain and SSO will adhere to the following:

- At the first sign of smoke, determine your situation and notify boats in the area that you might have a problem. Do not wait as you may lose your radio.
- Move any crew and passengers to a safe area of the vessel
- Cut off the air supply to the fire (i.e. close hatches, doors, windows, etc.)
- Maneuver the vessel to minimize the effect of wind on the fire
- If unable to control the fire, IMMEDIATELY notify the Coast Guard and any other vessels in the area. YOU HAVE A MAYDAY SITUATION.

Crew and other staff members will:

- Immediately use portable CO2 fire extinguishers at the base of the flames for flammable liquid or grease fires, or water for ordinary combustibles
- Halon and Dry Chemical fire extinguishers may be used for flammable liquid, grease or electrical fires

If applicable, notification of evacuation will be made to the GEI PM and the CHSO. The field representative will account for GEI personnel and subcontractor personnel and report their status to the PM.

The subcontractor will have fire extinguishers on board the boat.

13.3 Person Overboard

If someone falls overboard, the remaining personnel on the vessel will:

- Immediately throw anything that floats overboard to mark the position of the person
- Throw a life ring (Type IV PFD) overboard as close to the person as possible
- Notify the captain “Man Overboard” and on which side of the vessel
- Post a lookout to keep the person in sight. This person should try to make their way to the captain to assist him in bringing the vessel to the person in the water.

- Maneuver the vessel to pick up the person in the water. When the captain has the person in sight, he will release the deckhand to rig the rescue ladder.
- Have the life ring with line attached ready to throw near the person so they may be pulled to the boat
- Notify boats in the area by radio on that you have a person in the water
- Have a crew member attach a safety line to themselves and stand by to go in the water ONLY IF NECESSARY
- If the person is not located immediately, radio the Coast Guard and other vessels in the area
- Continue search until relieved by the Coast Guard

13.4 Severe Weather

The contingency plan for severe weather includes reviewing the expected weather to determine if severe weather is in the forecast. Severe weather includes high winds over 30 mph, heavy rains or snow squalls, thunderstorms, hurricanes, lightning storms, or wave action that makes boating unsafe. If severe weather is approaching, the decision to return to a pier or secure location at the shore of the creek will be made in a manner as to allow adequate time for the boat to return and all personnel to evacuate. The location where the boat will dock is to be determined by its location in the creek and the severity of the weather. The person in command of the vessel will make the final decision regarding movement of the boat. All equipment will be lashed securely to the deck of the boat and all personnel will evacuate the boat to a place of safety. The vessel captain will make the final decision for actions taken due to changing weather conditions.

The captain is responsible for:

- Closing all watertight and weather-tight doors, hatches and windows to prevent taking on water
- Keeping bilges dry to prevent loss of stability
- Keeping any passengers seated and evenly distributed
- Clearing all deck drains and securing lines from washing overboard

13.5 Abandon Ship

The captain and SSO:

- NEVER abandon ship unless actually forced to do so
- In the event the vessel has to be abandoned the captain and SSO will insure that nearby boats and the Coast Guard have been contacted with the locations
- Crew members will assist any passengers and instruct them in what to do
- If life jackets are not donned already (personnel are instructed to wear life jackets throughout the course of the work), all personnel should don their life jackets which should be distributed throughout the vessel in plain view.

- Life rings are on the side of the pilot house of the steel boat
- If near or after dark, attach water lights to rafts and life rings

13.6 Spills or Material Release

If a hazardous waste spill or material release occurs, the SSO or their representative will immediately assess the magnitude and potential seriousness of the spill or release based on the following:

- MSDS, if applicable, for the material spilled or released
- Source of the release or spillage of hazardous material
- An estimate of the quantity released and the rate at which it is being released
- The direction in which the spill or air release is moving
- Personnel who may be or may have been in contact with the material, or air release, and possible injury or sickness as a result
- Potential for fire and/or explosion resulting from the situation; and
- Estimates of area under influence of release.

If the spill or release is determined to be within the on-site emergency response capabilities, the SSO will ensure implementation of the necessary remedial action. If the release is beyond the capabilities of the site personnel, all personnel will be evacuated from the immediate area and the local fire department will be contacted. The SSO will notify the PM, the CHSO and the National Grid PM.

13.7 Alcohol and Drug Abuse Prevention

Alcohol and drugs will not be allowed on the work site. Project personnel under the influence of alcohol or drugs will not be allowed to enter the site.

14. Health and Safety Plan Sign-Off

All GEI personnel conducting site activities must read this Health and Safety Plan, be familiar with its requirements, and agree to its implementation.

Once the Health and Safety Plan has been read, complete this sign-off sheet, and return it to the Project Manager.

Site Name:
Paerdegat Basin Interim Remedial Measure – National Grid

Activity:

- Mobilization
- Biota Sampling
- Soil and Sediment Sampling
- Dock and Pier Removal

I have received and read the Health and Safety Plan, been briefed on it, and agree to its implementation.

Name	Signature	Date

APPENDIX A

Site-Specific Information

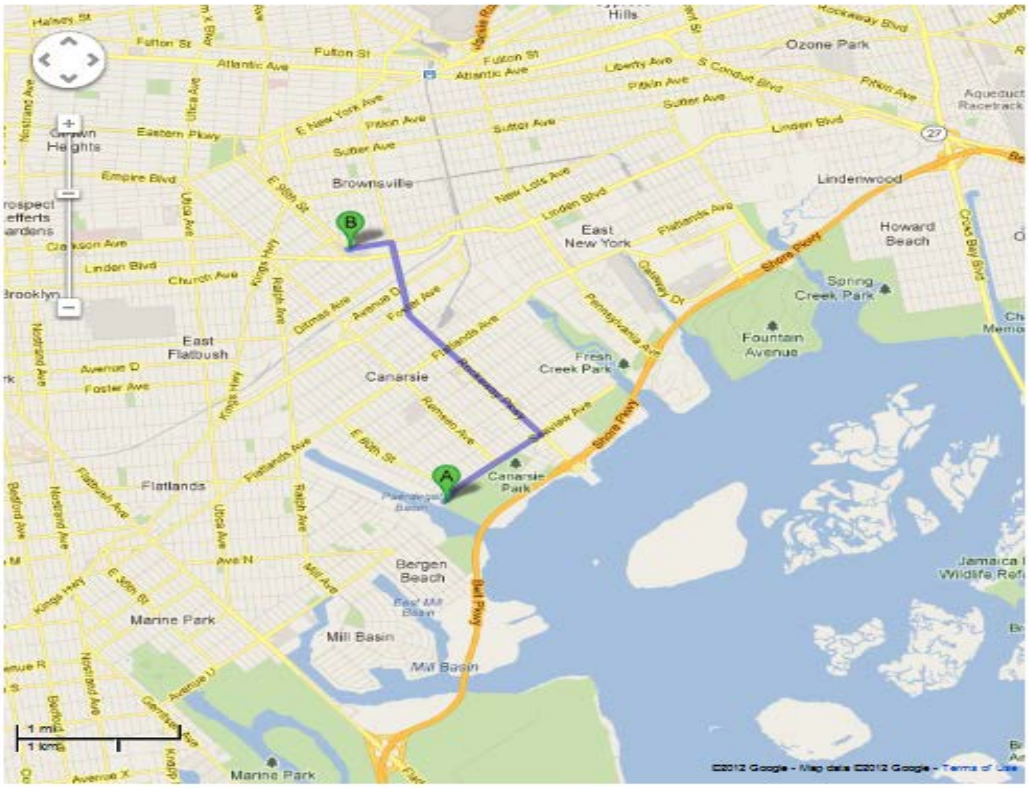
HOSPITAL ROUTE MAP
Brookdale University Hospital and Medical Center
One Brookdale Plaza, Brooklyn, New York 11212
718-240-5000

Google

Directions to Brookdale Hospital
Brookdale Plaza, New York, NY 11212
3.0 mi – about 9 mins

You can enter notes here.

Save trees. Go green!
Download Google Maps on your phone at google.com/gmm



A **Midget Squadron Yacht Club**
Foot Of Seaview Ave , Brooklyn, NY 11236, 11236 - (718) 251-9823

1.	Head **northeast** on **Seaview Ave** toward **E 80th St** About 2 mins	go 0.8 mi total 0.8 mi
2.	Turn left onto **Rockaway Pkwy** About 3 mins	go 1.3 mi total 2.1 mi
3.	Slight right onto **Rockaway Ave** About 2 mins	go 0.6 mi total 2.7 mi
4.	Turn left onto **Hegeman Ave** About 1 min	go 0.3 mi total 3.0 mi
5.	Turn left onto **E 98th St** Destination will be on the right	go 75 ft total 3.0 mi

B **Brookdale Hospital**
Brookdale Plaza, New York, NY 11212

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.
Map data ©2012 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

APPENDIX B

Hazard Communication Program

1.0 POLICY AND PURPOSE

It is the policy of the Consultant to furnish employees with a working environment safe from recognized hazards. This program is designed to provide the Consultant compliance with OSHA's Federal Hazard Communication Standard (29 CFR 1910.1200 and 1926.59).

The Consultant Hazard Communication (HAZCOM) Program has been compiled to provide guidelines for assisting this corporation in meeting the requirements of OSHA's Hazard Communication Standard. This program addresses the evaluation of potential Consultant workplace hazards and communication of pertinent hazard information to Consultant employees.

The **CONTRACTOR** must develop a HAZCOM for **CONTRACTOR** employees and **SUBCONTRACTORs**.

Although most **CONTRACTOR** field projects do not involve the use of hazardous substances, it is imperative that all hazardous materials be managed in accordance with this program. This applies to any usage of hazardous materials regardless of volume. The Contractor shall generate a list of chemicals that are anticipated to be used during work activities.

2.0 SCOPE

In accordance with 29 CFR 1910.1200 and 1926.59, this program applies to any potentially hazardous chemical which is known to be present in the workplace in such a manner that employees may potentially be exposed under normal conditions of use. This program also addresses chemicals that may be constituents of waste that may be encountered on a typical Consultant job site.

3.0 LOCATION OF WRITTEN PROGRAM

A complete original of this written program is located with the Consultant Corporate Health and Safety Specialist (CHSS) and with each Consultant Office/Branch Manager.

4.0 RESPONSIBILITIES

Overall coordination and implementation of Consultant HAZCOM Program is the responsibility of the CHSS. Any questions, comments, or suggestions relating to

Consultant HAZCOM Program should be directed to the CHSS.

The following subsections delineate the responsibilities of personnel as required for successful implementation of this program.

Corporate Health and Safety Specialist (CHSS)

The CHSS shall:

- Develop and oversee implementation of the written HAZCOM Program
- At a minimum, determine that field personnel engaged in hazardous waste operations receive OSHA 40-hour Health and Safety Training, 24-hour supervised on-the-job training, 8-hour Supervisory Training, and annual 8-hour Retraining as required by OSHA (29 CFR 1910.120 and 29 CFR 1926.65)

Office/Branch Managers

The Office/Branch Managers shall:

- Determine that all new employees at their office/branch receive training in accordance with the HAZCOM Program within 30 days of hire or prior to performing field work (whichever is sooner)
- Maintain at the office/branch an inventory of Material Safety Data Sheets (MSDSs) as available for all hazardous materials with which employees have the potential of coming into contact while on the job
- Determine that MSDSs are made readily available for employee review upon request by the employee
- Determine that label and warning protocol for hazardous materials is complied with

Supervisors (Project Managers and/or Field Team Leaders)

Supervisors shall:

- Develop and oversee completeness of site-specific HASPs for their projects
- Implement the hazard communication programs and HASPs for their projects
- Determine that field personnel are familiar with the HAZCOM Program regarding chemical use and potential chemical exposures in the field
- Determine that employees working on their project sites are familiar with site-specific HASPs and perform in compliance with the requirements of those HASPs.

Employee

It is the employee's responsibility to:

- Read the HAZCOM procedure within 30 days of employment by the Consultant or prior to performing field work for CONSULTANT (whichever is sooner)
- Gain familiarization with MSDSs of those hazardous materials which they use or may be exposed to
- Utilize information and measures as learned from the HAZCOM Program, including associated training and professional experiences, to protect themselves from adverse exposure to hazardous materials

5.0 PROGRAM REQUIREMENTS

Material Safety Data Sheets (MSDSs) and Chemical List

Complete sets of MSDSs for chemicals specific to each office/branch are maintained by the Consultant Office/Branch Manager and made readily available for review upon request by any employee.

A list of chemicals potentially used/encountered by Consultant personnel at offices/branches involved in hazardous waste operations is provided in Table 11-1. Note that Table 11-1 is not necessarily complete.

MSDSs are available for the listed chemicals described below.

- MSDSs for chemicals that are typically used for decontamination and/or sample preservation are compiled. Supplies of these chemicals are generally kept in Consultant field equipment storerooms.
- MSDSs for chemicals and materials that may be encountered on typical Consultant job sites are compiled. These MSDSs are typically included in site-specific Health and Safety Plans. MSDSs should be reviewed prior to performing fieldwork on those sites.
- MSDSs for chemicals used for Photo ionization detector (PID) soil gas instrument and standards are compiled. These chemicals are generally kept in small quantities to be used only by soil gas instrument technical personnel.

In addition, the consultant maintains an a comprehensive collection of MSDSs as printed by Genium Publishing Corporation and as obtained from manufacturers of products received at Consultants office are available for use by employees by request to the CHSS. This MSDS collection is updated periodically.

TABLE 11-1
CHEMICAL LIST
DECONTAMINATION AND/OR PRESERVATION CHEMICALS (Field/Storeroom Personnel)

Chemical	*Amount Stored	Location
Acetone	20 liters	Field Equipment Room Flammable Storage Cabinet
Acetonitrile	4 liters	Field Equipment Room Flammable Storage Cabinet
1-Butanol (n-Butyl Alcohol)	0.5 liter	Field Equipment Room Flammable Storage Cabinet
Hexane	20 liters	Field Equipment Room Flammable Storage Cabinet
Hydrochloric Acid	0.5 liter	Field Equipment Room Corrosive Storage Cabinet
Methanol	40 liters	Field Equipment Room Flammable Storage Cabinet
Nitric Acid	15 liters	Field Equipment Room Corrosive Storage Cabinet
Sodium Hydroxide	1 kg	Field Equipment Room Corrosive Storage Cabinet (separated from acids)
Sulfuric Acid	0.5 liter	Field Equipment Room Corrosive Storage Cabinet

CHEMICALS POTENTIALLY ENCOUNTERED ON TYPICAL JOB SITES

Chemical
Benzene
Coal Tar Creosote
Coal Tar Pitch
Cresol
Cyanide
1,1-Dichloroethylene
1,2-Dichloroethylene (both isomers)
Ethyl benzene
Gasoline
Naphtha (Coal Tar)
Naphthalene and related PAHs
Pentachlorophenol
Perchloroethylene
Polychlorinated Biphenyls
Styrene

DECONTAMINATION AND/OR PRESERVATION CHEMICALS (Field/Storeroom Personnel)

Chemical	*Amount Stored	Location
1,1,2,2-Tetrachloroethane		
Tetraethyl Lead		
Toluene		
1,1,1-Trichloroethane (methyl chloroform)		
Trichloroethylene		
Xylene		

**SOIL GAS STANDARD CHEMICALS (used by soil gas personnel only)

Chemical	*Amount Stored	Location
Stored for Occasional or Potential Future Use		
Benzene	10 grams	Field Equipment Room Refrigerator
1,1-Dichloroethylene	10 grams	Field Equipment Room Refrigerator
1,2-Dichloroethylene (both isomers)	14 grams	Field Equipment Room Refrigerator
Ethyl benzene	10 grams	Field Equipment Room Refrigerator
Perchloroethylene	10 grams	Field Equipment Room Refrigerator
Toluene	10 grams	Field Equipment Room Refrigerator
Trichloroethylene	10 grams	Field Equipment Room Refrigerator
Xylenes (o, m, & p)	6 grams	Field Equipment Room Refrigerator
Bromodichloromethane	1 gram	Field Equipment Room Refrigerator
Bromoform	5 grams	Field Equipment Room Refrigerator

**SOIL GAS STANDARD CHEMICALS (used by soil gas personnel only)

Chemical	*Amount Stored	Location
Stored for Occasional or Potential Future Use		
2-Chloroethyl vinyl ether	5 grams	Field Equipment Room Refrigerator
Dibromochloromethane	1 gram	Field Equipment Room Refrigerator
1,4-Dichlorobenzene	5 grams	Field Equipment Room Refrigerator
1,2-Dichloropropane	5 grams	Field Equipment Room Refrigerator
1,3-Dichloropropene	2 grams	Field Equipment Room Refrigerator
Styrene	2 grams	Field Equipment Room Refrigerator
1,1,2,2-Tetrachloroethane	2 grams	Field Equipment Room Refrigerator
1,1,1-Trichloroethane	2 grams	Field Equipment Room Refrigerator
1,1,2-Trichloroethane	5 grams	Field Equipment Room Refrigerator
Trichlorofluoromethane	5 grams	Field Equipment Room Refrigerator
1,2,4-Trimethylbenzene	2 grams	Field Equipment Room Refrigerator

* Amounts stored are based on typical field equipment room inventory (Colchester Office). Actual amounts may vary depending on facility location and project requirements.

** Soil gas standard chemicals are used for field testing/calibration of soil gas, field, analytical equipment.

LABELS AND WARNINGS

The Consultant labeling system for containers of hazardous materials is as follows:

- Containers are labeled, tagged, or marked in a legible fashion, with the identity of the hazardous materials contained therein.
- Containers are labeled, tagged, or marked in a legible fashion with the appropriate hazard warnings. This warning may be of any type of message, words, pictures or symbols that convey the hazards of the chemical.
- All required container labels, tags and/or markings are legible.
- Labels are affixed to the container itself (vs. lid). Note that lids may also be labeled, but not in lieu of container labeling.

The Consultant field equipment room maintenance technician is responsible that the Consultant labeling system is complied with at his/her office location. Project Managers and Field Team Leaders are responsible for determining that the Consultant labeling system is complied with for the field portion of their projects.

TRAINING

The Consultant Office/Branch Manager is responsible for determining that the HAZCOM Training Program is complied by personnel employed at their office/branch.

The Consultant's HAZCOM Program training requirements are listed below:

- Newly hired employees who may use or be exposed to hazardous materials will be required to familiarize themselves with the HAZCOM Program, and with the MSDSs associated with their job function.
- Selected employees will be required to attend a HAZCOM Program classroom training session. Training shall provide information on:

    - The physical and health hazards of the chemicals in the work area
    - Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area
    - Measures employees can take to protect themselves from these hazards
    - The details of the HAZCOM Program, including an explanation of MSDSs and CONSULTANTs container labeling system

- As required to achieve compliance with OSHA 1910.120 and 1926.65, technical staff engaged in hazardous waste operations will be provided with OSHA 40-hour HAZWOPER safety training, 24 hours of on-the-job training, and annual 8-hour HAZWOPER refresher courses.

6.0 MULTI-EMPLOYER WORK PLACES

The Consultant is obligated to provide the identity of any hazardous materials/conditions to other employers sharing the same workplace whose employees may be exposed. Likewise, all employers sharing the same workplace with the Consultant shall be obligated to identify all hazardous materials/conditions to which employees may be exposed. The employer sharing space with the Consultant will be required by the Consultant Project Manager to:

- Determine that a mutual exchange of this information occurs, and that health and safety hazards are minimized
- Provide to project employees, as part of the subcontractor HASP, MSDSs of identified hazardous materials to which they may be exposed
- Conform in full to the requirements of 29 CFR 1910.1200 and 29 CFR 1926.59, applicable HASPs, and established work procedures

These obligations may be accomplished via the exchange of written HAZCOM Programs, project HASPs, or MSDSs as appropriate.

7.0 BIENNIAL REVIEW

This program will be formally reviewed by the Consultant CHSS and company management on a biennial basis or more frequently if the CHSS deems it necessary to promote personnel safety. The program will be revised as necessary for continuing compliance with the OSHA Federal Hazard Communication Standard.

APPENDIX C

Cold Stress and Heat Stress Guidelines

Cold Stress Guidelines

	Symptoms	What to do
Mild Hypothermia	• Body Temp 98-90°F • Shivering • Lack of coordination, stumbling, fumbling hands • Slurred speech • Memory loss • Pale, cold skin	• Move to warm area • Stay active • Remove wet clothes and replace with dry clothes or blankets • Cover the head • Drink warm (not hot) sugary drink
Moderate Hypothermia	• Body temp 90-86°F • Shivering stops • Unable to walk or stand • Confused irrational	• All of the above, plus: • Call 911 • Cover all extremities completely • Place very warm objects, such as hot packs on the victim's head, neck, chest and groin
Severe Hypothermia	• Body temp 86-78°F • Severe muscle stiffness • Very sleepy or unconscious • Ice cold skin • Death	• Call 911 • Treat victim very gently • Do not attempt to re-warm
Frostbite	• Cold, tingling, stinging or aching feeling in the frostbitten area, followed by numbness • Skin color turns red, then purple, then white or very pale skin • Cold to the touch • Blisters in severe cases	• Call 911 • Do not rub the area • Wrap in soft cloth • If help is delayed, immerse in warm, not hot, water
Trench Foot	• Tingling, itching or burning sensation • Blisters	• Soak feet in warm water, then wrap with dry cloth bandages • Drink a warm sugary drink

HEAT STRESS GUIDELINES			
Form	Signs & Symptoms	Care	Prevention[3]
Heat Rash	Tiny red vesicles in affected skin area. If the area is extensive, sweating can be impaired.	Apply mild lotions and cleanse the affected area.	Cool resting and sleeping areas to permit skin to dry between heat exposures
Heat Cramps	Spasm, muscular pain (cramps) in stomach area and extremities (arms and legs).	Provide replacement fluids with minerals (salt) such as Gatorade.	Adequate salt intake with meals[1] ACCLIMATIZATION[2]
Heat Exhaustion	Profuse sweating, cool (clammy) moist skin, dizziness, confusion, pale skin color, faint, rapid shallow breathing, headache, weakness, muscle cramps.	Remove from heat, sit or lie down, rest, replace lost water with electrolyte replacement fluids (water, Gatorade) take frequent sips of liquids in amounts greater than required to satisfy thirst.	ACCLIMATIZATION[2] Adequate salt intake with meals[1] only during early part of heat season. Ample water intake, frequently during the day
Heat Stroke	HOT Dry Skin. Sweating has stopped. Mental confusion, dizziness, nausea, severe headache, collapse, delirium, coma.	HEAT STROKE IS A MEDICAL EMERGENCY - Remove from heat. - COOL THE BODY AS RAPIDLY AS POSSIBLE by immersing in cold (or cool) water, or splash with water and fan. Call for Emergency Assistance. Observe for signs of shock.	ACCLIMATIZATION[2] Initially moderate workload in heat (8 to 14 days). Monitor worker's activities.

Footnotes:

1.) American diets are normally high in salt, sufficient to aid acclimatization. However, during the early part of the heat season, (May, June), one extra shake of salt during one to two meals per day may help, so long as this is permitted by your physician. Check with your personal physician.

2.) ACCLIMATIZATION - The process of adapting to heat is indicated by worker's ability to perform hot jobs less fluid loss, lower concentrations of salt loss in sweat, and a reduced core (body) temperature and heart rate.

3.) Method to Achieve Acclimatization - Moderate work or exercise in hot temperatures during early part of heat season. Adequate salt (mineral) and water intake. Gradually increasing work time in hot temperatures. Avoid alcohol. Normally takes 8 to 14 days to achieve acclimatization. Lost rapidly, if removed from strenuous work (or exercise) in hot temperature for more than approximately five days.

APPENDIX D

Health and Safety Standard Operating Procedures (SOPs)

STANDARD OPERATING PROCEDURES
SOP NO. HS-003 Container Management

1.1 Objective

This SOP has been developed to minimize the potential for injuries to GEI employees performing container and drum handling and sampling, through proper use of engineering and administrative controls and education.

1.2 General

Hazardous substances and contaminated liquids and other residues will be handled, transported, labeled, and disposed of in accordance with this paragraph. Drums and containers will meet the appropriate DOT, OSHA, and EPA regulations for the wastes that they contain.

Site operations will be organized to minimize the amount of drum or container movement. Prior to movement of drums or containers, all employees exposed to the transfer operation will be notified of the potential hazards associated with the contents of the drums or containers. Unlabeled drums and containers will be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.

U.S. Department of Transportation specified salvage drums or containers and suitable quantities of proper absorbent will be kept available and used in areas where spills, leaks, or ruptures may occur. Where spills may occur, a spill containment program, which may be part of the health and safety plan, will be implemented to contain and isolate the entire volume of the hazardous substance being transferred. Fire extinguishing equipment meeting the requirements of 29 CFR Part 1910, Subpart L, will be on hand and ready for use to control incipient fires.

1.3 Opening Drums and Containers

The following procedures will be followed in areas where drums or containers are being opened:

- Employees not actually involved in opening drums or containers will be kept a safe distance from the drums or containers being opened.

- If employees must work near or adjacent to drums or containers being opened, a suitable shield that does not interfere with the work operation will be placed between the employee and the drums or containers being opened to protect the employee in case of accidental release.

- GEI employees will not handle or attempt to open bulging containers. Employees will not stand upon or work from drums or containers. GEI will contract with a hazardous waste company to handle, manage, and dispose of a bulging drum.

1.4 Material Handling Equipment

Material handling equipment used to transfer drums and containers will be selected, positioned, and operated to minimize sources of ignition.

1.5 Radioactive Wastes

GEI does not routinely handle or manage radioactive waste. If required to do so for a project, procedures will be approved by the Corporate Health and Safety Officer (CHSO) and Regional Health and Safety Officer (RHSO).

1.6 Shock-sensitive Wastes

GEI employees will not handle shock-sensitive waste. Shock-sensitive waste or chemicals may explode with friction, movement or heat. Some chemicals are shock-sensitive by nature, others become shock-sensitive through drying, decomposition, or slow reactions with oxygen, nitrogen, or the container. Some chemicals that are, or can, become shock-sensitive will have that hazard noted in the MSDS.

- Drums and containers containing packaged laboratory wastes will be considered to contain shock-sensitive or explosive materials until they have been characterized. *Caution: Shipping of shock-sensitive wastes may be prohibited under U.S. Department of Transportation regulations. Shippers will refer to 49 CFR 173.21 and 173.50.*

1.7 Laboratory Waste Packs

GEI employees will not handle or open laboratory waste packs.

1.8 Sampling of Drum and Container Contents

Sampling of containers and drums will be done in accordance with a site-specific sampling plan that will be developed in conjunction with a site-specific health and safety plan.

1.9 Shipping and Transport

Drums and containers will be identified and classified prior to packaging for shipment. Drum or container staging areas will be kept to a minimum number as approved by the client to safely identify and classify materials and prepare them for transport. Staging areas will be provided with adequate access and egress routes. Bulking of hazardous

wastes will be permitted only after a thorough characterization of the materials has been completed and approved by the Client.

1.10 Tank and Vault Procedures

GEI employees do not routinely sample vaults and tanks. Entry procedures will be coordinated and approved by the CHSO and RHSO.

1.11 Limitations

None

1.12 References

OSHA 1910.120 Hazardous Waste Operations and Emergency Response (j) Handling of Drums and Containers.

1.13 Attachments

GEI – Weekly Facility/Hazardous Waste Inspection Checklist.

1.14 Contact

GEI Corporate Health and Safety Officer
GEI Mid-West Regional Health and Safety Officer
GEI Atlantic Regional Health and Safety Officer
GEI New England Regional Health and Safety Officer
GEI Western Regional Region Health and Safety Officer

STANDARD OPERATING PROCEDURE
HS-004 Driver Safety

1.1 Objective

GEI values the safety of its employees, both on and while traveling to and from worksites. Accordingly, GEI has implemented a Save Driving Program to encourage safe driving habits and promote the ongoing safety of our staff and the communities where we work. For more information, refer to the Operation of Vehicles section of GEI's Employee Handbook.

More than 41,000 people lose their lives in motor vehicle crashes each year and over two million more suffer disabling injuries. This standard operating procedure provides requirements and recommendations to minimize the potential risks while operating or riding in a motor vehicle.

1.2 General Requirements

GEI employees will adhere to the following requirements when operating a vehicle while conducting business on behalf of GEI. These requirements apply to GEI owned, rental, and personal vehicles used to conduct GEI business:

- Employees must maintain a valid and current driver's license.
- All employees using a personal vehicle for work-related travel must have proper insurance coverage that meets the requirements in the state in which they reside.
- Employees must wear their safety belt at all times while in a moving vehicle.
- Vehicle accidents will be reported within two hours of their occurrence to their supervisor and a written Accident Report form will be submitted within 24 hours.
- Vehicles will be properly maintained and safely operated.
- Employees will follow safe driving behaviors, which include limiting distractions such as manipulating radios or other equipment that may cause a distraction. Employees are not to exceed the posted speed limit and should always maintain a safe distance between other vehicles.
- When parking a vehicle at a job site, the employee should position the vehicle in a manner to reduce or eliminate the need to operate the vehicle in reverse. A safety cone will be placed at the rear of the vehicle after parking the vehicle and be removed prior to moving the vehicle. This procedure makes the employee aware of other vehicles, equipment, and structures within the backup radius of the vehicle.

When driving a rental vehicle or GEI vehicle that you are unfamiliar with orient yourself to the vehicle by:

- Walking around the vehicle.
- Becoming familiar with the size of the vehicle.
- Adjusting all mirrors (rear and side).
- Becoming familiar with dashboard and steering controls.
- Locating the turn signals, windshield wipers, lights, emergency flashers, and the heating, air conditioning, and defrost controls.

1.3 Driving Defensively

Driving defensively means not only taking responsibility for yourself and your actions but also keeping an eye on "the other guy." Good defensive drivers may be able to anticipate what the other driver will do next. GEI recommends the following guidelines to help reduce your risks on the road.

Do not start the engine without securing each passenger in the vehicle. Safety belts save thousands of lives each year!

- Remember that driving too fast or too slow can increase the likelihood of a collision.
- Be alert! If you notice that a car is straddling the center line, weaving, making wide turns, stopping abruptly or responding slowly to traffic signals, the driver may be impaired or using a cellular telephone.
- Avoid an impaired driver by turning right at the nearest corner or exiting at the nearest exit. If it appears that an oncoming car is crossing into your lane, pull over to the roadside, sound the horn and flash your lights.
- Notify the police immediately after seeing a motorist who is driving suspiciously.
- Follow the rules of the road. Do not contest the "right of way" or try to race another car during a merge. Be respectful of other motorists.
- Do not follow too closely. GEI employees should use a "three-second following distance" or a "three-second plus following distance."
- While driving be cautious, aware, and responsible.

1.4 Cellular Phone Use and Other Distractions

Refer to the HR policy on use of cellular telephones while operating a vehicle on company business.

1.5 Drugs and Alcohol

The use of drugs or alcohol is prohibited when driving any vehicle on GEI business. Alcohol is a factor in almost half of all fatal motor vehicle crashes.

1.6 Adverse Driving Conditions

1.6.1 Driving at Night

Traffic death rates are three times greater at night than during the day. Driving at night is more of a challenge than many people think and is also more dangerous. Why is night driving so dangerous? One obvious answer is the darkness. Ninety percent of a driver's reaction depends on vision, and vision is severely limited at night. Depth perception, color recognition, and peripheral vision are all compromised after sundown.

Another factor adding danger to night or early morning driving is fatigue. Drowsiness makes driving more difficult by dulling concentration and slowing reaction time.

Fortunately, there are effective measures to minimize these after-dark dangers by preparing your car and following special guidelines while you drive. They include:

- Have your headlights properly aimed. Misaimed headlights blind other drivers and reduce your ability to see the road.
- Do not drink and drive. Alcohol severely impairs your driving ability and acts as a depressant. Just one drink can induce fatigue.
- Avoid smoking when you drive. Smoke's nicotine and carbon monoxide hamper night vision.
- If there is any doubt, turn your headlights on. Lights will not help you see better in early twilight, but they will make it easier for other drivers to see you. Being seen is as important as seeing.
- Do not overdrive your headlights. You should be able to stop inside the illuminated area. If you do not, you create a blind crash area in front of your vehicle.
- If an oncoming vehicle does not lower beams from high to low, avoid glare by watching the right edge of the road and using it as a steering guide.
- Make frequent stops for light snacks and exercise. If you are too tired to drive, stop and get some rest.

Observe night driving safety as soon as the sun goes down. ***Twilight is one of the most difficult times to drive, because your eyes are constantly changing to adapt to the growing darkness!***

1.6.2 Snow/Freezing Conditions

Sometimes, it is impossible to avoid driving in wintry weather conditions. When snow and ice are present, be prepared by following these winter driving safety tips.

1.6.2.1 Prepare the Vehicle Before a Snowstorm

- Check under the hood and take a look at the vehicles cooling system. Make sure the vehicle contains adequate antifreeze and the hoses are in good condition.

- Test heaters and defrosters ahead of time to make sure they are in good working condition.
- Test your windshield wipers and check the condition of your wiper blades. If wipers leave streaks on your windshields, replace the blades.
- It is recommended that a washer/antifreeze solution is used during winter conditions.
- Check all your lights and periodically clear them of snow and dirt.
- Car batteries need extra power in cold conditions. Make sure the battery's terminals are clean and cables are secure.
- Fill up. Keep your gas tank at least half full in the winter to help avoid gas line freeze up.

1.6.2.2 Driving During and After a Snowstorm

- Wear sunglasses. You might want to keep a pair in the car just in case the sun is reflecting off the snow.
- Be aware of blind spots created by snow banks.
- Be extra cautious of pedestrians and other vehicles in intersections.
- Allow extra time for braking and increase the distance between you and the car ahead of you.
- Reduce your speed and do not exceed the posted limit.
- If you start to lose traction, do not panic. Take your foot off the gas and gradually reduce your speed. Accelerate slowly once you feel traction is regained.
- If you start to skid, steer in the direction of the skid. Remember, steering can be more important than braking on slippery roads.

1.6.3 Driving In the Rain

Losing control of your car on wet pavement is a frightening experience. Unfortunately, it can happen unless you take preventive measures.

- You can prevent skids by driving slowly and carefully, especially on curves.
- Steer and brake with a light touch.
- When you need to stop or slow, do not brake hard or lock the wheels and risk a skid.
- Maintain mild pressure on the brake pedal.

If you do find yourself in a skid, remain calm, ease your foot off the gas, and carefully steer in the direction you want the front of the car to go. For cars without anti-lock brakes, avoid using your brakes. This procedure, known as "steering into the skid," will bring the back end of your car in line with the front. If your car has ABS, brake firmly as you "steer into the skid."

While skids on wet pavement may be frightening, hydroplaning can be even worse. Hydroplaning happens when the water in front of your tires builds up faster than your car's weight can push it out of the way. The water pressure causes your car to rise up and slide on a thin layer of water between your tires and the road. At this point, your car can be completely out of contact with the road, and you are in danger of skidding or drifting out of your lane, or even off the road.

To avoid hydroplaning, keep the tires properly inflated and maintain good tread on the tires. If tires need to be replaced, notify the branch manager or their designee. Slow down when roads are wet, and stay away from puddles. Try to drive in the tire tracks left by the cars in front of you. If you find yourself hydroplaning, do not brake or turn suddenly. This could throw your car into a skid. Ease your foot off the gas until the car slows and you can feel the road again. If you need to brake, do it gently with light pumping actions. If your car has anti-lock brakes, then brake normally; the car's computer will mimic a pumping action, when necessary.

A defensive driver adjusts his or her speed to the wet road conditions in time to avoid having to use any of these measures.

1.6.4 Off Road

If operation of a vehicle is required off publicly or privately maintained roads or in situations where four-wheel-drive vehicles are required, the appropriate vehicle for the situation will be used. Operators of vehicles being used in these situations will be trained on the use and limitations of the vehicle while operating in off-road situations.

1.7 Driver Training

All GEI employees are required to complete the on-line Driver Training modules. Employees will complete the quiz at the end of each module and forward the training certificate to the Regional Health and Safety Officer.

1.8 Sources

National Safety Council
Oklahoma Safety Council
GEI Consultants, Inc. Employee Handbook

1.9 Contact

GEI Corporate Health and Safety Officer
GEI Mid-West Regional Health and Safety Officer
GEI Atlantic Regional Health and Safety Officer
GEI New England Regional Health and Safety Officer
GEI Western Regional Region Health and Safety Officer

STANDARD OPERATING PROCEDURES

HS-007 General Safety Requirements

1.1 General Health and Safety Training

GEI requires all employees to complete Health and Safety Training on an annual basis. Project employees must have completed, at a minimum, GEI's General 4-Hour Health and Safety Training or when required, HAZWOPER training before beginning any on-site work. In addition, all field staff must be current in First Aid and CPR Training. Further Health and Safety training requirements can be found in Section 2 of the GEI Health and Safety Manual. In addition, all site-specific safety training will be completed before beginning work on each project site.

1.2 Tailgate Meetings

Health and Safety tailgate meetings will be conducted by the GEI Project Manager or site safety officer (SSO), and be recorded in the GEI field book or in the GEI briefing log. All GEI staff on site will sign the meeting log to indicate attendance.

1.3 Health and Safety Plans (HASP)

GEI projects must have a HASP before beginning any work. GEI HASP templates are located on the Health and Safety page on the GEI intranet. Specific requirements for HASPs are located in Section 7 of GEI's Health and Safety Manual. After the HASP has been completed, it must be sent to the Corporate Health and Safety Officer (CHSO) and the Regional Health and Safety Officer (RHSO) for review. All project employees must read the HASP and sign the signature page to document that they have read, understood, and will comply with the requirements of the HASP. The site-specific HASP must be kept on-site at all times.

1.4 Personal Protective Equipment (PPE)

Project-specific PPE will be identified in the HASP based on the hazards present during work tasks. All required PPE must be worn on the project site. More information regarding PPE is located in Section 6 of GEI's Health and Safety Manual.

1.5 Fire Protection and Prevention

The work site should be kept clear of flammable materials and debris. GEI field personnel should know where all fire extinguishers are located, and be familiar in the use of the extinguisher. Information on the correct use of a fire extinguisher is included in

GEI's general health and safety training. Call 911(or other number identified in the project HASP) in the event of a fire.

1.6 Accident/Incident Reporting

The following accident reporting procedures must be followed:

- Seek medical attention.
- Notify your supervisor.
- Notify CHSO and Human Resources (HR) within two hours of the accident/incident.
- Complete Accident Reporting Form (found on the Health and Safety page of the GEI Intranet) within **24 hours** and send to CHSO and HR. Refer to Section 8 of the GEI Health and Safety Manual for more information.

1.7 Near Miss Reporting

GEI employees will complete a near-miss reporting form if a hazardous or unsafe condition or near miss is observed. The near-miss reporting form is located on the Health and Safety page of the GEI Intranet. Refer to Section 8 of the GEI Health and Safety Manual for more information.

1.8 Housekeeping

Work areas, passages, and stairs will be kept clear of debris. All debris will be removed from the project site at regular intervals.

1.9 Illumination

Project sites will be illuminated either with natural or artificial illumination, in compliance with OSHA regulations.

1.10 Sanitation

Hand-washing is an essential form of protection from chemical and biological exposures and illness. GEI employees should wash their hands after performing work tasks and regularly throughout the day. If soap and water are not available, hand sanitizers and/or wipes should be used.

1.11 Machinery, Tools, Material, and Equipment

Machinery, tools, material, and equipment will be kept in good repair and will be inspected by a competent person. Any unsafe equipment will be identified as unsafe by

tagging or locking the controls to render them inoperable or will be physically removed from the site.

1.12 Vehicles

GEI's motor vehicles will be in good working order. Brakes, tires, head lights, and tail lights will be inspected prior to initial use and regularly during extended use by the vehicle operator. If a need for repair is discovered, the operator should contact the branch manager or their designee responsible for the scheduling of such repair to make arrangements for the repair. Each GEI-owned vehicle will have a fire extinguisher and first aid kit. Additional fire extinguishers and first aid kits are kept in each GEI office for use in personal or rental vehicles.

1.13 Heavy Equipment

GEI employees will keep a line of sight between them and heavy equipment operators. If a GEI employee needs to communicate with heavy equipment operators, they will use hand signals or direct communication with the operator. GEI employees should never operate or climb on heavy equipment. GEI employees should not approach heavy equipment while it is in operation. GEI personnel should not use cellular telephones when working near operating equipment. For more information regarding heavy equipment, refer to GEI's Heavy Equipment SOP.

1.14 Contact

GEI Corporate Health and Safety Officer
GEI Mid-West Regional Health and Safety Officer
GEI Atlantic Regional Health and Safety Officer
GEI New England Regional Health and Safety Officer
GEI Western Regional Region Health and Safety Officer

STANDARD OPERATING PROCEDURES

SOP No. HS-008 Hand and Power Tools

1.1 Objective

The purpose of this SOP is to minimize the potential for injuries to GEI employees when using hand and power tools.

1.2 General Requirements

1.2.1 Condition of Tools

All hand and power tools and similar equipment, whether furnished by GEI or the employee, will be maintained in a safe condition.

1.2.2 Guarding

When power tools are designed to accommodate guards, they will be equipped with such guards prior to, and at all times during, use. All guards will be in good condition and be adequate to provide protection to the employee.

1.2.3 Personal Protective Equipment

Employees using hand or power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects will be provided with the personal protective equipment (PPE) necessary to protect them from the hazard. All employees will wear work gloves and safety glasses at a minimum. In addition, face shields and hearing protection may be required.

1.3 Hand Tools

GEI does not issue or permit the use of unsafe hand tools.

1.3.1 Power-operated Hand Tools

1.3.1.1 Electric power-operated

Electric power operated tools will either be double-insulated type or grounded according to Occupational Safety and Health Administration (OSHA) regulations.

1.3.1.2 Pneumatic Power Tools

Pneumatic power tools will be properly maintained and operated according to the manufacturer's safe operating procedures.

1.3.1.3 Fuel Powered Tools

Fuel powered tools will be stopped while being refueled, serviced, or maintained, and fuel will be transported, handled, and stored in accordance with federal regulations.

1.3.1.4 Hydraulic Power Tools

The fluid used in hydraulic powered tools will be fire-resistant and approved under Schedule 30 of the U.S. Bureau of Mines, Department of the Interior, and will retain its operating characteristics at the most extreme temperatures to which it will be exposed.

1.3.1.5 Powder-actuated Tools

Only employees who have been trained in the operation of the particular tool in use will be allowed to operate a power-actuated tool.

1.3.2 Abrasive Wheels and Tools

1.3.2.1 Power

Grinding machines will be supplied with sufficient power to maintain the spindle speed at safe levels under all conditions of normal operations.

1.3.2.2 Guarding

Grinding machines will be equipped with safety guards in conformance with the requirements of the American National Standards Institute (ANSI) B7.1-1970.

1.3.3 Woodworking Tools

1.3.3.1 Disconnect Switches

Fixed power driven woodworking tools will be provided with a disconnect switch that can either be locked or tagged in the off position.

1.3.3.2 Speeds

The operating speed will be etched or otherwise permanently marked on all circular saws over 20 inches in diameter or operating at over 10,000 peripheral feet per minute. Saws will not be operated at a speed other than that marked on the blade.

1.3.3.3 Self-feed

Automatic feeding devices will be installed on machines whenever the nature of the work will permit. Feeder attachments will have the feed rolls or other moving parts covered or guarded so as to protect the operator from hazardous points.

1.3.3.4 Guarding

Portable, power-driven circular saws will be equipped with guards above and below the base plate or shoe.

1.3.3.5 Personal Protective Equipment

Personal protective equipment will conform to OSHA and ANSI standards.

1.3.3.6 Other Requirements

Woodworking tools and machinery will meet other applicable requirements of ANSI 01.1-1961, Safety Code for Woodworking Machinery.

1.3.4 Jacks – Lever and Ratchet, Screw, and Hydraulic

1.3.4.1 General Requirements

The manufacturer's rated capacity will be legibly marked on all jacks and will not be exceeded. All jacks will have a positive stop to prevent over-travel.

1.3.4.2 Blocking

When the working area does not have a solid working surface and it is necessary to provide a firm foundation, the base of the jack will be blocked or cribbed.

1.3.4.3 Operation and Maintenance

Hydraulic jacks exposed to freezing temperatures will be supplied with adequate antifreeze liquid. Jacks will be properly lubricated at regular intervals. Jacks will be thoroughly inspected, if necessary, based upon the service conditions. Repair or replacement parts will be examined for possible defects. Jacks that are out of order will be tagged accordingly, and will not be used until repairs are made. Parts subjected to wear will be inspected on a regular basis and repaired or replaced as needed.

1.4 References

OSHA Standards for the Construction Industry, Subpart I

1.5 Contact

GEI Corporate Health and Safety Officer
GEI Atlantic Regional Health and Safety Officer
GEI New England Regional Health and Safety Officer
GEI Mid-West Regional Health and Safety Officer
GEI Western Regional Health and Safety Officer

STANDARD OPERATING PROCEDURES

SOP NO. HS-009 Hazard Identification and Management

1.1 Objective

The purpose of this SOP is to outline the steps GEI personnel will take to identify potential hazards on site, the risks associated with these hazards, and the proper engineering controls, work practices, and personal protective equipment (PPE) to use to minimize the associated risks.

1.2 Hazard Identification

An initial identification of hazards should be done based on a review of available documents, including lists of chemicals used on site, analytical data from soil, surface water, groundwater, air, spill history, site history, equipment on site, maps, photos, and a preliminary survey.

1.3 Risk Identification

Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances will be identified. GEI employees and GEI subcontractors who will be working on the site will be informed of any risks that have been identified.

Risks to consider include, but are not limited to:

- Potential exposures exceeding the permissible exposure limits and published exposure levels.
- Potential Immediately to Life and Health (IDLH) Concentrations.
- Potential Skin Absorption and Irritation Sources.
- Potential Eye Irritation Sources.
- Potential hazardous atmospheres, including oxygen deficiency and fire and explosion hazards.

1.4 Engineering Controls, Work Practices, and Personal Protective Equipment for Employee Protection

Engineering controls, work practices, and PPE for substances regulated in OSHA Subpart Z (Toxic and Hazardous Substances) will be implemented in accordance with this section to protect employees from exposure to hazardous substances and safety and health hazards.

1.4.1 Engineering Controls, Work Practices, and Personal Protective Equipment for Substances Regulated in Subparts G (Occupational Health and Environment Control) and Subpart Z (Toxic and Hazardous Substances)

Engineering controls and work practices will be instituted to reduce and maintain employee exposure at or below the permissible exposure limits for substances regulated by 29 CFR Part 1910, to the extent required by Subpart Z, except to the extent that such controls and practices are not feasible.

Engineering controls that may be feasible include the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Work practices that may be feasible include removing all non-essential employees from potential exposure during opening of drums, wetting down dusty operations, and locating employees upwind of possible hazards.

If engineering controls and work practices are not feasible, or not required, any reasonable combination of engineering controls, work practices, and PPE will be used to reduce and maintain at or below the permissible exposure limits or dose limits for substances regulated by 29 CFR Part 1910, Subpart Z.

GEI will not implement a schedule of employee rotation as a means of compliance with permissible exposure limits or dose limits except when there is no other feasible way of complying with the airborne or dermal dose limits for ionizing radiation.

The provisions of 29 CFR, subpart G, Occupational Health and Environment control, will be followed.

1.4.2 Engineering Controls, Work Practices, and Personal Protective Equipment for Substances Not Regulated in Subparts G and Subparts Z

An appropriate combination of engineering controls, work practices, and personal protective equipment will be used to reduce and maintain employee exposure to or below published exposure levels for hazardous substances and health hazards not regulated by 29 CFR Part 1910, Subparts G and Subparts Z. GEI will use published literature and MSDS' as a guide in making the determination of what level of protection is appropriate for hazardous substances and health hazards for which there is no permissible exposure limit or published exposure limit.

1.4.3 Decontamination Procedure

Decontamination procedure(s) will be developed, communicated to employees, and implemented before any employees or equipment enter areas on site where potential for exposure to hazardous substances exists. Procedures will be developed to minimize

employee contact with hazardous substances or with equipment that has contacted hazardous substances.

All GEI employees leaving a contaminated area will be properly decontaminated; all contaminated clothing and equipment leaving a contaminated area will be properly disposed of or decontaminated.

Decontamination procedures will be monitored by the site safety officer to determine their effectiveness. When such procedures are found to be ineffective, the site safety officer will contact the CHSO and appropriate steps will be taken to correct any deficiencies.

1.4.3.1 Location

Decontamination will be performed in geographical areas that will minimize the exposure to employees, equipment, and the environment.

1.4.3.2 Equipment and Solvents

All equipment and solvents used for decontamination will be decontaminated or disposed of properly.

1.4.3.3 Personal Protective Clothing and Equipment

Protective clothing and equipment will be decontaminated, cleaned, laundered, maintained or replaced as needed to maintain their effectiveness.

Employees whose clothing becomes wetted with hazardous substances will immediately remove that clothing and proceed to shower. The clothing will be disposed of or decontaminated before it is removed from the work zone.

1.4.3.4 Commercial Laundries or Cleaning Establishments

Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment will be informed of the potentially harmful effects of exposures to hazardous substances.

1.4.3.5 Showers and Changing Rooms

Where the decontamination procedure indicates a need for regular showers and change rooms outside of a contaminated area, they will be provided and meet the requirements of 29 CFR 1910.141 (Sanitation). If temperature conditions prevent the effective use of water, then other effective means for cleansing will be provided and used.

1.5 Limitations

None

1.6 References

OSHA 1910.120 Hazardous Waste Operations and Emergency Response
OSHA 1910 Subpart G Occupational Health and Environment Control
OSHA 1910 Subpart Z Toxic and Hazardous Substances
OSHA 1910.141 General Environmental Controls - Sanitation

1.7 Contact

GEI Corporate Health and Safety Officer
GEI Mid-West Regional Health and Safety Officer
GEI Atlantic Regional Health and Safety Officer
GEI New England Regional Health and Safety Officer
GEI Western Regional Region Health and Safety Officer

STANDARD OPERATING PROCEDURES
SOP No. HS-010 Inclement Weather

1.1 Objective

Inclement weather can affect work activities and pose safety hazards to employees working in these conditions. The following guidelines will be followed when weather conditions become a safety concern.

1.2 Execution

All employees will be aware of local weather conditions and monitor any advisories issued by the National Weather Service and other local reporting services. Depending on location and season, storms are capable of producing heavy rain, floods, extreme temperatures, high wind conditions, lighting, tornados, and/or snowfall.

1.2.1 Heavy Rain

If working or driving in a storm use extreme caution and turn your lights on when the rainfall becomes heavy. Employees should be aware of the following:

- Heavy rain causes visibility issues, especially when driving.
- Surfaces and tools become slippery.
- If you are working in the rain and your clothes become wet there is a risk of hypothermia when exposed to winds, even in warm temperatures.
- If the storms are going to produce thunder and/or lightning, leave the work area immediately and move to a safe area.
- Use your best judgment to determine if the rainfall becomes too heavy to continue working safely.

1.2.2 Lightning

Lightning can strike as far as 10 miles from the area where it is raining. That's about the distance you can hear thunder. **If you can hear thunder, you are within striking distance. Seek safe shelter immediately.** This can be within a building or vehicle. Wait 30 minutes after the last clap of thunder or flash of lightning before going outside again.

1.2.3 Flooding

Flooding may occur as a result of heavy rain in a short period of time. Flooding can be particularly acute in canyon areas where dry creek beds can turn into raging rivers from rainfall in distant or higher elevation areas. Be aware of this and your surroundings and move to a safe place if you begin to see any signs that flooding may occur. Do not

attempt to drive through areas or streets that are flooded. Seek alternate routes. Be particularly cautious at night when flooded areas are difficult to see. Urban flooding can stop traffic and increase the potential for traffic accidents and being trapped in vehicles.

1.2.4 Extreme Temperatures

Work activities may take place in extreme heat or cold. Be prepared if these conditions are anticipated. Have the correct personal protective equipment (PPE) available, exercise proper fluid intake, and take breaks to complete work and prevent heat and cold stress. For more information about these conditions see the heat stress and cold stress programs found in GEI's Health and Safety Manual.

1.2.5 High Wind and Tornados

Tropical storms are described as storms with sustained winds ranging from 39 to 73 miles per hour (mph) and hurricanes produce sustained winds that exceed 74 mph. When winds approach 40 mph (gale force winds) twigs begin to break off of trees and vehicles will veer off of the road. When winds approach **40 mph** or the GEI employee feels unsafe based on the activities being performed, work is to be stopped and you should seek shelter as soon as possible. Blowing or falling debris and overhanging limbs/signs can be a significant hazard. Avoid driving in these conditions; 70 percent of injuries during hurricanes are a result of vehicle accidents. Note that tall or elevated equipment will have manufacturer's safe operating wind speeds defined that could be less than 40 mph, the operator's manual should be consulted prior to operation of the equipment.

A tornado is a violent, dangerous, rotating column of air that is in contact with both the surface of the earth and a cumulonimbus cloud or, in rare cases, the base of a cumulus cloud. The Fujita Scale is used to rate the intensity of a tornado by examining the damage caused by the tornado after it has passed over a man-made structure. Based on the Fujita Scale or F-Scale Numbers begin at F0: 40-72 mph and go to F6: 319-379 mph (F6 is generally theoretical). Nearly three-fourths of all tornados are on the weak F0-F1 scale with just over two-thirds of deaths resulting from the violent F4-F5 tornados. All tornado wind speeds exceed the 40 mph stop work speed, shelter should be taken immediately if a tornado is seen. If a tornado siren is sounded move immediately to safety indoors and then move to a windowless interior space, basement, stair well etc., or designated fall-out shelter if available. Windows should not be opened before an oncoming tornado, keep the building envelope closed to the extent possible. If there is no shelter available seat belt yourself into your stationary vehicle or seek a depression or low spot on the land surface.

1.2.6 Snowfall and Ice Conditions

Working in the winter months will result in activities taking place during periods of snowfall or icy conditions. If you are working during or after snow has fallen, dress appropriately for the conditions. Snow and ice can cause working surfaces to become

slippery; clear snow and ice from all work areas to prevent slip hazards. Use caution when performing any snow or ice removal activities to prevent injuries. Driving in snowy and icy conditions is also hazardous. Reduce speed and use caution if you must drive in these conditions.

If the weather conditions deteriorate and you do not feel safe working in these conditions, stop work, move to a safe indoor location, and contact your Project Manager to let them know the weather and work status and your location.

1.3 Limitations

- Follow safety procedures as defined in the site-specific health and safety plan (HASP) at all times.
- Protection from working in extreme weather conditions can best be accomplished if the conditions are anticipated. Monitor local weather conditions prior to starting work.

1.4 References

Center for Disease Control and Prevention – Natural Disasters and Severe Weather
http://www.bt.cdc.gov/disasters/
National Lightning Safety Institute
NOAA, National Weather Service
Office of Climate, Water, and Weather Services

1.5 Attachment

None

1.6 Contact

GEI Corporate Health and Safety Officer
GEI Mid-West Regional Health and Safety Officer
GEI Atlantic Regional Health and Safety Officer
GEI New England Regional Health and Safety Officer
GEI Western Regional Region Health and Safety Officer

STANDARD OPERATING PROCEDURES
HS-017 Water Safety

1.1 Objective

The purpose of this SOP is to ensure the safe deployment and return of GEI personnel during field activities while aboard a boat or when working near water.

1.2 Execution

Boat safety practices will be conducted in general accordance with guidance provided in the United States Army Corps of Engineers (USACE) Safety and Health Requirements Manual (EM) 385-1-1. Personnel will board the boat at specified locations to be determined and agreed upon prior to field deployment. The following safety practices will be adhered to:

- Boats operated by GEI will comply with Coast Guard regulations.
- Every GEI employee will wear a Type III Personal Flotation Device (PFDs) at all times when aboard any boat except when that boat is equipped with a fully enclosed cabin and the employee is inside. Boats must also, at a minimum, have Coast Guard approved PFDs on board for each person and at least one throwable flotation device, such as a seat cushion.
- For every boating activity, a trip plan must be communicated to someone in a position to take appropriate action when the GEI employee is overdue.
- For every trip requiring more than one day, daily communications with an appropriate base must be maintained.
- The consumption of alcoholic beverages and the use of illegal drugs will not be permitted at any time aboard boats on which GEI employees are present.
- All employees working on a boat will monitor the weather, incorporating, as appropriate, National Oceanic and Atmospheric Administration (NOAA) marine weather broadcasts and other local commercial weather forecasting services as may be available.
- For retrieving a person overboard, the boat operator will throw a life ring and line, and use a ladder attached to the boat or the boat step transom to allow the person to climb out of the water. The boat will be equipped with an ABC rated fire extinguisher(s) and a life ring attached to approximately 90 feet of rope.
- Emergency procedures for fire, person overboard, and capsizing will be reviewed on the first day of operations and any time a change of personnel occurs.

1.3 Working Near Water

OSHA Construction Industry Standards (1926) state: "employees working over or near water, **where the danger of drowning exists**, will be provided a Coast Guard-approved PFD." OSHA General Industry Standards (1910) do not address working over or near water. Therefore, GEI uses the OSHA Construction Standard for all employees and all tasks to ensure protection in all operations. A site-specific health and safety plan (HASP) is required to be completed and signed by all GEI employees that may be working over or near water before the work may begin.

The following procedures and safety devices will be provided for and used by employees at locations where the danger of drowning exists and when employees are not protected by passive fall protection systems such as railings, nets, safety belts, or other applicable provisions:

- **Personal Flotation Devices (PFD).** Employees will be required to wear U. S. Coast Guard approved personal flotation devices that are marked or labeled Type I PFD, Type II PFD, or Type III PFD, or a U.S. Coast Guard approved Type V PFD that is marked or labeled for use as a work vest for commercial use or for use on vessels. GEI employees will inspect buoyant work vests or life preservers for defects that could alter their strength or buoyancy prior to, and after, each use. Defective units will not be used and will be marked as defective and properly disposed.

- **Ring Buoys.** U. S. Coast Guard approved 30-inch ring buoys with at least 150 feet of 600 pound capacity line will be readily available for emergency rescue operations. Distance between ring buoys will not exceed 150 feet.

These requirements can be superseded by the use of 100 percent fall protection. If an employee cannot fall into the water as a result of use of active or passive fall protection, there is no danger of drowning and a PFD is not required. For example, where an employee is working on a steep slope and could fall into water, a PFD is required.

1.4 Procedures

Safety lines that prevent employees from reaching the water eliminate the danger of drowning, and negate the need for a PFD. The same is true when working on a barge or floating platform with an approved railing system.

Employees working over or near water where the distance to the water is greater than the length of the lanyard (and by virtue of safety devices no danger of drowning exists), are not required to comply with requirements for working in proximity to water. If the distance between the water surface and the employee is less than the length of the lanyard and thus will allow entry into the water, the OSHA standard is relevant. Employees who exit the basket of the aerial lift to a location that is over or near water, (and the danger of drowning as a result of a fall exists), and do not maintain 100 percent fall protection,

must wear a PFD. When GEI employees are working over or adjacent to water, the client will provide at least one lifesaving skiff to be immediately available for potential rescue purposes.

Employees will not work alone, where practical, in situations where a drowning hazard exists.

1.5 Training

Training will be conducted for employees unfamiliar with the use of safety equipment and PPE required by this SOP. Employees working over or near water will be trained in their responsibilities and the safe work practices associated with working on or near water.

1.6 Limitations

None

1.7 References

United States Army Corps of Engineers, Safety and Health Requirements Manual (EM), 385-1-1.November 3, 2003 – Section 19 Floating Plant and Marine Activities

1.8 Attachments

None

1.9 Contact

GEI Corporate Health and Safety Officer
GEI Mid-West Regional Health and Safety Officer
GEI Atlantic Regional Health and Safety Officer
GEI New England Regional Health and Safety Officer
GEI Western Regional Region Health and Safety Officer

1.10 Revision Dates

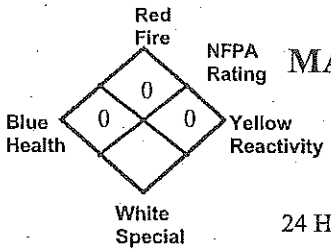
November 2010
May 2011

APPENDIX E

Material Safety Data Sheets (MSDSs)

04-3224
04-3210
S-70112

Alconox ®



MATERIAL SAFETY DATA SHEET

Alconox, Inc.
30 Glenn Street
White Plains, NY 10603

24 Hour Emergency Number – Chem-Tel (800) 255-3924

I. IDENTIFICATION

Product Name (as appears on label)	ALCONOX
CAS Registry Number:	Not Applicable
Effective Date:	January 1, 2001
Chemical Family:	Anionic Powdered Detergent
Manufacturer Catalog Numbers for sizes	1104, 1125, 1150, 1101, 1103 and 1112

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

There are no hazardous ingredients in ALCONOX as defined by the OSHA Standard and Hazardous Substance List 29 CFR 1910 Subpart Z.

III. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point (F):	Not Applicable
Vapor Pressure (mm Hg):	Not Applicable
Vapor Density (AIR=1):	Not Applicable
Specific Gravity (Water=1):	Not Applicable
Melting Point:	Not Applicable
Evaporation Rate (Butyl Acetate=1):	Not Applicable
Solubility in Water:	Appreciable-Soluble to 10% at ambient conditions
Appearance:	White powder interspersed with cream colored flakes.
pH:	9.5 (1%)

IV. FIRE AND EXPLOSION DATA

Flash Point (Method Used):	None
Flammable Limits:	LEL: No Data UEL: No Data
Extinguishing Media:	Water, dry chemical, CO_2, foam
Special Fire fighting Procedures:	Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.
Unusual Fire and Explosion Hazards:	None

V. REACTIVITY DATA

Stability:	Stable
Hazardous Polymerization:	Will not occur
Incompatibility (Materials to Avoid):	None
Hazardous Decomposition or Byproducts:	May release CO_2 on burning

VI. HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation? Yes Skin? No Ingestion? Yes
Health Hazards (Acute and Chronic):	Inhalation of powder may prove locally irritating to mucous membranes. Ingestion may cause discomfort and/or diarrhea. Eye contact may prove irritating.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No
Signs and Symptoms of Exposure:	Exposure may irritate mucous membranes. May cause sneezing.
Medical Conditions Generally Aggravated by Exposure:	Not established. Unnecessary exposure to this product or any industrial chemical should be avoided. Respiratory conditions may be aggravated by powder.
Emergency and First Aid Procedures:	Eyes: Immediately flush eyes with water for at least 15 minutes. Call a physician. Skin: Flush with plenty of water. Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs administer fluids. See a physician for discomfort.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken if Material is Released or Spilled:	Material foams profusely. Recover as much as possible and flush remainder to sewer. Material is biodegradable.
Waste Disposal Method:	Small quantities may be disposed of in sewer. Large quantities should be disposed of in accordance with local ordinances for detergent products.
Precautions to be Taken in Storing and Handling:	Material should be stored in a dry area to prevent caking.
Other Precautions:	No special requirements other than the good industrial hygiene and safety practices employed with any industrial chemical.

VIII. CONTROL MEASURES

Respiratory Protection (Specify Type):	Dust mask - Recommended
Ventilation:	Local Exhaust-Normal Special-Not Required Mechanical-Not Required Other-Not Required
Protective Gloves:	Impervious gloves are useful but not required.
Eye Protection:	Goggles are recommended when handling solutions.
Other Protective Clothing or Equipment:	None
Work/Hygienic Practices:	No special practices required

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**** MATERIAL SAFETY DATA SHEET ****

Methanol
14280

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Methanol
Catalog Numbers:
, S75959, S75965, S75965A, S75965HPLC, S75965SPEC, A408-1, A408-4, A408SK-4 A411-20, A411-4, A412-1, A412-20, A412-200, A412-200LC, A412-4, A412-4LC, A412-500, A412-500LC, A412CU1300, A413FB115, A412FB19, A412FB200, A412FB50, A412J500, A412P-4, A412P-4LC, A412POP19, A412POP200, A412POP50, A412POPB19, A412POPB200, A412POPB50, A412RE115, A412RE19, A412RE200, A412RE50, A412RS115, A412RS200, A412RS28, A412RS50, A412SK-4, A412SS-115, A412SS-19, A412SS-200, A413-20, A413-200, A413-4, A413-500, A433F-1GAL, A433P-4, A433P1GAL, A433S-20, A433S-200, A433S-4, A434-20, A450-4, A452-1, A452-4, A452-4LC, A452J1, A452NB219, A452POP19, A452POP200, A452POP28, A452POP50, A452POPN19, A452RS-115, A452RS-19, A452RS-200, A452RS-28, A452RS-50, A452SK-1, A452SK-4, A452SS-115, A452SS-19, A452SS-200, A452SS-50, A453-1, A453-1LC, A453-500, A453J1, A454-1, A454-1LC, A454-4, A454-4LC, A454POP19, A454POP200, A454POP50, A454RS-115, A454RS-19, A454RS-200, A454RS-28, A454RS-50, A454SS-19, A454SS-28, A454SS-50, A455-1, A455POP19, A455POP200, A455POP50, A455SS19, A455SS200, A455SS50, A457-4, A935-4, A935FB200, A935POPB200, A935RB200, A936-1, A936-4, A947-4, A947-4LC, A947POP19, A947POP200, A947POP50, A947RS-115, A947RS-200, A947RS-28, A947SS-115, A947SS-19, A947SS-200, A947SS-28, A947SS-50, BP1105-1, BP1105-4, BP1105POP19, BP1105POP20, BP1105POP50, BP1105RS19, BP1105SS19, BP1105SS28, BP1105SS50, BP2618100, HC400 1GAL, NC9633361, NC9766429, NC9780216, NC9905242, NC9941388, NC9942270, NC9964975, NC9979250, SC95-1, SW2-1, TIA9474, TIA947P200L .
Synonyms:
Carbinol; Methyl alcohol; Methyl hydroxide; Monohydroxymethane; Wood alcohol; Wood naptha; Wood spirits; Columbian spirits; Methanol.
Company Identification: Fisher Scientific
1 Reagent Lane
Fairlawn, NJ 07410
For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	EINECS#
67-56-1	Methanol	>99.0	200-659-6

Hazard Symbols: T F
Risk Phrases: 11 23/24/25 39/23/24/25

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW
Appearance: clear, colorless liquid. Flash Point: 11 deg C.
Danger! Flammable liquid and vapor. Causes respiratory tract irritation. May cause central nervous system depression. Poison! Cannot be made non-poisonous. Causes eye and skin irritation. May be fatal or cause blindness if swallowed. Harmful if swallowed, inhaled, or absorbed through the skin. Vapor harmful.
Target Organs: Eyes, nervous system, optic nerve.

Potential Health Effects
Eye:
Methanol is a mild to moderate eye irritant. Inhalation, ingestion or skin absorption of methanol can cause significant disturbances in vision, including blindness.
Skin:
Causes moderate skin irritation. Harmful if absorbed through the skin. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis. Methanol can be absorbed through the skin, producing systemic effects that include visual disturbances.
Ingestion:
Harmful if swallowed. May be fatal or cause blindness if swallowed. Aspiration hazard. May cause systemic toxicity with acidosis. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.
Inhalation:
Methanol is toxic and can very readily form extremely high vapor concentrations at room temperature. Inhalation is the most common route of occupational exposure. At first, methanol causes CNS depression with nausea, headache, vomiting, dizziness and incoordination. A time period with no obvious symptoms follows (typically 8-24 hrs). This latent period is followed by metabolic acidosis and severe visual effects which may include reduced reactivity and/or increased sensitivity to light, blurred, double

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and/or snowy vision, and blindness. Depending on the severity of exposure and the promptness of treatment, survivors may recover completely or may have permanent blindness, vision disturbances and/or nervous system effects.
Chronic:
Prolonged or repeated skin contact may cause dermatitis. Chronic exposure may cause effects similar to those of acute exposure. Methanol is only very slowly eliminated from the body. Because of this slow elimination, methanol should be regarded as a cumulative poison. Though a single exposure may cause no effect, daily exposures may result in the accumulation of a harmful amount. Methanol has produced fetotoxicity in rats and teratogenicity in mice exposed by inhalation to high concentrations that did not produce significant maternal toxicity.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.
Skin:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.
Ingestion:
Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.
Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician:
Effects may be delayed.
Antidote:
Ethanol may inhibit methanol metabolism.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:
Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Flammable liquid and vapor. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.
Extinguishing Media:
For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Water may be ineffective. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water.
Autoignition Temperature:464 deg C (867.20 deg F)
Flash Point: 11 deg C (51.80 deg F)
Explosion Limits, lower:6.0 vol %
Explosion Limits, upper:36.00 vol %
NFPA Rating: (estimated) Health: 1; Flammability: 3; Instability: 0

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks:
Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Avoid use in confined spaces. Avoid breathing vapor or mist.
Storage:
Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Keep containers tightly closed.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:
Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methanol	200 ppm; 250 ppm STEL; skin - potential for cutaneous absorption	200 ppm TWA; 260 mg/m3 TWA 6000 ppm IDLH	200 ppm TWA; 260 mg/m3 TWA

OSHA Vacated PELs:
Methanol:
200 ppm TWA; 260 mg/m3 TWA

Personal Protective Equipment

Eyes:
Wear chemical goggles.
Skin:
Wear appropriate protective gloves to prevent skin exposure.
Clothing:
Wear appropriate protective clothing to prevent skin exposure.
Respirators:
A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State:	Liquid
Color:	clear, colorless
Odor:	alcohol-like - weak odor
pH:	Not available.
Vapor Pressure:	127 mm Hg @ 25 deg C
Vapor Density:	1.11 (Air=1)
Evaporation Rate:	5.2 (Ether=1)
Viscosity:	0.55 cP 20 deg C
Boiling Point:	64.7 deg C @ 760 mm Hg
Freezing/Melting Point:	-98 deg C
Decomposition Temperature:	Not available.
Solubility in water:	miscible
Specific Gravity/Density:	.7910 g/cm3 @ 20&C
Molecular Formula:	CH4O
Molecular Weight:	32.04

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
High temperatures, ignition sources, confined spaces.
Incompatibilities with Other Materials:
Strong oxidizing agents, strong acids, powdered aluminum, powdered magnesium.
Hazardous Decomposition Products:
Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, formaldehyde.
Hazardous Polymerization: Will not occur.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 67-56-1: PC1400000
LD50/LC50:
CAS# 67-56-1: Draize test, rabbit, eye: 40 mg Moderate; Draize test, rabbit, eye: 100 mg/24H Moderate; Draize test, rabbit, skin: 20 mg/24H Moderate; Inhalation, rabbit: LC50 = 81000 mg/m3/14H; Inhalation, rat: LC50 = 64000 ppm/4H; Oral, mouse: LD50 = 7300 mg/kg; Oral, rabbit: LD50 = 14200 mg/kg; Oral, rat: LD50 = 5600 mg/kg; Skin, rabbit: LD50 = 15800 mg/kg.
Human LDLo Oral: 143 mg/kg.
Inhalation; 300 ppm caused visual field changes & headache.
LDLo Skin: 393 mg/kg.
experimental animals than humans, because most animal species metabolize methanol differently. Non-primate species do not ordinarily show symptoms of metabolic acidosis or the visual effects

which have been observed in primates and humans.
Carcinogenicity:
Methanol -
Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology:
No data available.
Teratogenicity:
There is no human information available. Methanol is considered to be a potential developmental hazard based on animal data. In animal experiments, methanol has caused fetotoxic or teratogenic effects without maternal toxicity.
Reproductive Effects:
See actual entry in RTECS for complete information.
Neurotoxicity:
ACGIH cites neuropathy, vision and CNS under TLV basis.
Mutagenicity:
See actual entry in RTECS for complete information.
Other Studies:
No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:
Fish: Fathead Minnow: 29.4 g/L; 96 Hr; LC50 (unspecified)Fish: Goldfish: 250 ppm; 11 Hr; resulted in deathFish: Rainbow trout: 8000 mg/L; 48 Hr; LC50 (unspecified)Fish: Rainbow trout: LC50 = 13-68 mg/L; 96 Hr.; 12 degrees CFish: Fathead Minnow: LC50 = 29400 mg/L; 96 Hr.; 25 degrees C, pH 7.63Fish: Rainbow trout: LC50 = 8000 mg/L; 48 Hr.; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 = 51,000-320,000 mg/L; 30 minutes; Microtox test

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: CAS# 67-56-1: waste number U154 (Ignitable waste).

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
Shipping Name: METHANOL
Hazard Class: 3
UN Number: UN1230
Packing Group: II
Canadian TDG
Shipping Name: METHANOL
Hazard Class: 3.61
UN Number: UN1230
Other Information: FLASHPOINT 11 C

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL
TSCA
CAS# 67-56-1 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA
CERCLA Hazardous Substances and corresponding RQs
CAS# 67-56-1: 5000 lb final RQ; 2270 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 67-56-1: acute, flammable.
Section 313
This material contains Methanol (CAS# 67-56-1, 99.0%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.
Clean Air Act:
CAS# 67-56-1 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.

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None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Methanol can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: T F

Risk Phrases:

R 11 Highly flammable.
R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
R 39/23/24/25 Toxic : danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.

Safety Phrases:

S 7 Keep container tightly closed.
S 16 Keep away from sources of ignition - No smoking.
S 36/37 Wear suitable protective clothing and gloves.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 67-56-1: 1

United Kingdom Occupational Exposure Limits

CAS# 67-56-1: OES-United Kingdom, TWA 200 ppm TWA; 266 mg/m3 TWA
CAS# 67-56-1: OES-United Kingdom, STEL 250 ppm STEL; 333 mg/m3 STEL

United Kingdom Maximum Exposure Limits

Canada

CAS# 67-56-1 is listed on Canada's DSL List.
This product has a WHMIS classification of B2, D1B, D2B.
CAS# 67-56-1 is listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 67-56-1: OEL-ARAB Republic of Egypt:TWA 200 ppm (260 mg/m3);Skin

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 7/21/1999 Revision #11 Date: 10/21/2002

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

MATERIAL SAFETY DATA SHEET: CRYSTAL SIMPLE GREEN®

I. PRODUCT & COMPANY INFORMATION

PRODUCT NAME: CRYSTAL SIMPLE GREEN®
OTHER NAMES: CRYSTAL SIMPLE GREEN® - SPECIALIZED CLEANER / DEGREASER
SIMPLE GREEN SAFETY TOWELS (fluid only)

COMPANY NAME: SUNSHINE MAKERS, INC.
15922 Pacific Coast Highway
Huntington Harbour, CA 92649 USA
Telephone: 800-228-0709 • 562-795-6000
Fax: 562-592-3034
Website: www.simplegreen.com

Version No. 4006
Issue Date: January 2002

For 24-hour emergency, call Chem-Tel, Inc.: 800-255-3924

USE OF PRODUCT: A specialized cleaner and degreaser for use in the industrial and institutional workplace..

II. INGREDIENT INFORMATION

The only ingredient of Crystal Simple Green® with established exposure limits is undiluted 2-butoxyethanol (<6%) (Butyl Cellosolve; CAS No. 111-76-2): the OSHA PEL and ACGIH TLV is 25 ppm (skin). Note, however, that Butyl Cellosolve is only one of the raw material ingredients that undergo processing and dilution during the manufacture of Crystal Simple Green®. Upon completion of the manufacturing process, Crystal Simple Green® does not possess the occupational health risks associated with exposure to undiluted Butyl Cellosolve. Verification of this is contained in the independent test results detailed under "Toxicological Information" on Page 3 of this MSDS.

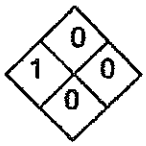
The Butyl Cellosolve in Crystal Simple Green® is part of a chemical category (glycol ethers) regulated by the Emergency Planning and Community Right-to-Know Act (SARA, Title III, section 313); therefore, a reporting requirement exists. Based upon chemical analysis, Crystal Simple Green® contains no known EPA priority pollutants, heavy metals, or chemicals listed under RCRA, CERCLA, or CWA. Analysis by TCLP (Toxicity Characteristic Leaching Procedure) according to RCRA revealed no toxic organic or inorganic constituents.

All components of Crystal Simple Green® are listed on the TSCA Chemical Substance Inventory.

III. HAZARDS IDENTIFICATION

UN Number: Not required
Dangerous Goods Class: Nonhazardous

Hazard Rating (NFPA/HMIS)
Health = 1* Reactivity = 0
Fire = 0 Special = 0



Rating Scale
0 = minimal 1 = slight
2 = moderate 3 = serious
4 = severe

*Mild eye irritant, non-mutagenic and non-carcinogenic. **None of the ingredients in Crystal Simple Green® are regulated or listed as potential cancer agents by Federal OSHA, NTP, or IARC.**

IV. FIRST AID MEASURES

SYMPTOMS OF OVEREXPOSURE AND FIRST AID TREATMENT

Eye contact: Reddening may develop. Immediately rinse the eye with large quantities of cool water; continue 10-15 minutes or until the material has been removed; be sure to remove contact lenses, if present, and to lift upper and lower lids during rinsing. Get medical attention if irritation persists.

Skin contact: Minimal effects, if any; rinse skin with water, rinse shoes and launder clothing before reuse. Reversible reddening may occur in some dermal-sensitive users; thoroughly rinse area and get medical attention if reaction persists.

Swallowing: Essentially non-toxic. Give several glasses of water to dilute; do not induce vomiting. If stomach upset occurs, consult physician.

Inhalation: Non-toxic. Exposures to concentrate-mist may cause mild irritation of nasal passages or throat; remove to fresh air. Get medical attention if irritation persists.

V. FIRE FIGHTING MEASURES

Crystal Simple Green® is stable, not flammable, and will not burn.

Flash Point/Auto-Ignition:	Not flammable.
Flammability Limits:	Not flammable.
Extinguishing Media:	Not flammable/nonexplosive. No special procedures required.
Special Fire Fighting Procedures:	None required.

VI. ACCIDENTAL RELEASE MEASURES

Recover usable material by convenient method; residual may be removed by wipe or wet mop. If necessary, unrecoverable material may be washed to drain with large quantities of water.

VII. HANDLING, STORAGE & TRANSPORT INFORMATION

No special precautions are required. **This product is non-hazardous for storage and transport according to the U.S. Department of Transportation Regulations.** Crystal Simple Green® requires no special labeling or placarding to meet U.S. Department of Transportation requirements.

UN Number:	Not required
Dangerous Goods Class:	Nonhazardous

VIII. EXPOSURE CONTROLS

Exposure Limits: The Crystal Simple Green® formulation presents no health hazards to the user when used according to label directions for its intended purposes. Mild skin and eye irritation is possible (please see Eye contact and Skin contact in Section IV.).

Ventilation: No special ventilation is required during use. Large-scale uses indoors should provide an increased rate of air exchange.

Human Health Effects or Risks from Exposure: Adverse effects on human health are not expected from Crystal Simple Green®, based upon twenty years of use of Simple Green without reported adverse health incidence in diverse population groups, including extensive use by inmates of U.S. Federal prisons in cleaning operations.

Crystal Simple Green® is a mild eye irritant; mucous membranes may become irritated by concentrate-mist.

Crystal Simple Green® is not likely to irritate the skin in the majority of users. Repeated daily application to the skin without rinsing, or continuous contact of Crystal Simple Green® on the skin may lead to temporary, but reversible, irritation.

Medical Conditions Aggravated by Exposure: No aggravation of existing medical conditions is expected; dermal-sensitive users may react to dermal contact by Crystal Simple Green®.

IX. PERSONAL PROTECTION

Precautionary Measures: No special requirements under normal use conditions.
Eye Protection: Caution, including reasonable eye protection, should always be used to avoid eye contact where splashing may occur.
Skin Protection: No special precautions required; rinse completely from skin after contact.
Respiratory Protection: No special precautions required except during large-scale spray applications where spray mist levels are high.
Work and Hygienic Practices: Wash or rinse hands before touching eyes or contact lenses. Follow standard hygienic practices for handling cleaning agents.

X. PHYSICAL AND CHEMICAL PROPERTIES

Appearance/odor::	Clear liquid	Vapor Pressure:	18 mm Hg @ 20 °C; 23.5 mm Hg @ 26 °C
Specific Gravity:	1.020	Vapor Density:	1.3 (air = 1)
pH of concentrate:	9.35	Density:	8.5 lbs./gallon
Evaporation:	>1 (butyl acetate = 1)		
Boiling Point:	100.6 °C (212 °F)		
Freezing Point:	-9 °C (16 °F) If product freezes, it will reconstitute without loss of efficacy when brought back to room temperature and agitated.		

VOC Composite Partial Pressure: 0 mm Hg @ 20 °C
Volatile Organic Compounds (VOCs): 0 g/L per ASTM Method D-2369. Per California AQMD's VOC test method, product must be diluted at least 2 parts of water to 1 part Crystal Simple Green® in order to meet SCAQMD Rule 1171 & Rule 1122 and BAAQMD Regulation 8-16 VOC requirements for solvent cleaning operations.
Water Solubility: Completely soluble in water.
Detection: Crystal Simple Green® has a characteristic odor that is not indicative of any hazardous situation.

XI. STABILITY AND REACTIVITY INFORMATION

Nonreactive. Crystal Simple Green® is stable, even under fire conditions, and will not react with water or oxidizers. Hazardous polymerization will not occur.

XII. TOXICOLOGICAL INFORMATION

The information and conclusions cited in this section are based on data and testing of Simple Green®. The data are directly applicable to Crystal Simple Green® because, except for the fragrance and dyes which have been removed, it contains the same ingredients as Simple Green®.

Nonhuman Toxicity

Acute Mortality Studies:
Oral LD_{50} (rat): >5.0 g/kg body weight // Dermal LD_{50} (rabbit): >2.0 g/kg body weight

Dermal Irritation: Only mild, but reversible, irritation was found in a standard 72-hr test on rabbits. A value of 0.2 (non-irritating) was found on a scale of 8.

Eye Irritation: With or without rinsing with water, the irritation scores in rabbits at 24 hours did not exceed 15 (mild irritant) on a scale of 110.

Subchronic dermal effects: No adverse effects, except reversible dermal irritation, were found in rabbits exposed to Simple Green® (up to 2.0 g/kg/day for 13 weeks) applied to the skin of 25 males and 25 females. Only female body weight gain was affected. Detailed microscopic examination of all major tissues showed no adverse changes.

Fertility Assessment by Continuous Breeding: The Simple Green® formulation had no adverse effect on fertility and reproduction in CD-1 mice with continuous administration for 18 weeks, and had no adverse effect on the reproductive performance of their offspring.

XIII. BIODEGRADABILITY AND ENVIRONMENTAL TOXICITY INFORMATION

Biodegradability:
Like Simple Green®, Crystal Simple Green® is readily decomposed by naturally occurring microorganisms. The biological oxygen demand (BOD), as a percentage of the chemical oxygen demand (COD), after 4, 7, and 11 days was 56%, 60%, and 70%, respectively. Per OECD Closed Bottle Test, Crystal Simple Green® meets OECD and EPA recommendations for ready biodegradability.

In a standard biodegradation test with soils from three different countries, Butyl Cellosolve reached 50% degradation in 6 to 23 days, depending upon soil type, and exceeded the rate of degradation for glucose, which was used as a control for comparison.

Environmental Toxicity Information:
Crystal Simple Green® is considered practically non-toxic per EPA's aquatic toxicity scale.

XIV. DISPOSAL CONSIDERATIONS

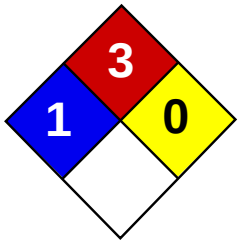
Crystal Simple Green® is fully water soluble and biodegradable and will not harm sewage-treatment microorganisms if disposal by sewer or drain is necessary. Dispose of in accordance with all applicable local, state, and federal laws.

XV. OTHER INFORMATION

Containers:	Crystal Simple Green® residues can be completely removed by rinsing with water; the container may be recycled or applied to other uses.
Contact Point:	Sunshine Makers, Inc., Research and Development Division: 562-795-6000.

***** NOTICE *****

All information appearing herein is based upon data obtained by the manufacturer and recognized technical sources. Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of this information, Sunshine Makers, Inc. or its distributors extends no warranties, makes no representations and assumes no responsibility as to the suitability of such information for application to purchaser's intended purposes or for consequences of its use.



Material Safety Data Sheet
Hexanes MSDS

Section 1: Chemical Product and Company Identification

Product Name: Hexanes

Catalog Codes: SLH2335, SLH2032

CAS#: 110-54-3

RTECS: MN9275000

TSCA: TSCA 8(b) inventory: Hexane

CI#: Not applicable.

Synonym:

Chemical Name: Hexane

Chemical Formula: C6-H14

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Hexanes	110-54-3	98.5-99.9

Toxicological Data on Ingredients: Hexane: ORAL (LD50): Acute: 25000 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (permeator), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to peripheral nervous system, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 225°C (437°F)

Flash Points: CLOSED CUP: -22.5°C (-8.5°F). (TAG)

Flammable Limits: LOWER: 1.15% UPPER: 7.5%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.

Special Remarks on Fire Hazards:
Extremely flammable liquid and vapor. Vapor may cause flash fire.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid, insoluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with skin. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves (impervious).

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 500 (ppm) from OSHA (PEL) [United States] Inhalation TWA: 1800 (mg/m3) from OSHA (PEL) [United States] Inhalation TWA: 176 (mg/m3) from ACGIH (TLV) [United States] SKIN TWA: 50 (ppm) from ACGIH (TLV) [United States] SKIN TWA: 500 STEL: 1000 (ppm) from ACGIH (TLV) [United States] Inhalation TWA: 1760 STEL: 3500 (mg/m3) from ACGIH (TLV) [United States] Inhalation Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Gasoline-like or petroleum-like (Slight.)

Taste: Not available.

Molecular Weight: 86.18g/mole

Color: Clear Colorless.

pH (1% soln/water): Not applicable.

Boiling Point: 68°C (154.4°F)

Melting Point: -95°C (-139°F)

Critical Temperature: Not available.

Specific Gravity: 0.66 (Water = 1)

Vapor Pressure: 17.3 kPa (@ 20°C)

Vapor Density: 2.97 (Air = 1)

Volatility: Not available.

Odor Threshold: 130 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.9

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility:
Soluble in diethyl ether, acetone. Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ingnition sources, incompatibles.

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Not available.

Special Remarks on Reactivity: Hexane can react vigorously with strong oxidizers (e.g. chlorine, bromine, fluorine)

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 25000 mg/kg [Rat]. Acute toxicity of the gas (LC50): 48000 ppm 4 hours [Rat].

Chronic Effects on Humans:
MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: peripheral nervous system, skin, central nervous system (CNS).

Other Toxic Effects on Humans:
Very hazardous in case of ingestion, of inhalation. Hazardous in case of skin contact (permeator). Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects based on animal data. May be tumorigenic based on animal data. May affect genetic material. Passes through the placental barrier in animal.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May cause mild skin irritation. It can be absorbed through the skin in harmful amounts. Eyes: May cause mild eye irritation. Inhalation: May be harmful if inhaled. Inhalation of vapors may cause respiratory tract irritation. Overexposure may affect, brain, spinal cord, behavior/central and peripheral nervous systems (lightheadness, dizziness, hallucinations, paralysis, blurred vision, memory loss, headache, euphoria, general anesthetic, muscle weakness, numbness of the extremeties, asphyxia, unconciousness and possible death), metabolism, respiration, blood, cardiovascular system, gastrointestinal system (nausea) Ingestion: May be harmful if swallowed. May cause gastrointestinal tract irritation with abdominal pain and nausea. May also affect the liver, blood, brain, peripheral and central nervous systems. Symptoms of over exposure by ingestion are similar to that of overexposure by inhalation.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Hexane UNNA: 1208 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Hexanes Illinois toxic substances disclosure to employee act: Hexanes Illinois chemical safety act: Hexanes New York release reporting list: Hexanes Rhode Island RTK hazardous substances: Hexanes Pennsylvania RTK: Hexanes Florida: Hexanes Minnesota: Hexanes Massachusetts RTK: Hexanes Massachusetts spill list: Hexanes New Jersey: Hexanes New Jersey spill list: Hexanes Louisiana spill reporting: Hexanes TSCA 8(b) inventory: Hexanes SARA 313 toxic chemical notification and release reporting: Hexanes CERCLA: Hazardous substances.: Hexanes: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable. R20- Harmful by inhalation. R38- Irritating to skin. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R62- Possible risk of impaired fertility. R65- Harmful: may cause lung damage if swallowed. R67- Vapors may cause drowsiness or dizziness. S9- Keep container in a well-ventilated place. S16- Keep away from sources of ignition - No smoking. S29- Do not empty into drains. S33- Take precautionary measures against static discharges. S36/37- Wear suitable protective clothing and gloves. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets. S62- If swallowed, do not induce vomiting: seek medical advice immediately and show this

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: g

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves (impervious). Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:19 PM

Last Updated: 06/09/2012 12:00 PM

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APPENDIX F

Incident Reporting

INCIDENT REPORT FORM

Please attach photographs relating to the incident if possible.

Report No. _____

Site: _____ Project No. _____

Location: _____

Date of Report: _____ Preparer's Name: _____

Name and Address of Injured: _____

Date of Birth _____ Date of Hire: _____ Title/Classification: _____

Division/Department _____ Date of Accident _____ Time: _____

Accident Category: ___ Motor Vehicle ___ Property Damage ___ Fire
___ Chemical Exposure ___ Near Miss ___ Other

Severity of Injury or Illness: ____ Non-disabling ___ Disabling
____ Medical Treatment ___ Fatality

Amount of Damage: $_____ Property Damaged: _____

Estimated Number of Days Away from Job: _____

Nature of Injury or Illness: _____

CLASSIFICATION OF INJURY:

____ Fractures	____ Heat Burns	____ Cold Exposure
____ Dislocations	____ Chemical Burns	____ Frostbite
____ Sprains	____ Radiation Burns	____ Heat Stroke
____ Abrasions	____ Bruises	____ Heat Exhaustion
____ Lacerations	____ Blisters	____ Concussion
____ Punctures	____ Toxic Respiratory Exposure	____ Faint/Dizziness
____ Bites	____ Toxic Ingestions	____ Toxic Respiratory
____ Toxic Ingestions	____ Dermal Allergy	

Part of Body Affected: _____

Degree of Disability: _____

Date Medical Care Was Received: _____

Where Medical Care Was Received: _____

Address (if off site): _____

Causative agent most directly related to accident (object substance, material, machinery, equipment conditions):

_____

_____

Was weather a factor? _____

Unsafe mechanical/physical/environmental condition at time of accident (be specific):

_____

Unsafe act by injured and/or others contributing to the accident (be specific, must be answered):

Personal factors (improper attitude, lack of knowledge or skill, slow reaction, fatigue):

Level of personal protection equipment required in Site Safety Plan: _____

Modifications: _____

Was injured using required equipment? _____

If not, how did actual equipment use differ from plan? _____

What can be done to prevent a recurrence of this type of accident (modification of machine; mechanical guards; correct environment training):

Detailed narrative description (how did accident occur, why; objects, equipment, tools used, circumstance assigned duties) (be specific):

(Use separate sheet as required)

Witnesses to accident _____

Signature of Preparer _____

Signature of Site Leader _____