

Former Bellport Gas Station

SUFFOLK COUNTY, NEW YORK

Site Management Plan

NYSDEC Site Number: E-1-52-194

Prepared for:

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Office of Pollution Control

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SITE MANAGEMENT PLAN

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 Introduction

This Site Management Plan (SMP) is required as an element of the remedial program at the Former Bellport Gas Station Site (hereinafter referred to as the “Site”) under the New York State (NYS) Environmental Restoration Program (ERP) administered by New York State Department of Environmental Conservation (NYSDEC). The site was remediated in accordance with State Assistance Contract (SAC) # C304320, Site # E-1-52-194, which was executed on May 8, 2008.

1.1.1 General

Suffolk County entered into a SAC with the NYSDEC to remediate a 0.292 acre property located in East Patchogue, Suffolk County, New York. This SAC required the Remedial Party, Suffolk County, to investigate and remediate contaminated media at the site. A figure showing the site location and boundaries of this 0.292-acre “site” is provided in Figure 1. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement.

Since no active remedial action will be performed, some contamination will be left in the subsurface at this site, which is hereafter referred to as ‘remaining contamination.’ This SMP was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by P.W. Grosser Consulting, Inc. (PWGC), on behalf of Suffolk County, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement for the site.

1.1.2 Purpose

No active remedial action is planned for the site, however the site contains residual contamination. ECs have been incorporated into the site remedy to control exposure to remaining contamination during the use of the site to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC by the County of Suffolk as Grantor, and recorded with the Suffolk County Clerk, will require compliance with this SMP and all ECs and ICs placed on the site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that remains at the site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the site after completion of the Remedial Action, including: (1) implementation and management of all ECs and ICs; (2) media monitoring; (3) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and

To address these needs, this SMP includes two plans: (1) an EC and IC Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring.

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP may be a violation of the environmental easement, which is grounds for revocation of the Certificate of Completion (COC);
- Failure to comply with this SMP may also be a violation of Environmental Conservation Law, 6NYCRR Part 375 and the SAC, for the site, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. In accordance with the Environmental Easement for the site, the NYSDEC will provide a written notice of any approved changes to the SMP to the site owner, and append these notices to the SMP that is retained in its files.

1.2 Site Background

1.2.1 Site Location and Description

The site is located in East Patchogue in the County of Suffolk, New York and is identified as District 200, Section 975.8, Block 4 and Lot 20 on the Suffolk County Tax Map. The site is an approximately 0.292-acre area bounded by residential properties to the north, Montauk Highway to the south, Lenox Avenue to the east, and commercial properties to the west (see Figure 1). The boundaries of the site are more fully described in Appendix A – Metes and Bounds.

1.2.2 Site History

This property has been occupied by many different independent retail gasoline service stations, such as Eastern Petroleum (1983), Major Fuel (1986), National (1987), Independent (1991), and Ocean/Coastal (1991-1998).

Suffolk County acquired the property in 1999 for failure to pay property taxes.

To address the areas of environmental impacts at the site, Suffolk County applied for inclusion into the NYSDEC's ERP in February 2007. The site was accepted into the NYDEC ERP program (Site ID #E-1-52-194) on July 26, 2007 and a SAC (#C304320) was issued.

As required in the ERP program, a Remedial Investigation Work Plan for the site was prepared in December of 2008. The objective of the investigation was to determine the vertical and horizontal extent of soil and groundwater contamination identified.

PWGC completed the Remedial Investigation in March of 2010. Results of the Remedial Investigation identified the following contaminants of concern:

- A single on-site cesspool (CP-1) and a single leaching drywell (DW-3) associated with the floor drain (FD-1) inside the service station were identified. Soil/sludge analytical data indicated semi-volatile organic compounds (SVOCs) and/or metals were detected in CP-1 and DW-3 above both SCDHS Action Levels and

Unrestricted Use Soil Cleanup Objectives (UUSCOs) specified in the NYSDEC 6 NYCRR Part 375.

- Slightly elevated concentrations of volatile organic compounds (VOCs) in the groundwater beneath the site were identified.

Based upon the results of the Remedial Investigation, it was recommended that the impacted underground injection control (UIC) structures be remediated. In addition it was recommended that groundwater monitoring be performed to monitor VOC concentrations in the groundwater beneath the site.

In April 2010, an inspection of the single story building that existed on site revealed evidence of structure failure. Due to safety issues regarding the dilapidated building, Suffolk County proceeded with its demolition in accordance with all State and County applicable procedures. Since demolition activities may have damaged the integrity of the remaining on-site UIC structures, the UICs were addressed as an emergency IRM prior to building demolition.

The IRM was implemented on April 21, 2010. The scope of work included the removal of impacted sediments from one leaching drywell (DW-3), one floor drain (FD-1), one cesspool (CP-1), closure of the on-site structures, and the removal of SVOC impacted sediments from DW-2 that were being stored within the building. Remediation was performed under the supervision of the SCDHS and the NYSDEC.

In August 2010 the NYSDEC issued a Proposed Remedial Action Plan (PRAP) for the site. The PRAP included a groundwater monitoring program to monitor VOC concentrations in groundwater. A public comment period had been set from September 1, 2010 through October 15, 2010 to provide an opportunity for public participation in the remedy selection process. In addition, a public meeting was held on September 23, 2010.

In December 2010, the NYSDEC issued a Record of Decision (ROD) presenting the selected remedy, which is no further action with monitoring of site groundwater to document that there is a continuing decreasing trend in VOCs detected in the groundwater beneath the site. In addition, a SMP was required for the site. The components of the remedy are as follows:

1. Maintenance of a soil cover system consisting of the five feet of clean soils, medium-fine sands with gravel, (15'-20' below grade) which lie above the

- impacted soils which begin at approximately 20' below grade to prevent human exposure to remaining contaminated soil/fill remaining at the site;
2. Groundwater monitoring program to ensure that there is a continuing downward trend regarding the petroleum related volatile organic compounds (VOCs) detected in site groundwater;
 3. Execution and recording of an Environmental Easement to restrict land use for Restricted Residential or less restrictive uses and prevent future exposure to any contamination remaining at the site.
 4. Restrict the use of groundwater as a source of potable or process water.
 5. Prohibit agriculture or vegetable gardens on the controlled property.
 6. Development and implementation of a Site Management Plan (SMP) for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls (EC/IC), (2) monitoring, and (3) reporting;
 7. Periodic certification of the EC/ICs listed above.

1.2.3 Geologic Conditions

The site is located approximately 40 feet above mean sea level. The site's topography is relatively undisturbed. No recent disturbances were observed; small trees and shrubs have almost re-vegetated the entire area north of the former one story building. No erosion of surface areas was noted. Site drywells were removed from service as a component of the Interim Remedial Measures (IRMs) that were implemented in October 2008 and April 2010. Recharges ran directly into the subsurface or into the former storm water drywells with no evidence of overland flow away from the site towards surface-water bodies. The nearest surface-water body is Hedges Creek/Dunton Lake, a class SB saline surface water body, located approximately 5,000 feet to the south-southeast. Based upon site topography, overland flow to this surface-water body is unlikely.

The geologic setting of Long Island is well documented and consists of crystalline bedrock composed of schist and gneiss overlain by layers of unconsolidated deposits.

Immediately overlying the bedrock is the Raritan Formation, consisting of the Lloyd sand confined by the Raritan Clay Member. The Lloyd sand is an aquifer and consists of discontinuous layers of gravel, sand, sandy and silty clay, and solid clay. The Raritan Clay is a solid and silty clay that is gray, red or white in color with few lenses of sand and gravel and abundant lignite and pyrite. Above the Raritan Clay lies the Magothy Formation. The Magothy aquifer consists of layers of fine to coarse sand of moderate to high permeability, with inter-bedded lenses of silt and clay of low permeability resulting in areas of preferential horizontal flow. Therefore, this aquifer generally becomes more confined with depth. The Magothy Formation is overlain by the Upper Glacial deposits which contains the Upper Glacial aquifer. The Upper Glacial aquifer is the water-table aquifer at this location and is comprised of medium to coarse sand and gravel with occasional thin lenses of fine sand and brown clay. This aquifer extends from the water table to the top of the Magothy and, therefore, is hydraulically connected to the Magothy aquifer.

The aquifer of concern at the former Bellport Gas Station site is the Upper Glacial aquifer which is an unconsolidated mixture of sand and gravel. The Upper Glacial aquifer is approximately 100 feet thick at the site, and has an estimated average horizontal hydraulic conductivity (permeability) of 270 feet/day and a vertical hydraulic conductivity of 27 feet/day (Franke & Cohen, 1972). Clay layers, such as the Gardiners clay and the "20-Foot-clay," where present, may act as local confining units, separating the Upper Glacial aquifer from the underlying Magothy aquifer which is the principal source of drinking water in Suffolk County. These clay layers extend throughout much of the south shore of Long Island. Based on data collected during monitoring well installation, depth to groundwater at the site ranged from approximately 18.84 to 19.46 feet below ground surface (bgs). No confining unit (clay) was present at the monitoring well locations. Regional groundwater flow at the site is to the south based upon the groundwater measurements obtained from the site.

A groundwater flow figure is shown in Figure 2.

1.3 Summary of Remedial Investigation Findings

A Remedial Investigation (RI) was performed to characterize the nature and extent of contamination at the site. The results of the RI are described in detail in the following reports:

- Site Characterization Report, O'Brien & Gere, July 2006
- Remedial Investigation Report, PWGC, March 2010

Generally, the RI determined that VOC impacts remain in subsurface soils in the former underground storage tank (UST) area located in the south-central sector of the property. Soil borings installed in that area of the site revealed petroleum staining at the water table as well as elevated PID readings. Elevated levels of VOC compounds were detected in the groundwater immediately down gradient of the former tank bed. A petroleum sheen and odor were also observed when sampling the down gradient wells. In addition, elevated levels of metals exceeding the Department's groundwater standards were detected in each of the groundwater samples collected. However, many of these metals are naturally occurring and are common in shallow groundwater. Concentrations of metals in groundwater are shown to be greatly reduced when the samples are filtered, as metals tend to adhere to sediments in turbid samples. It should be noted that elevated concentrations of metals are contained only in the samples collected from the permanent monitoring wells. The reason for the elevated concentrations of some of these metals is unknown, as significant sources of these metals in the soils were not encountered during the RI.

Below is a summary of site conditions when the RI was performed in 2010:

Soil

Surface soil samples were collected at two depths during the RI; 0-2 inches bgs and 1-1.5 feet bgs. Subsurface soil samples were collected at two depths during the RI; 16-18 feet bgs and 22-24 feet bgs. Soil/sludge samples were also collected from the base of on-site UIC structures. The soil/sludge samples collected from the bases of the UIC structures were analyzed for VOCs, SVOCs and metals in accordance with SCDHS and ERP procedures and protocol. Based on the results of soil samples previously collected at the site, the surface soil samples were analyzed for the presence of VOCs and metals, while the subsurface samples were analyzed for VOCs only.

The results of the soil samples and UIC structure samples collected as part of the RI were compared to Restricted-Residential Soil Cleanup Objectives (RRSCOs). They were also compared to the Protection of Groundwater SCOs, which are incorporated into the Unrestricted SCOs. None of the surface soil samples collected contained concentrations of VOCs above the RRSCOs. A sample collected from one of the UIC structures (CP-1) contained concentrations of SVOCs above the RRSCOs. In addition, samples collected from two other UIC structures (CP-1 and DW-3) contained concentrations of metals above the RRSCOs. The remediation and closure of the unused site UICs was conducted as a component of the two IRMs that were implemented at the site in October 2008 and April 2010.

Although VOCs were detected in the subsurface soils in the vicinity of the former USTs, the concentrations were below the RRSCOs. The remaining VOCs detected in the soil in the vicinity of the former UST tank area exhibited nuance characteristics of petroleum odor and staining and appears to be related to the elevated levels of VOCs detected in the groundwater.

UICs, which contained elevated levels of VOCs above RRSCOs have been removed from service as a component of IRMs that have been implemented at the site.

The primary sub-surface soil contaminants are the petroleum based VOCs associated with the operation of the former gas station. The soil contamination is associated with the petroleum contaminated soils located at the water table interface in the former tank bed area.

Site-Related Groundwater

Groundwater samples were collected to assess groundwater quality on-site and immediately down gradient of the site. Concentrations of VOCs exceeding the Department's groundwater standards were detected in each of the three groundwater monitoring wells and two of the three temporary geoprobe wells. It is evident that VOC impacts remain in subsurface soils in the former UST area located in the south-central sector of the property. Soil borings installed in that area of the site revealed petroleum staining at the water table as well as elevated PID readings. Elevated levels of VOC compounds were detected in the groundwater immediately down gradient of the former

tank bed. A petroleum sheen and odor were also observed when sampling the down gradient wells.

In addition, elevated levels of metals exceeding the Department's groundwater standards were detected in each of the groundwater samples collected. However, many of these metals are naturally occurring and are common in shallow groundwater. Concentrations of metals in groundwater are shown to be greatly reduced when the samples are filtered, as metals tend to adhere to sediments in turbid samples. It should be noted that elevated concentrations of metals are contained only in the samples collected from the permanent monitoring wells. The reason for the elevated concentrations of some of these metals is unknown, as significant sources of these metals in the soils were not encountered during the RI.

The primary groundwater contaminants are petroleum based VOCs associated with the operation of the former gas station. Specifically, the remaining petroleum contaminated soil associated with the location of the former underground storage tanks appears to be the cause of the elevated levels of VOCs found in groundwater.

It is not believed that the metals detected in the groundwater samples are a result of an on-site source of contamination. Therefore, the metals found in groundwater are not considered to be site specific contaminants of concern.

Site-Related Soil Vapor Intrusion

The potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of soil vapor and sub-slab soil vapor under the building that formerly existed on-site at the time of the RI. During the implementation of the RI, the on-site building was abandoned, so vapor intrusion was not a current concern at the site. No site-related soil vapor concerns were identified during the RI.

Three soil vapor samples, one sub-slab sample, an indoor and an ambient outdoor sample were collected on-site to evaluate the potential for soil vapor intrusion. VOCs were detected in each of the soil gas points at concentrations above laboratory method detection limits. Several of the detected compounds are common constituents in gasoline.

Using the outdoor air sample as a comparison to the indoor air concentration versus the sub-slab sample collected, VOCs were not intruding into the building that formerly existed on-site. Due to the building displaying signs of structural failure, the building was razed in April 2010.

Based on the findings of the RI, the release of petroleum has resulted in the detection of VOCs in soil vapor. Since the levels detected are marginal and exposure to the levels is non-existent since the single structure that existed on-site was demolished by Suffolk County, the remediation of site soil vapor will not be required.

Underground Storage Tanks

NYSDEC opened a spill number (8703461) in 1987 after an UST failed a tank test. Three (3) gasoline/diesel USTs and one (1) waste oil UST were removed from the site in 1988. The spill number was closed in 1988.

1.4 Summary of Remedial Actions

The site is undergoing a groundwater monitoring program in accordance with the NYSDEC-approved Remedial Design Work Plan, dated March 2011.

The following is a summary of the Remedial Actions performed at the site:

1. Execution and recording of an Environmental Easement to restrict land use and prevent future exposure to any contamination remaining at the site.
2. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) reporting;

1.4.1 Remaining Contamination

The Remedial Investigation identified slightly elevated concentrations of VOCs in the soil and groundwater beneath the site. A very low potential for human exposure to these contaminants exists as the contaminants are contained at a depth of greater than 20 feet and groundwater at the site is not used. In addition, the NYSDEC has completed an extensive off-site groundwater investigation in order to determine the extent of impact. Based on information obtained during the offsite groundwater investigation, the

NYSDEC concluded that impacts to private wells were eliminated through connections to public water, MTBE exposure at Dunton Lake and tidal creeks was not expected to cause adverse impacts to aquatic or terrestrial organism populations, and impacts to Bellport Bay were expected to be minimal.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 Introduction

2.1.1 General

Since remaining contaminated soil and groundwater exists beneath the site, EC/ICs are required to protect human health and the environment. This EC/IC Plan describes the procedures for the implementation and management of all EC/ICs at the site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of all EC/ICs on the site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the Excavation Work Plan for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the site remedy, as determined by the NYSDEC.

2.2 Engineering Controls

2.2.1 Engineering Control Systems

2.2.1.1 Soil Cover

Exposure to remaining contamination in soil at the site is prevented by a soil cover system placed over the site. This cover system is comprised of the five feet of clean soils, medium-fine sands with gravel, (15'-20' below grade) which lie above the impacted soils which begin at approximately 20' below grade. Soils above the cover

system also consist of medium-fine sands with gravel. The Excavation Work Plan that appears in Appendix B outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Since these soils will be located beneath an additional 15' of clean soil, routine inspections of the protective cover cannot be performed and is unnecessary.

2.2.2 Criteria for Completion of Remediation

2.2.2.1 Groundwater Monitoring Program

Groundwater monitoring activities to ensure that there is a continuing downward trend regarding the petroleum related VOCs detected in site groundwater will continue, as determined by the NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Initially, monitoring consisted of quarterly sampling of five onsite monitoring wells. Following the completion of one year of quarterly monitoring, the NYSDEC reduced the sampling frequency to semi-annual. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

2.3 Institutional Controls

A series of Institutional Controls is required by the ROD to: (1) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (2) limit the use and development of the site to Restricted Residential, Commercial, or Industrial uses only. Adherence to these ICs on the site is required by the Environmental Easement (Appendix A) and will be implemented under this SMP. These ICs are:

- The property may be used for Restricted Residential or less restrictive uses provided that the long term ICs/ECs included in this SMP are employed.
- Use of groundwater from beneath the property as a source of potable or process water, without necessary water quality treatment as determined by NYSDEC, NYSDOH, or SCDHS, is prohibited.

- Restrict disturbance of soils below 15' below grade without notification of the NYSDEC.
- Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in this SMP;
- On a yearly basis, the site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement.

2.3.1 Criteria for Completion of Remediation

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

The site has a series of ICs in the form of site restrictions. Adherence to these ICs is required by the Environmental Easement. Site restrictions that apply to the Controlled Property are:

- The property may only be used for restricted residential use provided that the long-term EC/ICs included in this SMP are employed.

- The property may not be used for a higher level of use, such as unrestricted use without additional remediation and amendment of the Environmental Easement, as approved by the NYSDEC;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use;
- The potential for vapor intrusion must be evaluated for any buildings developed in the area, and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the property are prohibited;
- The site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.3.2 Excavation Work Plan

The site has been, remediated for restricted residential or less restrictive use. Any future intrusive work that will penetrate the clean soils located between 15' and 20' below grade, or encounter or disturb the remaining contamination, including any modifications or repairs to the existing cover system will be performed in compliance with the Excavation Work Plan (EWP) that is attached as Appendix B to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the site. A sample HASP is attached as Appendix C to this SMP that is in current compliance with DER-10, and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. Based on future changes to State

and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-submitted with the notification provided in Section A-1 of the EWP. Any intrusive construction work that will disturb soil deeper than 15' below grade will be performed in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (See Section 5).

The site owner and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for protecting structures that may be affected by excavations (such as building foundations and bridge footings). The site owner will ensure that site development activities will not interfere with, or otherwise impair or compromise, the engineering controls described in this SMP.

2.3.3 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures located over areas that contain remaining contamination and the potential for soil vapor intrusion (SVI) has been identified, an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. Validated SVI data will be transmitted to the property owner within 30 days of validation. [“If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the property within 15 days of receipt of validated data”]

SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

2.4 Inspections and Notifications

2.4.1 Inspections

Inspections of all remedial components installed at the site will be conducted at the frequency specified in the SMP Monitoring Plan schedule. A comprehensive site-wide inspection will be conducted annually, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- If site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system;

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this plan (Section 5).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the site by a qualified environmental professional as determined by NYSDEC.

2.4.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the SAC, 6NYCRR Part 375, and/or Environmental Conservation Law.
- 7-day advance notice of any proposed ground-intrusive activities to occur below 15' pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other ECs and likewise any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the SAC, and all approved work plans and reports, including this SMP
- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 Contingency Plan

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to SCDHS Division of Environmental Quality (DEQ). These emergency contact lists must be maintained in an easily accessible location at the site.

Table [1]: Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362
SCDHS DEQ	(631) 852-5800

2.5.2 Map and Directions to Nearest Health Facility

Site Location: Former Bellport Gas Station

Nearest Hospital Name: Brookhaven Memorial Hospital Medical Center

Hospital Location: 101 Hospital Rd, Patchogue, NY 11772

Hospital Telephone: (631) 654-7100

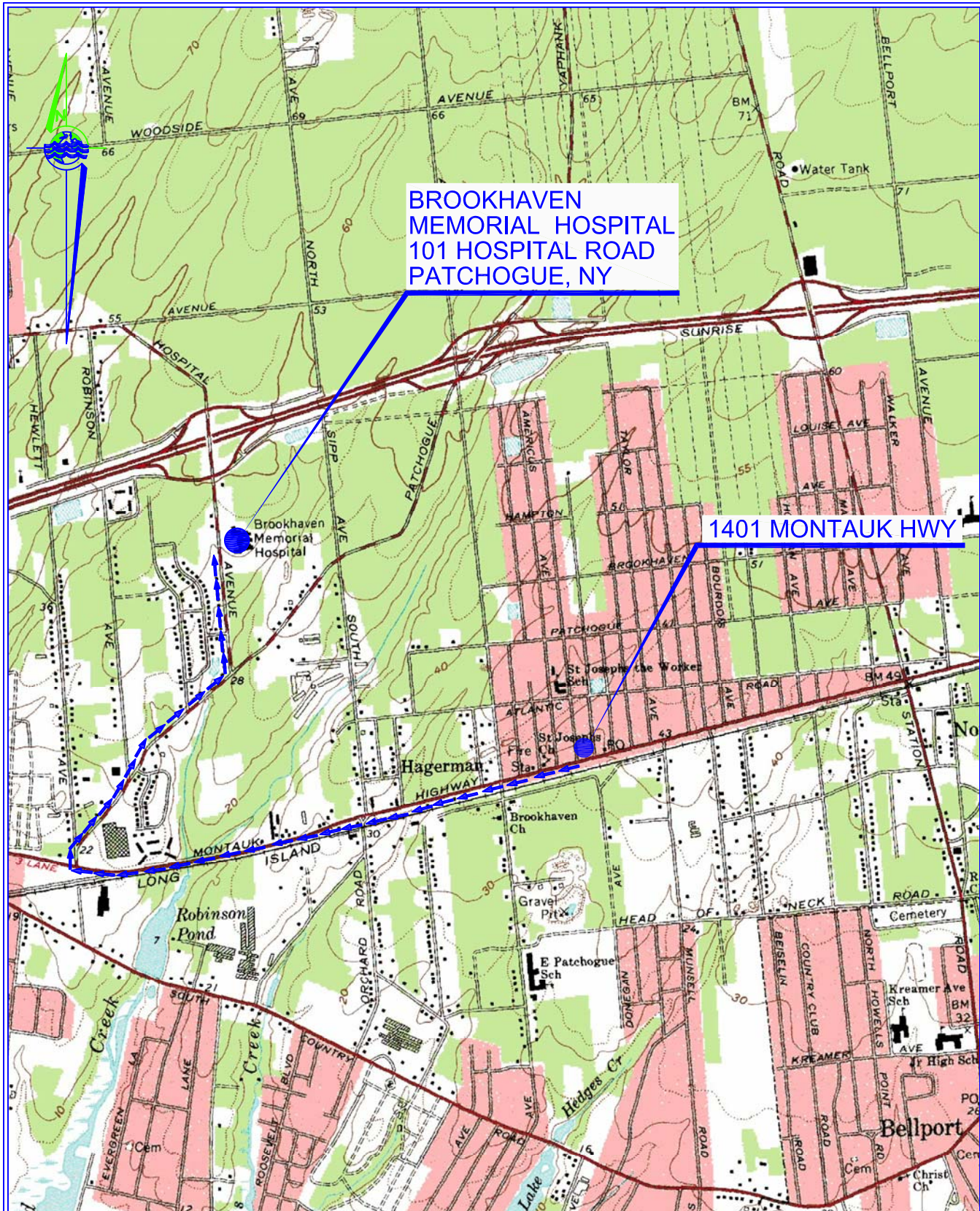
Directions to the Hospital:

1. Head west on Montauk Highway/County Rd 80 toward Narragansett Avenue (1.4 miles).
2. Turn right at East Patchogue-Yaphank Rd/Sills Rd/County Rd 101 (0.7 mile).
3. Turn Left at Hospital Road (0.3 mile).
4. Arrive at 101 Hospital Road on right.

Total Distance: 2.5 miles

Total Estimated Time: 6 minutes

Map Showing Route from the site to the Hospital:



**BROOKHAVEN
MEMORIAL HOSPITAL
101 HOSPITAL ROAD
PATCHOGUE, NY**

1401 MONTAUK HWY

Mapped, edited, and published by the Geological Survey
Revised in cooperation with New York
Department of Transportation
Control by USGS, USC&GS, and New Jersey Geodetic Survey

HOSPITAL ROUTE MAP

SCALE: 1:24,000

J:\Projects S-Z\SHD\1008 - Bellport Monitoring\Site Management Plan\CAD\Hospital Route Map.dwg (8x11v) Jun 09,2011-11:15am By: guzman

PWGC
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E-mail: info@pwgcr.com

1401 MONTAUK HWY, E. PATCHOGUE, NY TO
BROOKHAVEN MEMORIAL HOSPITAL
101 HOSPITAL ROAD, PATCHOGUE, NY

Project: SHD1008	Figure No: 3
Designed by: DE	
Approved by: PWG	
Drawn by: LLG	Date: 6/9/11

2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Table 1). The list will also be posted prominently at the site and made readily available to all personnel at all times.

3.0 SITE MONITORING PLAN

3.1 Introduction

3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site, the soil cover system, and all affected site media identified below. Monitoring of other Engineering Controls is described in Chapter 4, Operation, Monitoring and Maintenance Plan. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards and Part 375 SCOs for soil;
- Assessing achievement of the remedial performance criteria.
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Quarterly monitoring of the performance of the remedy and overall reduction in contamination on-site will be conducted for the first year. The frequency thereafter will be determined by NYSDEC. Trends in contaminant levels in air, soil, and/or groundwater in the affected areas, will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in Table 2 and outlined in detail in Sections 3.2 and 3.3 below.

Table 2: Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Matrix	Analysis
Well Monitoring	Quarterly (Year 1)	Groundwater	VOCs
Site Wide Inspection	Annually	N/A	N/A

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

3.2 Media Monitoring Program

3.2.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy.

Five monitoring wells have been installed to monitor both up-gradient and down-gradient groundwater conditions at the site. The network of on-site wells has been designed based on the following criteria:

- Four wells are installed down-gradient of the former UST locations and at the southern (down gradient) property boundary. One well is installed at the northern (up-gradient) property boundary (see Figure 1).
- Wells are screened at the water table in the Upper Glacial Aquifer.
- Wells are constructed of 2-inch diameter schedule 40 PVC, with 0.010-inch slot screen. Wells are screened from approximately 17 to 27 feet below grade, with an average water table depth of approximately 20 feet below grade. Wells are constructed with a gravel pack (No.2 sand) to two feet above the screened section,

capped by a two foot thick bentonite seal, and bentonite/cement grout to grade. Wells are finished at grade with a flush-mount manhole.

- Wells have been properly developed prior to sampling.
- Samples from the wells will be analyzed for VOCs by USEPA Method 8260.

Monitoring well construction logs are included in Appendix D.

Monitoring wells will be sampled on a quarterly basis for a minimum of one year, with the frequency thereafter to be determined by NYSDEC.

Following the completion of one year of quarterly monitoring, the NYSDEC modified sampling frequency to semi-annual. The sampling frequency may be modified with the approval NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

Deliverables for the groundwater monitoring program are specified below.

3.2.1.1 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log presented in Appendix E. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

Well monitoring and sampling will be performed in accordance with the procedures specified in PWGC's Remedial Design Work Plan (March 2011). Procedures are summarized as follows:

- Measure and record total depth, depth to water, and depth to LNAPL (if applicable) for each well.
- Purge each well of a minimum of three casing volumes of water, while measuring and recording field indicator parameters (temperature, conductivity, and pH).
- Samples will be collected following a minimum of three casing volumes purged and stabilization of field indicator parameters.

- Samples will be collected in pre-cleaned, pre-preserved, laboratory supplied glassware, and stored in a cooler packed with ice for transport to the analytical laboratory.

Analytical services will be provided by a NYSDOH ELAP certified laboratory.

3.2.1.2 Monitoring Well Repairs, Replacement And Decommissioning

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.3 Site-Wide Inspection

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, an inspection form will be completed (Appendix F). The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;

- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirm that site records are up to date.

3.4 Monitoring Quality Assurance/Quality Control

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the site (Appendix G). Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
 - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
 - Sample holding times will be in accordance with the NYSDEC ASP requirements.
 - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:
 - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
 - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;

- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.

3.5 Monitoring Reporting Requirements

Forms and any other information generated during regular monitoring events and inspections will be kept on file on-site. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP.

All monitoring results will be reported to NYSDEC on a periodic basis in the Periodic Review Report. A letter report will also be prepared [if required by NYSDEC], subsequent to each sampling event. The report (or letter) will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;

- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC. A summary of the monitoring program deliverables are summarized in Table [3] below.

Table 3: Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*
Groundwater Monitoring	Summary letter report following each event
Annual Groundwater Monitoring Report	Annually, due by April of the following year
Site-wide Inspection Report	Annually, to be submitted with Annual Groundwater Monitoring Report

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC

4.0 OPERATION AND MAINTENANCE PLAN

4.1 Introduction

The site remedy does not rely on any mechanical systems, such as sub-slab depressurization systems or air sparge/ soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

5.0 INSPECTIONS, REPORTING AND CERTIFICATIONS

5.1 Site Inspections

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3 Monitoring Plan and Section 4 Operation and Maintenance Plan of this SMP. At a minimum, a site-wide inspection will be conducted annually. Inspections will also be conducted whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

A general site-wide inspection form will be completed during the site-wide inspection (see Appendix F). These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format in the Periodic Review Report.

5.1.3 Evaluation of Records and Reporting

The results of the inspection and site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- The site remedy continues to be protective of public health and the environment and is performing as designed in the RAWP and FER.

5.2 Certification of Institutional Controls

For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;

- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the site is compliant with the environmental easement;
- The engineering control systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program [and generally accepted engineering practices]; and
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class “A” misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner’s Designated Site Representative]: [I have been authorized and designated by all site owners to sign this certification] for the site.
- No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and

Every five years the following certification will be added:

- The assumptions made in the qualitative exposure assessment remain valid.

The signed certification will be included in the Periodic Review Report described below.

5.3 Periodic Review Report

A Periodic Review Report will be submitted to the Department every year, beginning eighteen months after the [Certificate of Completion] is issued. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in Appendix A (Metes and Bounds). The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A site evaluation, which includes the following:
 - The compliance of the remedy with the requirements of the site-specific RAWP, ROD or Decision Document;
 - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;

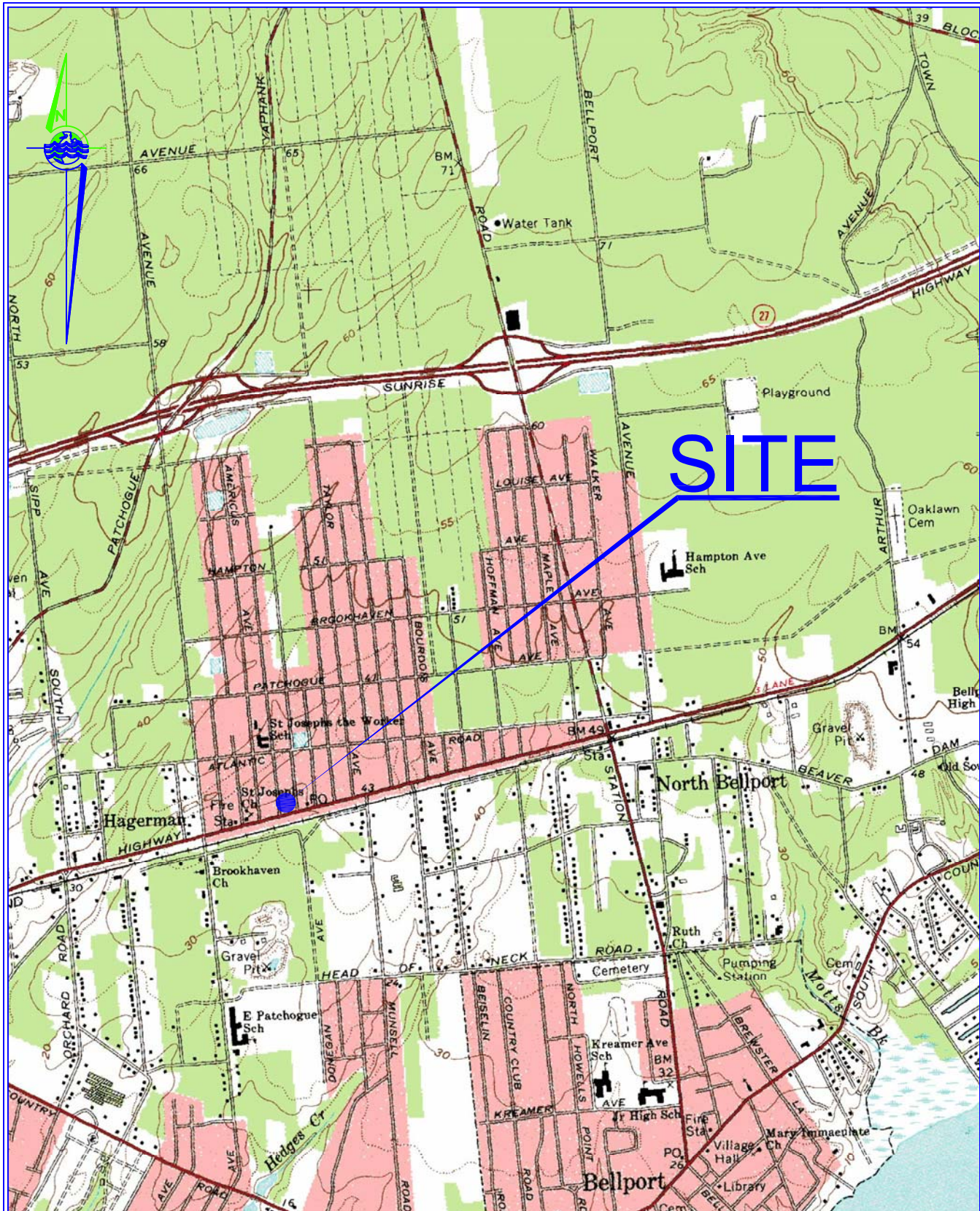
- Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
- Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
- The overall performance and effectiveness of the remedy.

The Periodic Review Report will be submitted, in hard-copy format, to the NYSDEC Central Office and Regional Office in which the site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation.

5.4 Corrective Measures Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

FIGURES



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 Department of Transportation
 Control by USGS, USC&GS, and New Jersey Geodetic Survey

VICINITY MAP

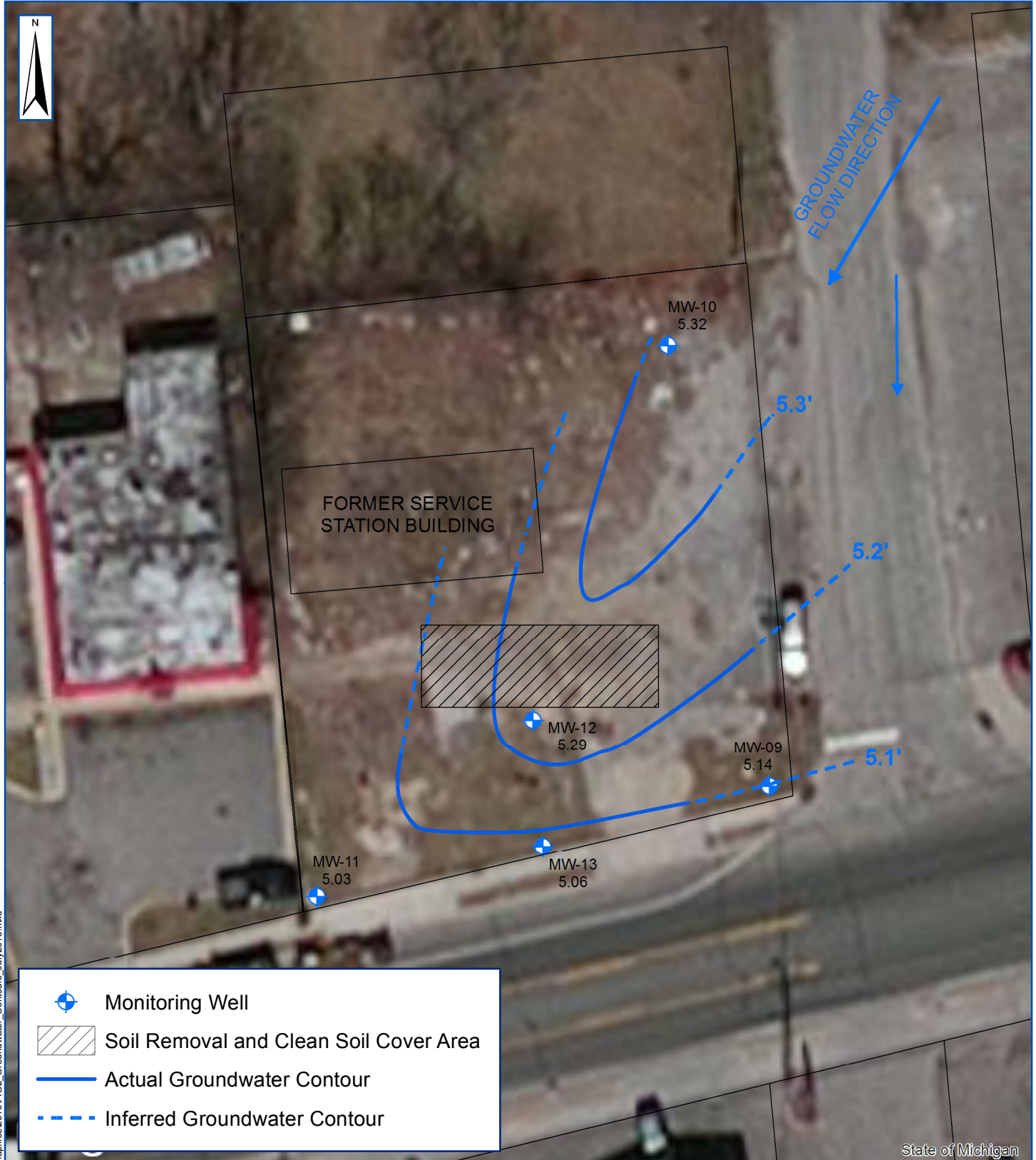
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 Strategic Environmental & Engineering Solutions
 630 Johnson Ave, Suite 7
 Bohemia, N.Y. 11716-2618
 Ph: 631 589-6353 Fx: 631 589-8705
 E-mail: info@pwgcrs.com

1401 MONTAUK HWY
 E. PATCHOGUE, NY

Project:	SHD1008	Figure No.:	3
Designed by:	AL		
Approved By:	PWGC		
Drawn by:	LLG	Date:	6/8/11



State of Michigan

-  Monitoring Well
-  Soil Removal and Clean Soil Cover Area
-  Actual Groundwater Contour
-  Inferred Groundwater Contour

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Strategic Environmental and Engineering Solutions

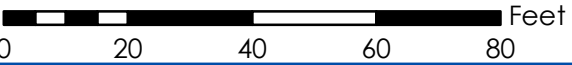
P.W. GROSSER CONSULTING, INC.

630 Johnson Avenue, Suite 7
Bohemia, NY 11716-2618
Phone: (631) 589-6353 • Fax: (631) 589-8705
E-mail: INFO@PWGROSSER.COM

GROUNDWATER CONTOURS

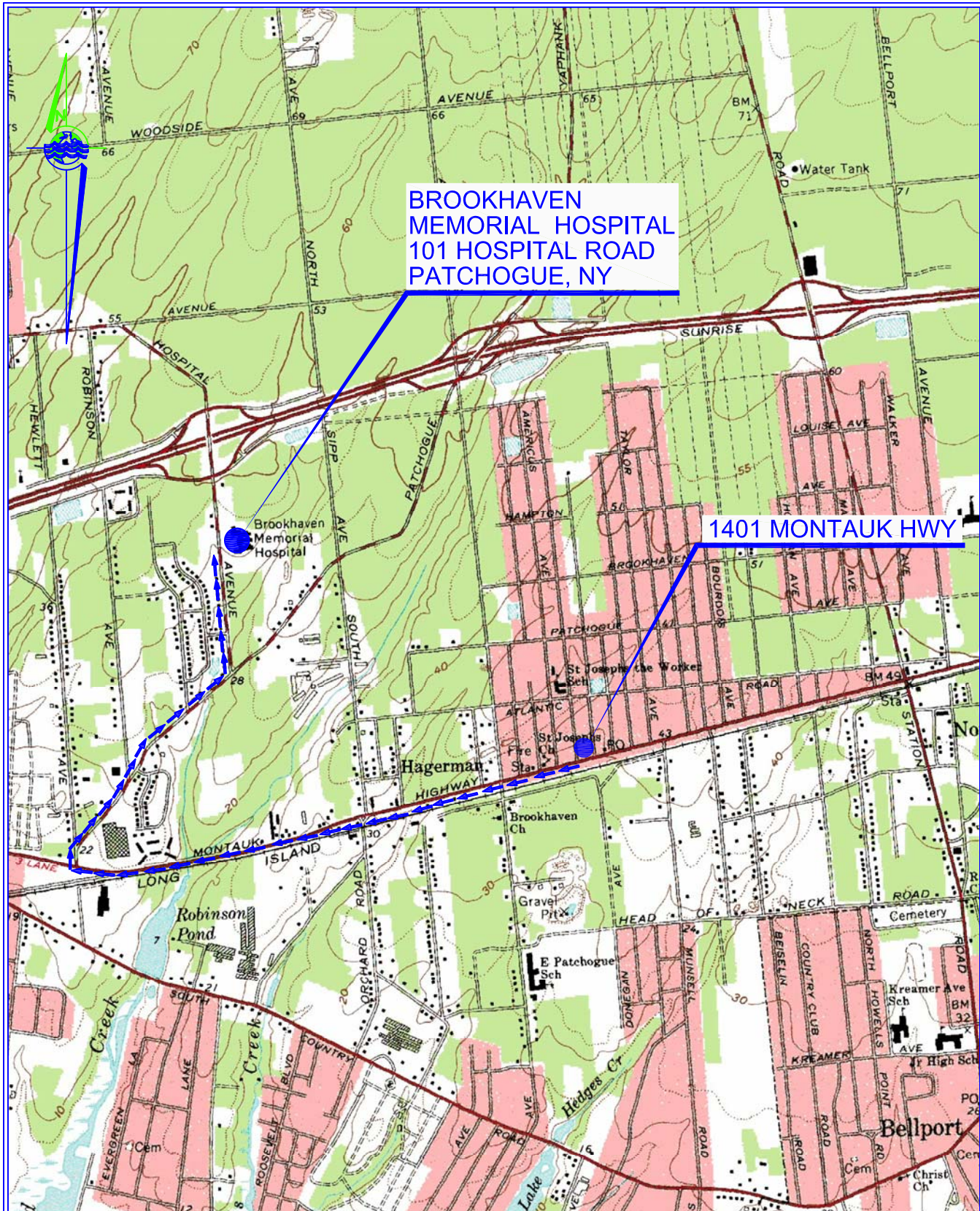
JULY 2013

1401 MONTAUK HIGHWAY
EAST PATCHOGUE, NEW YORK



0 20 40 60 80 Feet

Project:	SHD1008
Date:	11/22/2013
Designed by:	NCJ
Drawn by:	JMC
Approved by:	DE
Figure No:	2



**BROOKHAVEN
MEMORIAL HOSPITAL
101 HOSPITAL ROAD
PATCHOGUE, NY**

1401 MONTAUK HWY

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Revised in cooperation with New York
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Control by USGS, USC&GS, and New Jersey Geodetic Survey

HOSPITAL ROUTE MAP

SCALE: 1:24,000

J:\Projects S-Z\SHD\1008 - Bellport Monitoring\Site Management Plan\CAD\Hospital Route Map.dwg (8x11v) Jun 09,2011-11:15am By: guzman

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1401 MONTAUK HWY, E. PATCHOGUE, NY TO
BROOKHAVEN MEMORIAL HOSPITAL
101 HOSPITAL ROAD, PATCHOGUE, NY

Project: SHD1008	Figure No: 3
Designed by: DE	
Approved by: PWG	
Drawn by: LLG	Date: 6/9/11

**APPENDIX A – METES AND BOUNDS /
ENVIRONMENTAL EASEMENT**

COUNTY OF SUFFOLK
DEPARTMENT OF ENVIRONMENT AND ENERGY
DIVISION OF REAL PROPERTY ACQUISITION AND MANAGEMENT

Description of property to be acquired by Suffolk County
Under the Suffolk County Environmental Restoration Program
From County of Suffolk, reputed owner

Deed: Liber 11965 Page 605
Tax Map No: 0200-975.80-04.00-020.000

All that certain plot, place or parcel of land known as Lots 35 to 37 inclusive and part of Lot 34 of Block 785 on "Map No. 10, Map of Property of The New York and Brooklyn Suburban Investment Company of New York", filed August 5, 1880 in the Suffolk County Clerk's Office as File Map No. 102, situate, lying and being at Bellport, Town of Brookhaven, County of Suffolk, State of New York and shown on a survey prepared by L.K. McLean Associates, P.C. dated December 10, 2007. Said parcel being more particularly bounded and described as follows:

Beginning at a point formed by the intersection of the westerly boundary line of Lenox Avenue and the northerly boundary line of Montauk Highway (Robinson Blvd.);

Thence from said point of beginning, South 87°18'20" West, along said northerly boundary line of Montauk Highway (Robinson Blvd.), a distance of 101.07 feet to a point of intersection with the division line between the subject parcel on the east and land now or formerly of Montauk Highway Realty Corp. on the west;

Thence North 05°38'00" East, along said division line, a distance of 134.40 feet to a point of intersection with the division line between the subject parcel on the south and land now or formerly of Victor Balabanow, on the north;

Thence South 84°22'00" East, along said division line, a distance of 100.00 feet to a point on the first mentioned westerly boundary line of Lenox Avenue;

Thence South 05°38'00" West, along said westerly boundary line of Lenox Avenue, a distance of 119.78' (Act.) 119.80 feet (Deed) to the point or place of beginning.

Description of Environmental Easement to the People of the State of New York
From County of Suffolk, reputed owner

Deed: Liber 11965 Page 605
Part of Tax Map No: 0200-975.80-04.00-020.000

All that certain plot, place or parcel of land known as Lots 35 and 36 inclusive and part of Lots 34 and 37 of Block 785 on "Map No. 10, Map of Property of The New York and Brooklyn Suburban Investment Company of New York", filed August 5, 1880 in the Suffolk County Clerk's Office as File Map No. 102, situate, lying and being at Bellport, Town of Brookhaven, County of Suffolk, State of New York and shown on a survey prepared by L.K. McLean Associates, P.C. dated December 10, 2007. Said parcel being more particularly bounded and described as follows:

Beginning at a point formed by the intersection of the westerly boundary line of Lenox Avenue and the northerly boundary line of Montauk Highway (Robinson Blvd.);

Thence from said point of beginning, South 87°18'20" West, along said northerly boundary line of Montauk Highway (Robinson Blvd.), a distance of 101.07 feet to a point of intersection with the division line between the subject parcel on the east and land now or formerly of Montauk Highway Realty Corp. on the west;

Thence North 05°38'00" East, along said division line, a distance of 131.15 feet to a point;

Thence South 84°22'00" East, through said subject property, a distance of 100.00 feet to a point on the first mentioned westerly boundary line of Lenox Avenue;

Thence South 05°38'00" West, along said westerly boundary line of Lenox Avenue, a distance of 116.51 feet to the point or place of beginning.

CERTIFIED TO:

- COUNTY OF SUFFOLK
- FIRST AMERICAN TITLE INSURANCE COMPANY OF NEW YORK
- THE PEOPLE OF THE STATE OF NEW YORK ACTING THROUGH ITS COMMISSIONER OF THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

I hereby certify that this map was made from an actual survey completed by me on 11/29/2007 and updated on 10/11/2010.

DANIEL P. JEDLICKA, P.L.S.
NYSPLS No. 50098

SUFFOLK COUNTY REAL PROPERTY TAX MAP

DISTRICT 0200
SECTION 975.80
BLOCK 04.00
LOT 020.000

WELL DESC'S PER S.C.D.H.S.

ADDED BY: GLB DATE: 05/01/2013

REV. ENG NOTES/MW LOC'S

ADDED BY: GLB DATE: 03/05/2013

SMP REQUIREMENTS

ADDED BY: GLB DATE: 10/28/2011

EASEMENT

ADDED BY: TLS DATE: 12/09/2010

CERTIFICATIONS

REVISED BY: TLS DATE: 11/16/2010

UPDATED BY: KG/BW DATE: 10/11/2010

MADE BY: JL/PL DATE: 11/29/2007

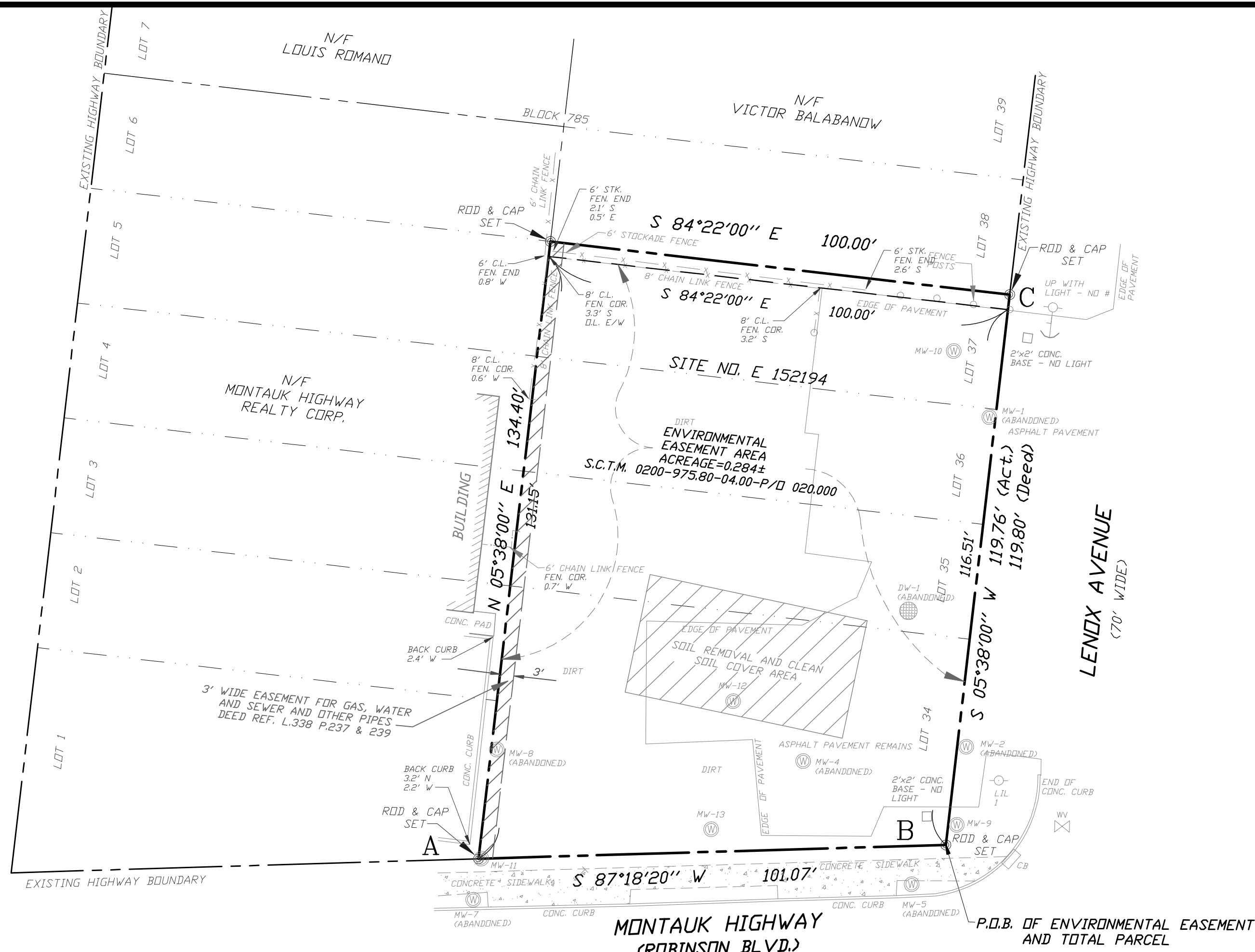
CHECKED BY: FPF DATE: 12/10/2007

TRACED BY: TLS DATE: 12/10/2007

COMPARED BY: RRF DATE: 12/11/2007



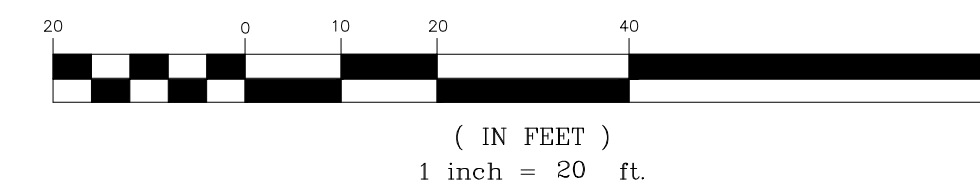
NARRAGANSETT AVENUE
(70' WIDE)



MAP OF PROPERTY
OF
COUNTY OF SUFFOLK
FORMER BELLPORT GAS STATION
ERP SITE NO. E 152194
AS SHOWN ON
MAP NO. 10, MAP OF PROPERTY OF
THE NEW YORK AND BROOKLYN SUBURBAN
INVESTMENT COMPANY OF NEW YORK
FILED: AUGUST 5, 1890 AS FILE MAP NO. 102
LOTS 35 THRU 37 INCLUSIVE AND PART OF LOT 34
IN BLOCK 785
LOCATED AT
BELLPORT
TOWN OF BROOKHAVEN
SUFFOLK COUNTY, NEW YORK

DECEMBER 10, 2007

GRAPHIC SCALE



AREA OF PARCEL = 12,708± SQ.FT. OR 0.292± ACRE
AREA OF ENVIRONMENTAL EASEMENT = 12,383± SQ.FT. OR 0.284± ACRE

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the New York Environmental Conservation Law.

THE ENGINEERING AND INSTITUTIONAL CONTROLS for the Easement are set forth in more detail in the Site Management Plan ("SMP"). A copy of the SMP must be obtained by any party with an interest in the property. The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233 or at derweb@gw.dec.state.ny.us.

ENGINEERING/INSTITUTIONAL CONTROLS

DIMENSIONS TO MONITORING WELLS FROM SET PROPERTY CORNERS

Ⓜ — Monitoring Well

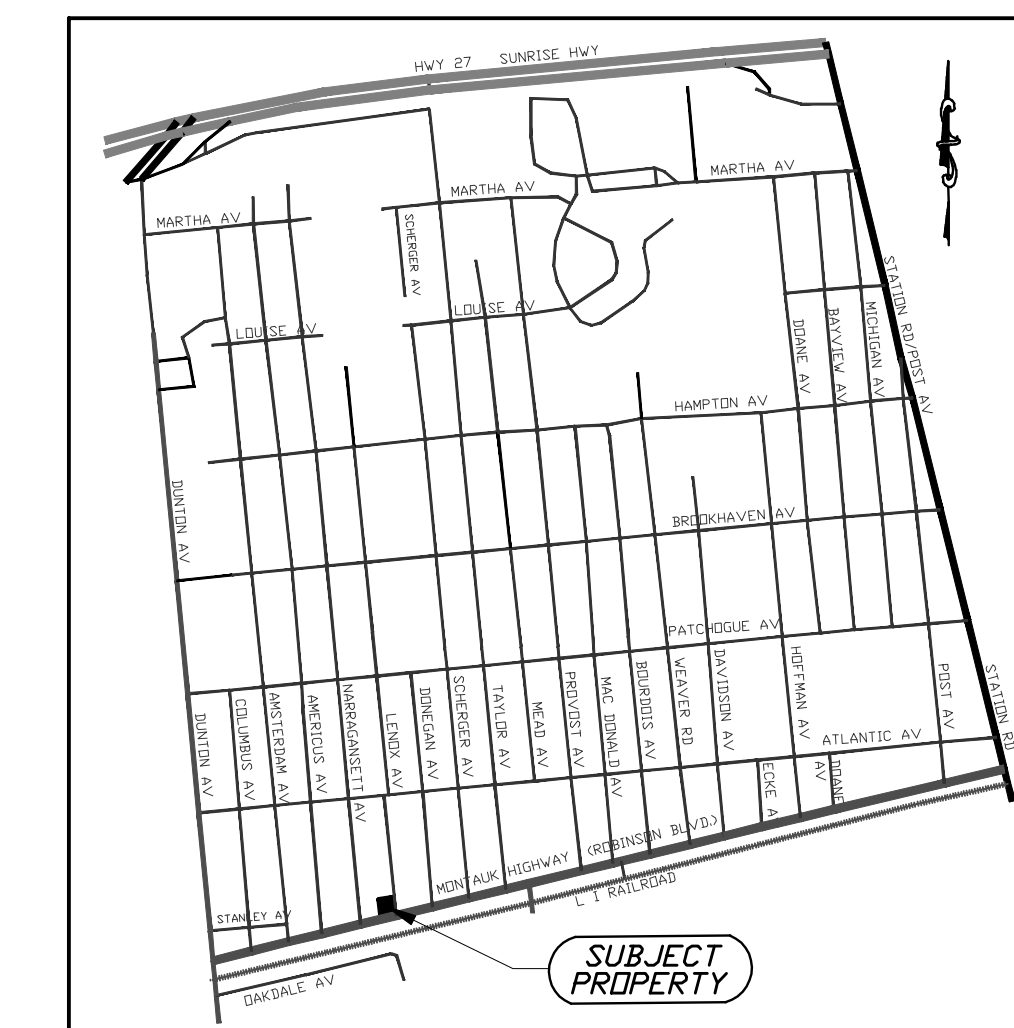
	MW-9	MW-10	MW-11	MW-12	MW-13
A			0.6'	64.5'	50.7'
B	5.0'	106.8'	100.4'	55.7'	50.8'
C	115.2'	17.2'			

- Cover System—The cover system is comprised of 5 feet of clean soils. Disturbance of soil below 15' below grade is restricted without notification of the NYSDEC. Procedures for the inspection and maintenance of this cover system are referred to in the Excavation Work Plan in Appendix B of the SMP.
- Monitoring Wells—On-site monitoring wells shown on this survey shall be monitored, maintained and replaced as required in the SMP.
- Groundwater Use Prohibition—the use of groundwater from beneath the property as a source of potable or process water, without necessary water quality treatment as determined by the NYSDEC, NYSDOH or SCDHS, is prohibited.
- Vegetable gardens and farming on the property are restricted as set forth in 6 NYCRR Section 375-1.8(g)(2).
- Land Use – The use and development of the site is limited to "restricted residential," "commercial" and "industrial uses" (as defined by 6 NYCRR Section 375-1.8(g)(2)(ii),(iii) and (iv)) only.

ENVIRONMENTAL EASEMENT AREA ACCESS

THE DEC OR THEIR AGENT MAY ACCESS THE ENVIRONMENTAL EASEMENT AREA AS SHOWN HEREON THROUGH ANY EXISTING STREET ACCESS OR BUILDING INGRESS/EGRESS ACCESS POINT.

This Survey has been revised with the benefit of Abstract Search No. 10-CS-42798(011S23545) as prepared by Advantage Title, Title Insurance Company, Dated November 3, 2011. The items in Schedule B affect the parcel shown hereon: Item #5 :Sewer Easement, L 338 P 239;

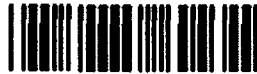


LOCATION MAP
NOT TO SCALE

NOTES

- PARCEL ADDRESS: 1401 MONTAUK HIGHWAY, EAST PATCHOGUE, NY 11772.
- MEASUREMENTS ARE IN ACCORDANCE WITH U.S. STANDARDS.
- BEARINGS SHOWN ARE REFERENCED TO SUBJECT PARCEL DEED FILED IN THE SUFFOLK COUNTY CLERK'S OFFICE IN LIBER 10650, PAGE 538.
- UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.
- ONLY COPIES FROM THE ORIGINAL OF THIS SURVEY MARKED WITH AN ORIGINAL OF THE LAND SURVEYOR'S EMBOSSED OR "INKED" SEAL SHALL BE CONSIDERED TO BE VALID TRUE COPIES.
- CERTIFICATIONS INDICATED HEREON SIGNIFY THAT THIS SURVEY WAS PREPARED IN ACCORDANCE WITH THE EXISTING CODE OF PRACTICE FOR LAND SURVEYORS ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS. SAID CERTIFICATIONS SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED AND ON HIS BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY AND LENDING INSTITUTION LISTED HEREON AND TO THE ASSIGNEES OF THE LENDING INSTITUTION. CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.
- RIGHTS-OF-WAY NOT SHOWN ARE NOT CERTIFIED.
- THE SURVEY CLOSES MATHEMATICALLY.

L. K. McLEAN ASSOCIATES, P.C.
CONSULTING ENGINEERS
437 SO. COUNTRY ROAD
BROOKHAVEN, NEW YORK



**SUFFOLK COUNTY CLERK
RECORDS OFFICE
RECORDING PAGE**

Type of Instrument: EASEMENT
Number of Pages: 10
Receipt Number : 13-0117959
TRANSFER TAX NUMBER: 13-04659

Recorded: 09/17/2013
At: 04:35:21 PM
LIBER: D00012744
PAGE: 734

District: 0200 Section: 975.80 Block: 04.00 Lot: 020.000

EXAMINED AND CHARGED AS FOLLOWS

Deed Amount: \$0.00

Received the Following Fees For Above Instrument

		Exempt			Exempt
Page/Filing	\$50.00	NO	Handling	\$20.00	NO
COE	\$5.00	NO	NYS SRCHG	\$15.00	NO
TP-584	\$5.00	NO	Notation	\$0.00	NO
Cert.Copies	\$0.00	NO	RPT	\$60.00	NO
Transfer tax	\$0.00	NO			
			Fees Paid	\$155.00	

TRANSFER TAX NUMBER: 13-04659

THIS PAGE IS A PART OF THE INSTRUMENT
THIS IS NOT A BILL

JUDITH A. PASCALE
County Clerk, Suffolk County

1 2

Number of pages 10

This document will be public record. Please remove all Social Security Numbers prior to recording.

RECORDED
2013 Sep 17 04:35:21 PM
JUDITH A. PASCALE
CLERK OF
SUFFOLK COUNTY
L D00012744
P 734
DT# 13-04659

Deed / Mortgage Instrument Deed / Mortgage Tax Stamp Recording / Filing Stamps

3 FEES

Page / Filing Fee 50-
 Handling 20.00
 TP-S84 5-
 Notation _____
 EA-5217 (County) _____ Sub Total 75
 EA-5217 (State) _____
 R.P.T.S.A. 60
 Comm. of Ed. 5.00
 Affidavit _____
 Certified Copy _____
 NYS Surcharge 15.00 Sub Total 80-
 Other _____ Grand Total 155



Mortgage Amt. _____
 1. Basic Tax _____
 2. Additional Tax _____
 Sub Total _____
 Spec./Assit. _____
 or _____
 Spec./Add. _____
 TOT. MTG. TAX _____
 Dual Town _____ Dual County _____
 Held for Appointment _____
 Transfer Tax _____
 Mansion Tax _____
 The property covered by this mortgage is or will be improved by a one or two family dwelling only.
 YES _____ or NO _____
 If NO, see appropriate tax clause on page # _____ of this instrument.
 8-21-13

4 Dist. 0; 2571732 0200 97580 0400 020000
 Real Property Tax Service Agency Verification
 P T S
 R C W H A
 13-SEP-13

5 Community Preservation Fund

Consideration Amount \$ _____
CPF Tax Due \$ _____

6 Satisfactions/Discharges/Releases List Property Owners Mailing Address RECORD & RETURN TO:
 Jennifer B. Kohn, Assistant County Attorney
 County of Suffolk
 H. Lee Dennison Bldg.
 100 Veterans Memorial Highway

Improved _____
 Vacant Land _____
 TD _____
 TD _____
 TD _____

Mail to: Judith A. Pascale, Suffolk County Clerk
 310 Center Drive, Riverhead, NY 11901
 www.suffolkcountyny.gov/clerk

7 Title Company Information
 Co. Name Advantage Title Agency
 Title # 10CS42798

8 Suffolk County Recording & Endorsement Page

This page forms part of the attached Environmental Easement made by: _____
 (SPECIFY TYPE OF INSTRUMENT)
County of Suffolk The premises herein is situated in _____
 SUFFOLK COUNTY, NEW YORK
 TO _____ In the TOWN of Brookhaven
 New York State Department of Environmental _____ In the VILLAGE
 Conservation _____ or HAMLET of _____

BOXES 6 THRU 8 MUST BE TYPED OR PRINTED IN BLACK INK ONLY PRIOR TO RECORDING OR FILING. (over)

**ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36
OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW**

THIS INDENTURE made this 21st day of August, 2013, between Owner(s) County of Suffolk, having an office at 100 Veteran's Memorial Highway, Hauppauge, County of Suffolk, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233.

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the address of 1401 Montauk Highway, East Patchogue in the Town of Brookhaven, County of Suffolk and State of New York, known and designated on the tax map of the County Clerk of Suffolk as tax map parcel numbers: District 0200 Section 975.80 Block 04.00 Lot 020.000, being the same as that property conveyed to Grantor by deed dated September 27, 1999 and recorded in the Suffolk County Clerk's Office in Liber 11995 at Page 605. The property subject to this Environmental Easement is a portion of a larger parcel (the "Controlled Property"), comprising approximately 0.284 +/- acres, and is hereinafter more fully described in the Land Title Survey dated December 10, 2007 with the most recent revision being May 01, 2013, prepared by Daniel P. Jedlicka, P.L.S. of L.K. McLean Associates, P.C., which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of State Assistance Contract Number: C304320, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. **Purposes.** Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. **Institutional and Engineering Controls.** The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii),
Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial
as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP.

(4) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(5) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(6) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(7) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP.

(8) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP.

[6/11]

(9) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall annually, or such time as NYSDEC may allow, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

[6/11]

- (1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).
- (2) the institutional controls and/or engineering controls employed at such site:
 - (i) are in-place;
 - (ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and
 - (iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;
- (3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;
- (4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;
- (5) the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;
- (6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and
- (7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

[6/11]

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. **Notice.** Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to: Site Number: E152194
 Office of General Counsel
 NYSDEC
 625 Broadway
 Albany New York 12233-5500

With a copy to: Site Control Section
 Division of Environmental Remediation
 NYSDEC
 625 Broadway
 Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. **Recordation.** Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. **Amendment.** Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Grantor: County of Suffolk

By:  _____

Print Name: Dennis M. Cohen

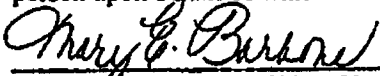
Title: Chief Deputy County Executive Date: 8/6/13

Grantor's Acknowledgment

STATE OF NEW YORK)

COUNTY OF Suffolk) ss:

On the 6 day of August in the year 2013, before me, the undersigned, personally appeared Dennis M. Cohen, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.


Notary Public - State of New York

MARY E. BARBONE
NOTARY PUBLIC-STATE OF NEW YORK
No. 018A6127940
Qualified in Suffolk County
My Commission Expires May 31, 2017

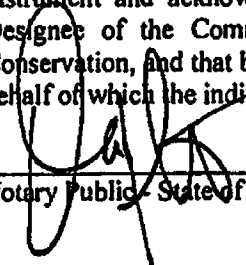
THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner.

By: 
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 21st day of August, in the year 2013, before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.



Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5092146
Qualified in Schenectady County
Commission Expires August 22, 2014

SCHEDULE "A" PROPERTY DESCRIPTION

Description of Environment Easement to the People of the State of New York
From County of Suffolk, reputed owner

Deed: Liber 11995 Page 605
Part of Tax Map No: 0200-975.80-04.00-020.000

Amended July 15, 2013

DESCRIPTION OF ENVIRONMENTAL EASEMENT AREA

ALL that certain plot, piece or parcel of land known as Lots 35 and 36 inclusive and part of Lots 34 and 37 of Block 785 on "Map No. 10, Map of Property of The New York and Brooklyn Suburban Investment Company of New York", filed August 5, 1890 in the Suffolk County Clerk's Office as File Map No. 102, situate, lying and being at Bellport, Town of Brookhaven, County of Suffolk, State of New York and shown on a survey prepared by L.K. McLean Associates, P.C. dated December 10, 2007. Said parcel being more particularly bounded and described as follows:

BEGINNING at a point formed by the intersection of the westerly boundary line of Lenox Avenue and the northerly boundary line of Montauk Highway (Robinson Blvd.);

THENCE from said point of beginning, South 87 degrees 18 minutes 20 seconds West, along said northerly boundary line of Montauk Highway (Robinson Blvd.), a distance of 101.07 feet to a point of intersection with the division line between the subject parcel on the east and land now or formerly of Montauk Highway Realty Corp. on the west;

THENCE North 05 degrees 38 minutes 00 seconds East, along said division line, a distance of 131.15 feet to a point;

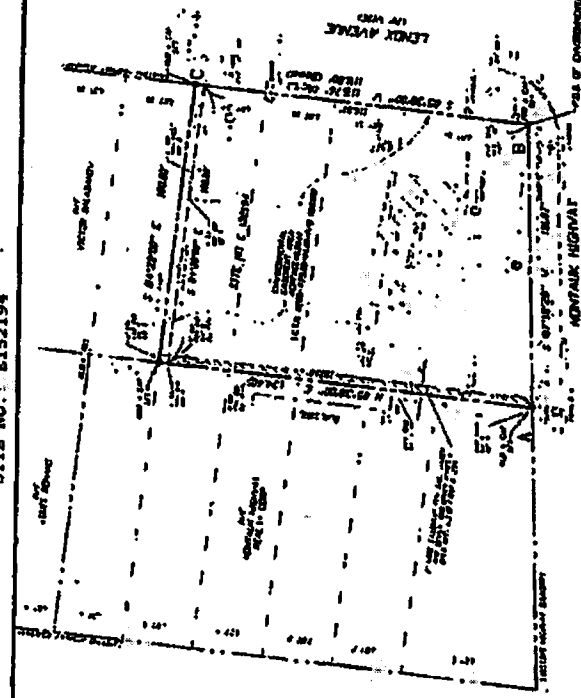
THENCE South 84 degrees 22 minutes 00 seconds East, through said subject property, a distance of 100.00 feet to a point on the first mentioned westerly boundary line of Lenox Avenue;

THENCE South 05 degrees 38 minutes 00 seconds West, along said westerly boundary line of Lenox Avenue, a distance of 116.51 feet to the point or place of **BEGINNING**.

COUNTY: SUFFOLK

SITE NO.: E152194

COUNTY OF SUFFOLK
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF SOIL CONSERVATION AND EROSION CONTROL



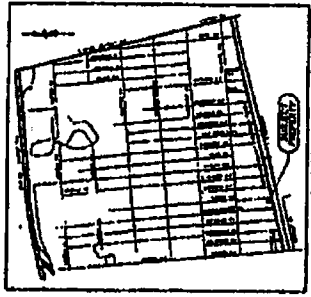
STATE ASSISTANCE CONTRACT: C304329
Survey No. 0702A29

MAP OF PROPERTY OF COUNTY OF SUFFOLK FORMER BELLPORT GAS STATION ERP SITE NO. E 152194 AS SHOWN ON MAP NO. 10, MAP OF PROPERTY OF THE NEW YORK AND BROOKLYN SUBURBAN INVESTMENT COMPANY OF NEW YORK FILED AS FILE MAP NO. 102 IN THE OFFICE OF THE CLERK OF SUPREMACY COURT IN BLOCK 743

LOCATED AT BELLPORT BROOKHAVEN SUFFOLK COUNTY, NEW YORK



AREA OF PARCEL - 0.2801 ACRES
AREA OF ENVIRONMENTAL EASEMENT - 11,223.5 SQ. FT. OR 0.2564 ACRES



- 1. THE PROPERTY IS SUBJECT TO AN ENVIRONMENTAL EASEMENT HELD BY THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PURSUANT TO TITLE 36 OF ARTICLE 71 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW.
- 2. THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THE EASEMENT ARE SET FORTH IN MORE DETAIL IN THE SITE MANAGEMENT PLAN ("SMP"). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP MAY BE OBTAINED FROM THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, NY 12223 OR AT darweb@ser.dec.state.ny.us.
- 3. ENGINEERING/INSTITUTIONAL CONTROLS: DIMENSIONS TO MONITORING WELLS FROM SET PROPERTY CORNERS: MW-10: MW-10: MW-11: MW-12: MW-13: 5.0' 104.8' 17.2' 6.0' 100.4' 64.5' 50.7' 110.2' 59.7' 59.8'
- 4. COVER SYSTEM - The cover system is comprised of 5 feet of clean soils. Disturbance of soil below 15' below grade is restricted without notification of the NYSDEC. Procedures for the inspection and maintenance of this cover system are referred to in the Excavation Work Plan in Appendix B of the SMP.
- 5. MONITORING WELLS - On-site monitoring wells shown on this survey shall be monitored, maintained and replaced as required in the SMP.
- 6. GROUNDWATER USE PROHIBITION - The use of groundwater from beneath the property as a source of potable or process water, without necessary water quality treatment as determined by the NYSDEC, NYSDOH or SCDFS, is prohibited.
- 7. VEGETABLE GARDENS AND FARMING on the property are restricted as set forth in 6 NYCRR Section 375-1.8(g)(2).
- 8. LAND USE - The use and development of the site is limited to "restricted residential," "commercial" and "industrial uses" (as defined by 6 NYCRR Section 375-1.8(g)(2)(i),(ii) and (iv)) only.

L. K. McLEAN ASSOCIATES, P.C.
317 W. 63rd Street
New York, NY 10023

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the New York State Environmental Conservation Law.

THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THE EASEMENT ARE SET FORTH IN MORE DETAIL IN THE SITE MANAGEMENT PLAN ("SMP"). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP MAY BE OBTAINED FROM THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, NY 12223 OR AT darweb@ser.dec.state.ny.us.

ENGINEERING/INSTITUTIONAL CONTROLS

- 1. DIMENSIONS TO MONITORING WELLS FROM SET PROPERTY CORNERS: MW-10: MW-10: MW-11: MW-12: MW-13: 5.0' 104.8' 17.2' 6.0' 100.4' 64.5' 50.7' 110.2' 59.7' 59.8'
- 2. COVER SYSTEM - The cover system is comprised of 5 feet of clean soils. Disturbance of soil below 15' below grade is restricted without notification of the NYSDEC. Procedures for the inspection and maintenance of this cover system are referred to in the Excavation Work Plan in Appendix B of the SMP.
- 3. MONITORING WELLS - On-site monitoring wells shown on this survey shall be monitored, maintained and replaced as required in the SMP.
- 4. GROUNDWATER USE PROHIBITION - The use of groundwater from beneath the property as a source of potable or process water, without necessary water quality treatment as determined by the NYSDEC, NYSDOH or SCDFS, is prohibited.
- 5. VEGETABLE GARDENS AND FARMING on the property are restricted as set forth in 6 NYCRR Section 375-1.8(g)(2).
- 6. LAND USE - The use and development of the site is limited to "restricted residential," "commercial" and "industrial uses" (as defined by 6 NYCRR Section 375-1.8(g)(2)(i),(ii) and (iv)) only.

ENVIRONMENTAL EASEMENT AREA ACCESS
THE DEC OR THEIR AGENT MAY ACCESS THE ENVIRONMENTAL EASEMENT AREA AS SHOWN HEREON THROUGH ANY EXISTING STREET ACCESS OR BUILDING INGRESS/BUSINESS ACCESS POINT.



WELLS AND MONITORING WELLS: MW-10, MW-11, MW-12, MW-13
DATE OF SURVEY: 10/15/03
SCALE: AS SHOWN
DRAWN BY: [Name]
CHECKED BY: [Name]
DATE: 10/15/03

APPENDIX B – EXCAVATION WORK PLAN

B-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

Chief Engineer
Suffolk County Department of Health Services
Division of Environmental Quality
360 Yaphank Avenue - Suite 2C
Yaphank, New York 11980
Phone: (631) 862-5800

In addition, the site owner or their representative will notify the Department. Currently, this notification will be made to:

John Sheehan
NYSDEC
Division of Environmental Remediation
Region 1
50 Circle Road
Stony Brook, NY 11790-3409
Phone: (631) 444-0244

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control,
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work,
- A summary of the applicable components of this EWP,

- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in Appendix C of this document,
- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

B-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

B-3 STOCKPILE METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC.

B-4 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under his/her supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

B-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

B-6 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

B-7 MATERIALS REUSE ON-SITE

Reuse of soils on the site will be limited to the clean soils located less than 15' below grade. Contaminated soils will be disposed of offsite as described in Section B-6.

B-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

B-9 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in Table 1. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

B-10 STORMWATER POLLUTION PREVENTION

For construction projects exceeding 1 acre, a Stormwater Pollution Prevention Plan that conforms to the requirements of the NYSDEC Division of Water guidelines and NYS regulation will need to be prepared. This plan should cover the following topics:

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

B-11 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's

Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

B-12 COMMUNITY AIR MONITORING PLAN

Should Community Air Monitoring be necessary, the monitoring will follow the procedures specified in the Community Air Monitoring Plan (CAMP) utilized during the Remedial Investigation. A copy of the Camp is included as Appendix C to the SMP.

Exceedence of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

B-13 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis will include covering of stockpiles with plastic sheeting. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the

excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

B-14 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

APPENDIX C –HASP AND CAMP

FORMER BELLPORT GAS STATION SITE
1401 MONTAUK HIGHWAY
EAST PATCHOGUE, NY
SITE: #E-1-52-194

HEALTH AND SAFETY PLAN

SUBMITTED TO:



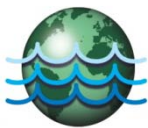
New York State Department of Environmental Conservation
Division of Environmental Remediation
NYSDEC Region 1
50 Circle Road
Stony Brook, New York 11790-3409

ON BEHALF OF:



Suffolk County Department of Health Services
Office of Pollution Control
15 Horseblock Place
Farmingville, New York 11738

PREPARED BY:



P.W. Grosser Consulting, Inc.
630 Johnson Avenue, Suite 7
Bohemia, New York 11716
Phone: 631-589-6353
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PWGC Project Number: SHD1008

NOVEMBER 2013

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1.0 STATEMENT OF COMMITMENT

This Health and Safety Plan (HASP) has been prepared to ensure that workers are not exposed to chemical, biological, and physical hazards during the planned Remedial Action (RA) activities to be performed at the Former Bellport Gas Station Site located in East Patchogue, New York. P.W. Grosser Consulting Inc.'s (PWGC's) policy is to minimize the possibility of work-related exposure through awareness and qualified supervision, health and safety training, medical monitoring, use of appropriate personal protective equipment, and the following activity specific safety protocols contained in this HASP. PWGC has established a guidance program to implement this policy in a manner that protects personnel to the maximum reasonable extent.

This HASP, which applies to persons present at the site who are actually or potentially exposed to safety or health hazards, describes emergency response procedures for actual and potential physical, biological and chemical hazards. This HASP is also intended to inform and guide personnel entering the work area or exclusion zone. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy.

This HASP will also serve as a guide to summarize the HASP requirements of potential subcontractors that may work at the site and may need to generate their own HASP.

2.0 INTRODUCTION

2.1 Purpose

This HASP addresses the minimum health and safety practices that will be employed by site workers participating in remedial action (RA) activities at the project site located at the Former Bellport Gas Station Site located in East Patchogue, New York.

The HASP takes into account the specific hazards inherent to the site and presents the minimum requirements which are to be met by PWGC, its subcontractors, and other on-site personnel in order to avoid and, if necessary, protect against health and/or safety hazards. PWGC sub-contractors will have the option of adopting this HASP or developing their own site-specific document. If a subcontractor chooses to prepare their own HASP, it must meet the minimum requirements as detailed in this HASP and must be made available to PWGC.

Activities performed under this HASP will comply with applicable parts of Occupational Safety and Health Administration (OSHA) Regulations, primarily 29 CFR Parts 1910 and 1926 and all other applicable federal, state, and local regulations. Modifications to the HASP may be made with the approval of the PWGC Health and Safety Manager (HSM) and/or Project Manager (PM). A copy of this HASP will be maintained on-site during all work activities.

Refusal to comply with the HASP or violation of any safety procedures by field personnel may result in their immediate removal from the site following consultation with the HSM and the Field Team Leader (FTL)/Site Health and Safety Officer (SHSO).

2.2 Scope

This HASP addresses the potential hazards related to potential site management activities. Potential activities may include the following:

- Groundwater Monitoring and Sampling
- Soil Excavation Oversight
- Application of Oxygen Releasing Compound Oversight
- Soil Sampling

Potential hazards associated with this scope are listed below and are discussed in more detail in this HASP after the project organization and responsibilities section.

- Chemical Hazards
- Biological Hazards
- Physical Hazards

2.3 Application

The HASP applies to all personnel involved in the above tasks who wish to gain access to active work areas, including but not limited to:

- PWGC employees and subcontractors;
- Client representatives; and
- Federal, state or local representatives.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section specifies the project organization and responsibilities.

3.1 Project Manager

- Participates in major incident investigations;
- Ensures that the HASP has all of the required approvals before site work is conducted; and
- Has the overall project responsibility for project health and safety.

3.2 Field Team Leader (FTL)/ Site Health and Safety Officer (SHSO)

- Ensures that the HASP is implemented in conjunction with the Health and Safety Manager (HSM);
- Ensures that field work is scheduled with adequate equipment to complete the job safely;
- Enforces site health and safety rules;
- Ensures that proper personal protective equipment is utilized;
- Ensures that the HSM is informed of project changes that require modifications to the HASP;
- Ensures that the procedure modifications are implemented;
- Investigates incidents;
- Conducts the site safety briefing;
- Reports to HSM to provide summaries of field operations and progress; and
- Acts as Emergency Coordinator.

3.3 Health and Safety Manager

1. Provides for the development of the HASP;
2. Serves as the primary contact to review health and safety matters that may arise;
3. Approves individuals who are assigned SHSO responsibilities;
4. Coordinates revisions of this HASP with field personnel; and
5. Assists in the investigation of major accidents.

3.4 Site Personnel

- Report any unsafe or potentially hazardous conditions to the FTL/SHSO;
- Maintain knowledge of the information, instructions and emergency response actions contained in this HASP; and
- Comply with rules, regulations and procedures as set forth in this HASP and any revisions.

4.0 SITE HISTORY AND PROJECT DESCRIPTION

4.1 Project Background

This Health and Safety Plan (HASP) has been prepared by PWGC, on behalf of Suffolk County for Site Management activities at the Former Bellport Gas Station Site. Planned activities include the implementation of a groundwater monitoring plan which will include quarterly sampling of three existing groundwater monitoring well and the two newly installed wells. The purpose is to monitor concentrations of volatile organic compounds (VOCs) detected in the groundwater beneath the site in order to document a decreasing trend.

4.2 Site Location and Description

The subject property is a former gas station, approximately 0.3 acres in size. The site is located at 1401 Montauk Highway in East Patchogue, New York. The property is located on the north side of Montauk Highway and is bounded on the east by Lenox Avenue, on the north by residential properties, and on the west and south by commercial properties. A single story building formerly occupied the property, but was demolished in 2010 as part of an Interim Remedial Measure. The property is currently vacant and contains no buildings or structures.

5.0 POTENTIAL HAZARDS OF THE SITE

This section presents an assessment of the chemical, biological, and physical hazards that may be encountered during the tasks specified under Section 2.0. Additional information can be found in Appendix A - Material Safety Data Sheets or in Appendix B - Activity Hazard Analyses.

5.1 Chemical Hazards

Review of historical information from the site indicates that the soil at the site is contaminated with petroleum related compounds (of JP-4 origin) which are present at levels in soil above NYSDEC) recommended soil cleanup objectives (RSCOs) These compounds may present an occupational exposure hazard during site operations.

In addition to the chemical hazards present at the site, remedial activities will include the application of oxygen releasing compound (ORC). This material will require proper handling as part of the application process.

Specific information on the chemicals identified at the Site can be found in Table 5-1 as well as on the Material Safety Data Sheets found in Appendix A.

Table 5-1
Potential Chemical Hazards

COMPOUND	CAS#	OSHA PEL	ROUTES OF EXPOSURE	SYMPTOMS OF EXPOSURE	TARGET ORGANS	PHYSICAL DATA
Acetone	67-64-1	TWA 590 mg/m ³	Inhalation Ingestion Skin/Eye	Irritation eyes, nose, throat; headache, dizziness, CNS depressant; dermatitis	Eyes, skin, respiratory system, CNS	BP-133°F VP= 4mm Colorless liquid with a fragrant, mint-like odor
Arsenic	7440-38-2	TWA 0.002 mg/m ³	Inhalation Skin Absorption Ingestion Skin/Eye	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin (potential occupational carcinogen)	Liver, kidneys, skin, lungs, lymphatic system (lung & lymphatic cancer)	BP-Sublimes VP= 0mm Metal: Silver-gray or tin-white, brittle, odorless solid
Benzene	71-43-2	0.1 ppm	Inhalation Skin Absorption Ingestion Skin/Eye	Irritation eyes, skin, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude, dermatitis; bone marrow depressant	Eyes, skin, respiratory system, blood, CNS, bone marrow	BP-176°F VP= 75mm Colorless to light-yellow liquid with an aromatic odor
Beryllium	7440-41-7	TWA 0.002 mg/m ³	Inhalation Skin/Eye	Berylliosis (chronic exposure): anorexia, weight loss, weakness, chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes, dermatitis; (potential occupational carcinogen)	Eyes, skin, respiratory system (lung cancer)	BP-4532°F VP= 0mm (approx) Metal: A hard, brittle, gray-white solid
Cadmium	7440-43-9	TWA 0.01 mg/m ³ (total dust), 0.002 mg/m ³ (respirable fraction)	Inhalation Ingestion Eye	Cough, sore throat Abdominal Pain, diarrhea, headache, nausea, vomiting Redness, pain	Lungs, Kidney	BP-765 °C Density – 8.6 g/cm ³
Chlorobenzene	108-90-7	TWA 350 mg/m ³	Inhalation Ingestion Skin/Eye	Irritation eyes, skin, nose; drowsiness, incoordination; CNS depressant	Eyes, skin, respiratory system, CNS, liver	BP-270°F VP= 9mm Colorless liquid with an almond-like odor
Chromium	7440-47-3	TWA 0.5 mg/m ³	Inhalation Eye	Cough Redness	None	BP-2642°C
Copper	7440-50-8	TWA 0.2 mg/m ³ (as fume), 1.0 mg/m ³ (as dust, mist)	Inhalation Skin Ingestion Eye	Cough, headache, shortness of breath, sore throat Redness Abdominal pain, nausea, vomiting Redness, pain	Skin	BP-2595°C
1,4-Dichlorobenzene	106-46-7	TWA 450 mg/m ³	Inhalation Skin Absorption Ingestion Skin/Eye	Irritation eyes, swell periorbital; profuse rhinitis; headache, anorexia, nausea, vomiting, weight loss, jaundice, cirrhosis	Liver, respiratory system, eyes, kidneys, skin	BP-345°F VP=1.3mm Colorless or white crystalline solid with a mothball-like odor

COMPOUND	CAS#	OSHA PEL	ROUTES OF EXPOSURE	SYMPTOMS OF EXPOSURE	TARGET ORGANS	PHYSICAL DATA
Ethylbenzene	100-41-4	TWA 435 mg/m ³	Inhalation Ingestion Skin/Eye	Irritation eyes, skin, mucous membrane; headache, dermatitis, narcosis, coma	Eyes, skin, respiratory system, CNS	BP-277°F VP=7mm Colorless liquid with an aromatic odor.
Isopropylbenzene	98-82-8	TWA 245 mg/m ³	Inhalation Skin Absorption Ingestion Skin/Eye	Irritation eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma	Eyes, skin, respiratory system, CNS	BP-306°F VP=8mm Colorless liquid with a sharp, penetrating, aromatic odor.
Lead	7439-92-1	TWA 0.5 mg/m ³	Ingestion	Abdominal pain, nausea, vomiting	Blood, bone marrow, CNS, kidneys, reproductive system	BP-1740°C
Mercury	7439-97-6	TWA 0.05 mg/m ³	Inhalation Skin Absorption Ingestion Skin/Eye	Irritation eyes, skin; cough, chest pain, dyspnea, bronchitis pneumonitis; tremor, insomnia, irritability, indecision, headache, fatigue, weakness; stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria	Eyes, skin, respiratory system, CNS, kidneys	BP-674°F VP=0.0012mm Metal: Silver-white, heavy, odorless liquid
4-Methylphenol	106-44-5	TWA 10 mg/m ³	Inhalation Skin Absorption Ingestion Skin/Eye	Irritation eyes, skin, mucous membrane; CNS effects: confusion, depression, respiratory failure; dyspnea, irregular rapid respiratory, weak pulse; eye, skin burns; dermatitis; lung, liver, kidney, pancreas damage	Eyes, skin, respiratory system, CNS, liver, kidneys, pancreas, CVS	BP-396°F VP=0.11mm Crystalline solid with a sweet, tarry odor
Naphthalene	91-20-3	TWA 50 mg/m ³	Inhalation Skin Absorption Ingestion Skin/Eye	Irritation eyes; headache, confusion, excitement, malaise; nausea, vomiting, abdominal pain; irritation bladder, profuse sweating; jaundice, hematuria, hemoglobinuria, renal shutdown; dermatitis; optical neuritis, corneal damage	Eyes, skin, blood, liver, kidneys, CNS	BP-424°F VP=0.08mm Colorless to brown solid with an odor of mothballs
Phenol	108-95-2	TWA 19 mg/m ³	Inhalation Skin Absorption Ingestion Skin/Eye	Irritation eyes, nose, throat; anorexia, weight loss, weakness, muscle ache, pain; dark urine, cyanosis; liver, kidney damage; skin burns; dermatitis; ochronosis; tremor, convulsions, twitch	Eyes, skin, respiratory system, kidneys	BP-359°F VP=0.4mm Colorless to light-pink, crystalline solid with a sweet, acrid odor
Toluene	108-88-3	TWA 375 mg/m ³	Inhalation Skin Absorption Ingestion Skin/Eye	Irritation eyes, nose; fatigue, weakness, confusion, euphoria, dizziness, headache; dilated pupils, lacrimation, nervousness, muscle fatigue, insomnia; paresthesia, dermatitis; liver, kidney damage	Eyes, skin, respiratory system, CNS, liver, kidneys	BP-232°F VP=21mm Colorless liquid with a sweet, pungent, benzene-like odor

COMPOUND	CAS#	OSHA PEL	ROUTES OF EXPOSURE	SYMPTOMS OF EXPOSURE	TARGET ORGANS	PHYSICAL DATA
1,1,1-Trichloroethane	71-55-6	TWA 1900 mg/m ³	Inhalation Ingestion Skin/Eye	Irritation eyes, skin; headache, lassitude, CNS depressant, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage	Eyes, skin, CNS, CVS, liver	BP-165°F VP=100mm Colorless liquid with a mild chloroform-like odor
o-Xylene	95-47-6	TWA 435 mg/m ³	Inhalation Skin Absorption Ingestion Skin/Eye	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait, corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, respiratory system, CNS, gastrointestinal tract, blood, liver, kidneys	BP-292°F VP=7mm Colorless liquid with an aromatic odor
m-Xylene	108-38-3	TWA 435 mg/m ³	Inhalation Skin Absorption Ingestion Skin/Eye	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait, corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, respiratory system, CNS, gastrointestinal tract, blood, liver, kidneys	BP-282°F VP=9mm Colorless liquid with an aromatic odor
p-Xylene	106-42-3	TWA 435 mg/m ³	Inhalation Skin Absorption Ingestion Skin/Eye	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait, corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, respiratory system, CNS, gastrointestinal tract, blood, liver, kidneys	BP-281°F VP=9mm Colorless liquid with an aromatic odor

Abbreviations

C = Ceiling limit, not to be exceeded

CNS = Central Nervous System

CVS= Cardiovascular System

TWA = Time-weighted average (8 hours)

OSHA = Occupational Safety and Health Administration

ppm = parts per million

PEL=Permissible Exposure Limit

BP = Boiling Point

5.2 Biological Hazards

The site is currently overgrown with small shrubs and grasses/weeds. During the course of the project, there is potential for workers to come into contact with biological hazards such as animals, insects and plants. The Activity Hazard Analyses found in Appendix B includes specific hazards and control measures for each task, if applicable.

5.2.1 Animals

The immediate vicinity of the site is well developed, however approximately ¼ mile north of the site the area is undeveloped forest. Therefore, it is possible that white tailed deer, raccoon, foxes, possum, dogs, cats, rats and mice may be present. Workers shall use discretion and avoid all contact with animals.

5.2.2 Insects & Arachnids

Insects, such as mosquitoes, ticks, bees and wasps may be present during certain times of the year. Workers will be encouraged to wear repellents and PPE, if deemed necessary, when working in areas where insects are expected to be present.

During the months of April through October, particular caution must be exercised to minimize exposure to deer ticks and the potential for contracting Lyme disease. Specific precautionary work practices that are recommended include the following:

1. Cover your body as much as possible. Wear long pants and long sleeved shirts. Light color clothing makes spotting of ticks easier.
2. Try to eliminate possible paths by which the Deer Tick may reach unprotected skin. For example, tuck bottoms of pants into socks or boots and sleeves into gloves. (Duct tape may be utilized to help seal cuffs and ankles). If heavy concentrations of ticks or insects are anticipated or encountered, Tyvek coveralls may be utilized for added protection when the potential for heat stress is not a concern.
3. Conduct periodic and frequent, (e.g., hourly), surveys of your clothing for the presence of ticks. Remove any tick, save it and report to the clinic with the tick.
4. Use insect /tick repellents that contain the chemical DEET (n,n-Diethyltoluamide). Apply repellents in accordance with manufacturers' recommendations. These repellents are readily available and include such brands as Deep Woods OFF and Maximum Strength OFF.

5.2.3 Plants

Poison ivy has been identified at the site; poison sumac and oak may also be present. The FTL/SHSO should identify the susceptible individuals. Worker shall avoid all contact with these plants.

5.3 Physical Hazards

Most safety hazards are discussed in the Activity Hazard Analyses (AHA) in Appendix B for the different phases of the project. In addition to the AHAs, general work rules and other safety procedures are described in Section 11 of this HASP.

5.3.1 Temperature Extremes

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.

Cold Stress

At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia as well as slippery surfaces, brittle equipment, and poor judgment.

PWGC's Heat/Cold Stress Protocols are specified in Appendix C.

5.3.2 Steam, Heat and Splashing

Exposure to steam/heat/splashing hazards can occur during steam cleaning activities. Splashing can also occur during well development and sampling activities. Exposure to steam/heat/splashing can result in scalding/burns, eye injury, and puncture wounds.

5.3.3 Noise

Noise is a potential hazard associated with the operation of heavy equipment, drill rigs, pumps and engines. Workers will wear hearing protection while in the work zone when these types of machinery are operating.

5.3.4 Fire and Explosion

When conducting excavation activities, the opportunity of encountering fire and explosion hazards may exist from encountering underground utilities, from the use of diesel engine equipment, and other potential ignition sources. During dry periods there is an increased chance of forest and brush fires starting at the job site. If these conditions occur no smoking will be permitted at the site and all operations involving potential ignition sources will be monitored continuously (fire watch).

5.3.5 Manual Lifting/Material Handling

Manual lifting of heavy objects may be required. Failure to follow proper lifting technique can result in back injuries and strains. Back injuries are a serious concern as they are the most common work place injury, often resulting in lost or restricted work time, and long treatment and recovery periods.

5.3.6 Slips, Trips and Falls

Working in and around the site will pose slip, trip and fall hazards due to slippery surfaces that may be oil covered, or from rough terrain, surfaces that are steep inclines, surfaced debris, or surfaces which are wet from rain or ice. Falls may result in twisted ankles, broken bones, head trauma or back injuries.

5.3.7 Heavy Equipment Operation

Heavy equipment including backhoes, excavators, and dump trucks will be utilized during the soil excavation and soil handling phases. Working with or near heavy equipment poses many potential hazards, including electrocution, fire/explosion, being struck by or against, or pinched/caught/crushed by, and can result in serious physical harm.

5.3.8 Electrocution

Encountering underground utilities may pose electrical hazards to workers. Additionally, overhead electrical lines can be a concern during drilling operations. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death.

6.0 ACTIVITY HAZARD ANALYSES

The Activity Hazard Analysis (AHA) is a systematic way of identifying the potential health and safety hazards associated with major phases of work on the project and the methods to avoid, control and mitigate those hazards. The AHAs will be used to train work crews in proper safety procedures during phase preparatory meetings.

AHAs have been developed by PWGC for the following phases of work:

- Soil and Groundwater sampling
- Site Mobilization/Demobilization
- Soil Excavation Oversight
- ORC application
- Decontamination

Copies of these AHAs are included in Appendix B of this HASP.

7.0 PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment (PPE) specified in **Table 6-1** represents the hazard analysis and PPE selection required by 29 CFR 1910.132. Specific information on known potential hazards can be found under Section 5.0 and **Appendix B** - Activity Hazard Analyses. For the purposes of PPE selection, the HSM and FTL/SHSO are considered competent persons. The signatures on the approval page of the HASP constitute certification of the hazard assessment. For activities not covered by **Table 7-1**, the FTL/SHSO will conduct the hazard assessment, select the PPE, and document changes in the appropriate field logs. PPE selection will be made in consultation with the HSM.

Modifications for initial PPE selection may also be made by the FTL/SHSO in consultation with the HSM and changes documented accordingly. If major modifications occur, the HSM will notify the PM.

PPE Abbreviations

HEAD PROTECTION

HH = Hard Hat

HEARING PROTECTION

EP = ear plugs

EM = ear muffs

EYE/FACE PROTECTION

APR = Full Face Air Purifying Respirator

MFS = Mesh Face shield

PFS = Plastic Face shield

SG = ANSI approved safety glasses with side shields

FOOT PROTECTION

Neo = Neoprene

OB = Overboot

Poly = polyethylene coated boot

Rub = rubber slush boots

STB = Leather work boots with steel toe

HAND PROTECTION

Cot = cotton

But = Butyl

LWG = Leather Work Gloves

Neo = Neoprene

Nit = Nitrile

Sur = Surgical

BODY PROTECTION

WC = work clothes

Cot Cov = Cotton Coveralls

Poly = Polyethylene coated

Tyvek® coveralls

Saran = Saranex coated coveralls

Tyvek® = Uncoated Tyvek® coveralls

RESPIRATORY PROTECTION

APR = Full-face air purifying respirator with organic vapor cartridges

ASR = Full face air supplied respirator with escape bottle

SCBA = Self-contained breathing apparatus

7.1 Hazard Assessment for Selection of Personal Protective Equipment

The initial selection of personal protective equipment for each task was done by performing a hazard assessment taking into consideration the following:

- Potential chemical and physical hazards present;
- Work operations to be performed;
- Potential routes of exposure;
- Concentrations of contaminants present; and
- Characteristics, capabilities and limitations of PPE and any hazard that the PPE presents or magnifies.

A review of the analytical data from previous sampling events indicates that petroleum contamination as identified in **Table 5-1** are the primary contaminants of concern.

The exposure routes for these chemicals are inhalation, skin absorption, skin/eye contact and ingestion. Chemical protective gloves will be required for all activities that involve sample handling and the likelihood for skin contact. The proper use of PPE and strict adherence to decontamination and personal hygiene procedures will effectively minimize skin contact and ingestion as potential routes of exposure.

**Table 6-1
Personal Protective Equipment Selection**

TASK	HEAD	EYE/FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR
Mobilization/ Demobilization	HH	SG	STB	WG	WC	None	None
Soil Excavation Oversight	HH	SG	STB	WG	WC, Tyvek® as needed	EM or EP	None initially APR if action levels exceeded
ORC Application	HH	SG	STB	WG, Nit & Sur as needed	WC, Tyvek® as needed	EM or EP	HEPA filter APR for personnel in vicinity of application area
Soil/GW sampling	HH	SG	STB	WG, Nit & Sur as needed	WC, Tyvek® as needed	None	None initially APR if action levels exceeded
Decontamination	HH	SG	STB	Nit + Sur	WC, Tyvek® as needed	None	None initially APR if action levels exceeded

7.2 Respirator Cartridge Change-Out Schedule

A respirator cartridge change-out schedule has been developed in order to comply with 29 CFR 1910.134. If the use of respirators is necessary, the respirator cartridge change-out schedule for this project will be as follows:

- o Cartridges shall be removed and disposed of at the end of each shift, when cartridges become wet or wearer experiences breakthrough, whichever occurs first; and
- o If the humidity exceeds 85%, then cartridges shall be removed and disposed of after 4 hours of use.

Respirators shall not be stored at the end of the shift with contaminated cartridges left on. Cartridges shall not be worn on the second day, no matter how short of time period they were used the day before.

8.0 AIR MONITORING

Air monitoring will be performed for protection for on-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from remedial activities at the site. Air monitoring will be used to help to confirm that the remedial work will not spread contamination off-site through the air. The primary concerns for this site are VOCs and dust particulates.

Real-time monitoring for dust and VOCs will be conducted both within the work area, and along the site perimeter, during excavation, soil handling, and ORC application activities.

Level D level of protection will be utilized unless dust monitoring exceeds concentrations greater than 150 $\mu\text{g}/\text{m}^3$ over daily background or PID readings in excess of 25.0 ppmv in the breathing zone are detected.

Detailed information on the types, frequency and location of real-time monitoring and community air monitoring requirements are provided in the Community Air Monitoring Plan (CAMP) prepared for this project.

9.0 ZONES, PROTECTION AND COMMUNICATION

9.1 Site Control

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

The zones are based upon current knowledge of proposed site activities. It is possible that the zone configurations may be altered or reduced due to work plan revisions. Should this occur, the work zones will be adjusted accordingly, and documented in the field logbook.

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

Support Zone - The SZ is an uncontaminated area that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

Contamination Reduction Zone - The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides for 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 EZ entry and egress in addition to access for heavy equipment and emergency support services.

Exclusion Zone - All activities, which may involve exposure to site contaminants, hazardous materials and/or conditions, should be considered an EZ. The FTL/SHSO may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the site FTL/SHSO allowing adequate space for the activity to be completed, field members and emergency equipment.

9.2 Contamination Control

Decontamination areas will be established for the following activities.

- Soil Excavation
- ORC Application

9.2.1 *Personnel Decontamination Station*

All personnel and portable equipment used in the EZ shall be subject to a thorough decontamination process, as deemed necessary by the FTL/SHSO. Sampling equipment shall be decontaminated. As necessary, all boots and gloves will be decontaminated using soap and water solution and scrub brushes or by simple removal and disposal. All used respiratory protective equipment will be decontaminated daily and sanitized with appropriate sanitizer solution.

All drums generated as a result of sampling and decontamination activities will be marked and stored at a designated area at the site until the materials can be properly disposed of off-site. All non-expendable sampling equipment will be decontaminated. This usually entails the use of Alconox, solvent and distilled/deionized water rinses to eliminate contaminants.

9.3 **Communication**

Each PWGC team member will have a cell phone/radio for communication with the PM, FTL/SHSO and other team members during field activities.

Hand Signals - Hand signals shall be used by field teams, along with the buddy system. The entire field team shall know them before operations commence and their use covered during site-specific training. Typical hand signals are the following:

SIGNAL	MEANING
Hand gripping throat	Out of air, can't breathe
Grip on a partner's wrist or placement of both hands around a partner's waist.	Leave the area immediately, no debate.
Hands on top of head	Need assistance
Thumbs up	Okay, I'm all right, I understand.
Thumbs down	No, negative.

10.0 MEDICAL SURVEILLANCE PROCEDURES

All contractor and subcontractor personnel performing field work where potential exposure to contaminants exists at the site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f).

11.0 SAFETY CONSIDERATIONS

11.1 General Health and Safety Work Practices

A list of general health and safety work practices is included as an included in Appendix D. The work rules will be posted in a conspicuous location at the site.

11.2 The Buddy System

At a minimum, employees shall work in groups of two in such a manner that they can observe each other and maintain line-of-sight for each employee within the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

11.3 Sample Handling

Personnel responsible for the handling of samples should wear the prescribed level of protection. Samples should be identified as to their hazard and packaged as to prevent spillage or breakage. Sample containers shall be decontaminated in the CRZ or EZ before entering a clean Support Zone area. Any unusual sample conditions, odors, or real-time readings should be noted. Laboratory personnel should be advised of sample hazard level and the potential contaminants present. This can be accomplished by a phone call to the lab coordinator and/or including a written statement with the samples reviewing lab safety procedures in handling, in order to assure that the practices are appropriate for the suspected contaminants in the sample.

11.4 Excavation

The remedial action will largely consist of the excavation impacted soils, as well as the removal of approximately 30 feet clean overburden. This work should comply with 29 CFR 1926, Subpart P-Excavations. It provides for the designation of a "Competent Person" and general requirements for safe excavating practices. The program also incorporates company standards for the monitoring of potentially hazardous atmospheres; protection from water hazards; analyzing and maintaining the stability of adjacent structures; daily competent person inspections; soil classification; sloping and benching; protective systems; and training.

The Competent Person will be the FTL or other designee with appropriate training and experience. The Competent Person will be assisted in his/her duties by other technical personnel such as the HSM, geologists, structural engineers and soils engineers.

12.0 DISPOSAL PROCEDURES

All discarded materials, waste materials or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard or causing litter to be left on site.

All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary, labeled and segregated for disposal. All non-contaminated materials will be collected and bagged for appropriate disposal as non-hazardous solid waste. Additional waste disposal procedures may be developed as applicable.

13.0 EMERGENCY RESPONSE PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly, and require an immediate response; therefore, contingency planning and advanced training of staff is essential. Specific elements of emergency support procedures which are addressed in the following subsections include communications, local emergency support units, and preparation for medical emergencies, first aid for injuries incurred on site, record keeping, and emergency site evacuation procedures.

13.1 Responsibilities

13.1.1 Health and Safety Manager (HSM)

The HSM oversees and approves the Emergency Response/Contingency Plan and performs audits to determine that the plan is in effect and that all pre-emergency requirements are met. The HSM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

13.1.2 Field Team Leader/Site Health and Safety Officer (FTL/SHSO)

The FTL/SHSO is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The FTL/SHSO is required to immediately notify the HSM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the HSM can ensure that OSHA is notified within the required time frame. The HSM will be notified of all OSHA recordable injuries, fires, spills, releases or equipment damage in excess of \$500 within 24 hours.

13.1.3 Emergency Coordinator

The Emergency Coordinator for the project is the FTL/SHSO.

The emergency coordinator will locate emergency phone numbers and identify hospital routes prior to beginning work on site. The emergency coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator will implement the Emergency Response/Contingency Plan whenever conditions at the site warrant such action.

13.1.4 Site Personnel

Site personnel are responsible for knowing the Emergency Response/Contingency Plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a site emergency.

**Table 12-1
Emergency Telephone Numbers**

Contact	Firm or Agency	Telephone Number
Police	SCPD	911
Fire		911
Hospital	Brookhaven Memorial Hospital	(631) 654-7100
Ambulance		911
Project Manager/Health and Safety Manager	Zeb Youngman PWGC	(516) 807-6896
Health & Safety Officer	Derek Ersbak PWGC	(516) 852-6750
NYSDEC Site Contact	John Sheehan	(631) 444-0247
SCDHS Site Contact	Jim Meyers	(631) 852-5800
Poison Control Center		(800) 962-1253
Chemtrec(for spills)		(800) 424-9300

13.5 Emergency Site Evacuation Routes and Procedures

In order to mobilize the manpower resources and equipment necessary to cope with a fire or other emergency, a clear chain of authority will be established. The EC will take charge of all emergency response activities and dictate the procedures that will be followed for the duration of the emergency. The EC will report immediately to the scene of the emergency, assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive. At his/her discretion, the EC also may order the closure of the site for an indefinite period.

All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs, including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, the EC will notify site personnel. All heavy equipment will be shut down and all personnel will evacuate the work areas and assemble at the evacuation

meeting point, which will be determined upon arrival at the site by the FTL/SHSO, prior to work beginning. This will then be conveyed to all crew members during the site-specific briefing.

The EC will give directions for implementing whatever actions are necessary. Any project team member may be assigned to be in charge of emergency communications during an emergency. He/she will attend the site telephone specified by the EC from the time the alarm sounds until the emergency has ended.

The EC will remain at the site to provide any assistance requested by emergency-response squads as they arrive to deal with the situation.

13.6 Fire Prevention and Protection

In the event of a fire or explosion, procedures will include immediately evacuating the site (air horn will sound for a single continuous blast), and notification of local fire and police departments. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

13.6.1 Fire Prevention

Adhering to the following precautions will help prevent fires:

- o Good housekeeping and storage of materials;
- o Storage of flammable liquids and gases away from oxidizers;
- o No smoking in the exclusion zone or any work area;
- o No hot work without a properly executed hot work permit;
- o Shutting off engines to refuel;
- o Grounding and bonding metal containers during transfer of flammable liquids;
- o Use of UL approved flammable storage cans;
- o Fire extinguishers rated at least 10 pounds ABC located on all heavy equipment, in all trailers and near all hot work activities; and
- o Monthly inspections of all fire extinguishers.

13.7 Overt Chemical Exposure

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the Material Safety Data Sheet or recommended by the Corporate Medical Consultant will be followed, when necessary.

SKIN AND EYE CONTACT: Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, and then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination. Skin should also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs.

INHALATION: Move to fresh air. Decontaminate and transport to hospital or local medical provider.

INGESTION: Decontaminate and transport to emergency medical facility.

PUNCTURE WOUND OR LACERATION: Decontaminate and transport to emergency medical facility.

13.8 Decontamination during Medical Emergencies

If emergency life-saving first aid and/or medical treatment is required, normal decontamination procedures may need to be abbreviated or postponed. The FTL/SHSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed on-site, a plastic barrier placed between the injured individual and clean surfaces should be used to help prevent contamination of the inside of ambulances and/or medical personnel. Outer garments may then be removed at the medical facility. No attempt will be made to wash or rinse the victim if his/her injuries are life threatening, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the normal decontamination procedures will be followed.

13.9 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone:

- Health and Safety Manager;
- Project Manager; and
- The employer of any injured worker who is not a PWGC employee.

Written confirmation of verbal reports are to be completed by the FTL/SHSO using the Incident Report Form and submitted within 24 hours. The incident report and investigation form is found in Appendix F. If the employee involved is not a PWGC employee, his employer will receive a copy of the report.

13.10 Adverse Weather Conditions

In the event of adverse weather conditions, the FTL/SHSO will determine if work can continue without potentially risking the safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries;
- Potential for cold stress and cold-related injuries;
- Treacherous weather-related working conditions (hail, rain, snow, ice, high winds);
- Limited visibility (fog);
- Potential for electrical storms;
- Earthquakes; and
- Other major incidents.

Site activities will be limited to daylight hours, or when suitable artificial light is provided, and acceptable weather conditions prevail. The FTL/SHSO will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

13.11 Spill Control and Response

All small hazardous spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the MSDS will be consulted to assist in determining the best means of containment and cleanup. For small spills, sorbent materials such as sand, sawdust or commercial sorbents should be placed directly on the substance to contain the spill and aid recovery. Any acid spills should be diluted or neutralized carefully prior to attempting recovery. Berms of earthen or sorbent materials can be used to contain the leading edge of the spills. Drains or drainage areas should be blocked. All spill containment materials will be properly disposed. An exclusion zone of 50 to 100 feet around the spill area should be established depending on the size of the spill. The following seven steps should be taken by the Emergency Coordinator:

- o Determine the nature, identity and amounts of major spill components;
- o Make sure all unnecessary persons are removed from the spill area;
- o Notify appropriate response teams and authorities;
- o Use proper PPE in consultation with the FTL/SHSO;
- o If a flammable liquid, gas or vapor is involved, remove all ignition sources and use non-sparking and/or explosive proof equipment to contain or clean up the spill (diesel only vehicles, air operated pumps, etc.);
- o If possible, try to stop the leak with appropriate material; and,
- o Remove all surrounding materials that can react or compound with the spill.

13.12 Emergency Equipment

The following minimum emergency equipment shall be kept and maintained on-site:

- Industrial first aid kit;
- Fire extinguishers (one per work area); and
- Spill response kit.

14.0 TRAINING

14.1 General Health and Safety Training

In accordance with PWGC corporate policy, and pursuant to 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).

14.1.1 Three Day Supervised On the Job Training

In addition to the required initial hazardous waste operations training, each employee shall have received three days of directly supervised on-the-job training. This training will address the duties the employees are expected to perform.

14.2 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 1910.120 requirements and related company programs and procedures.

14.3 Site-Specific Training

Prior to commencement of field activities, all field personnel (PWGC, remedial contractors, and sub-contractors) 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.

14.4 On-Site Safety Briefings

Project personnel and visitors will be given on-site health and safety briefings daily by the FTL/SHSO to assist site personnel in safely conducting their work activities. A copy of the Daily Briefing Sign-In Sheet is contained in Appendix G. 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. Prior to starting any new activity, a training session using the Activity Hazard Analysis will be held for crew members involved in the activity.

14.5 First Aid and CPR

The HSM will identify those individuals requiring first aid and CPR training to ensure that emergency medical treatment is available during field activities. It is anticipated that a minimum of one field person on-site at any one time will have first aid and CPR training. The training will be consistent with the requirements of the American Red Cross Association or American Heart Association. If none are available on-site, then the HSM shall be notified.

14.6 Supervisory Training

Supervisors and health and safety personnel shall have completed an additional eight hours of specialized training in accordance with 29 CFR 1910.120.

15.0 LOGS, REPORTS AND RECORDKEEPING

Changes to the HASP will be documented in the Health and Safety log book and as appropriate, the HSM and/or PM will be notified. Daily tailgate meetings will be documented in the H&S log book as well as personnel on-site.

15.1 Medical and Training Records

Copies or verification of training (40-hour, 8-hour, supervisor, site-specific training and documentation of three day OJT) and medical clearance for hazardous waste site work and respirator use will be maintained on-site. Records for all subcontractor employees will also be kept on-site.

15.2 Incident Report and Investigation Form

The incident report and investigation form is to be completed for all accidents and incidents, including near misses. The form can be found in Appendix F.

15.3 Health and Safety Logbooks

The FTL/SHSO will maintain a logbook during site work. The daily site conditions, personnel, monitoring results and significant events will be recorded. The original logbooks will become part of the exposure records file.

APPENDIX A

MATERIAL SAFETY DATA SHEETS

ACETONE

0087
April 1994

CAS No: 67-64-1
RTECS No: AL3150000
UN No: 1090
EC No: 606-001-00-8

2-Propanone
Dimethyl ketone
Methyl ketone
 C_3H_6O / $CH_3-CO-CH_3$
Molecular mass: 58.1

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, alcohol-resistant foam, water in large amounts, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE			
Inhalation	Sore throat. Cough. Confusion. Headache. Dizziness. Drowsiness. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	Dry skin.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
Eyes	Redness. Pain. Blurred vision. Possible corneal damage.	Safety spectacles or face shield. Contact lenses should not be worn.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Nausea. Vomiting. (Further see Inhalation). (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL

Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Then wash away with plenty of water. Personal protection: self-contained breathing apparatus.

PACKAGING & LABELLING

F Symbol
Xi Symbol
R: 11-36-66-67
S: (2-)9-16-26
UN Hazard Class: 3
UN Pack Group: II

EMERGENCY RESPONSE

Transport Emergency Card: TEC (R)-30S1090
NFPA Code: H 1; F 3; R 0

SAFE STORAGE

Fireproof. Separated from strong oxidants.

IMPORTANT DATA

Physical State; Appearance

COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

Physical dangers

The vapour is heavier than air and may travel along the ground; distant ignition possible.

Chemical dangers

The substance can form explosive peroxides on contact with strong oxidants such as acetic acid, nitric acid, hydrogen peroxide. Reacts with chloroform and bromoform under basic conditions, causing fire and explosion hazard. Attacks plastic.

Occupational exposure limits

TLV: 500 ppm as TWA, 750 ppm as STEL; A4 (not classifiable as a human carcinogen); BEI issued; (ACGIH 2004).

MAK: 500 ppm 1200 mg/m³ Peak limitation category: I(2);

Pregnancy risk group: IIc; (DFG 2004).

Routes of exposure

The substance can be absorbed into the body by inhalation and through the skin.

Inhalation risk

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20/C ; on spraying or dispersing, however, much faster.

Effects of short-term exposure

The vapour irritates the eyes and the respiratory tract. The substance may cause effects on the central nervous system, liver, kidneys and gastrointestinal tract.

Effects of long-term or repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the blood and bone marrow.

PHYSICAL PROPERTIES

Boiling point: 56/C

Melting point: -95/C

Relative density (water = 1): 0.8

Solubility in water: miscible

Vapour pressure, kPa at 20/C: 24

Relative vapour density (air = 1): 2.0

Relative density of the vapour/air-mixture at 20/C (air = 1): 1.2

Flash point: -18/C c.c.

Auto-ignition temperature: 465/C

Explosive limits, vol% in air: 2.2-13

Octanol/water partition coefficient as log Pow: -0.24

ENVIRONMENTAL DATA

NOTES

Use of alcoholic beverages enhances the harmful effect.

Card has been partly updated in October 2005. See sections Occupational Exposure Limits, EU classification.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible for the use which might be made of this information

ARSENIC

0013

October 1999

CAS No: 7440-38-2
 RTECS No: CG0525000
 UN No: 1558
 EC No: 033-001-00-X

Grey arsenic
 As
 Atomic mass: 74.9

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames. NO contact with strong oxidizers. NO contact with hot surfaces.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Risk of fire and explosion is slight when exposed to hot surfaces or flames in the form of fine powder or dust.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!	IN ALL CASES CONSULT A DOCTOR!
Inhalation	Cough. Sore throat. Shortness of breath. Weakness. See Ingestion.	Closed system and ventilation.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
Skin	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
Eyes	Redness.	Face shield or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Abdominal pain. Diarrhoea. Nausea. Vomiting. Burning sensation in the throat and chest. Shock or collapse. Unconsciousness.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Evacuate danger area! Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment.	T Symbol N Symbol R: 23/25-50/53 S: (1/2-)20/21-28-45-60-61 UN Hazard Class: 6.1 UN Pack Group: II Do not transport with food and feedstuffs. Marine pollutant.

EMERGENCY RESPONSE	SAFE STORAGE
Transport Emergency Card: TEC (R)-61GT5-II	Separated from strong oxidants, acids, halogens, food and feedstuffs. Well closed.

IMPORTANT DATA

Physical State; Appearance

ODOURLESS, BRITTLE, GREY, METALLIC-LOOKING CRYSTALS.

Chemical dangers

Upon heating, toxic fumes are formed. Reacts violently with strong oxidants and halogens, causing fire and explosion hazard. Reacts with acids to produce toxic arsine gas (see: ICSC 0222).

Occupational exposure limits

TLV: 0.01 mg/m³ as TWA; A1 (confirmed human carcinogen); BEI issued; (ACGIH 2004).

MAK: Carcinogen category: 1; Germ cell mutagen group: 3A; (DFG 2004).

Routes of exposure

The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

Inhalation risk

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly, when dispersed.

Effects of short-term exposure

The substance is irritating to the eyes, the skin and the respiratory tract. The substance may cause effects on the gastrointestinal tract, cardiovascular system, central nervous system and kidneys, resulting in severe gastroenteritis, loss of fluid, and electrolytes, cardiac disorders, shock, convulsions and kidney impairment. Exposure above the OEL may result in death. The effects may be delayed. Medical observation is indicated.

Effects of long-term or repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the mucous membranes, skin, peripheral nervous system, liver and bone marrow, resulting in pigmentation disorders, hyperkeratosis, perforation of nasal septum, neuropathy, liver impairment, anaemia. This substance is carcinogenic to humans. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Sublimation point: 613°C
Density: 5.7 g/cm³

Solubility in water: none

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms. It is strongly advised that this substance does not enter the environment.

NOTES

The substance is combustible but no flash point is available in literature.

Depending on the degree of exposure, periodic medical examination is suggested.

Do NOT take working clothes home.

Refer also to cards for specific arsenic compounds, e.g., Arsenic pentoxide (ICSC 0377), Arsenic trichloride (ICSC 0221), Arsenic trioxide (ICSC 0378), Arsine (ICSC 0222).

Card has been partly updated in October 2004. See sections Occupational Exposure Limits, EU classification, Emergency Response.

Card has been partly updated in October 2005 in section Effects of long-term or repeated exposure.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible for the use which might be made of this information

BENZENE**ICSC: 0015****Date of Peer Review: May 2003**Cyclohexatriene
Benzol

CAS #	71-43-2	C ₆ H ₆
RTECS #	CY1400000	Molecular mass: 78.1
UN #	1114	
EC #	601-020-00-8	

TYPES OF HAZARD / EXPOSURE	ACUTE HAZARDS / SYMPTOMS	PREVENTION	FIRST AID / FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive. Risk of fire and explosion: see Chemical Dangers.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Use non-sparking handtools. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		AVOID ALL CONTACT!	
Inhalation	Dizziness. Drowsiness. Headache. Nausea. Shortness of breath. Convulsions. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	MAY BE ABSORBED! Dry skin. Redness. Pain. (Further see Inhalation).	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
Eyes	Redness. Pain.	Face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to

			a doctor.
Ingestion	Abdominal pain. Sore throat. Vomiting. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
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Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Personal protection: complete protective clothing including self-contained breathing apparatus.	Do not transport with food and feedstuffs. EU Classification Symbol: <u>F</u> , <u>T</u> R: <u>45-46-11-36/38-48/23/24/25-65</u> S: <u>53-45</u> Note: [E] UN Classification UN Hazard Class: 3 UN Pack Group: II
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EMERGENCY RESPONSE	SAFE STORAGE
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Transport Emergency Card: TEC (R)-30S1114 / 30GF1-II NFPA Code: H2; F3; R0	Fireproof. Separated from food and feedstuffs oxidants and halogens.
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<p>IPCS International Programme on Chemical Safety</p> 	<p>Prepared in the context of cooperation between the International Programme on Chemical Safety and the Commission of the European Communities © IPCS, CEC 2004</p> <p style="text-align: center;">SEE IMPORTANT INFORMATION ON BACK</p>
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BENZENE

ICSC: 0015

IMPORTANT DATA

<p>PHYSICAL STATE; APPEARANCE: COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.</p> <p>PHYSICAL DANGERS: The vapour is heavier than air and may travel along the ground; distant ignition possible. As a result of flow, agitation, etc., electrostatic charges can be generated.</p> <p>CHEMICAL DANGERS: Reacts violently with oxidants, nitric acid, sulfuric acid and halogens causing fire and explosion hazard. Attacks plastic and rubber.</p> <p>OCCUPATIONAL EXPOSURE LIMITS:</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation, through the skin and by ingestion.</p> <p>INHALATION RISK: A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20°C.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE: The substance is irritating to the eyes, the skin and the respiratory tract. Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous</p>
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<p>TLV: 0.5 ppm as TWA; 2.5 ppm as STEL; (skin); A1; BEI issued; (ACGIH 2004). MAK: H; Carcinogen category: 1; Germ cell mutagen group: 3A; (DFG 2004).</p>	<p>system, resulting in lowering of consciousness. Exposure far above the occupational exposure limit value may result in unconsciousness and death.</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: The liquid defats the skin. The substance may have effects on the bone marrow and immune system, resulting in a decrease of blood cells. This substance is carcinogenic to humans.</p>
<p>PHYSICAL PROPERTIES</p>	
<p>Boiling point: 80°C Melting point: 6°C Relative density (water = 1): 0.88 Solubility in water, g/100 ml at 25°C: 0.18 Vapour pressure, kPa at 20°C: 10 Relative vapour density (air = 1): 2.7</p>	<p>Relative density of the vapour/air-mixture at 20°C (air = 1): 1.2 Flash point: -11°C c.c. Auto-ignition temperature: 498°C Explosive limits, vol% in air: 1.2-8.0 Octanol/water partition coefficient as log Pow: 2.13</p>
<p>ENVIRONMENTAL DATA</p>	
<p>The substance is very toxic to aquatic organisms.</p>	
<p>NOTES</p>	
<p>Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is indicated. The odour warning when the exposure limit value is exceeded is insufficient. Card has been partly updated in October 2004. See sections Occupational Exposure Limits, EU classification, Emergency Response.</p>	
<p>ADDITIONAL INFORMATION</p>	
<p>LEGAL NOTICE Neither the CEC nor the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information</p>	
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BERYLLIUM**0226**

October 1999

CAS No: 7440-41-7
 RTECS No: DS1750000
 UN No: 1567
 EC No: 004-001-00-7

Glucinium
 Be
 Atomic mass: 9.0

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Special powder, dry sand, NO other agents.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	

EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
Inhalation	Cough. Shortness of breath. Sore throat. Weakness. Symptoms may be delayed (see Notes).	Local exhaust. Breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
Eyes	Redness. Pain.	Face shield or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Evacuate danger area! Consult an expert! Carefully collect the spilled substance into containers; if appropriate moisten first, then remove to safe place. Chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment.	T+ Symbol R: 49-25-26-36/37/38-43-48/23 S: 53-45 Note: E UN Hazard Class: 6.1 UN Subsidiary Risks: 4.1 UN Pack Group: II

EMERGENCY RESPONSE	SAFE STORAGE
Transport Emergency Card: TEC (R)-61GTF3-II NFPA Code: H3; F1; R0	Separated from strong acids, bases, chlorinated solvents, food and feedstuffs.

IMPORTANT DATA

Physical State; Appearance
GREY TO WHITE POWDER.

Physical dangers

Dust explosion possible if in powder or granular form, mixed with air.

Chemical dangers

Reacts with strong acids and strong bases forming flammable/explosive gas (hydrogen - see ICSC0001). Forms shock sensitive mixtures with some chlorinated solvents, such as carbon tetrachloride and trichloroethylene.

Occupational exposure limits

TLV: 0.002 mg/m³ as TWA, 0.01 mg/m³ as STEL; A1 (confirmed human carcinogen); (ACGIH 2004).

MAK: sensitization of respiratory tract and skin (Sah); Carcinogen category: 1; (DFG 2004).

Routes of exposure

The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

Inhalation risk

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

Effects of short-term exposure

The aerosol of this substance is irritating to the respiratory tract. Inhalation of dust or fumes may cause chemical pneumonitis. Exposure may result in death. The effects may be delayed. Medical observation is indicated.

Effects of long-term or repeated exposure

Repeated or prolonged contact may cause skin sensitization. Lungs may be affected by repeated or prolonged exposure to dust particles, resulting in chronic beryllium disease (cough, weight loss, weakness). This substance is carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: above 2500°C
Melting point: 1287°C

Density: 1.9 g/cm³
Solubility in water: none

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms.

NOTES

Depending on the degree of exposure, periodic medical examination is suggested.

Do NOT take working clothes home.

Card has been partly updated in October 2005. See sections Occupational Exposure Limits, Emergency Response.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible for the use which might be made of this information

CADMIUM0020
April 2005CAS No: 7440-43-9
RTECS No: EU9800000
UN No: 2570
EC No: 048-002-00-0Cd
Atomic mass: 112.4

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Flammable in powder form and spontaneously combustible in pyrophoric form. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking. NO contact with heat or acid(s).	Dry sand. Special powder. NO other agents.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	

EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
Inhalation	Cough. Sore throat.	Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes	Redness. Pain.	Safety goggles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Abdominal pain. Diarrhoea. Headache. Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rest. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Evacuate danger area! Personal protection: chemical protection suit including self-contained breathing apparatus. Remove all ignition sources. Sweep spilled substance into containers. Carefully collect remainder, then remove to safe place.	T+ Symbol N Symbol R: 45-26-48/23/25-62-63-68-50/53 S: 53-45-60-61 Note: E UN Hazard Class: 6.1

EMERGENCY RESPONSE	SAFE STORAGE
	Fireproof. Dry. Keep under inert gas. Separated from ignition sources, oxidants acids, food and feedstuffs.

IMPORTANT DATA

Physical State; Appearance

SOFT BLUE-WHITE METAL LUMPS OR GREY POWDER. MALLEABLE. TURNS BRITTLE ON EXPOSURE TO 80/C AND TARNISHES ON EXPOSURE TO MOIST AIR.

Physical dangers

Dust explosion possible if in powder or granular form, mixed with air.

Chemical dangers

Reacts with acids forming flammable/explosive gas (hydrogen - see ICSC0001). Dust reacts with oxidants, hydrogen azide, zinc, selenium or tellurium, causing fire and explosion hazard.

Occupational exposure limits

TLV: (Total dust) 0.01 mg/m³; (Respirable fraction) 0.002 mg/m³; as TWA; A2 (suspected human carcinogen); BEI issued; (ACGIH 2005).

MAK: skin absorption (H); Carcinogen category: 1; Germ cell mutagen group: 3A; (DFG 2004).

Routes of exposure

The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

Inhalation risk

A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

Effects of short-term exposure

The fume is irritating to the respiratory tract. Inhalation of fume may cause lung oedema (see Notes). Inhalation of fumes may cause metal fume fever. The effects may be delayed. Medical observation is indicated.

Effects of long-term or repeated exposure

Lungs may be affected by repeated or prolonged exposure to dust particles. The substance may have effects on the kidneys, resulting in kidney impairment. This substance is carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 765/C
Melting point: 321/C
Density: 8.6 g/cm³

Solubility in water: none
Auto-ignition temperature: (cadmium metal dust) 250/C

ENVIRONMENTAL DATA

NOTES

Reacts violently with fire extinguishing agents such as water, foam, carbon dioxide and halons.

Depending on the degree of exposure, periodic medical examination is indicated.

The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential.

Do NOT take working clothes home.

Cadmium also exists in a pyrophoric form (EC No. 048-011-00-X), which bears the additional EU labelling symbol F, R phrase 17, and S phrases 7/8 and 43. UN numbers and packing group will vary according to the physical form of the substance.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible

CHROMIUM

0029

October 2004

CAS No: 7440-47-3
RTECS No: GB4200000

Chrome
(powder)
Cr
Atomic mass: 52.0

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Combustible under specific conditions.	No open flames if in powder form.	In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION		Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	

EXPOSURE		PREVENT DISPERSION OF DUST!	
Inhalation	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
Skin		Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
Eyes	Redness.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Personal protection: P2 filter respirator for harmful particles.	

EMERGENCY RESPONSE	SAFE STORAGE

IMPORTANT DATA

Physical State; Appearance

GREY POWDER

Physical dangers

Dust explosion possible if in powder or granular form, mixed with air.

Chemical dangers

Chromium is a catalytic substance and may cause reaction in contact with many organic and inorganic substances, causing fire and explosion hazard.

Occupational exposure limitsTLV: (as Cr metal, Cr(III) compounds) 0.5 mg/m³ as TWA; A4; (ACGIH 2004).

MAK not established.

Inhalation risk

A harmful concentration of airborne particles can be reached quickly when dispersed.

Effects of short-term exposure

May cause mechanical irritation to the eyes and the respiratory tract.

PHYSICAL PROPERTIES

Boiling point: 2642/C
Melting point: 1900/CDensity: 7.15 g/cm³
Solubility in water: none

ENVIRONMENTAL DATA

NOTES

The surface of the chromium particles is oxidized to chromium(III)oxide in air.
See ICSC 1531 Chromium(III) oxide.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible

COPPER**0240**

September 1993

CAS No: 7440-50-8
 RTECS No: GL5325000
 UN No:
 EC No:

Cu
 Atomic mass: 63.5

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Special powder, dry sand, NO other agents.
EXPLOSION			

EXPOSURE		PREVENT DISPERSION OF DUST!	
Inhalation	Cough. Headache. Shortness of breath. Sore throat.	Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes	Redness. Pain.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Sweep spilled substance into containers. Carefully collect remainder. Then remove to safe place (extra personal protection: P2 filter respirator for harmful particles).	Symbol R: S:

EMERGENCY RESPONSE	STORAGE
	Separated from: see Chemical Dangers.

IMPORTANT DATA

Physical State; Appearance

RED POWDER, TURNS GREEN ON EXPOSURE TO MOIST AIR.

Chemical Dangers

Shock-sensitive compounds are formed with acetylenic compounds, ethylene oxides and azides. Reacts with strong oxidants like chlorates, bromates and iodates, causing explosion hazard.

Occupational Exposure Limits

TLV: ppm; 0.2 mg/m³ fume (ACGIH 1992-1993).
TLV (as Cu, dusts & mists): ppm; 1 mg/m³ (ACGIH 1992-1993).

Routes of Exposure

The substance can be absorbed into the body by inhalation and by ingestion.

Inhalation Risk

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

Effects of Short-term Exposure

Inhalation of fume may cause metal fever (see Notes).

Effects of Long-term or Repeated Exposure

Repeated or prolonged contact may cause skin sensitization.

PHYSICAL PROPERTIES

Boiling point: 2595°C
Melting point: 1083°C

Relative density (water = 1): 8.9
Solubility in water: none

ENVIRONMENTAL DATA

NOTES

The symptoms of metal fume fever do not become manifest until several hours.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible for the use which might be made of this information

ETHYLBENZENE

0268

March 1995

CAS No: 100-41-4
 RTECS No: DA0700000
 UN No: 1175
 EC No: 601-023-00-4

Ethylbenzol
 Phenylethane
 EB
 C_8H_{10} / $C_6H_5-C_2H_5$
 Molecular mass: 106.2

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling.	In case of fire: keep drums, etc., cool by spraying with water.

EXPOSURE		PREVENT GENERATION OF MISTS!	
Inhalation	Cough. Dizziness. Drowsiness. Headache.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes	Redness. Pain. Blurred vision.	Face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	(Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Give a slurry of activated charcoal in water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Ventilation. Collect leaking liquid in covered containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Personal protection: A filter respirator for organic gases and vapours.	EU classification F Symbol Xn Symbol R: 11-20 S: (2-)16-24/25-29 UN classification UN Hazard Class: 3 UN Pack Group: II

EMERGENCY RESPONSE	SAFE STORAGE
Transport Emergency Card: TEC (R)-30S1175 or 30GF1-I+II NFPA Code: H2; F3; R0	Fireproof. Separated from strong oxidants.

IMPORTANT DATA

Physical State; Appearance

COLOURLESS LIQUID, WITH AROMATIC ODOUR.

Physical dangers

The vapour mixes well with air, explosive mixtures are easily formed.

Chemical dangers

Reacts with strong oxidants. Attacks plastic and rubber.

Occupational exposure limits

TLV: 100 ppm as TWA, 125 ppm as STEL; A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued (ACGIH 2005).

MAK: skin absorption (H); Carcinogen category: 3A; (DFG 2004).

Routes of exposure

The substance can be absorbed into the body by inhalation of its vapour, through the skin and by ingestion.

Inhalation risk

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20/C.

Effects of short-term exposure

The substance is irritating to the eyes, the skin and the respiratory tract. Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system. Exposure far above the OEL could cause lowering of consciousness.

Effects of long-term or repeated exposure

Repeated or prolonged contact with skin may cause dermatitis.

PHYSICAL PROPERTIES

Boiling point: 136/C

Melting point: -95/C

Relative density (water = 1): 0.9

Solubility in water, g/100 ml at 20/C: 0.015

Vapour pressure, kPa at 20/C: 0.9

Relative vapour density (air = 1): 3.7

Relative density of the vapour/air-mixture at 20/C (air = 1): 1.02

Flash point: 18/C c.c.

Auto-ignition temperature: 432/C

Explosive limits, vol% in air: 1.0-6.7

Octanol/water partition coefficient as log Pow: 3.2

ENVIRONMENTAL DATA

The substance is harmful to aquatic organisms.

NOTES

The odour warning when the exposure limit value is exceeded is insufficient.

Card has been partly updated in October 2005. See sections Occupational Exposure Limits, Emergency Response.

ADDITIONAL INFORMATION

LEGAL NOTICE

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CUMENE0170
April 2000

CAS No: 98-82-8 (1-Methylethyl)benzene
RTECS No: GR8575000 2-Phenylpropane
UN No: 1918 Isopropylbenzene
EC No: 601-024-00-X C_9H_{12} / $C_6H_5CH(CH_3)_2$
Molecular mass: 120.2

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Above 31/C explosive vapour/air mixtures may be formed.	Above 31/C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.

EXPOSURE		PREVENT GENERATION OF MISTS!	
Inhalation	Dizziness. Ataxia. Drowsiness. Headache. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	Dry skin.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	(See Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. Personal protection: filter respirator for organic gases and vapours.	Xn Symbol N Symbol R: 10-37-51/53-65 S: (2-)24-37-61-62 Note: C UN Hazard Class: 3 UN Pack Group: III Marine pollutant.

EMERGENCY RESPONSE	SAFE STORAGE
Transport Emergency Card: TEC (R)-30S1918 or 30GF1-III NFPA Code: H2; F3; R1	Fireproof. Separated from strong oxidants, acids. Cool. Keep in the dark. Store only if stabilized.

IMPORTANT DATA

Physical State; Appearance

COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

Physical dangers

As a result of flow, agitation, etc., electrostatic charges can be generated.

Chemical dangers

Reacts violently with acids and strong oxidants causing fire and explosion hazard. The substance can form explosive peroxides.

Occupational exposure limits

TLV: 50 ppm as TWA; (ACGIH 2004).
MAK: 50 ppm, 250 mg/m³; Peak limitation category: II(4); skin absorption (H); Pregnancy risk group: C; (DFG 2004).

Routes of exposure

The substance can be absorbed into the body by inhalation and through the skin.

Inhalation risk

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20/C.

Effects of short-term exposure

The substance is irritating to the eyes and the skin. Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system. Exposure far above the OEL may result in unconsciousness.

Effects of long-term or repeated exposure

Repeated or prolonged contact with skin may cause dermatitis.

PHYSICAL PROPERTIES

Boiling point: 152/C
Melting point: -96/C
Relative density (water = 1): 0.90
Solubility in water: none
Vapour pressure, Pa at 20/C: 427
Relative vapour density (air = 1): 4.2

Relative density of the vapour/air-mixture at 20/C (air = 1): 1.01
Flash point: 31/C c.c.
Auto-ignition temperature: 420/C
Explosive limits, vol% in air: 0.9-6.5
Octanol/water partition coefficient as log Pow: 3.66

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

NOTES

Check for peroxides prior to distillation; eliminate if found.
Card has been partly updated in April 2005. See sections Occupational Exposure Limits, Emergency Response.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible

CAS No: 7439-92-1
RTECS No: OF7525000

Lead metal
Plumbum
(powder)
Pb
Atomic mass: 207.2

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	

EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	PREVENT DISPERSION OF DUST! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
Inhalation		Local exhaust or breathing protection.	Fresh air, rest.
Skin		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Give plenty of water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment. Personal protection: P3 filter respirator for toxic particles.	

EMERGENCY RESPONSE	SAFE STORAGE
	Separated from food and feedstuffs and incompatible materials. See Chemical Dangers.

IMPORTANT DATA

Physical State; Appearance

BLUISH-WHITE OR SILVERY-GREY SOLID IN VARIOUS FORMS. TURNS TARNISHED ON EXPOSURE TO AIR.

Physical dangers

Dust explosion possible if in powder or granular form, mixed with air.

Chemical dangers

On heating, toxic fumes are formed. Reacts with oxidants. Reacts with hot concentrated nitric acid, boiling concentrated hydrochloric acid and sulfuric acid. Attacked by pure water and by weak organic acids in the presence of oxygen.

Occupational exposure limits

TLV: 0.05 mg/m³ as TWA; A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued; (ACGIH 2004).
MAK: Carcinogen category: 3B; Germ cell mutagen group: 3A; (DFG 2004).
EU OEL: as TWA 0.15 mg/m³; (EU 2002).

Routes of exposure

The substance can be absorbed into the body by inhalation and by ingestion.

Inhalation risk

A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

Effects of long-term or repeated exposure

The substance may have effects on the blood, bone marrow, central nervous system, peripheral nervous system and kidneys, resulting in anaemia, encephalopathy (e.g., convulsions), peripheral nerve disease, abdominal cramps and kidney impairment. Causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 1740/C
Melting point: 327.5/C

Density: 11.34 g/cm³
Solubility in water: none

ENVIRONMENTAL DATA

Bioaccumulation of this chemical may occur in plants and in mammals. It is strongly advised that this substance does not enter the environment.

NOTES

Depending on the degree of exposure, periodic medical examination is suggested.
Do NOT take working clothes home.
Card has been partly updated in April 2005. See section Occupational Exposure Limits.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible

MERCURY

0056
April 2004

CAS No: 7439-97-6
RTECS No: OV4550000
UN No: 2809
EC No: 080-001-00-0

Quicksilver
Liquid silver
Hg
Atomic mass: 200.6

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Risk of fire and explosion.		In case of fire: keep drums, etc., cool by spraying with water.

EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!	IN ALL CASES CONSULT A DOCTOR!
Inhalation	Abdominal pain. Cough. Diarrhoea. Shortness of breath. Vomiting. Fever or elevated body temperature.	Local exhaust or breathing protection.	Fresh air, rest. Artificial respiration if indicated. Refer for medical attention.
Skin	MAY BE ABSORBED! Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
Eyes		Face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion		Do not eat, drink, or smoke during work. Wash hands before eating.	Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Evacuate danger area in case of a large spill! Consult an expert! Ventilation. Collect leaking and spilled liquid in sealable non-metallic containers as far as possible. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Chemical protection suit including self-contained breathing apparatus.	T Symbol N Symbol R: 23-33-50/53 S: (1/2-)7-45-60-61 UN Hazard Class: 8 UN Pack Group: III Special material. Do not transport with food and feedstuffs.

EMERGENCY RESPONSE	STORAGE
Transport Emergency Card: TEC (R)-80GC9-II+III	Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs. Well closed.

IMPORTANT DATA

Physical State; Appearance

ODOURLESS, HEAVY AND MOBILE SILVERY LIQUID METAL.

Chemical dangers

Upon heating, toxic fumes are formed. Reacts violently with ammonia and halogens causing fire and explosion hazard. Attacks aluminium and many other metals forming amalgams.

Occupational exposure limits

TLV: 0.025 mg/m³ as TWA; (skin); A4; BEI issued; (ACGIH 2004).
MAK: 0.1 mg/m³; Sh; Peak limitation category: II(8); Carcinogen category: 3B; (DFG 2003).

Routes of exposure

The substance can be absorbed into the body by inhalation of its vapour and through the skin, also as a vapour!

Inhalation risk

A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20/C.

Effects of short-term exposure

The substance is irritating to the skin. Inhalation of the vapours may cause pneumonitis. The substance may cause effects on the central nervous system and kidneys. The effects may be delayed. Medical observation is indicated.

Effects of long-term or repeated exposure

The substance may have effects on the central nervous system and kidneys, resulting in irritability, emotional instability, tremor, mental and memory disturbances, speech disorders. May cause inflammation and discoloration of the gums. Danger of cumulative effects. Animal tests show that this substance possibly causes toxic effects upon human reproduction.

PHYSICAL PROPERTIES

Boiling point: 357/C
Melting point: -39/C
Relative density (water = 1): 13.5
Solubility in water: none

Vapour pressure, Pa at 20/C: 0.26
Relative vapour density (air = 1): 6.93
Relative density of the vapour/air-mixture at 20/C (air = 1): 1.009

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. In the food chain important to humans, bioaccumulation takes place, specifically in fish.

NOTES

Depending on the degree of exposure, periodic medical examination is indicated.
No odour warning if toxic concentrations are present.
Do NOT take working clothes home.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible

NAPHTHALENE

0667
April 2005

CAS No: 91-20-3
RTECS No: QJ0525000
UN No: 1334 (solid); 2304 (molten)
EC No: 601-052-00-2

Naphthene
 $C_{10}H_8$
Molecular mass: 128.18

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 80°C explosive vapour/air mixtures may be formed. Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	

EXPOSURE		PREVENT DISPERSION OF DUST!	
Inhalation	Headache. Weakness. Nausea. Vomiting. Sweating. Confusion. Jaundice. Dark urine.	Ventilation (not if powder), local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	MAY BE ABSORBED! (Further see Inhalation).	Protective gloves.	Rinse skin with plenty of water or shower.
Eyes		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Abdominal pain. Diarrhoea. Convulsions. Unconsciousness. (Further see Inhalation).	Do not eat, drink, or smoke during work. Wash hands before eating.	Rest. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Personal protection: filter respirator for organic gases and vapours. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place.	Xn Symbol N Symbol R: 22-40-50/53 S: (2-)36/37-46-60-61 UN Hazard Class: 4.1 UN Pack Group: III Do not transport with food and feedstuffs. Marine pollutant.

EMERGENCY RESPONSE	SAFE STORAGE
Transport Emergency Card: TEC (R)-41S1334 (solid); 41GF1-II+III (solid); 41S2304 (molten) NFPA Code: H2; F2; R0	Separated from strong oxidants, food and feedstuffs. Store in an area without drain or sewer access.

IMPORTANT DATA

Physical State; Appearance

WHITE SOLID IN VARIOUS FORMS, WITH CHARACTERISTIC ODOUR.

Physical dangers

Dust explosion possible if in powder or granular form, mixed with air.

Chemical dangers

On combustion, forms irritating and toxic gases. Reacts with strong oxidants.

Occupational exposure limits

TLV: 10 ppm as TWA; 15 ppm as STEL; (skin); A4 (not classifiable as a human carcinogen); (ACGIH 2005).
MAK: skin absorption (H); Carcinogen category: 2; Germ cell mutagen group: 3B; (DFG 2004).

Routes of exposure

The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

Inhalation risk

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20/C. See Notes.

Effects of short-term exposure

The substance may cause effects on the blood, resulting in lesions of blood cells (haemolysis). See Notes. The effects may be delayed. Exposure by ingestion may result in death. Medical observation is indicated.

Effects of long-term or repeated exposure

The substance may have effects on the blood, resulting in chronic haemolytic anaemia. The substance may have effects on the eyes, resulting in the development of cataract. This substance is possibly carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 218/C Sublimation slowly at room temperature
Melting point: 80/C
Density: 1.16 g/cm³
Solubility in water, g/100 ml at 25/C: none
Vapour pressure, Pa at 25/C: 11

Relative vapour density (air = 1): 4.42
Flash point: 80/C c.c.
Auto-ignition temperature: 540/C
Explosive limits, vol% in air: 0.9-5.9
Octanol/water partition coefficient as log Pow: 3.3

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. The substance may cause long-term effects in the aquatic environment.

NOTES

Some individuals may be more sensitive to the effect of naphthalene on blood cells.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible

CAS No: 108-95-2
RTECS No: SJ3325000
UN No: 1671
EC No: 604-001-00-2

Carbolic acid
Phenic acid
Hydroxybenzene
C₆H₆O / C₆H₅OH
Molecular mass: 94.1

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Combustible.	NO open flames. NO contact with strong oxidants.	Alcohol-resistant foam, powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 79/C explosive vapour/air mixtures may be formed.	Above 79/C use a closed system, ventilation.	In case of fire: keep drums, etc., cool by spraying with water.

EXPOSURE		AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
Inhalation	Sore throat. Burning sensation. Cough. Dizziness. Headache. Nausea. Vomiting. Shortness of breath. Laboured breathing. Unconsciousness. Symptoms may be delayed (see Notes).	Avoid inhalation of fine dust and mist. Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Half-upright position. Refer for medical attention.
Skin	EASILY ABSORBED. Serious skin burns. Numbness. Convulsion. Collapse. Coma. Death.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower. To remove substance use polyethylene glycol 300 or vegetable oil. Refer for medical attention. Wear protective gloves when administering first aid.
Eyes	Pain. Redness. Permanent loss of vision. Severe deep burns.	Face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Corrosive. Abdominal pain. Convulsions. Diarrhoea. Shock or collapse. Sore throat. Smoky, greenish-dark urine.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Give plenty of water to drink. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment.	T Symbol C Symbol R: 23/24/25-34-48/20/21/22-68 S: (1/2-)24/25-26-28-36/37/39-45 UN Hazard Class: 6.1 UN Pack Group: II Do not transport with food and feedstuffs.

EMERGENCY RESPONSE	SAFE STORAGE
Transport Emergency Card: TEC (R)-61S1671 NFPA Code: H 3; F 2; R 0	Provision to contain effluent from fire extinguishing. Separated from strong oxidants, food and feedstuffs. Dry. Well closed. Keep in a well-ventilated room.

IMPORTANT DATA

Physical State; Appearance

COLOURLESS TO YELLOW OR LIGHT PINK CRYSTALS, WITH CHARACTERISTIC ODOUR.

Chemical dangers

Upon heating, toxic fumes are formed. The solution in water is a weak acid. Reacts with oxidants causing fire and explosion hazard.

Occupational exposure limits

TLV: 5 ppm as TWA; (skin); A4; BEI issued; (ACGIH 2004).
MAK: H; Carcinogen category: 3B; (DFG 2004).

Routes of exposure

The substance can be absorbed into the body rapidly by inhalation of its vapour, through the skin and by ingestion.

Inhalation risk

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20/C.

Effects of short-term exposure

The substance and the vapour is corrosive to the eyes, the skin and the respiratory tract. Inhalation of vapour may cause lung oedema (see Notes). The substance may cause effects on the central nervous system, heart and kidneys, resulting in convulsions, coma, cardiac disorders respiratory failure, collapse. Exposure may result in death. The effects may be delayed. Medical observation is indicated.

Effects of long-term or repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the liver and kidneys.

PHYSICAL PROPERTIES

Boiling point: 182/C

Melting point: 43/C

Density: 1.06 g/cm³

Solubility in water: moderate

Vapour pressure, Pa at 20/C: 47

Relative vapour density (air = 1): 3.2

Relative density of the vapour/air-mixture at 20/C (air = 1): 1.001

Flash point: 79/C c.c.

Auto-ignition temperature: 715/C

Explosive limits, vol% in air: 1.36-10

Octanol/water partition coefficient as log Pow: 1.46

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

NOTES

Other UN numbers: 2312 (molten); 2821 (solution).

Use of alcoholic beverages enhances the harmful effect.

Depending on the degree of exposure, periodic medical examination is suggested.

The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential.

Immediate administration of an appropriate inhalation therapy by a doctor or a person authorized by him/her, should be considered.

Card has been partly updated in October 2004. See sections Occupational Exposure Limits, EU classification, Emergency Response.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible

CAS No: 108-88-3
RTECS No: XS5250000
UN No: 1294
EC No: 601-021-00-3

Methylbenzene
Toluol
Phenylmethane
C₆H₅CH₃ / C₇H₈
Molecular mass: 92.1

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding). Do NOT use compressed air for filling, discharging, or handling. Use non-sparking handtools.	In case of fire: keep drums, etc., cool by spraying with water.

EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
Inhalation	Cough. Sore throat. Dizziness. Drowsiness. Headache. Nausea. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
Eyes	Redness. Pain.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	PACKAGING & LABELLING
Evacuate danger area in large spill! Consult an expert in large spill! Remove all ignition sources. Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Personal protection: self-contained breathing apparatus in large spill.	F Symbol Xn Symbol R: 11-38-48/20-63-65-67 S: (2-)36/37-46-62 UN Hazard Class: 3 UN Pack Group: II

EMERGENCY RESPONSE	SAFE STORAGE
Transport Emergency Card: TEC (R)-30S1294 NFPA Code: H 2; F 3; R 0	Fireproof. Separated from strong oxidants.



IMPORTANT DATA

Physical State; Appearance

COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

Physical dangers

The vapour mixes well with air, explosive mixtures are formed easily. As a result of flow, agitation, etc., electrostatic charges can be generated.

Chemical dangers

Reacts violently with strong oxidants causing fire and explosion hazard.

Occupational exposure limits

TLV: 50 ppm as TWA; (skin); A4; BEI issued; (ACGIH 2004).
MAK: 50 ppm, 190 mg/m³; H; Peak limitation category: II(4);
Pregnancy risk group: C; (DFG 2004).

Routes of exposure

The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

Inhalation risk

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20/C.

Effects of short-term exposure

The substance is irritating to the eyes and the respiratory tract. The substance may cause effects on the central nervous system. If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. Exposure at high levels may result in cardiac dysrhythmia and unconsciousness.

Effects of long-term or repeated exposure

The liquid defats the skin. The substance may have effects on the central nervous system. Exposure to the substance may enhance hearing damage caused by exposure to noise. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 111/C
Melting point: -95/C
Relative density (water = 1): 0.87
Solubility in water: none
Vapour pressure, kPa at 25/C: 3.8
Relative vapour density (air = 1): 3.1

Relative density of the vapour/air-mixture at 20/C (air = 1): 1.01
Flash point: 4/C c.c.
Auto-ignition temperature: 480/C
Explosive limits, vol% in air: 1.1-7.1
Octanol/water partition coefficient as log Pow: 2.69

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

NOTES

Depending on the degree of exposure, periodic medical examination is suggested.
Use of alcoholic beverages enhances the harmful effect.
Card has been partly updated in October 2004. See sections Occupational Exposure Limits, EU classification, Emergency Response.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible

1,1,1-TRICHLOROETHANE

0079

October 1994

CAS No: 71-55-6

RTECS No: KJ2975000

UN No: 2831

EC No: 602-013-00-2

Methyl chloroform
Methyltrichloromethane
alpha-Trichloroethane
 $C_2H_3Cl_3$ / CCl_3CH_3
Molecular mass: 133.4

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Combustible under specific conditions. Heating will cause rise in pressure with risk of bursting. See Notes. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT GENERATION OF MISTS!	
Inhalation	Headache. Dizziness. Drowsiness. Nausea. Ataxia. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
Skin	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes	Redness.	Safety goggles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Diarrhoea. Nausea. Vomiting. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Give a slurry of activated charcoal in water to drink. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL

Ventilation. Collect leaking and spilled liquid in sealable, suitable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. Personal protection: self-contained breathing apparatus.

PACKAGING & LABELLING

Xn Symbol
N Symbol
R: 20-59
S: (2-)24/25-59-61
Note: F
UN Hazard Class: 6.1
UN Pack Group: III

Do not transport with food and feedstuffs. Marine pollutant.

EMERGENCY RESPONSE

Transport Emergency Card: TEC (R)-61S2831
NFPA Code: H2; F1; R0

SAFE STORAGE

Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs and incompatible materials. See Chemical Dangers. Cool. Dry. Ventilation along the floor.

IMPORTANT DATA

Physical State; Appearance

COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

Physical dangers

The vapour is heavier than air.

Chemical dangers

The substance decomposes on heating or on burning producing toxic and corrosive fumes including phosgene and hydrogen chloride. Reacts violently with aluminium, manganese and their alloys, alkalis, strong oxidants, acetone and zinc. Attacks natural rubber. Mixtures of 1,1,1-trichloroethane with potassium or its alloys are shock sensitive. Reacts slowly with water releasing corrosive hydrochloric acid.

Occupational exposure limits

TLV: 350 ppm as TWA, 450 ppm as STEL; A4 (not classifiable as a human carcinogen); BEI issued (ACGIH 2004). MAK: 200 ppm, 1100 mg/m³; Peak limitation category: II(1); skin absorption (H); Pregnancy risk group: C; (DFG 2004).

Routes of exposure

The substance can be absorbed into the body by inhalation of its vapour and by ingestion.

Inhalation risk

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20/C.

Effects of short-term exposure

The substance is irritating to the eyes, the skin and the respiratory tract. The substance may cause effects on the heart, central nervous system and liver, resulting in cardiac disorders and respiratory failure. Exposure at high levels may result in death. Medical observation is indicated.

Effects of long-term or repeated exposure

The liquid defats the skin. The substance may have effects on the liver.

PHYSICAL PROPERTIES

Boiling point: 74/C

Melting point: -30/C

Relative density (water = 1): 1.34

Solubility in water: none

Vapour pressure, kPa at 20/C: 13.3

Relative vapour density (air = 1): 4.6

Flash point: see Notes

Auto-ignition temperature: 537/C

Explosive limits, vol% in air: 8-16

Octanol/water partition coefficient as log Pow: 2.49

ENVIRONMENTAL DATA

The substance is harmful to aquatic organisms. This substance may be hazardous to the environment; special attention should be given to air quality and ground water contamination.

NOTES

Combustible vapour/air mixtures difficult to ignite, may be developed under certain conditions.

The substance burns only in excess oxygen or if a strong source of ignition is present.

Use of alcoholic beverages enhances the harmful effect.

Depending on the degree of exposure, periodic medical examination is suggested.

An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert.

Do NOT use in the vicinity of a fire or a hot surface, or during welding.

Aerothene, Algylen, Trichloran, Chlorylen, Genklene, Chlorothene NU, Chlorothene VG, and Solvent 111 are trade names.

Card has been partly updated in April 2005. See section Occupational Exposure Limits.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible

CAS No: 95-47-6
 RTECS No: ZE2450000
 UN No: 1307
 EC No: 601-022-00-9

ortho-Xylene
 1,2-Dimethylbenzene
 o-Xylol
 $C_6H_4(CH_3)_2$ / C_8H_{10}
 Molecular mass: 106.2

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 32/C explosive vapour/air mixtures may be formed.	Above 32/C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
Inhalation	Dizziness. Drowsiness. Headache. Nausea.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.
SPILLAGE DISPOSAL		PACKAGING & LABELLING	
Ventilation. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: filter respirator for organic gases and vapours.)		EU classification Xn Symbol R: 10-20/21-38 S: (2-)25 Note: C UN classification UN Hazard Class: 3 UN Pack Group: III	
EMERGENCY RESPONSE		SAFE STORAGE	
Transport Emergency Card: TEC (R)-30S1307-III NFPA Code: H 2; F 3; R 0		Fireproof. Separated from strong oxidants and strong acids.	

IMPORTANT DATA

Physical State; Appearance

COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

Physical dangers

As a result of flow, agitation, etc., electrostatic charges can be generated.

Chemical dangers

Reacts with strong acids and strong oxidants.

Occupational exposure limits

TLV: 100 ppm as TWA; 150 ppm as STEL A4 (ACGIH 2001). BEI specified by (ACGIH 2001).

MAK: 100 ppm, 440 mg/m³. Peak limitation category: II(2) skin absorption (H); Pregnancy risk group: D (DFG 2005).

EU OEL: 50 ppm as TWA; 100 ppm as STEL (skin) (EU 2000).

Routes of exposure

The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

Inhalation risk

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20/C.

Effects of short-term exposure

The substance is irritating to the eyes and the skin. The substance may cause effects on the central nervous system. If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis.

Effects of long-term or repeated exposure

The liquid defats the skin. The substance may have effects on the central nervous system. Exposure to the substance may enhance hearing damage caused by exposure to noise. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 144/C

Melting point: -25/C

Relative density (water = 1): 0.88

Solubility in water: none

Vapour pressure, kPa at 20/C: 0.7

Relative vapour density (air = 1): 3.7

Relative density of the vapour/air-mixture at 20/C (air = 1): 1.02

Flash point: 32/C c.c.

Auto-ignition temperature: 463/C

Explosive limits, vol% in air: 0.9-6.7

Octanol/water partition coefficient as log Pow: 3.12

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

NOTES

Depending on the degree of exposure, periodic medical examination is indicated.

The recommendations on this Card also apply to technical xylene.

See ICSC 0086 p-Xylene and 0085 m-Xylene.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible for the use which might be made of this information

CAS No: 108-38-3
 RTECS No: ZE2275000
 UN No: 1307
 EC No: 601-022-00-9

meta-Xylene
 1,3-Dimethylbenzene
 m-XyloI
 $C_6H_4(CH_3)_2$ / C_8H_{10}
 Molecular mass: 106.2

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 27/C explosive vapour/air mixtures may be formed.	Above 27/C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE!	
Inhalation	Dizziness. Drowsiness. Headache. Nausea.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL

Ventilation. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: filter respirator for organic gases and vapours.)

PACKAGING & LABELLING

EU classification
 Xn Symbol
 R: 10-20/21-38
 S: (2-)25
 Note: C
UN classification
 UN Hazard Class: 3
 UN Pack Group: III

EMERGENCY RESPONSE

NFPA Code: H 2; F 3; R 0;
 Transport Emergency Card: TEC (R)-30S1307-III

SAFE STORAGE

Fireproof. Separated from strong oxidants and strong acids.

IMPORTANT DATA

Physical State; Appearance

COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

Physical dangers

As a result of flow, agitation, etc., electrostatic charges can be generated.

Chemical dangers

Reacts with strong acids and strong oxidants.

Occupational exposure limits

TLV: 100 ppm as TWA; 150 ppm as STEL A4 (ACGIH 2001). BEI specified by (ACGIH 2001).

MAK: 100 ppm, 440 mg/m³. Peak limitation category: II(2) skin absorption (H); Pregnancy risk group: D (DFG 2005).

EU OEL: 50 ppm as TWA; 100 ppm as STEL (skin) (EU 2000).

Routes of exposure

The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

Inhalation risk

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20/C.

Effects of short-term exposure

The substance is irritating to the eyes and the skin. The substance may cause effects on the central nervous system. If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis.

Effects of long-term or repeated exposure

The liquid defats the skin. The substance may have effects on the central nervous system. Exposure to the substance may enhance hearing damage caused by exposure to noise. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 139/C

Melting point: -48/C

Relative density (water = 1): 0.86

Solubility in water: none

Vapour pressure, kPa at 20/C: 0.8

Relative vapour density (air = 1): 3.7

Relative density of the vapour/air-mixture at 20/C (air = 1): 1.02

Flash point: 27/C c.c.

Auto-ignition temperature: 527/C

Explosive limits, vol% in air: 1.1-7.0

Octanol/water partition coefficient as log Pow: 3.20

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

NOTES

Depending on the degree of exposure, periodic medical examination is indicated.

The recommendations on this Card also apply to technical xylene.

See ICSC 0084 o-Xylene and 0086 p-Xylene.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible for the use which might be made of this information

CAS No: 106-42-3
 RTECS No: ZE2625000
 UN No: 1307
 EC No: 601-022-00-9

para-Xylene
 1,4-Dimethylbenzene
 p-Xylol
 $C_6H_4(CH_3)_2$ / C_8H_{10}
 Molecular mass: 106.2

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/SYMPTOMS	PREVENTION	FIRST AID/FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 27°C explosive vapour/air mixtures may be formed.	Above 27°C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
Inhalation	Dizziness. Drowsiness. Headache. Nausea.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
Skin	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
Eyes	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
Ingestion	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL

Ventilation. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: filter respirator for organic gases and vapours.)

PACKAGING & LABELLING

EU classification
 Xn Symbol
 R: 10-20/21-38
 S: (2-)25
 Note: C
UN classification
 UN Hazard Class: 3
 UN Pack Group: III

EMERGENCY RESPONSE

Transport Emergency Card: TEC (R)-30S1307-III
 NFPA Code: H 2; F 3; R 0

SAFE STORAGE

Fireproof. Separated from strong oxidants, and strong acids.

IMPORTANT DATA

Physical State; Appearance

COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

Physical dangers

As a result of flow, agitation, etc., electrostatic charges can be generated.

Chemical dangers

Reacts with strong acids and strong oxidants.

Occupational exposure limits

TLV: 100 ppm as TWA; 150 ppm as STEL A4 (ACGIH 2001). BEI specified by (ACGIH 2001).

MAK: 100 ppm, 440 mg/m³. Peak limitation category: II(2) skin absorption (H); Pregnancy risk group: D (DFG 2005).

EU OEL: 50 ppm as TWA; 100 ppm as STEL (skin) (EU 2000).

Routes of exposure

The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

Inhalation risk

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20/C.

Effects of short-term exposure

The substance is irritating to the eyes and the skin. The substance may cause effects on the central nervous system. If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis.

Effects of long-term or repeated exposure

The liquid defats the skin. The substance may have effects on the central nervous system. Exposure to the substance may enhance hearing damage caused by exposure to noise. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 138/C

Melting point: 13/C

Relative density (water = 1): 0.86

Solubility in water: none

Vapour pressure, kPa at 20/C: 0.9

Relative vapour density (air = 1): 3.7

Relative density of the vapour/air-mixture at 20/C (air = 1): 1.02

Flash point: 27/C c.c.

Auto-ignition temperature: 528/C

Explosive limits, vol% in air: 1.1-7.0

Octanol/water partition coefficient as log Pow: 3.15

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

NOTES

Depending on the degree of exposure, periodic medical examination is indicated.

The recommendations on this Card also apply to technical xylene.

See ICSC 0084 o-Xylene and 0085 m-Xylene.

ADDITIONAL INFORMATION

LEGAL NOTICE

Neither the EC nor the IPCS nor any person acting on behalf of the EC or the IPCS is responsible for the use which might be made of this information

APPENDIX B

ACTIVITY HAZARD ANALYSES

Project Identification Former Bellport Gas Station	Location East Patchogue, New York	Estimated Dates TBD
Phase of Work Mobilization/ Demobilization	Page 1 of 1	Analysis Approved by Paul Boyce, PE, PM/HSM
TASKS	HAZARDS	CONTROL MEASURES
1. Mobilization and demobilization of equipment site tools, personnel	Slips/trips/falls	<ul style="list-style-type: none"> Maintain alertness to slip/trip/fall hazards; Maintain good housekeeping; Walk, do not run; Wear footwear with soles that grip; Unloading areas should be on even terrain; and Mark and repair if possible tripping hazards.
	Manual lifting and material handling	<ul style="list-style-type: none"> Instruct personnel on proper lifting techniques; Use proper lifting techniques; and Team lifting will be used for heavy loads or use mechanical lifting devices.
	Temperature extremes	<ul style="list-style-type: none"> Drink plenty of fluids; Train personnel of signs/symptoms of heat/cold stress; Monitor air temperatures when extreme weather conditions are present; and Stay in visual and verbal contact with your buddy.
	Vehicular traffic	<ul style="list-style-type: none"> Spotters will be used when backing up trucks and heavy equipment and when moving equipment.
	Overhead hazards	<ul style="list-style-type: none"> Personnel will be required to wear hard hats that meet ANSI Standard Z89.1; Ground personnel will stay clear of suspended loads; Equipment will be provided with guards, canopies or grills to protect the operator from falling or flying objects; and Overhead hazards will be identified prior to commencing work operations.
	Noise	<ul style="list-style-type: none"> Ear plugs or ear muffs shall be worn for operations that exceed 85 decibels.
	Electrocution	<ul style="list-style-type: none"> Equipment will be equipped with GFCI; A licensed electrician will conduct electrical work; Equipment will stay a minimum of 15 feet from overhead-energized electrical lines and the electrified third rail (up to 50 kV). This distance will increase 0.4 inches for each 1 kV above 50 kV.
	Track Hazards	<ul style="list-style-type: none"> Caution will be used when working in close proximity to the electrified third rail (see "Electrocution" above). Workers are required to have completed NYCT Track Safety Training Flag men will be used when necessary (e.g., working in limited access track areas).
	Biological hazards	<ul style="list-style-type: none"> Be alert to the presence of biological hazards; Wear insect repellent; Follow procedures in Section 4.2.2 for tick bites; FTL/SHSO should be aware of on-site personnel with allergic reactions in insect bites and stings.

Project Identification Former Bellport Gas Station	Location East Patchogue, New York	Estimated Dates TBD
Phase of Work Drilling	Page 1 of 2	Analysis Approved by Paul Boyce, PE, PM/HSM
TASKS	HAZARDS	CONTROL MEASURES
1. Drill to required depths and collect soil samples/install groundwater sampling points.	Chemical hazards	<ul style="list-style-type: none"> Wear appropriate PPE per Table 6-1; Perform air monitoring per Community Air Monitoring Plan; Practice contamination avoidance; Follow proper decontamination procedures; and Wash hands/face before eating, drinking or smoking.
	Hand and power tool usage	<ul style="list-style-type: none"> Equip electrical equipment with GFCI's; Inspect electrical equipment and tools prior to use; Daily inspections will be performed; Remove broken or damaged tools from service; Use the tool for its intended purpose; Use in accordance with manufacturer instructions; and Tag and remove defective equipment.
	Temperature extremes	<ul style="list-style-type: none"> Drink plenty of fluids; Train personnel of signs/symptoms of heat/cold stress; Monitor air temperatures when extreme weather conditions are present; and, Stay in visual and verbal contact with your buddy.
	Manual lifting and material handling	<ul style="list-style-type: none"> Instruct personnel on proper lifting techniques; Use proper lifting techniques; and Team lifting will be used for heavy loads or use mechanical lifting devices.
	Fire/Explosion	<ul style="list-style-type: none"> ABC type fire extinguishers shall be readily available; No smoking in work area.
	Biological hazards	<ul style="list-style-type: none"> Be alert to the presence of biological hazards; Wear insect repellent; Follow procedures in Section 4.2.2 for tick bites; FTL/SHSO should be aware of on-site personnel with allergic reactions in insect bites and stings.
	Heavy equipment	<ul style="list-style-type: none"> Ground personnel will stay clear of suspended loads; Ground personnel will stay out of the swing radius; Eye contact with operators will be made before approaching equipment; Equipment will not be approached on blind sides; Equipment will be equipped with backup alarms or spotters shall be used.
	Slips/Trips/Falls	<ul style="list-style-type: none"> Maintain alertness to slip/trip/fall hazards; Maintain good housekeeping; Walk, do not run; Wear footwear with soles that grip; Unloading areas should be on even terrain; and mark and repair if possible tripping hazards are present.
	Electrocution	<ul style="list-style-type: none"> Equipment will be equipped with GFCI; A licensed electrician will conduct electrical work; Equipment will stay a minimum of 15 feet from overhead-energized electrical lines and the electrified third rail (up to 50 kV). This distance will increase 0.4 inches for each 1 kV above 50 kV.

Project Identification Former Bellport Gas Station	Location East Patchogue, New York	Estimated Dates TBD
Phase of Work Drilling	Page 2 of 2	Analysis Approved by Paul Boyce, PE, PM/HSM
TASKS	HAZARDS	CONTROL MEASURES
	Noise	<ul style="list-style-type: none"> Hearing protection mandatory at or above 85 dBA. Instruct personnel how to properly wear hearing protective devices. <ul style="list-style-type: none"> • Disposable ear plugs or other hearing protection required when working near noisy equipment..
	Steam/Heat/Splashing	<ul style="list-style-type: none"> Use face shield and safety glasses or goggles; Stay out of the splash/steam radius; Do not direct steam at anyone; Do not hold objects with your foot and steam area near it; Direct spray to minimize spread of constituents of concern; and Use shielding as necessary.
	Excavation hazards	<ul style="list-style-type: none"> Follow 29 CFR 1926 Subpart P.
	Overhead hazards	<ul style="list-style-type: none"> Personnel will be required to wear hard hats that meet ANSI Standard Z89.1; Ground personnel will stay clear of suspended loads; Equipment will be provided with guards, canopies or grills to protect the operator from falling or flying objects; and Overhead hazards will be identified prior to commencing work operations.
	Electrocution	<ul style="list-style-type: none"> Equipment will be equipped with GFCI; A licensed electrician will conduct electrical work; Equipment will stay a minimum of 15 feet from overhead-energized electrical lines and the electrified third rail (up to 50 kV). This distance will increase 0.4 inches for each 1 kV above 50 kV.

Project Identification Former Bellport Gas Station	Location East Patchogue, New York	Estimated Dates TBD
Phase of Work Soil/Groundwater Sampling	Page 1 of 1	Analysis Approved by Paul Boyce, PE, PM/HSM
TASKS	HAZARDS	CONTROL MEASURES
1. Collect soil/groundwater samples.	Chemical hazards	<ul style="list-style-type: none"> Wear appropriate PPE per Table 6-1; Practice contamination avoidance; Follow proper decontamination procedures; and Wash hands/face before eating, drinking or smoking.
	Temperature extremes	<ul style="list-style-type: none"> Drink plenty of fluids; Train personnel of signs/symptoms of heat/cold stress; Monitor air temperatures when extreme weather conditions are present; and Stay in visual and verbal contact with your buddy.
	Manual lifting and material handling	<ul style="list-style-type: none"> Site personnel will be instructed on proper lifting techniques; mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available.
	Slips/Trips/Falls	<ul style="list-style-type: none"> Maintain alertness to slip/trip/fall hazards; Maintain good housekeeping; Walk, do not run; Wear footwear with soles that grip; Unloading areas should be on even terrain; and Mark and repair if possible tripping hazards.
	Electrocution	<ul style="list-style-type: none"> Equipment will be equipped with GFCI; A licensed electrician will conduct electrical work; Equipment will stay a minimum of 15 feet from overhead-energized electrical lines and the electrified third rail (up to 50 kV). This distance will increase 0.4 inches for each 1 kV above 50 kV.

Project Identification Former Bellport Gas Station	Location East Patchogue, New York	Estimated Dates TBD
Phase of Work Decontamination	Page 1 of 1	Analysis Approved by Paul Boyce, PE, PM/HSM
TASKS	HAZARDS	CONTROL MEASURES
1. Decontaminate equipment	Chemical hazards	<ul style="list-style-type: none"> Wear appropriate PPE per Table 6-1; Practice contamination avoidance; Follow proper decontamination procedures; and Wash hands/face before eating, drinking or smoking.
	Temperature extremes	<ul style="list-style-type: none"> Drink plenty of fluids; Train personnel of signs/symptoms of heat/cold stress; Monitor air temperatures when extreme weather conditions are present; and Stay in visual and verbal contact with your buddy.
	Manual lifting and material handling	<ul style="list-style-type: none"> Site personnel will be instructed on proper lifting techniques; mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available.
	Slips/Trips/Falls	<ul style="list-style-type: none"> Maintain alertness to slip/trip/fall hazards; Maintain good housekeeping; Walk, do not run; Wear footwear with soles that grip; Unloading areas should be on even terrain; and Mark and repair if possible tripping hazards.
	Electrocution	<ul style="list-style-type: none"> Equipment will be equipped with GFCI; A licensed electrician will conduct electrical work; Equipment will stay a minimum of 15 feet from overhead-energized electrical lines and the electrified third rail (up to 50 kV). This distance will increase 0.4 inches for each 1 kV above 50 kV.

APPENDIX C

HEAT/COLD STRESS PROTOCOLS

HEAT STRESS

Heat Stress (Hyperthermia)

Heat stress is the body's inability to regulate the core temperature. A worker's susceptibility to heat stress can vary according to his/her physical fitness, degree of acclimation to heat, humidity, age and diet.

1. Prior to site activity, the field team leader may make arrangements for heat stress monitoring (i.e., monitoring heart rate, body temperature, and body water loss) during actual site work if conditions warrant. In addition, the FTL is to ensure that each team member has been acclimatized to the prevailing environmental conditions, that personnel are aware of the signs and symptoms of heat sickness, that they have been adequately trained in first aid procedures, and that there are enough personnel on-site to rotate work assignments and schedule work during hours of reduced temperatures. Personnel should not consume alcoholic or caffeinated beverages but rather drink moderate levels of an electrolyte solution and eat well prior to commencing site work.
2. Although there is no specific test given during a baseline physical that would identify a person's intolerance to heat, some indicators are tobacco or medication use, dietary habits, body weight, and chronic conditions such as high blood pressure or diabetes.
3. *Heat cramps*, caused by profuse perspiration with inadequate fluid intake and salt replacement, most often afflict people in good physical condition who work in high temperature and humidity. Heat cramps usually come on suddenly during vigorous activity. Untreated, heat cramps may progress rapidly to heat exhaustion or heat stroke. First aid treatment: remove victim to a cool place and replace lost fluids with water.
4. Thirst is not an adequate indicator of heat exposure. Drinking fluid by itself does not indicate sufficient water replacement during heat exposure. A general rule, the amount of water administered should replace the amount of water lost, and it should be administered at regular intervals throughout the day. For every half pound of water lost, 8 ounces of water should be ingested. Water should be replaced by drinking 2 – 4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink split 50/50 with water.

5. *Heat exhaustion* results from salt and water loss along with peripheral pooling of blood. Like heat cramps, heat exhaustion tends to occur in persons in good physical health who are working in high temperatures and humidity. Heat exhaustion may come on suddenly as dizziness and collapse. Untreated, heat exhaustion may progress to heat stroke.
6. *Treatment for heat exhaustion:* Move the victim to a cool environment (e.g. air-conditioned room/car), lay victim down and fan him/her. If the air-conditioning is not available, remove the victim to a shaded area, remove shirt, and fan. If symptoms do not subside within an hour, notify 911 to transport to hospital.
7. *Heat stroke* results from the body's inability to dissipate excess heat. A true medical emergency that requires immediate care, it usually occurs when one ignores the signs of heat exhaustion and continues strenuous activities. Working when the relative humidity exceeds 60% is a particular problem. Workers in the early phase of heat stress may not be coherent of they will be confused, delirious or comatose. Changes in behavior, irritability and combativeness are useful early signs of heat stroke.
8. *Treatment of heat stroke:* Move the victim to a cool, air-conditioned environment. Place victim in a semi-reclined position with head elevated and strip to underclothing. Cool victim as rapidly as possible, applying ice packs to the arms and legs and massaging the neck and torso. Spray victim with tepid water and constantly fan to promote evaporation. Notify 911 to transport to hospital as soon as possible.

TABLE 1

SYMPTOMS OF HEAT STRESS

Heat cramps are caused by heavy sweating with inadequate fluid intake. Symptoms include;

- Muscle cramps
- Cramps in the hands, legs, feet and abdomen

Heat exhaustion occurs when body organs attempt to keep the body cool. Symptoms include;

- Pale, cool moist skin
- Core temperature elevated 1-2°
- Thirst
- Anxiety
- Rapid heart rate
- Heavy sweating
- Dizziness
- Nausea

Heat stroke is the most serious form of heat stress. Immediate action must be taken to cool the body before serious injury and death occur. Symptoms are;

- Red, hot, dry skin
- Lack of perspiration
- Seizures
- Dizziness and confusion
- Strong, rapid pulse
- Core temperature of 104° or above
- Coma

TABLE 2

HEAT STRESS INDICATORS

Heat stress indicator	When to measure	If Exceeds...	Action
Heart rate (pulse)	Beginning of rest period	110 beats per minute	Shorten next work period by 33%
Oral temperature	Beginning of rest period	99°F (after thermometer is under tongue for 3 minutes)	Shorten next work period by 33%
		100.6°F	Prohibit work in impermeable clothing
Body weight	<ol style="list-style-type: none"> 1. Before workday begins (a.m.) 2. After workday ends (p.m.) 		Increase fluid intake

COLD STRESS

Cold stress (Hypothermia)

In hypothermia the core body temperature drops below 95°F. Hypothermia can be attributed to a decrease in heat production, increased heat loss or both.

Prevention

Institute the following steps to prevent overexposure of workers to cold:

1. Maintain body core temperature at 98.6°F or above by encouraging workers to drink warm liquids during breaks (preferably not coffee) and wear several layers of clothing that can keep the body warm even when the clothing is wet.
2. Avoid frostbite by adequately covering hands, feet and other extremities. Clothing such as insulated gloves or mittens, earmuffs and hat liners should be worn. To prevent contact frostbite (from touching metal and cold surfaces below 20°F), workers should wear gloves. Tool handles should be covered with insulating material.
3. Adjust work schedules to provide adequate rest periods. When feasible, rotate personnel and perform work during the warmer hours of the day.
4. Provide heated shelter. Workers should remove their outer layer(s) of clothing while in the shelter to allow sweat to evaporate.
5. In the event that wind barriers are constructed around an intrusive operation (such as drilling), the enclosure must be properly vented to prevent the buildup of toxic or explosive gases or vapors. Care must be taken to keep a heat source away from flammable substances.
6. Using a wind chill chart such as the one in Table 3, obtain the equivalent chill temperature (ECT) based on actual wind speed and temperature. Refer to the ECT when setting up work warm-up schedules, planning appropriate clothing, etc. Workers should use warming shelters at regular intervals at or below an ECT of 20°F. For exposed skin, continuous exposure should not be permitted at or below an ECT of -25°F.

Frostbite

Personnel should be aware of symptoms of frostbite/hypothermia. If the following symptoms are noticed in any worker, he/she should immediately go to a warm shelter.

Condition	Skin Surface	Tissue Under Skin	Skin Color
Frostnip	Soft	Soft	Initially red, then white
Frostbite	Hard	Soft	White and waxy
Freezing	Hard	Hard	Blotchy, white to yellow-gray to gray

1. *Frostnip* is the incipient stage of frostbite, brought about by direct contact with a cold object or exposure of a body part to cool/cold air. Wind chill or cold water also can be major factors. This condition is not serious. Tissue damage is minor and the response to care is good. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostnip.
2. *Treatment of frostnip*: Care for frostnip by warming affected areas. Usually the worker can apply warmth from his/her bare hands, blow warm air on the site, or, if the fingers are involved, hold them in the armpits. During recovery, the worker may complain of tingling or burning sensation, which is normal. If the condition does not respond to this simple care, begin treatment for frostbite.
3. *Frostbite*: The skin and subcutaneous layers become involved. If frostnip goes untreated, it becomes superficial frostbite. This condition is serious. Tissue damage may be serious. The worker must be transported to a medical facility for evaluation. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostbite. The affected area will feel frozen, but only on the surface. The tissue below the surface must still be soft and have normal response to touch. *DO NOT* squeeze or poke the tissue. The condition of the deeper tissues can be determined by gently palpating the affected area. The skin will turn mottled or blotchy. It may also be white and then turn grayish-yellow.
4. *Treatment of frostbite*: When practical, transport victim as soon as possible. Get the worker inside and keep him/her warm. Do not allow any smoking or alcohol consumption. Thaw frozen parts by immersion, re-warming in a 100°F to 106°F water bath. Water temperature will drop rapidly, requiring additional warm water throughout the process. Cover the thawed part with a dry sterile dressing. Do not puncture or drain any blisters.

NOTE: Never listen to myths and folk tales about the care of frostbite. *Never* rub a frostbitten or frozen area. *Never* rub snow on a frostbitten or frozen area. Rubbing the area may cause

serious damage to already injured tissues. Do not attempt to thaw a frozen area if there is any chance it will be re-frozen.

5. *General cooling/Hypothermia:* General cooling of the body is known as systemic hypothermia. This condition is not a common problem unless workers are exposed to cold for prolonged periods of time without any shelter.

Body Temperature	°C	Symptoms
99-96	37-35.5	Intense, uncontrollable shivering
95-91	35.5-32.7	Violent shivering persists. If victim is conscious, he has difficulty speaking.
90-86	32-30	Shivering decreases and is replaced by strong muscular rigidity. Muscle coordination is affected. Erratic or jerkey movements are produced. Thinking is less clear. General comprehension is dulled. There may be total amnesia. The worker is generally still able to maintain the appearance of psychological contact with his surroundings.
85-81	29.4-27.2	Victim becomes irrational, loses contact with his environment, and drifts into a stuporous state. Muscular rigidity continues. Pulse and respirations are slow and the worker may develop cardiac arrhythmias.
80-78	26.6-18.5	Victim becomes unconscious. He does not respond to the spoken word. Most reflexes cease to function. Heartbeat becomes erratic
Below 78	25.5	Cardiac and respiratory centers of the brain fail. Ventricular fibrillation occurs; probably edema and hemorrhage in the lungs; death.

6. *Treatment of hypothermia:* Keep worker dry. Remove any wet clothing and replace with dry clothes, or wrap person in dry blankets. Keep person at rest. Do not allow him/her to move around. Transport the victim to a medical facility as soon as possible.

TABLE 3⁽¹⁾
COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED
AS AN EQUIVALENT TEMPERATURE (UNDER CALM CONDITIONS)

Estimated wind Speed (in mph)	Actual Temperature Reading (°F)P											
	50	40	30	20	10	0	10	20	30	40	50	60
	Equivalent Chill Temperature (°F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	15	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-146
(Wind speeds greater than 40 mph have little additional effect.)	LITTLE DANGER in < hr with dry skin. Maximum danger of false sense of security.			INCREASING DANGER Danger from freezing of exposed flesh within one minute			GREAT DANGER may freeze within 30 seconds.			Flesh		
Trench foot and immersion foot may occur at any point on this chart												

Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

(1) Reproduced from American Conference of Governmental Industrial Hygienists, Threshold Limit Values and Biological Exposure Indices for 1985-1988, p.01.

APPENDIX D

GENERAL HEALTH AND SAFETY WORK PRACTICES

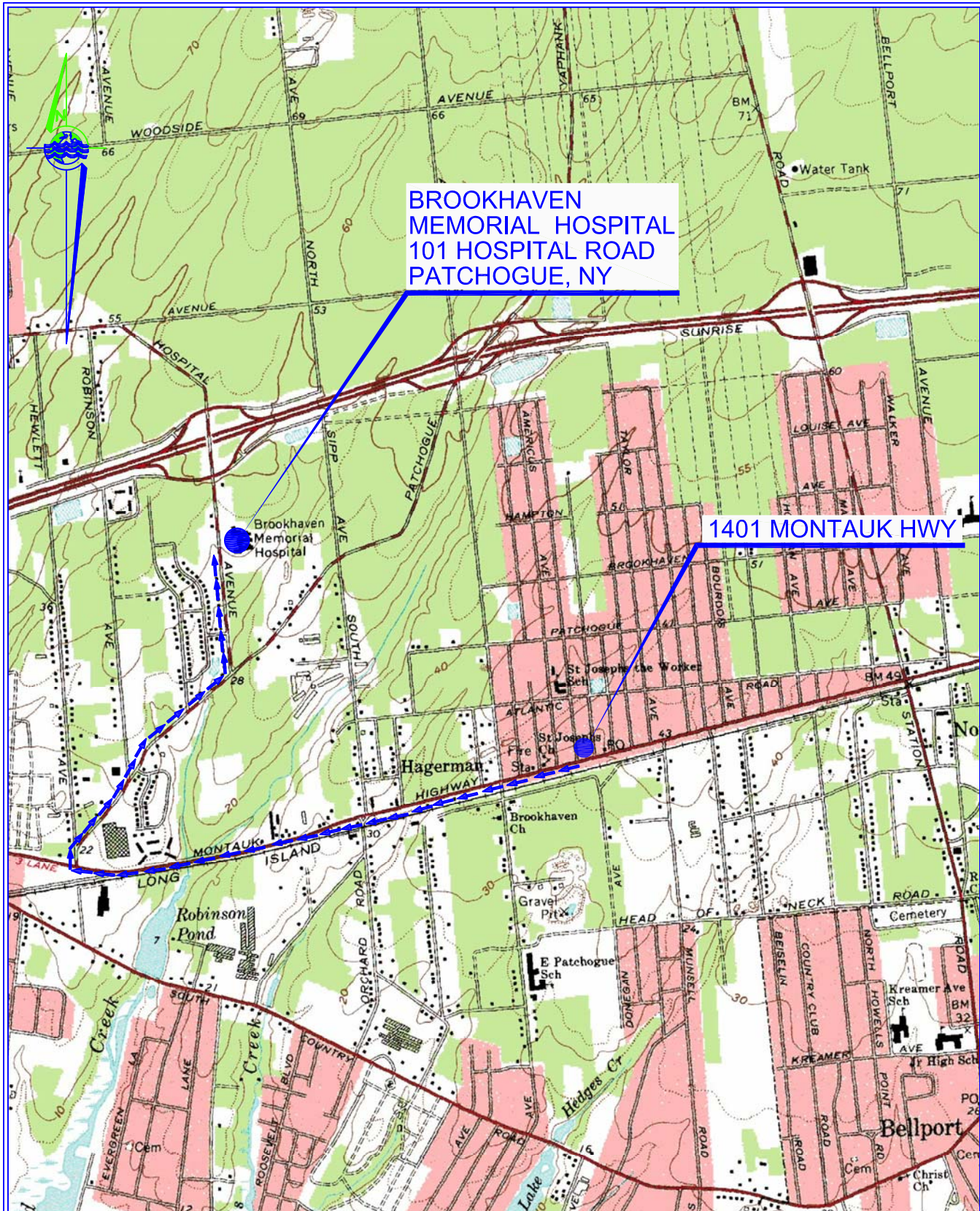
GENERAL HEALTH AND SAFETY WORK PRACTICES

1. Site personnel must attend each day's Daily Briefing and sign the attendance sheet.
2. Any individual taking prescribed drugs shall inform the FTL/HSO of the type of medication. The FTL/HSO will review the matter with the HSM and the Corporate Medical Consultant (CMC), who will decide if the employee can safely work on-site while taking the medication.
3. The personal protective equipment specified by the FTL/HSO and/or associated procedures shall be worn by site personnel. This includes hard hats and safety glasses which must be worn in active work areas.
4. Facial hair (beards, long sideburns or mustaches) which may interfere with a satisfactory fit of a respirator mask is not allowed on any person who may be required to wear a respirator.
5. Personnel must follow proper decontamination procedures and shower as soon as possible upon completion of work shift.
6. Eating, drinking, chewing tobacco or gum, smoking and any other practice that may increase the possibility of hand-to-mouth contact is prohibited in the exclusion zone or the contamination reduction zone. (Exceptions may be permitted by the HSM to allow fluid intake during heat stress conditions).
7. Lighters, matches, cigarettes and other forms of tobacco are prohibited in the Exclusion Zone.
8. Signs and demarcations shall be followed. Such signs and demarcation shall not be removed, except as authorized by the FTL/HSO.
9. No one shall enter a permit-required confined space without a permit and appropriate training. Confined space entry permits shall be implemented as issued.
10. Personnel must follow Hot Work Permits as issued.
11. Personnel must use the Buddy System in the Exclusion Zone.
12. Personnel must follow the work-rest regimens and other practices required by the heat stress program.
13. Personnel must follow lockout/tagout procedures when working on equipment involving moving parts or hazardous energy sources.
14. No person shall operate equipment unless trained and authorized.
15. No one may enter an excavation greater than four feet deep unless authorized by the Competent Person. Excavations must be sloped or shored properly. Safe means of access and egress from excavations must be maintained.
16. Ladders and scaffolds shall be solidly constructed, in good working condition, and inspected prior to use. No one may use defective ladders or scaffolds.
17. Fall protection or fall arrest systems must be in place when working at elevations greater than six feet for temporary working surfaces and four feet for fixed platforms.
18. Safety belts, harnesses and lanyards must be selected by the Supervisor. The user must inspect the equipment prior to use. No defective personal fall protection equipment shall be used. Personal fall protection that has been shock loaded must be discarded.
19. Hand and portable power tools must be inspected prior to use. Defective tools and equipment shall not be used.
20. Ground fault interrupters shall be used for cord and plug equipment used outdoors or in damp locations. Electrical cords shall be kept out walkways and puddles unless protected and rated for the service.
21. Improper use, mishandling, or tampering with health and safety equipment and samples is prohibited.
22. Horseplay of any kind is prohibited.
23. Possession or use of alcoholic beverages, controlled substances, or firearms on any site is forbidden.
24. Incidents, no matter how minor, must be reported immediately to the Supervisor.
25. Personnel shall be familiar with the Site Emergency Action Plan, which is contained in Section 12 of the HASP/EAP.

The above Health and Safety Rules are not all inclusive and it is your responsibility to comply with regulations set forth by OSHA, the client, PWGC Supervisors, and the FTL/HSO.

APPENDIX E

HOSPITAL ROUTE MAPS & EMERGENCY PHONE NUMBERS



**BROOKHAVEN
MEMORIAL HOSPITAL
101 HOSPITAL ROAD
PATCHOGUE, NY**

1401 MONTAUK HWY

Mapped, edited, and published by the Geological Survey
Revised in cooperation with New York
Department of Transportation
Control by USGS, USC&GS, and New Jersey Geodetic Survey

HOSPITAL ROUTE MAP

SCALE: 1:24,000

J:\Projects S-Z\SHD\1008 - Bellport Monitoring\Site Management Plan\CAD\Hospital Route Map.dwg (8x11v) Jun 09,2011-11:15am By: guzman

PWGC
Strategic Environmental & Engineering Solutions
630 Johnson Ave, Suite 7
Patchogue, NY 11771-2618
Ph: 631 589-6353 Fax: 631 589-8705
E-mail: info@pwgcrs.com

**1401 MONTAUK HWY, E. PATCHOGUE, NY TO
BROOKHAVEN MEMORIAL HOSPITAL
101 HOSPITAL ROAD, PATCHOGUE, NY**

Project: SHD1008	Figure No: 3
Designed by: DE	
Approved by: PWG	
Drawn by: LLG	Date: 6/9/11

EMERGENCY PHONE NUMBERS

General Emergencies - New York City Police/Fire Department/Ambulance	911
Non-Emergency Hotline - New York City Police/Fire Department/Ambulance	311
Local Emergency Medical Center (Brookhaven Memorial Hospital)	1-631-654-7100
National Response Center	1-800-424-8802
Poison Control	1-212-340-4494
Paul Boyce, PE, PWGC PM/HSM	1-516-315-6031
Zeb Youngman, PWGC PM/HSM	1-516-807-6896
Derek Ersbak, PWGC FTL/HSO	1-516-852-6750
Chris Amato, PWGC Alternate FTL/HSO	1-631-365-5202

APPENDIX F

INCIDENT REPORT FORM / INVESTIGATION FORM

INCIDENT / NEAR MISS REPORT AND INVESTIGATION - PAGE 1 OF 2		
TYPE OF INCIDENT - CHECK ALL THAT APPLY		
<input type="checkbox"/> INJURY/ILLNESS	<input type="checkbox"/> VEHICLE DAMAGE	<input type="checkbox"/> PROPERTY DAMAGE
<input type="checkbox"/> SPILL/RELEASE	<input type="checkbox"/> PERMIT EXCEEDENCE	<input type="checkbox"/> NEAR MISS
GENERAL INFORMATION		
PROJECT NAME:	DATE OF REPORT:	REPORT NO.:
DATE OF INCIDENT:	TIME:	DAY OF WEEK:
LOCATION OF INCIDENT:		
WEATHER CONDITIONS:	ADEQUATE LIGHTING AT SCENE? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	
DESCRIBE WHAT HAPPENED (STEP BY STEP - USE ADDITIONAL PAGES IF NECESSARY)		
AFFECTED EMPLOYEE INFORMATION		
NAME:	EMPLOYEE: <input type="checkbox"/> YES <input type="checkbox"/> NO	
HOME ADDRESS:		
SOCIAL SECURITY NO.:	HOME PHONE NO.:	
JOB CLASSIFICATION:	YEARS IN JOB CLASSIFICATION:	
HOURS WORKED ON SHIFT PRIOR TO INCIDENT:	AGE:	
DID INCIDENT RELATE TO ROUTINE TASK FOR JOB CLASSIFICATION? <input type="checkbox"/> YES <input type="checkbox"/> NO		
INJURY/ILLNESS INFORMATION		
NATURE OF INJURY OR ILLNESS:		
OBJECT/EQUIPMENT/SUBSTANCE CAUSING HARM:		
FIRST AID PROVIDED? <input type="checkbox"/> YES <input type="checkbox"/> NO		
IF YES, WHERE WAS IT GIVEN: <input type="checkbox"/> ON-SITE <input type="checkbox"/> OFF-SITE		
IF YES, WHO PROVIDED FIRST AID:		
WILL THE INJURY/ILLNESS RESULT IN: <input type="checkbox"/> RESTRICTED DUTY <input type="checkbox"/> LOST TIME <input type="checkbox"/> UNKNOWN		

INCIDENT / NEAR MISS REPORT AND INVESTIGATION - PAGE 2 OF 2		REPORT NO.
MEDICAL TREATMENT INFORMATION		
WAS MEDICAL TREATMENT PROVIDED? <input type="checkbox"/> YES <input type="checkbox"/> NO		
IF YES, WAS MEDICAL TREATMENT PROVIDED: <input type="checkbox"/> ON-SITE <input type="checkbox"/> DR.'S OFFICE <input type="checkbox"/> HOSPITAL		
NAME OF PERSON(S) PROVIDING TREATMENT:		
ADDRESS WHERE TREATMENT WAS PROVIDED:		
TYPE OF TREATMENT:		
VEHICLE AND PROPERTY DAMAGE INFORMATION		
VEHICLE/PROPERTY DAMAGED:		
DESCRIPTION OF DAMAGE:		
SPILL AND AIR EMISSIONS INFORMATION:		
SUBSTANCE SPILLED OR RELEASED:	FROM WHERE:	TO WHERE:
ESTIMATED QUANTITY/DURATION:		
CERCLA HAZARDOUS SUBSTANCE? <input type="checkbox"/> YES <input type="checkbox"/> NO		
REPORTABLE TO AGENCY? <input type="checkbox"/> YES <input type="checkbox"/> NO SPECIFY:		
WRITTEN REPORT: <input type="checkbox"/> YES <input type="checkbox"/> NO TIME FRAME:		
RESPONSE ACTION TAKEN:		
PERMIT EXCEEDENCE		
TYPE OF PERMIT:	PERMIT #:	
DATE OF EXCEEDENCE:	DATE FIRST KNOWLEDGE OF EXCEEDENCE:	
PERMITTED LEVEL OR CRITERIA:		
EXCEEDENCE LEVEL OR CRITERIA:		
REPORTABLE TO AGENCY? <input type="checkbox"/> YES <input type="checkbox"/> NO SPECIFY:		
WRITTEN REPORT: <input type="checkbox"/> YES <input type="checkbox"/> NO TIME FRAME:		
RESPONSE ACTION TAKEN:		
NOTIFICATIONS		
NAMES OF PERSONNEL NOTIFIED:	DATE/TIME:	
CLIENT NOTIFIED:	DATE/TIME:	
AGENCY NOTIFIED:	DATE/TIME:	
CONTACT NAME:		
PERSONS PREPARING REPORT		
EMPLOYEE'S NAME:(PRINT)	SIGN:	
SUPERVISOR'S NAME:(PRINT)	SIGN:	

INVESTIGATIVE REPORT			
DATE OF INCIDENT:		DATE OF REPORT:	REPORT NUMBER:
INCIDENT COST: ESTIMATED: \$ _____		ACTUAL: \$ _____	
OSHA RECORDABLE(S): <input type="checkbox"/> YES <input type="checkbox"/> NO # RESTRICTED DAYS ____ # DAYS AWAY FROM WORK ____			
CAUSE ANALYSIS			
IMMEDIATE CAUSES - WHAT ACTIONS AND CONDITIONS CONTRIBUTED TO THIS EVENT?			
BASIC CAUSES - WHAT SPECIFIC PERSONAL OR JOB FACTORS CONTRIBUTED TO THIS EVENT?			
ACTION PLAN			
REMEDIAL ACTIONS - WHAT HAS AND OR SHOULD BE DONE TO CONTROL EACH OF THE CAUSES LISTED?			
ACTION	PERSON RESPONSIBLE	TARGET DATE	COMPLETION DATE
PERSONS PERFORMING INVESTIGATION			
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
MANAGEMENT REVIEW			
PROJECT MANAGER: (PRINT)	SIGN:	DATE:	
COMMENTS:			
H&S MANAGER: (PRINT)	SIGN:	DATE:	
COMMENTS:			

EXAMPLES OF IMMEDIATE CAUSES

Substandard Actions

1. Operating equipment without authority
2. Failure to warn
3. Failure to secure
4. Operating at improper speed
5. Making safety devices inoperable
6. Removing safety devices
7. Using defective equipment
8. Failure to use PPE properly
9. Improper loading
10. Improper placement
11. Improper lifting
12. Improper position for task
13. Servicing equipment in operation
14. Under influence of alcohol/drugs
15. Horseplay

Substandard Conditions

1. Guards or barriers
2. Protective equipment
3. Tools, equipment, or materials
4. Congestion
5. Warning system
6. Fire and explosion hazards
7. Poor housekeeping
8. Noise exposure
9. Exposure to hazardous materials
10. Extreme temperature exposure
11. Illumination
12. Ventilation
13. Visibility

EXAMPLES OF BASIC CAUSES

Personal Factors

1. Capability
2. Knowledge
3. Skill
4. Stress
5. Motivation
6. Work Standards
7. Wear and tear
8. Abuse or misuse

Job Factors

1. Supervision
2. Engineering
3. Purchasing
4. Maintenance
5. Tools/equipment

MANAGEMENT PROGRAMS FOR CONTROL OF INCIDENTS

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Leadership and administration 2. Management training 3. Planned inspections 4. Task analysis and procedures 5. Task observation 6. Emergency preparedness 7. Organizational rules 8. Accident/incident analysis 9. Personal protective equipment | <ol style="list-style-type: none"> 10. Health control 11. Program audits 12. Engineering controls 13. Personal communications 14. Group meetings 15. General promotion 16. Hiring and placement 17. Purchasing controls |
|---|---|

APPENDIX G

DAILY BRIEFING SIGN-IN SHEET

DAILY BRIEFING SIGN-IN SHEET

Date: _____ Project Name/Location: _____

Person Conducting Briefing: _____

1. AWARENESS (topics discussed, special safety concerns, recent incidents, etc.)

2. OTHER ISSUES (HASP/EAP changes, attendee comments, etc.)

3. ATTENDEES (Print Name):

1.	21.
2.	22.
3.	23.
4.	24.
5.	25.
6.	26.
7.	27.
8.	28.
9.	29.
10.	30.
11.	31.
12.	32.
13.	33.
14.	34.
15.	35.
16.	36.
17.	37.
18.	38.
19.	39.
20.	40.

FORMER BELLPORT GAS STATION SITE
1401 MONTAUK HIGHWAY
EAST PATCHOGUE, NY
SITE: #E-1-52-194

COMMUNITY AIR MONITORING PLAN

SUBMITTED TO:



New York State Department of Environmental Conservation
Division of Environmental Remediation
NYSDEC Region 1
50 Circle Road
Stony Brook, New York 11790-3409

ON BEHALF OF:



Suffolk County Department of Health Services
Office of Pollution Control
15 Horseblock Place
Farmingville, New York 11738

PREPARED BY:



P.W. Grosser Consulting, Inc.
630 Johnson Avenue, Suite 7
Bohemia, New York 11716
Phone: 631-589-6353
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PWGC Project Number: SHD1008

NOVEMBER 2013

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Table 2-1	Frequency and Location of Air Monitoring
Table 2-2	Real-Time Air Monitoring Action Levels

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) provides measures for protection for on-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the investigation) from potential airborne contaminant releases resulting from subsurface investigation activities at the Former Bellport Gas Station site, East Patchogue, New York.

Action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that the remedial work did not spread contamination off-site through the air.

The primary concerns for this site are volatile organic compounds (VOCs), metals (represented by particulate dust) and dust particulates.

1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- 29 CFR 1910.120(h): This regulation specifies that air shall be monitored to identify and quantify levels of airborne hazardous substances and health hazards, and to determine the appropriate level of protection for workers.
- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan: This guidance specifies that a community air-monitoring program shall be implemented to protect the surrounding community and to confirm that the work does not spread contamination off-site through the air.
- New York State Department of Environmental Conservation (NYSDEC) Technical and Guidance Memorandum (TAGM) #4031 - Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites: This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2.0 AIR MONITORING

The following sections contain information describing the types, frequency and location of real-time monitoring.

2.1 Real-Time Monitoring

This section addresses the real-time monitoring conducted within the work area, and along the site perimeter, during intrusive activities such as drilling and excavation.

2.1.1 Work Area

The following instruments shall be used for work area monitoring:

- Photoionization Detector (PID)
- Dust Monitor

Table 2-1 presents a breakdown of each main activity and provides the instrumentation, frequency and location of the real-time monitoring for the site. Table 2-2 lists the Real-Time Air Monitoring Action Levels to be used in work areas.

2.1.2 Community Air Monitoring Requirements

To establish ambient air background concentrations, air quality monitoring shall be performed at several locations around the site perimeter before investigation activities begin. Air monitoring shall be continued periodically in series during work activities.

Fugitive respirable dust will be monitored using a MiniRam Model PDM-3 aerosol monitor or equivalent. Air will be monitored for VOCs with a portable Photovac MicroTip photoionization detector (PID), or equivalent. Table 2-1 presents a breakdown of each main activity and provides the instrumentation, frequency and location of the real-time monitoring for the site. Table 2-2 lists the Real-Time Air Monitoring Action Levels to be used in work areas. Air monitoring data shall be documented in a site log book by the designated site safety officer. PWGC's site safety officer or delegate shall calibrate and maintain air monitoring instruments in accordance with manufacturer's specifications. Instruments shall be zeroed daily and checked for accuracy and a daily log shall be kept. If additional air monitoring is required, protocols shall be appended to this plan.

**TABLE 2-1
FREQUENCY AND LOCATION OF AIR MONITORING**

ACTIVITY	AIR MONITORING INSTRUMENT	FREQUENCY AND LOCATION
Drilling, Excavation	PID, Dust Monitor	Continuous in Breathing Zone (BZ) and downwind work area perimeter during intrusive activities or if odors become apparent. Screening upon arrival at sampling locations, screening in the BZ during sampling and downwind work area perimeter every 30 minutes during non-intrusive activities

**TABLE 2-2
REAL-TIME AIR MONITORING ACTION LEVELS**

AIR MONITORING INSTRUMENT	MONITORING LOCATION	ACTION LEVEL	SITE ACTION	REASON
PID	Breathing Zone	0-25 ppm, non-transient	None	Exposure below established exposure limits
PID	Breathing Zone	25-100 ppm, non-transient	Don APR	Based on potential exposure to VOCs
PID	Breathing Zone	>100 ppm, non-transient	Don ASR or SCBA, Institute vapor/odor suppression measures, Notify HSM.	Increased exposure to site contaminants, potential for vapor release to public areas.
PID	Work Area Perimeter	< 5 ppm	None	Exposure below established exposure limits.
PID	Work Area Perimeter	> 5 ppm	Stop work and implement vapor release response plan until readings return to acceptable levels, Notify HSM.	Increased exposure to site contaminants, potential for vapor release to public areas
Aerosol Monitor	Work Area Perimeter	>100 but < 150 $\mu\text{g}/\text{m}^3$ for 15 minutes	Institute dust suppression measures, Notify HSM.	Work to continue if particulate concentrations remain below 150 $\mu\text{g}/\text{m}^3$
Aerosol Monitor	Work Area Perimeter	>150 $\mu\text{g}/\text{m}^3$	Don ASR or SCBA, Institute dust suppression measures, Notify HSM.	Stop work until readings return to acceptable levels,

3.0 VAPOR EMISSION RESPONSE PLAN

This section is excerpted from the NYSDOH guidance for Community Air Monitoring Plan - Ground Intrusive Activities.

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities shall be halted and monitoring continued. Vapor suppression measures can also be taken at this time. If the organic vapor level decreases below 5 ppm above background, work activities can resume. If organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided:

- Organic vapor levels 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If organic vapor levels exceed 25 ppm at the perimeter of the work area, work activities shall be halted. When work is halted, downwind air monitoring as directed by the Site Health & Safety Officer (SHSO) shall be implemented to determine whether vapor emission may impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission Response Plan Section.

4.0 MAJOR VAPOR EMISSION RESPONSE PLAN

If organic vapor levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, work activities shall be halted.

If, following the cessation of the work activities, or as the result of an emergency, organic vapor levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality shall be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If efforts to abate the emission source (see Section 5.0) are unsuccessful and if organic vapor levels are approaching 5 ppm above background for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect.

However, the Major Vapor Emission Response Plan shall be immediately placed in effect if organic vapor levels are greater than 10 ppm above background.

Upon activation, the following activities shall be undertaken:

1. Emergency Response Contacts, as identified in the Health & Safety Plan, shall go into effect.
2. The local police authorities shall be contacted immediately by the Health & Safety Officer and advised of the situation.
3. Frequent air monitoring shall be conducted at 30-minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Health & Safety Officer.

5.0 VAPOR SUPPRESSION TECHNIQUES

Vapor suppression techniques shall be employed when action levels warrant their use. Although not anticipated as part of the remedial investigation techniques to be implemented for control of VOCs from stockpiled soil or open excavations may include one or more of the following:

- cover with plastic
- cover with "clean soil"
- application of hydro-mulch material*
- limit working hours to favorable wind and temperature conditions

*This material is a seedless version of the hydro-seed product commonly used by commercial landscaping contractors to provide stabilization and rapid grow-in of grasses or wild flowers along highways, embankments and other large areas. Hydro-mulch can be sprayed over open excavation areas, temporary stockpile areas and loaded trucks, as necessary. This is a highly effective method for controlling odors, because the release of odors is sealed immediately at the source.

6.0 DUST SUPPRESSION TECHNIQUES

Reasonable dust-suppression techniques shall be employed during work that may generate dust, such as excavation, grading, and placement of clean fill. The following techniques were shown to be effective for controlling the generation and migration of dust during remedial activities:

- Wetting equipment and excavation faces;
- Spraying water on buckets during excavation and dumping;
- Hauling materials in properly covered containers; and,
- Restricting vehicle speeds to 10 mph.

Using atomizing sprays should prevent overly wet conditions, conserve water, and offer an effective means of suppressing fugitive dust. It is imperative that utilizing water for suppressing dust not create surface runoff.

7.0 DATA QUALITY ASSURANCE

7.1 Calibration

Instrument calibration shall be documented in the designated field logbook. Instruments shall be calibrated before each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

7.2 Operations

Instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment shall be maintained on-site by the FOL/HSO for reference.

7.3 Data Review

The Field Team Leader FOL/SHSO shall interpret monitoring data based on Table 2-2 and his/her professional judgment. The FOL/HSO shall review the data with the HSM to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, comparison to direct reading instrumentation and changes in the integrated monitoring strategy.

Monitoring and sampling data, along with sample documentation shall be periodically reviewed by the HSM.

8.0 RECORDS AND REPORTING

Readings shall be recorded and available for review by personnel from NYSDEC and NYSDOH. Should any of the action levels be exceeded, the NYSDEC Division of Air Resources shall be notified in writing within five (5) working days.

The notification shall include a description of the control measures implemented to prevent further exceedances.

APPENDIX D – MONITORING WELL CONSTRUCTION LOG

APPENDIX E – GROUNDWATER SAMPLING LOG

APPENDIX F – SITE WIDE INSPECTION FORM

Former Bellport Gas Station Site – Site-wide Inspection Form

Date: _____ Time: _____

Weather: _____

Reason for Inspection: Routine other _____

Inspection Observations

Current site use: _____

Is there evidence of any of the following site activities / conditions at the site:

- Groundwater use
- Unrestricted (single family) residential housing
- Soil Disturbance at a depth >15'
- Environmental issue which has potential to impact human health.

General Observations / Comments:

Performed by: _____

Printed Name

Signature

Title

Company

APPENDIX G - QAPP

Appendix G Quality Assurance Project Plan

This quality assurance project plan (QAPP) presents the objectives, functional activities, methods, and quality assurance / quality control (QA/QC) requirements associated with sample collection and laboratory analysis for characterization activities. The QAPP follows requirements detailed in DER-10, Section 2.

Project Organization

The Remedial Design (RD) efforts will be coordinated by PWGC on behalf of the SCDHS. The following text identifies the responsibilities of various organizations supporting the RD:

- The NYSDEC Project Manager (John Sheehan) will be responsible for coordinating approval of requested modifications and providing guidance on regulatory requirements.
- The SCDHS Project Manager (James Meyers) will be responsible for providing technical support and acting as a liaison to SCDHS personnel working on the RD and the NYSDEC Project Manager.
- The PWGC Program Manager (James Rhodes) will provide technical expertise for review of the project plans, reports, and ongoing field activities. The program manager will be responsible for the coordination of the overall Environmental Restoration Program with the SCDHS. The Program Manager will act as the projects Quality Assurance Manager.
- PWGC Project Manager (Zeb Youngman) will be responsible for the day to day project management, task leadership, and project engineering support and for the planning and implementation of RD activities. The Project Manager will also act as the site Health and Safety Manager (HSM).
- PWGC Field Team Leader/SHSO (Derek Ersbak) will be responsible for sample collection, oversight of subcontractor personnel, and coordination of daily field activities. Mr. Ersbak will act as the Site Health and Safety Officer ensuring implementation of the Site Health and Safety Plan (HASP).
- A New York State Department of Health (NYSDOH) ELAP certified laboratory will perform required analyses and reporting.

Laboratory Analysis

Requirements for sample analysis are described below.

Groundwater Samples

Groundwater samples will be submitted to an NYSDOH ELAP certified laboratory. Samples will be analyzed for VOCs.

The samples will be analyzed in accordance with NYSDEC ASP methods. Category B data deliverables will be submitted for samples analyzed.

Analytical methods, preservation, container requirements, and holding time are shown in **Table 1**.

TABLE 1
ANALYTICAL METHODS
(GROUNDWATER)

Sample Matrix	Sample Designations	Sample Type	Parameters	EPA Method	Sample Preservation	Holding Time	Sample Container	Laboratory
Groundwater	GW-Groundwater	Grab	VOCs	8260	Cool to 4°C	7 days	40-mil vials	Chemtech

Field/Laboratory Data Control Requirements

Quality Control (QC) procedures must be followed in the field and at the laboratory to ensure that reliable data are obtained. When performing this field sampling effort, care shall be taken to prevent the cross-contamination of sampling equipment, sample bottles, and other equipment that could compromise sample integrity. QC samples to be collected in the field are provided in **Table 2**.

TABLE 2
FIELD/LABORATORY QC REQUIREMENTS

Sample Type	Frequency	Purpose
Field Duplicate	One duplicate sample, or One per 20 samples of the same matrix.	To evaluate the precision of the field sampling and laboratory analyses.
Equipment Blank	One per type of sampling method used for each batch of sampling equipment. Equipment blanks are collected in the field using analyte-free water supplied by the laboratory.	To assess the cleanliness of the sampling equipment and the effectiveness of the decontamination process.
Trip Blank	One VOA (volatile organic analysis) trip blank per sample cooler that contains site samples to be analyzed for VOAs.	To detect VOC cross-contamination during sample shipping and handling. No trip blanks are anticipated because VOCs are not part of the proposed analytical analysis.
Method Blank	One per 20 samples of same matrix	To document contamination resulting from the analytical process.
Matrix Spike	One per 20 samples of same matrix	It is used to measure the efficiency of all steps of the sampling and analytical methods in recovering the target analytes from the sample. It is a sample spiked with known quantities of analytes and subjected to the entire analytical procedure.
Matrix Spike Duplicate	One per 20 samples of same matrix.	To reinforce the matrix spike information. It is a second aliquot of the same sample as the matrix spike.

Chain-of-Custody, Sample Packaging, and Shipment

For each day of sampling, a chain-of-custody sheet will be completed and submitted to the laboratory. A copy of the chain-of-custody sheet will also be retained by the Project Manager. The chain-of-custody sheet will include the project name, the sampler's signature, sampling locations, the date and time of sample collection, and analysis parameters requested.

Samples must be packaged and shipped in a manner that maintains sample preservation requirements during transport (i.e., ice to keep samples cool until receipt at the laboratory), ensures that sample holding times can be achieved by the laboratory, and ensures that the samples cannot be tampered with.

If a commercial carrier ships samples, a bill of lading (waybill) may be used as documentation of sample custody. Receipts for bills of lading and other documentation of shipment shall be maintained as part of the permanent custody documentation. Commercial carriers are not required to sign the chain-of-custody as long as it is enclosed in the shipping container and the evidence tape (custody seal) remains in place.

Data Usability and Validation

The main purpose of the data is for use in defining the extent of contamination at the site, to aid in evaluation of potential human health and ecological exposure assessments, and to support remedial action decisions. Based upon this data use usability and validation will be performed as described below. Complete data packages will be archived in the project files, and if deemed necessary additional validation can be performed using procedures in the following sections.

Data Usability and Validation Requirements

Data usability and validation are performed on analytical data sets primarily to confirm that sampling and chain-of-custody documentation are complete, that sample numbers can be tied to the specific sampling locations, that samples were analyzed within the required holding times, and that the analyses met the data quality requirements specified in the sampling plan.

Data Usability and Validation Methods

A designee of the PWGC Project Manager will complete a data usability evaluation for the data collected during the RI. A data usability summary report (DUSR) will be prepared following guidance in DER-10, Appendix 2B.

Independent third party data validation will be performed on 5% of the sample data or on one sample from each sample delivery group (SDG), whichever is greater. Data validation will be performed by a qualified subcontractor independent of the project.

Field Equipment Calibration

Equipment will be inspected and approved by the Field Team Leader before being used. Equipment will be calibrated to factory specifications, if required. Monitoring equipment will be calibrated following manufacturer recommended schedules. Daily field response checks and calibrations will be performed as necessary following manufacturer standard operating procedures. Equipment calibrations will be documented in the field logbook.

Management of RD Derived Waste

Waste materials generated from field operations may consist of purge water, and miscellaneous solid materials such as personal protective equipment (PPE) and supplies. PWGC will arrange for the disposition of derived waste generated during field operations.

Purge water generated during field activities will be stored in 55-gallon drums. The drums will be labeled to indicate the source of the fluid and will be stored in a designated area on site. Following receipt of the groundwater sampling results, recommendations for disposition of the water will be provided to the NYSDEC.

Field Documentation

Documentation will take place on either appropriate file forms or in a site logbook. Permanent black or blue ink will be used to record information in the logbook. Errors in field documentation will be lined through, initialed, dated, and corrected. Forms will be kept by the PWGC Field Team Leader during field activities. Field activities will be documented in the field logbook. The logbook will contain waterproof pages that are consecutively numbered, and will be permanently bound with a hard cover. Upon completion of daily activities, any unused portions of pages will be lined-through and initialed.

The primary purpose of the field logbook is to contain a record of daily field activities and to provide descriptions of each activity. Entries in the field logbook will be recorded and dated by the person making the entry.