FORMER QUICK AND CLEAN CLEANERS

Site # 130198

INTERIM REMEDIAL MEASURE
WORK PLAN

(IRMWP)

PREPARED FOR:
380 ROCKAWAY TURNPIKE REALTY CORPORATION
36 LAWRENCE AVENUE
LAWRENCE, NEW YORK 11559

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

PREPARED BY:

JOHN V. SODERBERG P.E
PO BOX 265
STONY BROOK, NEW YORK

July 2015

Table of Contents

Table of Contents Cont...

Figures

Appendices

1.0 Introduction

The following document is an Interim Remedial Measure Work Plan (IRMWP) prepared by John V. Soderberg P.E on behalf of 380 Rockaway Turnpike Corporation located at 380 Rockaway Turnpike, Cedarhurst, Nassau County, New York. The purpose of this IRM is to address sub-slab vapors beneath the building via the installation of an active mitigation system.

The Site is the location of the former Quick and Clean Cleaners, an on-site dry-cleaning service which operated on the premises from at least 1980 to 1991. Investigations performed by the Nassau County Department of Health (NCDOH) in 1980 and 1991 found that tetrachloroethene (PCE) had been released at the Site in discharge water and/or condensate (vapors).

The Site was initially assigned a "P" (potential) listing on the Inactive Hazardous Waste Site Registry by the New York Department of Environmental Conservation (NYSDEC) in 2009. The NYSDEC conducted a site characterization in July-August 2001 (SCR 8/10) and upgraded the registry listing to a Class 2 site in August 2011.

This IRM is proposed to address sub-slab vapors beneath the building's slab on grade foundation. An Engineering control (E.C) will be implemented with the purpose of removing sub-slab vapors via active sub-slab depressurization.

1.1 Site Location and Description

The address for the subject property is 380 Rockaway Turnpike, Cedarhurst, NY. The subject property is designated as Section 39, Block 344, Lots 216 and 220 by the Nassau County Department of Assessment. The subject property is located within the Incorporated Village of Cedarhurst, Town of Hempstead, Nassau County, NY as shown in Figure-1. The lot has 123 feet of frontage on Rockaway Turnpike and is approximately 100 feet deep for a combined area of 0.318 acres (13,853 ft2). Figure-2.

The subject site is developed with a 3,984ft^2 1-story masonry building, built in 1962 for commercial (retail) use. Based on current zoning and the location of the property, it is likely to remain in commercial-retail use.

The elevation of the property ranges from approximately 10 to 13 feet above National Geodetic Vertical Datum (NGVD). The topography in the vicinity of the site generally slopes from southeast to northwest. The depth to groundwater beneath the site, as determined from field measurements, is between 5.0' and 10.0' feet below grade surface (bgs). Groundwater flow has been reported as ranging from north to southwest at the adjacent

property to the north (former Cumberland Farms Service Station). Despite this wide range of anticipated flow the actual direction of groundwater flow is presumably to the west northwest (>270 degrees). This notion is based upon previously conducted investigation data indicating elevated contamination found northwest of the Site and/or source area. A groundwater flow survey has been conducted as part of the RIWP at the subject property and all indications lead to a west northwest flow direction. The final flow model will be included within the final draft of the RIR.

The area surrounding the Site consists of retail "strip stores" and service stations along the east side of Rockaway Turnpike with single-family residential homes located adjacent to the east. Adjacent properties to the north include a former Cumberland Farms Service Station (CFSS) and an active Shell station. Adjacent properties to the south include a Sunoco, Getty and Gulf service stations. In total the subject property is flanked north and south by four (4) active and one (1) former service station. The west side of Rockaway Turnpike is characterized by larger shopping centers with industrial buildings/warehouses, major oil storage facilities (MOSF) and the Town of Hempstead incinerator plant adjacent to the west.

1.2 Site History

The environmental history of the subject lots was summarized in the SCR dated August 2010 as prepared by Environmental Assessment and Remediation (EAR) under contract to the NYSDEC. This summary consisted of a chronology of events based solely on NCDOH files. According to the SCR the NCDOH identified approximate PCE concentrations of 67,000 ppb in a sample of "industrial wastewater discharge" at the Site on 3/26/80. In 1991 NCDOH reported PCE concentrations of 1.3 million ug/kg in shallow soil (<2 ft) adjacent to a vapor discharge pipe in the rear of the building. This soil was successfully removed in 1992 by the operator under NCDOH oversight and the case was closed by NCDOH on 3/30/92. In 2009 the NYSDEC classified the site with a "P" designation for potential listing on the Inactive Hazardous Waste Site Registry.

A soil vapor intrusion study was conducted during the winter of 2012 which included sub-slab and indoor air sampling at multiple businesses and residences throughout the surrounding community. The results from the study did not indicate any elevated indoor air readings above the limit of 30 ug/m^3 in any of the residences. The highest concentration detected in indoor air was found in a nearby residence which indicated a concentration of only 15.9 ug/m^3. The only other highly significant PCE detection found was detected in the sub-slab of the former cleaner at 124 ug/$m^{3.}$

A Remedial Investigation Work Plan (RIWP) was issued and approved as per the Jan 28th, 2013 NYSDEC letter. Field work commenced weeks later after access agreements were granted. A full scale off-site groundwater investigation was conducted, which included

supplemental boring locations intended to complete data gaps in the conceptual site model (CSM) developed during the site characterization described below. The results of these findings are currently being validated and compiled into the RIR.

1.3 Summary of Site Characterization Report

The field investigation portion of the SCR was conducted at the site from December 8, 2009 through March 25, 2010 and consisted of the collection and analysis of 7 soil samples from 7 boring locations, 28 groundwater samples from 10 on-site locations, 39 groundwater samples from 9 off-site locations and 6 soil gas samples from 4 on-site and 2 off-site locations. All soil and groundwater samples were collected with GeoProbe®-type direct push equipment and tooling. According to logs contained in the SCR, soil samples were collected for the first 8 feet through a 4 ft macro-core sampler using the single-tube method and then using a 4 ft large bore sampler for the remainder of the boring to a maximum of 20 ft. On-site groundwater sampling performed in December 2009 were collected through a 2 ft mill slotted rod which was driven to multiple depths ranging from 10 to 70 feet with samples collected in 10 foot intervals. Off-site samples collected in March 2010 utilized a 2 ft wire wrap discrete sampler. Purge volumes varied considerably ranging from 0 to 0.5 gallons per sample for the mill slot sampler to 0.10 to 3 gallons for the wire wrap sampler.

The results of this investigation did not identify any chlorinated compounds above unrestricted soil clean up objectives (SCOs) in any of the soil samples collected. However, petroleum VOCs including ethylbenzene, toluene and xylene were reported in 5 of 7 soil samples at concentrations significantly above unrestricted and groundwater protection SCOs.

On-site groundwater samples reported elevated concentrations of both chlorinated VOCs (CVOCs) and petroleum VOCs (PVOCs) at every sampling location. The highest concentrations of both CVOCs and PVOCs were reported in the shallowest samples.

CVOC concentrations were generally highest at the rear (east) and north side of the building. In almost all cases PVOC concentrations were considerably higher than the CVOC concentrations. The anomalously high CVOC and PVOC concentrations reported from 70-72 ft) at select locations were not explained in the SCR and are likely attributed to deficiencies in the method of sampling.

Off-site CVOC concentrations were comprised for the most part of PCE with only small amounts of TCE and the other parameters. Off-site PVOC detections were generally low and ranged from non-detect to 162 ug/l with the highest detections reported in the 50-52 interval.

CVOC detections in soil gas ranged from 11 ug/m^3 to 5,717 ug/m^3 with the highest concentrations occurring at the north property line. The main constituent in the soil gas at these locations was cis-DCE.

1.4 Site Geology / Hydrogeology

According to boring logs included in the SCR, subsurface materials at the site consist of medium to coarse sand and gravel for the upper 10 feet followed by fine to medium sand to 18 feet below grade. A 1 to 2 ft layer of silt and clay was reported at some locations. Soils deeper than 20 feet were not characterized although silt and clay zones were suspected at 34 feet to 52 feet based on limited groundwater recharge and clogging of the groundwater sampling tools with silt and clay. The depth to groundwater was not measured at the site during the site characterization although it is reported in the drill logs at a depth of 11 feet below the surface. However, this is inconsistent with water level measurements made in monitoring wells at the adjacent property to the north that report the depth to water ranging from 3.61 to 4.89 feet. The groundwater flow direction has been determined at the site to be west northwest.

1.5 Conceptual Site Model (CSM)

The source of the on-site CVOC contamination has been identified as a former shallow PCE impacted soil area at the rear of the building near the southeast corner of the property. Based on NCDOH reports and follow-up investigations the source area consisted of a 12 ft x 12 ft area which extended 3 to 3.5 feet deep. The area was exposed and covered at the surface with a layer of gravel. Precipitation recharging through this impacted soil would become contaminated with PCE transporting it to the shallow water table as a dissolved component and forming a contaminant plume. The plume would then migrate in the direction of groundwater flow.

The presence of high concentrations of petroleum (gasoline) constituents in soil and groundwater along the south property line and near the southeast corner indicates past migration from the known gasoline spill at the adjacent Sunoco S/S to the south.

PCE is present on and off-site with almost no transformation products present off-site. This may indicate a second source at an off-site location or the fact that transformation products of PCE tend to lag at the rear of the plume with PCE being detected at the lead or toe of the plume. PCE a DNAPL tends to initiate the formation of the plume by traveling vertical to depth while moving with the flow of groundwater, which in this case appears to be northwest.

CVOCs have been documented on the former CFSS property to the north including the far northwest corner of the property. The CFSS was known to include an auto repair shop with shallow recharge structures present across the property. PCE is also historically used in automobile brake cleaning and engine degreasing products. It is, therefore, possible that there may be other sources of PCE responsible for the off-site groundwater contamination reported in the SCR.

2.0 Soil Vapor Intrusion (SVI) Mitigation

The term soil vapor intrusion or SVI refers to the process by which volatile chemicals migrate from a sub-surface source into the indoor air of buildings. In order to prevent the possibility of SVI at the subject site the following IRM is proposed to address sub-slab soil vapor contamination.

2.1 Soil Vapor Migration Pathways

Typical soil vapor migration pathways include entrance into a building through cracks or perforations in the slab or walls, and through openings around sump pumps or where pipes and electrical wires go through the foundation. The vapor movement is primarily a result of a difference between interior and exterior pressures. As established in the NYSDOH Vapor Intrusion Guidance, October 2006, the basic requirements that must be established with respect to a soil vapor mitigation program are as follows:

- Methods of Mitigation;
- Pilot testing, installation and design of mitigation systems
- Post-mitigation testing
- Operation, maintenance and monitoring of mitigation systems;
- Termination of mitigation system operations; and
- Annual certification

2.2 Methods of Mitigation

The most effective methods of mitigation involve sealing of infiltration points and actively manipulating the pressure differential between the building's interior and exterior on a continuous basis. In this case the subject site is constructed with a slab-on-grade foundation so the installation of an active SSDS will be the most feasible, cost effective means of mitigation. (NYSDOH Guidance for SVI. October 2006 p. 58)

2.2.1 Sealing of Infiltration Points

The interior area(s) identified as requiring mitigation will be further inspected as to the integrity and condition of the poured concrete floor and any utility or other perforation or penetrations into the sub-grade surface.

As part of the IRM activities, all cracks and "sealable" penetrations will be sealed utilizing hydraulic cement or equivalent sealing material. All joints, cracks and other penetrations of slabs, floor assemblies and foundation walls below or in contact with the ground surface will be sealed with materials that prevent air leakage. All areas to be sealed will be completed prior to the pilot test or any other testing performed at the property in order to limit the generation of misleading site data.

2.2.2 Buildings with a slab-on-grade foundation

In conjunction with sealing potential sub-surface vapor points, active sub-slab depressurization (SSD system or SSDS) is the preferred mitigation method for buildings with a basement or slab-on-grade foundation. An SSDS uses a fan-powered vent and piping to draw vapors from the soil beneath the buildings slab. In many cases soil conditions beneath the slab begin to settle over time creating a void space for harmful vapors to harbor. The SSDS essentially creates a negative pressure differential underneath the slab resulting in vapor discharge to the atmosphere. Lower sub-slab air pressure relative to indoor air pressure prevents the infiltration of sub-slab vapors into the building. (NYSDOH GSVI. October 2006 p. 58) This helps prevent elevated indoor air concentrations from entering into the building and continually removes any harmful vapors from the building.

2.3 Proposed Remedy Design (SSDS)

Sub-slab vapor contamination discovered under the building will be removed via active sub-slab depressurization (SSDS). Two inch (2") diameter PVC screened piping will be installed at two (2) different locations within the building. Access points to the building will coincide with the remodeling plan of the building that proposes exterior drains to be trenched along the north and rear side (east) of the building. JVS will utilize drain entry points exiting the building in order to route SSDS piping to the exterior of the building and eventually the roof. Two (2) five (5') lengths of screened piping, wrapped in filter fabric, will be used to draw sub-slab vapors from underneath the building's slab where solid PVC riser pipe will finish the system to grade, eventually exhausting to the atmosphere above the roof line. Please refer to Figure-3 drawings engineered to portray the layout of the system. The engineering control (E.C) associated with the system will be a small powered radon fan or blower specifically designed for sub-surface vapor removal. The E.C specs have been attached as Appendix-A to

this report. The blower will not need an enclosure due to its relatively quiet operation and minimal vibration. If needed, the blower motor will be wired to an existing sub-panel or simply plugged into the wall with a 110v grounded plug. The mounting location of the blower will be selected during the field installation but will most likely be fixed on the exterior wall in close proximity to the exhaust stack. A system shut-down warning light will be installed to the motor wiring to indicate its "on" operation. If the light is ever discovered to be "off" site personnel will contact JVS in order to diagnose the issue.

2.4 Pilot Testing of the System

A one-day communication test of the sub-slab beneath the basement floor is proposed for implementation. The objective of the testing will be to establish the radius of influence (ROI) and assure all areas beneath the slab are subject to vacuum. The test will be conducted via four (4) small diameter shallow sub-slab permanent vapor points (PV) and four (4) shallow sub-slab temporary vapor points (TV). The eight (8) PV/TV points will be installed at eight select locations within the sub-slab of the former cleaners. Please refer to Figure-4 for the location of the PV/TV points within the building and Figure-5. Specifically, the PV points in the sub-slab will be at an approximate distance of fifteen feet away from each SSDS leg, installed approximately one foot deep within the poured concrete floor and the TV points will be located at select areas to ensure influence under the entire slab. The PV and TV monitoring points will be used to record pressure responses during the test as per the *Guidance for Evaluating Soil Vapor Intrusion in the State of New York NYSDOH, 2006) and the Radon Mitigation Standards (USEPA 402-R-03-078).* These PV points can also be used if necessary during other key phases of the project to check both on pressure as well as VOCs in soil gas.

A rotary core drill will be used to penetrate the concrete floor slab to install half inch diameter PV/TV points to an approximate depth of one foot below the concrete slab. These PV points will be installed as permanent points as per the NYSDOH guidance. A 3/8-inch diameter polyethylene tubing will be affixed to the permanent soil vapor screen point, which will be installed to within one inch of the bottom of the hole at each PV and TV location. A permanent seal between the tubing and the concrete sub floor will be used to ensure that no air leaks are possible at the vacuum measuring point. TV points will possess a temporary seal to prevent air leaks. The communication test will be conducted using the vacuum blower to apply a vacuum within the proposed SSDS system. The test will be conducted at two different vacuum settings, to simulate the effect of different combinations of vacuum and air flow. The TV points will be installed in the same manner as the PV points except they will be abandoned with clean grout and sealed upon completion of their use.

Air pressure (vacuum) measurements will be recorded at each of the eight (8) PV/TV monitoring points just before the start of each test to ensure that baseline sub-slab air pressures are within normal ranges. Air pressure measurements will continue approximately once every

10 minutes while applying a continuous vacuum to the SSDS. Air pressure will be measured with a Dwyer Magnehelic® vacuum meter, calibrated to atmospheric pressure prior to the test. The test will be run utilizing the proposed radon blower, with the equivalent vacuum reading of 6 in/Hg and a vacuum flow rate of approximately 80 feet per minute (FM) (equivalent to an air consumption rate of 25 CFM).

2.5 Post Installation Testing of the System

Routine airflow and concentration testing of the system will be performed on a quarterly basis by JVS technicians in order to collect airflow and bulk air concentration data. Pressure field extension testing will also be conducted to ensure pressure change is occurring beneath the entire slab. Airflow calculations for the SSDS will be generated using inline airflow rates and concentration data collected near the SSDS piping. In order to collect air concentration measurements, total VOC measurements will be measured with a photoionization detector (PID) meter via a sample port installed within the riser at each leg of the system and the overall exhaust piping. Stack emission sampling will be performed on a quarterly basis using a tedlar bag to collect exhaust air from the stack. The tedlar bag will be transported under strict chain of custody to a New York State certified lab for testing of chlorinated compounds by EPA method TO-17. JVS will generate a database to store all data acquired during monitoring events. Quarterly reports to the Department will include routine airflow and VOC concentration data collected during each monitoring event. Reports will also detail any system repairs or alterations that occurred between sampling events. Generally, no continued indoor air quality monitoring is required if the system has been installed properly and is maintaining a vacuum beneath the entire slab. As is, indoor air sampling conducted within the subject building during the winter of 2012 did not indicate any VOC contamination.

2.6 Operation and Maintenance (OM and M)

When mitigation systems are implemented at a site, the operation, maintenance and monitoring (OM&M) protocols for the systems are typically set forth in a site-specific OM&M plan. Subsequent to the initial installation and start-up of the system, weekly monitoring will be conducted to evaluate the effectiveness of the system, as well as to ensure emissions are not exceeding regulatory guidelines. Monthly vapor sampling (of the in-line sample ports and stack exhaust) will be conducted to ensure that the system is adequately removing VOC-impacted soil vapors. Routine maintenance will be performed weekly for the first month and quarterly thereafter. During routine maintenance the following activities will be performed:

- A visual inspection of the complete system (blower vent fan, piping, warning device, etc.);

- Identification and repair of leaks; and

- Inspection of the exhaust or discharge point to verify no new air intakes have been located nearby

As necessary, preventive maintenance (e.g., replacing vent fans), repairs and/or adjustments will be made to the system to ensure its continued effectiveness at mitigating exposures related to soil vapor intrusion. The need for preventive maintenance will depend upon the life expectancy and warranty for the specific part, as well as visual observations over time. The need for repairs and/or adjustments will depend upon the results of a specific activity compared to that obtained when system operations were initiated. If significant changes are made to the system or when the systems performance is unacceptable, the system may need to be redesigned and restarted.

In addition to the routine OM&M activities described here, the building's owner and tenants will be given information packages that explain the systems operation, maintenance and monitoring. Therefore, at any time during the systems operation, the building's owner or tenants may check that the system is operating properly.

2.7 Termination of SSDS Operation

The SSDS will not be turned off or shut down without prior approval from either the State Health Department or DEC. The SSDS will remain operational until it is no longer needed to address current or potential exposures related to soil vapor intrusion. Termination of the mitigation system will comply with the procedures discussed in the NYSDOH guidance and with NYSDEC and NYSDOH concurrence. A petition for the termination of the SSDS would be largely based upon the following:

1. Residual subsurface sources of contamination, if any, of VOCs in subsurface vapors have been remediated based upon an evaluation of appropriate post-remedial sampling results;

2. Residual contamination, if any, in sub-surface vapors is not expected to affect indoor air quality significantly based upon indoor, outdoor air and sub-slab vapor sampling results:

3. Residual contamination, if any, in sub-surface vapors is not expected to affect indoor quality significantly when the SSDS is turned off based upon indoor air, outdoor air and sub-slab vapor sampling results at representative structure; and

4. There is no "rebound" effect that requires additional mitigation efforts observed when the SSDS system is turned off for a period of time.

JVS will consult with the property owner to make such a determination if any one of the above conditions has been satisfied and both the NYSDEC and the NYSDOH will be petitioned on this matter for concurrence prior to system termination.

2.8 Schedule of Implementation

JVS will be prepared to mobilize to the site within two weeks of the approved IRMWP. JVS will be sure to notify the client and DEC at least 5 days before the commencement of the field work. Access agreements will not be required as all of the proposed work is to be conducted on the Client's property.

3.0 Evaluation of Proposed Mitigation Program

3.1 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375 Section 1.10, which governs the remediation of environmental restoration projects in New York State. The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection as follows:

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of the remedial alternative's ability to protect public health and the environment. The installation of engineering controls such as an SSDS or an SVE has been recognized for a long time as the foremost means of achieving protection of public health, relative to sub-slab vapor migration and to address residual soil contamination. Significant research on the successfulness of SVE and other types of sub slab depressurization has been performed as a result of the mitigation of radon. The majority of technology regarding the installation of SVE and/or SSDS systems to mitigate volatile organic compounds is an outgrowth of radon research and VOCs. Furthermore, this technology is specifically recommended for use as per the *Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH 2006) and the Radon Mitigation Standards (USEPA 402-R-03-078).*

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the NYSDEC has determined to be applicable on a case-specific basis. The installation and operation of an SSDS fully complies with the New York State SCGs relative to VOC vapor migration as it will serve to mitigate or remove the potential for current and/or future potential

exposure pathways. The remainder of the criteria set forth in Part 375 are five "primary balancing criteria" and are used to compare the positive and negative aspects of the remedial strategy.

3. Short-term Effectiveness. This criterion relates to the potential short-term adverse impacts of the remedial action upon the community, the workers and the environment during the construction and/or implementation of the SSDS. As the SSDS system can be both pilot-tested and installed within a quick independent time frame (several days), no short-term adverse impacts were identified relative to the workers, community or the environment. A Photoionization Detector will be used to monitor VOCs (CAMP) in air during the installation of the SSDS system, as part of normal health and safety provisions. As needed, supplemental ventilation such as an industrial vacuum fan can be used to control any temporary vapors that may be emitted during installation procedures.

4. Long-term Effectiveness and Permanence. This criterion is used to evaluate the long-term effectiveness of the remedial alternative after implementation. The SSDS system has been designed to address sub-slab conditions at the site. Therefore, this criterion looks at 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls. As this system specifically addresses any shallow source of VOC contamination present below the foundation slab and/or emanating from groundwater, concentrations will diminish over time. Therefore, the magnitude of remaining environmental risks can be considered to be addressed under this option. Furthermore, the implementation of an active SSDS will serve to mitigate and prevent any indoor air impacts from occurring. The adequacy of the SSDS (properly installed, operated, monitored, and maintained) to control sub-slab vapors, in addition to its reliability over time, are both considered to be excellent, due to the long-term track record established.

5. Reduction of Toxicity, Mobility or Volume. The ability of the remedial alternative to permanently and/or significantly reduce the toxicity, mobility or volume of the wastes is required to be evaluated. The SSDS is specifically designed to significantly reduce the VOC vapor contamination in the sub-slab. Furthermore, as there will be pressure changes beneath the slab and within the building, the VOC vapor will be routed exterior to the building, ultimately resulting in reduced volume over time.

6. Implement ability. The technical and administrative feasibility of implementing the remedial alternative must be considered. Again, as SSDS is a widely used application for soil gas mitigation and soil remediation, implement ability of the construction and use of this system is considered to be excellent.

7. Cost-Effectiveness. Capital costs and operation, maintenance, and monitoring costs are also part of the evaluation criteria. The construction of an SSDS is considered to be extremely cost-

effective as it can be installed into existing structures (retrofit) without requiring widespread, difficult and costly building reconstruction. Furthermore, it can be used within the sub-slab proximate to any shallow soil source areas.

8. Community Acceptance. Public review is not required as the following Work Plan is an Interim Remedial Measure and not proposed to be the final remedy. Regardless of this fact, this IRM requires the implementation of a Community Air Monitoring Plan (CAMP) and a proposed small scale remedy that would likely ensure community acceptance.

4.0 Health and Safety

The Health and Safety Plan (HASP) takes into account the specific hazards inherent in conducting the on-site IRMWP, and presents the minimum requirements which are to be met by JVS and other personnel in order to avoid and, if necessary, protect against health and/or safety hazards. A HASP has been prepared and is provided in Appendix - B of this Work Plan. Activities performed under the HASP will comply with applicable parts of OSHA Regulations, primarily 29 CFR Parts 1910 and 1926. Modifications to the HASP may be made with the approval of the JVS Site Safety Officer (SSO) and/or Project Manager (PM).

5.0 Community Air Monitoring Plan

The Community Air Monitoring Plan (CAMP) provides measures for protection for on/off-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site commercial workers) from potential airborne contaminant releases resulting from mitigation activities. The action levels specified 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 during the field work is stray odors from VOCs. The CAMP for this investigation is provided as Appendix - C.

6.0 Project Schedule

Upon approval of this IRMWP materials will be ordered which may take up to seven (7) business days. Upon receipt of the project materials JVS will be ready to mobilize within two (2) weeks from the day the materials arrive. The anticipated time for the implementation of the Work Plan is outline below:

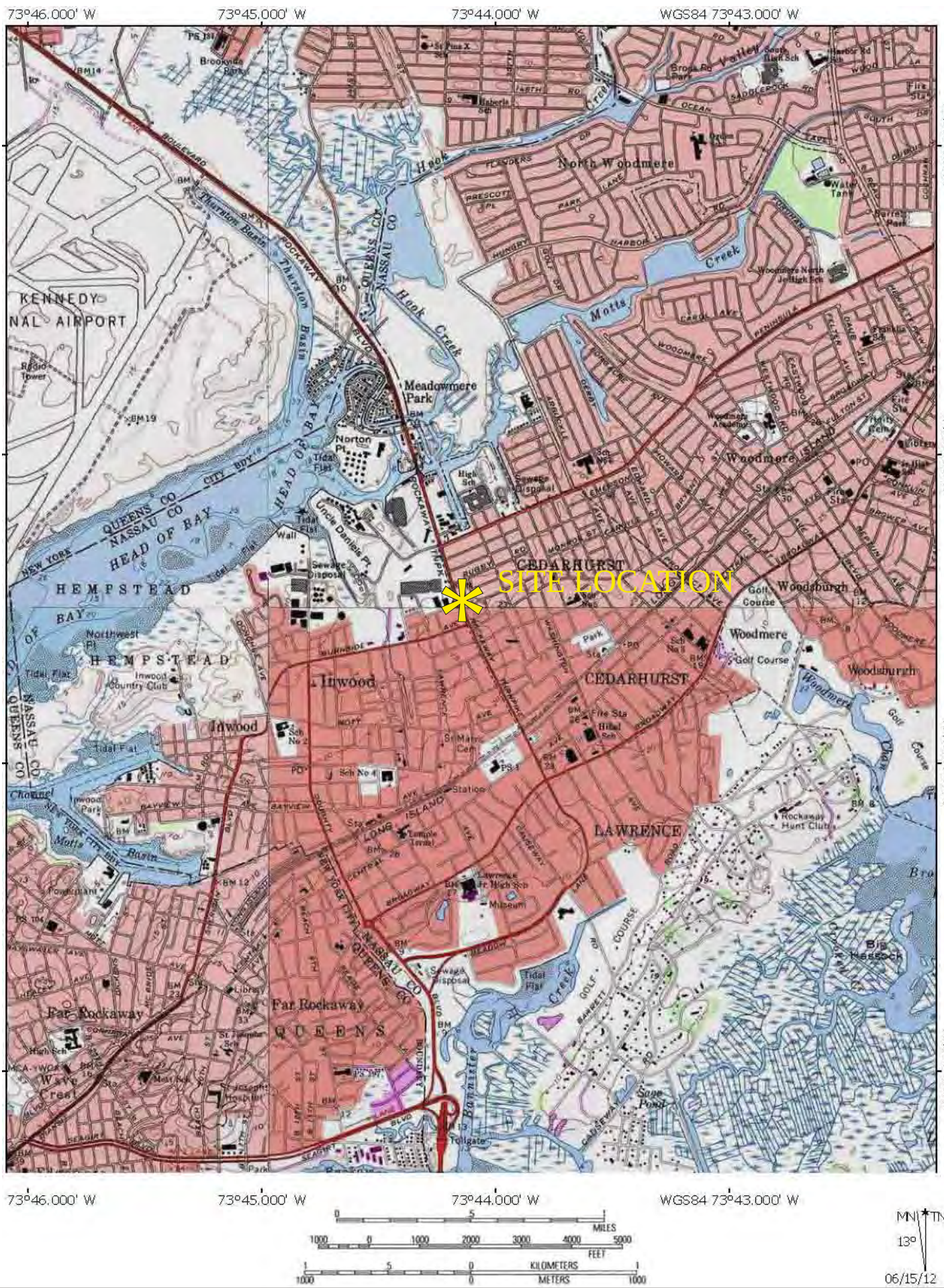
Task:	Materials(delivery)	Mobilization	Total Duration
Sub-Slab Piping	1 week	2 hours	1 day
Finish Piping (exhaust piping out building to roof)	1week	2 hours	1 day
Blower installation (E.C)	2-4 weeks	2 hours	2-4 days
Post Installation Testing	1 day	2 hours	1 day

7.0 Construction Completion Report (CCR)

After completion of the remedial measure a Construction Completion Report (CCR) will be completed in accordance with approved activities conducted under IRM Work Plan. The CCR will include but not be limited to:

- summary of remedial actions completed
- description of any problems encountered during construction and the resolution
- as-built drawings bearing a NYS Professional Engineer stamp
- description of any Engineering Controls and/or Institutional Controls
- list of the remedial action objectives

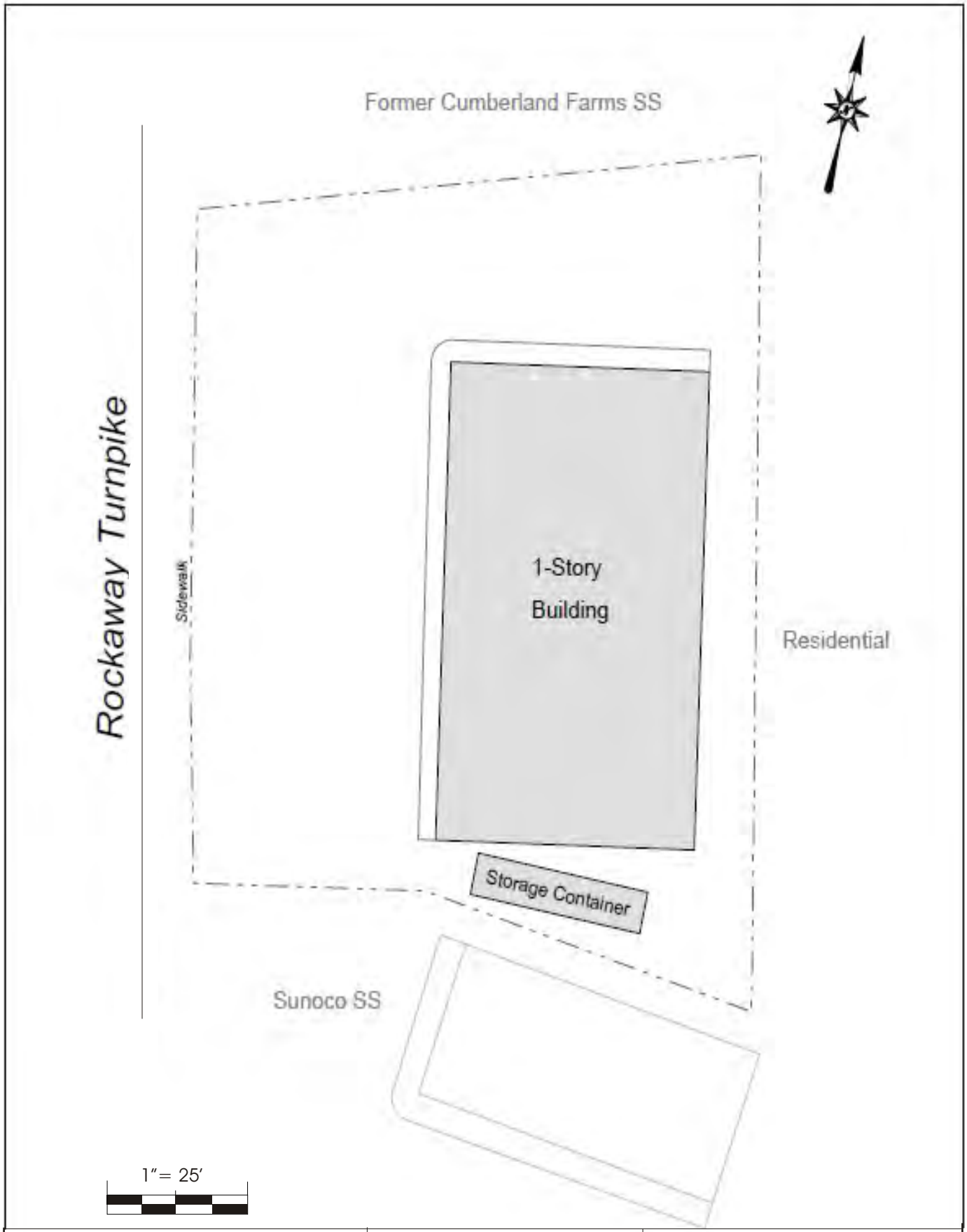
FIGURES



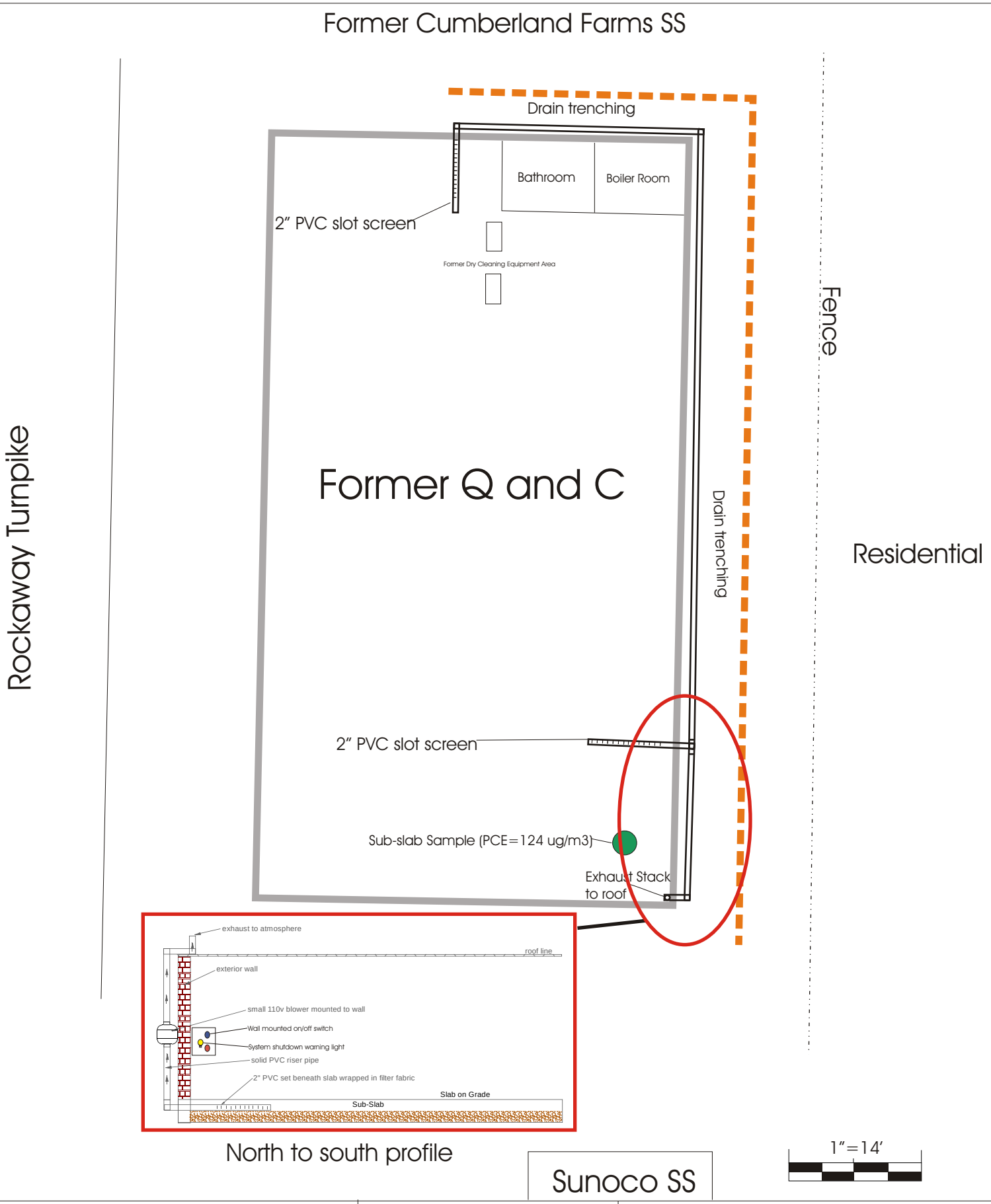
Former Quick and Clean Cleaners
380 Rockaway Turnpike
Cedarhurst, New York

Figure-1
Site Location

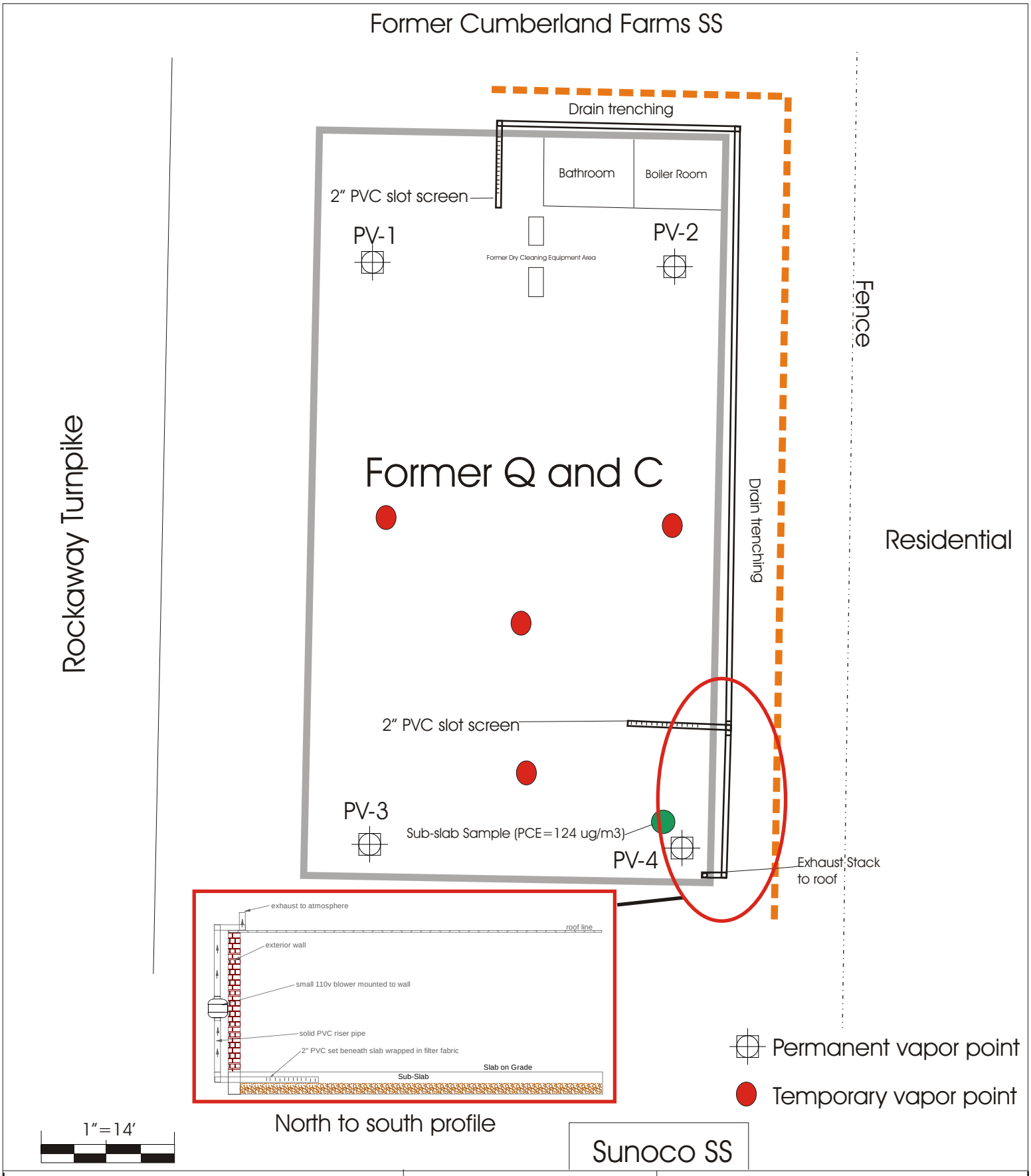
John V. Soderberg P.E
PO Box 263
Stony Brook, New York



Former Quick and Clean Cleaners **380 Rockaway Turnpike** **Cedarhurst, New York**	Figure-2 Site Map	**John V. Soderberg P.E** **PO Box 263** **Stony Brook, New York**



Former Quick and Clean Cleaners **380 Rockawa y Turnpike** **Cedarhurst, New York**	Figure-3 SSDS Schematic	**John V. Soderberg P.E** **PO Box 263** **Stony Brook, New York**



Former Quick and Clean Cleaners **380 Rockaway Turnpike** **Cedarhurst, New York**	Figure-4 Permanent/Temp Point Locations	John V. Soderberg P.E 265 PO Box Stony Brook, NY

John V. Soderberg P.E
PO Box 263
Stony Brook, NY

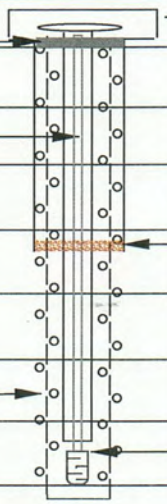
Drawn By: JGH

Figure-5

Permanent Vapor Well Log

Project: Former Quick and Clean Cleaners
Client: 380 Rockaway Turnpike LLC
Location: 380 Rockaway Turnpike Cedarhurst, NY
Well No: PV-1-4 **Use:** Monitoring
Probing Method: Manual Tools
Casing Type: N/A **Casing Dia:** N/A **Casing Length:** N/A
Screen Type: N/A **Screen Dia:** N/A **Screen Length:** N/A
Screen Slot: N/A **Gravel Pack:** #2 Fil-pro
Casing Seal: Cement **Finish:** Flush Mounted

Date: 2013
Be Job No:
Driller: TBD
Bore Hole Dia: 2.0"
Sample Method: TO-15
Depth to Water: N/A
Total Depth: 1'
Security: 5" Manhole

Depth Below Grade	Sample Information	Well Design	Identification/Remarks
0'	Hydraulic Cement Seal		5" Manhole flush mounted
	3/8" Poly-tube		
			Bentonite Seal
Fil-Pro Gravel	Pack Material		
1'			Vapor / Screen Point

APPENDICES

APPENDIX A

Blower Specifications

RadonAway™
The World's Leading Radon Fan Manufacturer

GP Series

Radon Mitigation Fans

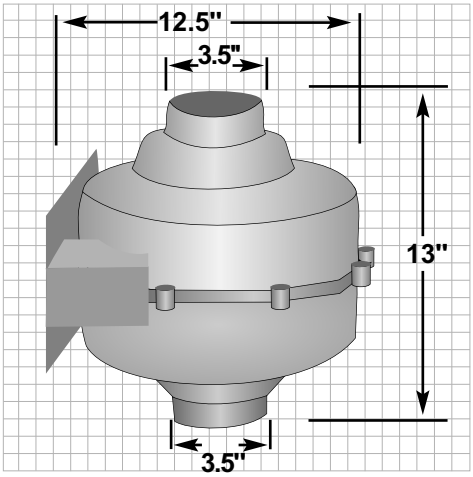
All RadonAway fans are specifically designed for radon mitigation. GP Series Fans provide a wide range of performance that makes them ideal for most sub-slab radon mitigation systems.

Features:

- Five-year hassle-free warranty
- Mounts on duct pipe or with integral flange
- 3.5" diameter ducts for use with 3" or 4" pipe
- Electrical box for hard wire or plug in
- ETL Listed - for indoor or outdoor use
- Meets all electrical code requirements
- Thermally protected
- Rated for commercial and residential use.

Model	Watts	Max. Pressure "WC	Typical CFM vs. Static Pressure WC						
			1.0"	1.5"	2.0"	2.5"	3.0"	3.5"	4.0"
GP201	40-60	2.0	82	58	5	-	-	-	-
GP301	55-90	2.6	92	77	45	10	-	-	-
GP401	60-110	3.4	93	82	60	40	15	-	-
GP501	70-140	4.2	95	87	80	70	57	30	10

Choice of model is dependent on building characteristics including sub-slab materials and should be made by a radon professional.



For Further Information Contact:

03/08
P/N 02002

APPENDIX B

Health and Safety Plan

FORMER QUICK AND CLEAN CLEANERS

INVESTIGATION HEALTH AND SAFETY PLAN
(HASP)

PREPARED FOR:
380 ROCKAWAY TURNPIKE REALTY CORPORATION
36 LAWRENCE AVENUE
LAWRENCE, NY 11559

PREPARED BY:

John V. Soderberg P.E
PO Box 263
Stony Brook, NY

July 2015

TABLE OF CONTENTS

FIGURES

APPENDICES

STATEMENT OF COMMITMENT

This Health and Safety Plan (HASP) has been prepared to ensure that workers are not exposed to risks from hazardous materials during the planned Interim Remedial Measure Work Plan (IRMWP) at the Former Quick and Clean Cleaners Site at 380 Rockaway Turnpike, Cedarhurst, New York.

This HASP, which applies to persons present at the site actually or potentially exposed to hazardous materials, describes emergency response procedures for actual and potential 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 by signing off on receipt of their individual copy of the document. Contractors and suppliers are retained as independent contractors and are responsible for ensuring the health and safety of their own employees.

1.0 Introduction and Site Entry Requirements

This document describes the health and safety guidelines developed by John V. Soderberg P.E (JVS). for the proposed IRMWP at 380 Rockaway Turnpike, Cedarhurst, New York to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes during subsurface investigation activities. In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final rule, this HASP, including the attachments, addresses safety and health hazards related to subsurface sample collection activities and is based on the best information available. The HASP may be revised by JVS at the request of 380 Rockaway Turnpike Corp and/or a regulatory agency upon receipt of new information regarding site conditions. Changes will be documented by written amendments signed by JVS's project manager, site safety officer and/or the JVS's health and safety consultant.

1.1 Training Requirements

Personnel entering the exclusion zone or decontamination zone are required to be certified in health and safety practices for hazardous waste site operations as specified in the Federal OSHA Regulations CFR 1910.120e (revised 3/6/90).

Paragraph (e - 3) of the above referenced regulations requires that all on-site management personnel directly responsible for or who supervise employees engaged in hazardous waste operations, must initially receive 8 hours of supervisor training related to managing hazardous waste work.

Paragraph (e - 8) of the above referenced regulations requires that workers and supervisors receive 8 hours of refresher training annually on the items specified in Paragraph (e-1) and/or (e-3).

Additionally all on-site personnel must receive adequate site-specific training in the form of an on-site Health and Safety briefing prior to participating in field work with emphasis on the following:

- Protection of the adjacent community from hazardous vapors and/or dust which may be released during intrusive activities.
- Identification of chemicals known or suspected to be present on-site and the health effects and hazards of those substances.
- The need for vigilance in personnel protection, and the importance of attention to proper use, fit and care of personnel protective equipment.
- Decontamination procedures.
- Site control including work zones, access and security.
- Hazards and protection against heat or cold.
- The proper observance of daily health and safety practices, such as entry and exit of work zones and site. Proper hygiene during lunch, break, etc.
- Emergency procedures to be followed in case of fire, explosion and sudden release of hazardous gases.

Health and Safety meetings will be conducted on a daily basis and will cover protective clothing and other equipment to be used that day, potential and chemical and physical hazards, emergency procedures, and conditions and activities from the previous day.

1.2 Medical Monitoring Requirements

Field personnel and visitors entering the exclusion zone or decontamination zone must have completed appropriate medical monitoring required under OSHA 29 CFR 1910.120(f). Medical monitoring enables a physician to monitor each employee's health, physical condition, and his fitness to wear respiratory protective equipment and carry out on-site tasks.

1.3 Site Safety Plan Acceptance, Acknowledgments and Amendments

The project superintendent and the site safety officer are responsible for informing personnel (JVS) employees and/or owner or owner's representatives) entering the work area of the contents of this plan and ensuring that each person signs the safety plan acknowledging the on-site hazards and procedures required to minimize exposure to adverse effects of these hazards. A copy of the Acknowledgment Form is included in **Appendix - A**.

Site conditions may warrant an amendment to the HASP. Amendments to the HASP are acknowledged by completing forms included in **Appendix - B**.

1.4 Key Personnel, Roles and Responsibilities

Personnel responsible for implementing this Health and Safety Plan are:

Name	Title	Address	Contact No.
Mr. Walter Berninger	Project Manager	17 Old Dock Road Yaphank, NY	631-589-6521(office) 631-774-6682 (cell)
Mr. Justin Halpin	Site Safety Officer/ Supervisor	17 Old Dock Road Yaphank, NY	631-589-6521
Mr. Joel Meyers	Geo-Technician	17 Old Dock Road Yaphank, NY	631-589-6521
Mr. Eusi Watkins	Geo-Technician	17 Old Dock Road Yaphank, NY	631-589-6521

The project manager is responsible for overall project administration and, with guidance from the site safety officer, for supervising the implementation of this HASP. The site safety officer will conduct daily (tail gate or tool box) safety meetings at the project site and oversee daily safety issues. Each subcontractor and supplier (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute about health and safety or project activities, on-site personnel will attempt to resolve the issue. If the issue cannot be resolved at the site, then the project manager will be consulted.

The site safety officer is also responsible for coordinating health and safety activities related to hazardous material exposure on-site. The site safety officer is responsible for the following:

1. Educating personnel about information in this HASP and other safety requirements to be observed during site operations, including, but not limited to, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.

2. Coordinating site safety decisions with the project manager.

3. Designating exclusion, decontamination and support zones on a daily basis.

4. Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality monitoring program specified in this HASP.

5. Maintaining the work zone entry/exit log and site entry/exit log.

6. Maintaining records of safety problems, corrective measures and documentation of chemical exposures or physical injuries (the site safety officer will document these conditions in a bound notebook and maintain a copy of the notebook on-site).

The person who observes safety concerns and potential hazards that have not been addressed in the daily safety meetings should immediately report their observations/concerns to the site safety officer or appropriate key personnel.

2.0 Site Background and Scope of Work

The address for the subject property is 380 Rockaway Turnpike, Cedarhurst, NY. The subject property is designated as Section 39, Block 344, Lots 216 and 220 by the Nassau County Department of Assessment. The subject property is located in the Incorporated Village of Cedarhurst, Town of Hempstead, Nassau County, NY as shown on **Figure 1**. The lot has 123 feet of frontage on Rockaway Turnpike and is approximately 100 feet deep for a combined area of 0.318 acres (13,852 sf). **Figure-2**

The subject site is developed with a 3,984^{sf} 1-story masonry building, built in 1962 for commercial (retail) use. Based on current zoning and the location of the property, it is likely to remain in commercial-retail use.

The elevation of the property ranges from approximately 10 to 13 feet above the National Geodetic Vertical Datum (NGVD). The topography in the vicinity of the site generally slopes from southeast to northwest. The depth to groundwater beneath the site, as determined from field measurements, is approximately 4.5 to 5 feet below grade. Groundwater flow can not be determined from regional water table elevation maps and has been reported as ranging from north to southwest at the adjacent property to the north (former Cumberland Farms SS).

The area surrounding the Site consists of retail "strip stores" and service stations along the east side of Rockaway Turnpike with single-family residential homes adjacent to the east. Adjacent properties to the north include a former Cumberland Farms service station and an active Shell service station. Adjacent properties to the south include a Sunoco, Getty and Gulf service stations. In total the subject property is flanked north and south by 4 active and 1 former service station. The west side of Rockaway Turnpike is characterized by larger shopping centers with industrial buildings/ warehouses, major oil storage facilities (MOSF) and the Town of Hempstead incinerator plant adjacent to the west.

2.1 Previous Investigations

The field investigation portion of the Site Characterization Report (SCR) was conducted at the site from December 8, 2009 through March 25, 2010 and consisted of the collection and analysis of 7 soil samples from 7 boring locations, 28 groundwater samples from 10 on-site locations, 39 groundwater samples from 9 off-site locations and 6 soil gas samples from 4 on-site and 2 off-site locations. All soil and groundwater samples were collected with GeoProbe®-type direct push equipment and tooling.

According to logs contained in the SCR, soil samples were collected for the first 8 feet through a 4 ft macro-core sampler using the single-tube method and then using a 4 ft large bore sampler for the remainder of the boring to a maximum of 20 ft. On-site groundwater sampling performed in December 2009 were collected through a 2 ft mill slotted rod which was driven to multiple depths ranging from 10 to 70 feet with samples collected in 10 foot intervals. Off-site samples collected in

March 2010 utilized a 2 ft wire wrap discrete sampler. Purge volumes varied considerably ranging from 0 to 0.5 gallons per sample for the mill slot sampler to 0.10 to 3 gallons for the wire wrap sampler. The results of this investigation did not identify any chlorinated compounds above unrestricted soil clean up objectives (SCOs) in any of the soil samples collected. However, petroleum VOCs including ethylbenzene, toluene and xylene were reported in 5 of 7 soil samples at concentrations significantly above unrestricted and groundwater protection SCOs. Total petroleum VOCs in soil ranged from 2,550 ug/kg at location EP7 (12-14 ft) to 107,000 ug/kg at EP5 (12-14 ft). EP5 is located near the south property line adjacent to the Sunoco service station.

On-site groundwater samples reported elevated concentrations of both chlorinated VOCs (CVOCs) and petroleum VOCs (PVOCs) at every sampling location. With the exception of EP7 the highest concentrations of both CVOCs and PVOCs were reported in the shallowest samples. EP7 reported the highest detections of both CVOCs and PVOCs in the 70-72 ft interval and had the highest PVOC concentrations reported with a total of 185,426 ug/L.

CVOC detections in the shallow intervals ranged from non-detect at EP5 (20-22 ft) to 14,830 ug/L at EP9 (10-12 ft). In addition to EP9, the highest CVOC concentrations were reported at locations MW7, EP8 (10-12 ft) and EP3 (10-12 ft). On-site CVOC totals were comprised almost entirely of cis-dichloroethene ©-DCE) and vinyl chloride (VC). The highest tetrachloroethene (PCE) and trichloroethene (TCE) concentrations were reported as 595 and 217 ug/L, respectively, in EP8 (20-22 ft). On-site CVOC concentrations were generally highest at the rear (east) and north side of the building.

PVOC concentrations in shallow samples ranged from 2,907 ug/L at location EP1 (20-22 ft) to 30,821 ug/L at EP3 (10-12 ft). In almost all cases PVOC concentrations were considerably higher than the CVOC concentrations. The anomalously high CVOC and PVOC concentrations reported at EP7 (70-72 ft) were not explained in the SCR and are likely attributed to deficiencies in the method of sampling. This will be confirmed as part of the Remedial Investigation work.

Off-site CVOC concentrations were highest in samples from the 30-32 ft interval and ranged from 51 ug/L at location EP10 (west of the subject site) to 21,149 ug/L at location EP15. Off-site CVOC concentrations were comprised for the most part of PCE with only small amounts of TCE and the other parameters. Off-site PVOC detections were generally low and ranged from non-detect to 162 ug/L with the highest detections reported in the 50-52 interval.

CVOC detections in soil gas ranged from 11 ug/m3 to 5,717 ug/m3 with the highest concentrations occurring in SP2 and SP5 located at the north property line. The main constituent
in the soil gas at these locations was cis-DCE.

2.2 Remedial Investigation

The Remedial Investigation included the installation of 12 groundwater borings, 3 monitoring wells and the conduct of a soil vapor intrusion study (SVI).

Groundwater borings were sampled at select intervals from the aquifer surface to a depth of approximately 74 feet below grade (interval depths vary per location). Multiple groundwater samples were collected from each boring location.

All borings were advanced with GeoProbe® direct push equipment and sampled with a 4 foot screen point 16 (SP-16) sampler tool and 2' mil slot sampling device. Groundwater conditions were characterized by the staff scientist or Geo-technician. Retained water samples from each boring have been submitted to a New York State Department of Health ELAP-certified laboratory for EPA Method 8260 analysis.

The groundwater samples were collected by installing a 4 foot screen point 16 (SP-16) sampling tool to the desired depth below the water table. Groundwater samples were collected from the temporary wells using disposable polyethylene tubing connected to a peristaltic pump equipped with disposable peristaltic pump tubing or with a stainless steel check valve attached to the poly-tubing.

3.0 Site Hazard Evaluation

This section identifies the hazards associated with the proposed scope of work, general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against using engineering controls and/or personal protective equipment.

This HASP has been developed for work performed at the site in association with a Interim Remedial Measure. The primary hazards to the field crew will be physical hazards related to chemical exposures to the field crew from exposure to potential contaminants or vapors, which may be present at the site.

3.1 Physical Hazards

3.1.1 Tripping Hazards

An area of risk associated with on-site activities are presented by uneven ground, concrete, curbstones or equipment which may be present at the site thereby creating a potential tripping hazard. During intrusive work, care should be taken to mark or remove any obstacles within the exclusion zone.

3.1.2 Cuts and Lacerations

Field activities that involve boring equipment may result in cuts or lacerations from machinery and tools used in collecting samples, cutting disposable tubing and opening acetate sleeves and liners. A first aid kit approved by the American Red Cross will be available during all subsurface investigative activities.

3.1.3 Lifting Hazards

Improper lifting by workers is one of the leading causes of industrial injuries. Field workers may be required to lift heavy objects such as boring tools, buckets of decontamination water, cement, etc. Therefore, all members of the field crew should be trained in the proper methods of lifting heavy objects. All workers should be cautioned against lifting objects too heavy for one person.

3.1.4 Utility Hazards

Before conducting any subsurface boring or sampling, the contractor will be responsible for locating and verifying all existing utilities at each boring location.

3.1.5 Traffic Hazards

All traffic, vehicular and pedestrian, shall be maintained and protected at all times consistent with local, state and federal agency regulations regarding such traffic and in accordance with NYCDOT

guidelines. The contractor shall carry on his operations without undue interference or delays to traffic. The contractor shall furnish all labor, materials, guards, barricades, signs, lights, and anything else necessary to maintain traffic and to protect his work and the public, during operations.

3.2 Work in Extreme Temperatures

Work under extremely hot or cold weather conditions requires special protocols to minimize the chance that employees will be affected by heat or cold stress.

3.2.1 Heat Stress

The combination of high ambient temperature, high humidity, physical exertion, and personal protective apparel, which limits the dissipation of body heat and moisture, can cause heat stress.

The following prevention, recognition and treatment strategies will be implemented to protect personnel from heat stress. Personnel will be trained to recognize the symptoms of heat stress and to apply the appropriate treatment.

1. Prevention

    a. Provide plenty of fluids. Available in the support zone will be a 50% solution of fruit punch and water or plain water.

    b. Work in Pairs. Individuals should avoid undertaking any activity alone.

    c. Provide cooling devices. A spray hose and a source of water will be provided to reduce body temperature, cool protective clothing and/or act as a quick-drench shower in case of an exposure incident.

    d. Adjustment of the work schedule. As is practical, the most labor-intensive tasks should be carried out during the coolest part of the day.

2. Recognition and Treatment

    a. Heat Rash (or prickly heat):
    Cause: Continuous exposure to hot and humid air, aggravated by chafing clothing.

Symptoms: Eruption of red pimples around sweat ducts accompanied by intense itching and tingling.
Treatment: Remove source or irritation and cool skin with water or wet cloths.

b. Heat Cramps (or heat prostration)

Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.
Symptoms: Muscular weakness, staggering gait, nausea, dizziness, shallow breathing, pale and clammy skin, approximately normal body temperature.
Treatment: Perform the following while making arrangement for transport to a medical facility. Remove the worker to a contamination reduction zone. Remove protective clothing. Lie worker down on back in a cool place and raise feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of salt-water solution, using one teaspoon of salt in 12 ounces of water. Transport to a medical facility.

c. Heat Stroke

Cause: Same as heat exhaustion. This is also an extremely serious condition.
Symptoms: Dry and hot skin, dry mouth, dizziness, nausea, headache and rapid pulse.
Treatment: Cool worker immediately by immersing or spraying with cool water or sponge bare skin after removing protective clothing. Transport to hospital.

3.2.2 Cold Exposure

Exposure to cold weather, wet conditions and extreme wind-chill factors may result in excessive loss of body heat (hypothermia) and/or frostbite. To guard against cold exposure and to prevent cold injuries, appropriate warm clothing should be worn, warm shelter must be readily available, rest periods should be adjusted as needed, and the physical conditions of on-site field personnel should be closely monitored. Personnel and supervisors working on-site will be made aware of the signs and symptoms of frost bite and hypothermia such as shivering, reduced blood pressure, reduced coordination, drowsiness, impaired judgment, fatigue, pupils dilated but reactive to light and numbing of the toes and fingers.

3.3 Chemical Hazards

A Site Characterization previously performed at the site identified both chlorinated and petroleum volatile organic compounds in soil and groundwater which may be encountered during the remedy installment. In addition, chlorinated compounds in soil vapors were also reported at the Site particularly along the northern property line.

The primary routes of exposure to these contaminants are inhalation, ingestion and absorption.

Appendix - C includes information sheets for suspected chemicals that may be encountered at the site.

3.3.1 Respirable Dust and Direct Contact with Soil and Groundwater

Dust may be generated from boring activities. If visible observation detects elevated levels of dust, a program of wetting will be employed by the site safety officer. If elevated dust levels persist, the site safety office will employ dust monitoring using a particulate monitor (MiniRae or equivalent). If monitoring detects concentrations greater than 150 ì g/m3 over daily background, the site safety officer will take corrective actions as defined herein, including the use of water for dust suppression and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges.

Absorption pathways for dust and direct contact with soil and groundwater will be mitigated with the implementation of latex gloves, hand washing and decontamination exercises when necessary.

3.3.2 Organic Vapors

Considering the past and present use of the properties, VOCs may be encountered at the site in soil and/or groundwater. Therefore, boring activities may cause the release of organic vapors to the atmosphere. The site safety officer will periodically monitor organic vapors with a Photoionization Detector (PID) during boring activities to determine whether organic vapor concentrations exceed action levels shown below.

PID Response	Action
Sustained readings of 5 ppm or greater	Shut down equipment and allow area to vent. Resume when readings return to background
Sustained readings of 5 ppm or greater that do not subside after venting	Implement Vapor Release Plan (Section 6.8). Re-evaluate respiratory protection as upgrade may be required.

4.0 Personal Protective Equipment (PPE)

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, OSHA 29 CFR 1910.120©, (g), and 1910.132. Protective equipment shall be NIOSH approved and respiratory protection shall conform to OSHA 29 CFR Part 1910.133 and 1910.134 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136. The only true difference among the levels of protection from D thru B is the addition of the type of respiratory protection. **It is anticipated that work will be performed in Level D PPE.**

4.1 Level D

Level D PPE shall be donned when the atmosphere contains no known hazards and work functions preclude splashes, immersion, or the potential for inhalation of, or contact with, hazardous concentrations of harmful chemicals. Level D PPE consists of:

- standard work uniform, coveralls, or tyvek, as needed;
- steel toe and steel shank work boots;
- hard hat;
- gloves, as needed;
- safety glasses;
- hearing protection;
- equipment replacements are available as needed.

4.2 Level C

Level C PPE shall be donned when the concentrations of measured total organic vapors in the breathing zone exceed background concentrations (using a portable OVA, or equivalent), but are less than 5 ppm. The specifications on the APR filters used must be appropriate for contaminants identified or expected to be encountered. Level C PPE shall be donned when the identified contaminants have adequate warning properties and criteria for using APR have been met. Level C PPE consists of:

- chemical resistant or coated tyvek coveralls;
- steel-toe and steel-shank work boots;
- chemical resistant over boots or disposable boot covers;
- disposable inner gloves (surgical gloves);
- disposable outer gloves;
- full face APR fitted with organic vapor/dust and mist filters or filters appropriate for the
- identified or expected contaminants;
- hard hat;
- splash shield, as needed; and,
- ankles/wrists taped with duct tape.

4.3 Activity-Specific Levels of Personal Protection

The required level of PPE is activity-specific and is based on air monitoring results (Section 4.0) and properties of identified or expected contaminants. **It is expected that site work will be performed in Level D.** If air monitoring results indicate the necessity to upgrade the level of protection engineering controls (i.e. Facing equipment away from the wind and placing site personnel upwind of excavations, active venting, etc.) will be implemented before requiring the use of respiratory protection.

5.0 Site Control

5.1 Work Zones

The primary purpose of site controls is to establish the perimeter of a hazardous area, to reduce the migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. When operations are to take place involving hazardous materials, the site safety officer will establish an exclusion zone, a decontamination zone, and a support zone. These zones "float" (move around the site) depending on the tasks being performed on any given day. The site safety officer will outline these locations before work begins and when zones change. The site safety officer records this information in the site log book. **It is expected that for soil boring and sampling activities, identification of an exclusion zone, decontamination zone, and support zone will not be necessary.**

Tasks requiring OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training are carried out in the exclusion zone. The exclusion zone is defined by the site safety officer but will typically be a 50-foot area around work activities. Gross decontamination (as determined by the site Health and Safety Officer) is conducted in the exclusion zone; all other decontamination is performed in the decontamination zone or trailer.

Protective equipment is removed in the decontamination zone. Disposable protective equipment is stored in receptacles staged in the decontamination zone, and non-disposable equipment is decontaminated. All personnel and equipment exit the exclusion zone through the decontamination zone. If a decontamination trailer is provided the first aid equipment, an eye wash unit, and drinking water are kept in the decontamination trailer.

The support zone is used for vehicle parking, daily safety meetings, and supply storage. Eating, drinking, and smoking are permitted only in the support zone. When a decontamination trailer is not provided, the eye wash unit, first aid equipment, and drinking water are kept at a central location designated by the site safety officer.

6.0 Contingency Plan/Emergency Response Plan

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms: illnesses, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital will be posted in the command post. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment.

6.1 Emergency Equipment On-site

Private telephones: Site personnel.
Two-way radios: Site personnel where necessary.
Emergency Alarms: On-site vehicle horns*.
First aid kits: On-site, in vehicles or office.
Fire extinguisher: On-site, in office or on equipment.

6.2 Emergency Telephone Numbers

General Emergencies 911
Nassau County Police (4rth precinct Hewlett, NY) 516-573-6400
St. John's Hospital 718-869-7000
NYSDEC Spills Division 800-457-7362
NYSDEC Hazardous Waste Division 718-482-4994
NCDOH Nassau County Department of Health 516-227-9697
Lawrence-Cedarhurst Fire Department 516-569-0042
National Response Center 800-424-8802
Poison Control 212-340-4494
Site Safety Officer 631-589-6521
Project Manager 631-589-6521 or cell 631-774-6682

6.3 Personnel Responsibilities During an Emergency

The project manager is primarily responsible for responding to and correcting any emergency situations. However, in the absence of the project manager, the site safety officer shall act as the project manager's on-site designee and perform the following tasks:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, evacuate and secure the site, or upgrade/downgrade the level of protective clothing and respiratory protection;

- Ensure that appropriate federal, state, and local agencies are informed and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;

- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;

- Determine the cause of incidents and make recommendations to prevent recurrence; and,

- Ensure that all required reports have been prepared.

The following key personnel are planned for this project:

- Project Manager: Mr. Walter Beringer 631-589-6521 (office)

- Site Safety Officer/Supervisor: Justin Halpin 631-589-6521 (cell 631-774-6682)

- Geo-Technician: Mr. Joel Meyers 631-589-6521

- Geo-Technician: Mr. Eusi Watkins 631-589-6521

6.4 Medical Emergencies

A person who becomes ill or injured in the exclusion zone will be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination will be completed and first aid administered prior to transport. First aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (**Appendix D**) must be filled out for any injury.

A person transporting an injured/exposed person to a clinic or hospital for treatment will take the directions to the hospital (**Appendix D**) and information on the chemical(s) to which they may have been exposed (**Appendix C**).

6.5 Fire or Explosion

In the event of a fire or explosion, the local fire department will be summoned immediately. The site safety officer or his designated alternate will advise the fire commander of the location, nature and

identification of the hazardous materials on-site. If it is safe to do so, site personnel may:

- use fire fighting equipment available on site; or,
- remove or isolate flammable or other hazardous materials that may contribute to the fire.

6.6 Evacuation Routes

Evacuation routes established by work area locations for each site will be reviewed prior to commencing site operations. As the work areas change, the evacuation routes will be altered accordingly, and the new route will be reviewed.

Under extreme emergency conditions, evacuation is to be immediate without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel will follow these instructions:

- Keep upwind of smoke, vapors, or spill location.
- Exit through the decontamination corridor if possible.
- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.
- The site safety officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.
- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

6.7 Spill Control Procedures

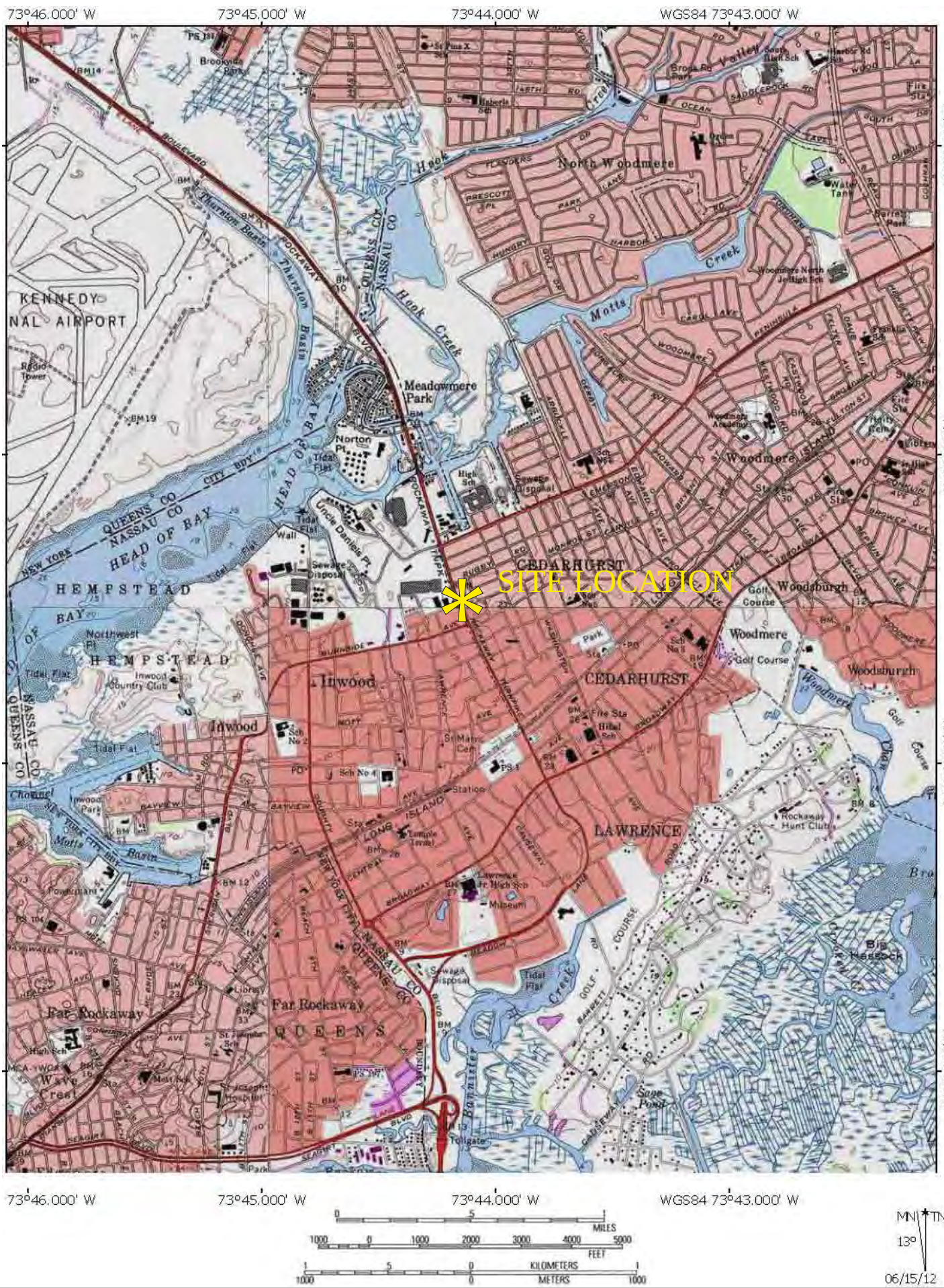
Spills associated with site activities may be attributed to project equipment and include gasoline, diesel and hydraulic oil. In the event of a leak or a release, site personnel will inform their supervisor immediately, locate the source of spillage and stop the flow if it can be done safely. A spill containment kit including absorbent pads, booms and/or granulated speedy dry absorbent material will be available to site personnel to facilitate the immediate recovery of the spilled material. Daily inspections of site equipment components including hydraulic lines, fuel tanks, etc. will be performed by their respective operators as a preventative measure for equipment leaks and to ensure equipment soundness. In the event of a spill, site personnel will immediately notify the NYSDEC (1-800-457-7362), and a spill number will be generated.

6.8 Vapor Release Plan

If work zone organic vapor (excluding methane) exceeds 5 ppm, then a downwind reading will be made either 200 feet from the work zone or at the property line, whichever is closer. If readings at this location exceed 5 ppm over background, the work will be stopped.

If 5 ppm of VOCs are recorded over background on a PID at the property line, then an off-site reading will be taken within 20 feet of the nearest residential or commercial property, whichever is closer. If efforts to mitigate the emission source are unsuccessful for 30 minutes, then the designated site safety officer will:

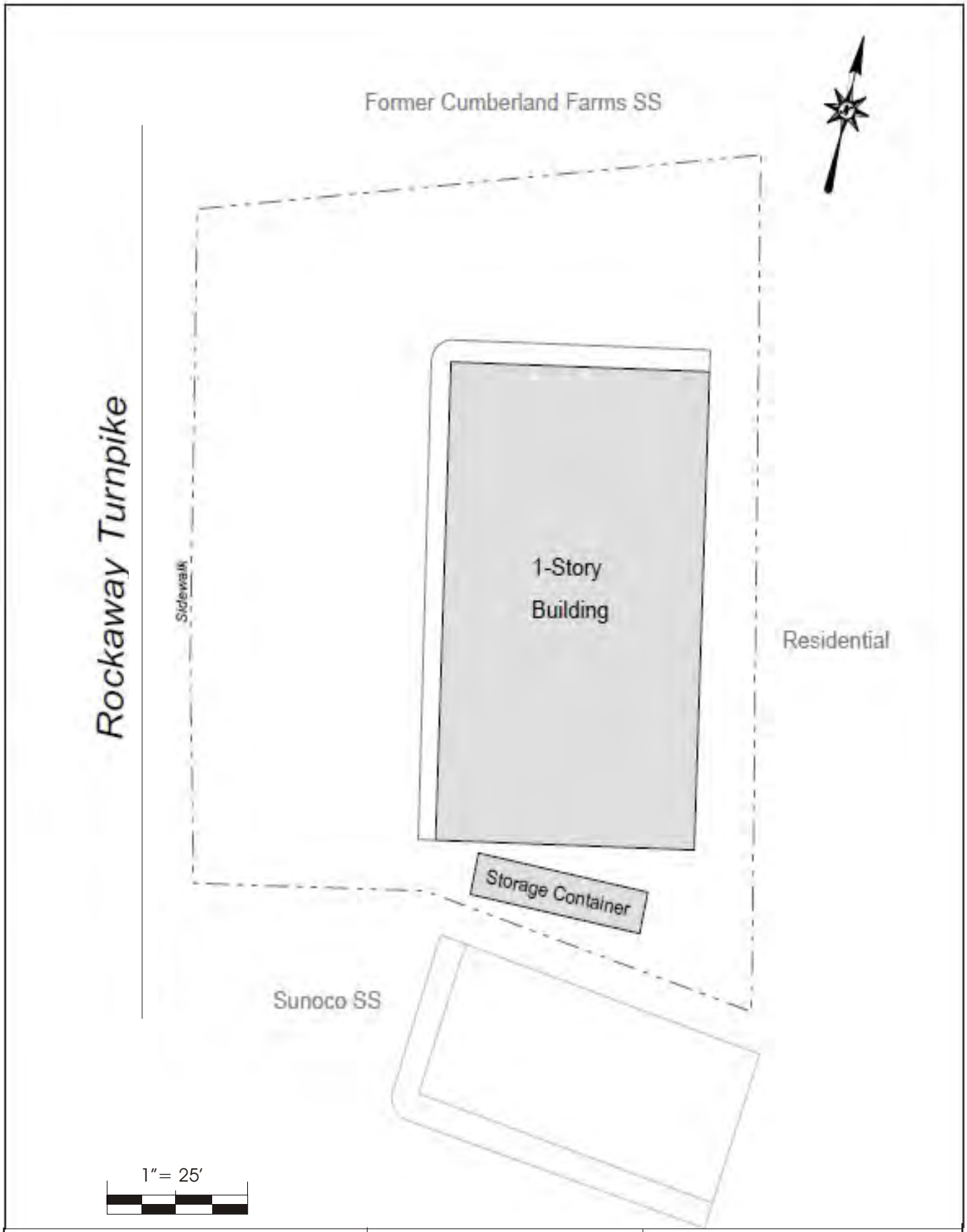
- contact the local police;
- continue to monitor air every 30 minutes, 20 feet from the closest off-site property. If two successive readings are below 5 ppm (non-methane), off-site air monitoring will be halted.
- All property line and off site air monitoring locations and results associated with vapor releases will be recorded in the site safety log book.



Former Quick and Clean Cleaners
380 Rockaway Turnpike
Cedarhurst, New York

Figure-1
Site Location

John V. Soderberg P.E
PO Box 263
Stony Brook, New York



Former Quick and Clean Cleaners **380 Rockaway Turnpike** **Cedarhurst, New York**	Figure-2 Site Map	**John V. Soderberg P.E** **PO Box 263** **Stony Brook, New York**

APPENDIX A

SITE SAFETY ACKNOWLEDGEMENT FORM

DAILY BREIFING SIGN-IN SHEET

Date:_____ Person Conducting Briefing:_____

Project Name and Location:_____

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

_____

_____

_____

_____

2. OTHER ISSUES (HASP changes, attendee comments, etc…):

_____

_____

_____

3. ATTENDEES (Print Name):

1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

APPENDIX B

SITE SAFETY PLAN AMENDMENTS

SITE SAFETY PLAN AMENDMENT FORM

Site Safety Plan Amendment #: _____

Site Name: _____

Reason for Amendment: _____

_____

_____

_____

Alternative Procedures: _____

_____

_____

_____

Required Changes in PPE: _____

_____

_____

_____

_____ _____

Project Superintendent (signature) **Date**

_____ _____

Health and Safety Consultant (signature) **Date**

_____ _____

Site Safety Officer (signature) **Date**

APPENDIX C

CHEMICAL HAZARDS

CHEMICAL HAZARDS

The attached International Chemical Safety Cards are provided for contaminants of concern that have been identified in soils and/or groundwater at the site.

International Chemical Safety Cards

TETRACHLOROETHYLENE

ICSC: 0076

1,1,2,2-Tetrachloroethylene
Perchloroethylene
Tetrachloroethene
C_2Cl_4 / $Cl_2C=CCl_2$
Molecular mass: 165.8

ICSC # 0076
CAS # 127-18-4
RTECS # KX3850000
UN # 1897
EC # 602-028-00-4
April 13, 2000 Validated

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			
EXPOSURE		STRICT HYGIENE! PREVENT GENERATION OF MISTS!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea. Weakness. 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. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles , face shield .	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Give plenty of water to drink. Rest.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. 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.	Separated from metals ,(see Chemical Dangers), food and feedstuffs . Keep in the dark. Ventilation along the floor.	Do not transport with food and feedstuffs. Marine pollutant. Xn symbol N symbol R: 40-51/53 S: (2-)23-36/37-61 UN Hazard Class: 6.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0076

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

TETRACHLOROETHYLENE

ICSC: 0076

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The vapour is heavier than air.

CHEMICAL DANGERS:
On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive fumes (hydrogen chloride, phosgene, chlorine). The substance decomposes slowly on contact with moisture producing trichloroacetic acid and hydrochloric acid. Reacts with metals such as aluminium, lithium, barium, beryllium.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 25 ppm as TWA, 100 ppm as STEL; A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued; (ACGIH 2004).
MAK: skin absorption (H);
Carcinogen category: 3B;
(DFG 2004).
OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 3-hours)
NIOSH REL: Ca Minimize workplace exposure concentrations. See Appendix A
NIOSH IDLH: Ca 150 ppm See: 127184

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation 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 . If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. The substance may cause effects on the central nervous system. Exposure at high levels may result in unconsciousness.

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. This substance is probably carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 121°C
Melting point: -22°C
Relative density (water = 1): 1.6
Solubility in water, g/100 ml at 20°C: 0.015

Vapour pressure, kPa at 20°C: 1.9
Relative vapour density (air = 1): 5.8
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.09
Octanol/water partition coefficient as log Pow: 2.9

ENVIRONMENTAL DATA

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

N O T E S

Depending on the degree of exposure, periodic medical examination is suggested. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT use in the vicinity of a fire or a hot surface, or during welding. An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert. Card has been partly updated in April 2005. See section Occupational Exposure Limits.

Transport Emergency Card: TEC (R)-61S1897

NFPA Code: H2; F0; R0;

ADDITIONAL INFORMATION

IMPORTANT LEGAL NOTICE:

International Chemical Safety Cards

TRICHLOROETHYLENE

ICSC: 0081

1,1,2-Trichloroethylene
Trichloroethene
Ethylene trichloride
Acetylene trichloride
C_2HCl_3 / $ClCH=CCl_2$
Molecular mass: 131.4

ICSC # 0081
CAS # 79-01-6
RTECS # KX4550000
UN # 1710
EC # 602-027-00-9
April 10, 2000 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible under specific conditions. See Notes.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION		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! STRICT HYGIENE!	
•INHALATION	Dizziness. Drowsiness. Headache. Weakness. Nausea. 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. Pain.	Safety spectacles, 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. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Give one or two glasses of water to drink. Rest.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. 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.	Separated from metals (see Chemical Dangers), strong bases, food and feedstuffs . Dry. Keep in the dark. Ventilation along the floor. Store in an area without drain or sewer access.	Do not transport with food and feedstuffs. Marine pollutant. T symbol R: 45-36/38-52/53-67 S: 53-45-61 UN Hazard Class: 6.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0081 OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

TRICHLOROETHYLENE

ICSC: 0081

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The vapour is heavier than air. As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive fumes (phosgene , hydrogen chloride). The substance decomposes on contact with strong alkali producing dichloroacetylene , which increases fire hazard. Reacts violently with metal powders such as magnesium, aluminium, titanium, and barium. Slowly decomposed by light in presence of moisture, with formation of corrosive hydrochloric acid.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 50 ppm as TWA; 100 ppm as STEL; A5; BEI issued; (ACGIH 2004).
MAK:
Carcinogen category: 1; Germ cell mutagen group: 3B; (DFG 2007).
OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)
NIOSH REL: Ca See Appendix A See Appendix C
NIOSH IDLH: Ca 1000 ppm See: 79016

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation 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 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 , resulting in respiratory failure . Exposure could cause lowering of consciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the central nervous system , resulting in loss of memory. The substance may have effects on the liver and kidneys (see Notes). This substance is probably carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 87°C
Melting point: -73°C
Relative density (water = 1): 1.5
Solubility in water, g/100 ml at 20°C: 0.1
Vapour pressure, kPa at 20°C: 7.8
Relative vapour density (air = 1): 4.5
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.3
Auto-ignition temperature: 410°C
Explosive limits, vol% in air: 8-10.5
Octanol/water partition coefficient as log Pow: 2.42
Electrical conductivity: 800pS/m

ENVIRONMENTAL DATA

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

N O T E S

Combustible vapour/air mixtures difficult to ignite, may be developed under certain conditions. Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is suggested. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT use in the vicinity of a fire or a hot surface, or during welding. An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert.

Transport Emergency Card: TEC (R)-61S1710

NFPA Code: H2; F1; R0;
Card has been partially updated in October 2004: see Occupational Exposure Limits, EU Classification, Emergency Response.
Card has been partially updated in April 2010: see Occupational Exposure Limits, Ingestion First Aid, Storage.

ADDITIONAL INFORMATION

Material Safety Data Sheet

cis-1,2-Dichloroethylene, 97%

ACC# 97773

Section 1 - Chemical Product and Company Identification

MSDS Name: cis-1,2-Dichloroethylene, 97%
Catalog Numbers: AC113380000, AC113380025, AC113380100
Synonyms: cis-Acetylene dichloride.
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
156-59-2	cis-1,2-Dichloroethylene	97	205-859-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Clear liquid. Flash Point: 6 deg C.
Warning! Flammable liquid and vapor. Harmful if inhaled. Unstabilized substance may polymerize. Causes eye and skin irritation. May be harmful if swallowed. May cause respiratory tract irritation.
Target Organs: Central nervous system, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes moderate eye irritation.
Skin: Causes moderate skin irritation. May cause dermatitis.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed. May cause central nervous system depression.
Inhalation: May cause respiratory tract irritation. May cause narcotic effects in high concentration. Eye irritation, vertigo, and nausea were reported in humans exposed at 2200 ppm.
Chronic: Not available. Some German investigators reported fatty degeneration of the liver upon repeated narcotic doses in rats and

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.
Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.
Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Use water spray to keep fire-exposed containers cool. Flammable liquid and vapor. Fire or excessive heat may result in violent rupture of the container due to bulk polymerization. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. Hazardous polymerization may occur under fire conditions.
Extinguishing Media: Use water fog, dry chemical, carbon dioxide, or regular foam.
Flash Point: 6 deg C (42.80 deg F)
Autoignition Temperature: 440 deg C (824.00 deg F)
Explosion Limits, Lower:9.70 vol %
Upper: 12.80 vol %
NFPA Rating: (estimated) Health: 2; Flammability: 3; Instability: 2

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Pure vapor will be uninhibited and may polymerize in vents or other confined spaces.
Storage: Keep away from sources of ignition. Store in a tightly closed container. Flammables-area. Store protected from light and air.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
cis-1,2-Dichloroethylene	200 ppm TWA	none listed	none listed

OSHA Vacated PELs: cis-1,2-Dichloroethylene: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear chemical splash goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: Clear
Odor: Pleasant odor
pH: Not available.
Vapor Pressure: 201 mm Hg @ 25 deg C
Vapor Density: 3.34 (air=1)
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 60 deg C @ 760 mm Hg
Freezing/Melting Point:-80 deg C
Decomposition Temperature: Not available.
Solubility: Insoluble.
Specific Gravity/Density:1.2800
Molecular Formula:C2H2Cl2
Molecular Weight:96.94

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. This material is a monomer and may polymerize under certain conditions if the stabilizer is lost.
Conditions to Avoid: Light, ignition sources, exposure to air, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, copper.
Hazardous Decomposition Products: Hydrogen chloride, phosgene, carbon monoxide, carbon dioxide.
Hazardous Polymerization: May occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 156-59-2: KV9420000
LD50/LC50:
CAS# 156-59-2:
Inhalation, rat: LC50 = 13700 ppm;
.

Carcinogenicity:
CAS# 156-59-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	1,2-DICHLOROETHYLENE
Hazard Class:		3
UN Number:		UN1150
Packing Group:		II

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 156-59-2 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 156-59-2 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European / International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:
XN F
Risk Phrases:

R 11 Highly flammable.
R 20 Harmful by inhalation.
R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.
S 29 Do not empty into drains.
S 7 Keep container tightly closed.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 156-59-2: No information available.

Canada - DSL/NDSL

CAS# 156-59-2 is listed on Canada's NDSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Section 16 - Additional Information

MSDS Creation Date: 2/09/1998
Revision #5 Date: 3/16/2007

International Chemical Safety Cards

VINYL CHLORIDE

ICSC: 0082

Chloroethene
Chloroethylene
VCM
C_2H_3Cl / $H_2C=CHCl$
Molecular mass: 62.5
(cylinder)

ICSC # 0082
CAS # 75-01-4
RTECS # KU9625000
UN # 1086 (stabilized)
EC # 602-023-00-7
April 13, 2000 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Extremely flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking.	Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out; in other cases extinguish with powder, carbon dioxide.
EXPLOSION	Gas/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Use non-sparking handtools.	In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.
EXPOSURE		AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	Dizziness. Drowsiness. Headache. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	ON CONTACT WITH LIQUID: FROSTBITE.	Protective gloves. Cold-insulating gloves. Protective clothing.	ON FROSTBITE: rinse with plenty of water, do NOT remove clothes.
•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		Do not eat, drink, or smoke during work.	

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Consult an expert! Ventilation. Remove all ignition sources. Personal protection: complete protective clothing including self-contained breathing apparatus.	Fireproof. Separated from incompatible materials .(See Chemical Dangers.) Cool. Store only if stabilized.	Note: D F+ symbol T symbol R: 45-12 S: 53-45 UN Hazard Class: 2.1

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0082

International Chemical Safety Cards

VINYL CHLORIDE

ICSC: 0082

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS COMPRESSED LIQUEFIED GAS , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The gas is heavier than air, and may travel along the ground; distant ignition possible. Vinyl chloride monomer vapours are uninhibited and may form polymers in vents or flame arresters of storage tanks, resulting in blockage of vents.

CHEMICAL DANGERS:
The substance can under specific circumstances form peroxides, initiating explosive polymerization. The substance will polymerize readily due to heating and under the influence of air, light and on contact with a catalyst, strong oxidizing agents and metals such as copper and aluminium, with fire or explosion hazard. The substance decomposes on burning producing toxic and corrosive fumes (hydrogen chloride , phosgene). Attacks iron and steel in the presence of moisture.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 1 ppm as TWA; A1 (confirmed human carcinogen); (ACGIH 2004).
MAK:
Carcinogen category: 1;
(DFG 2004).
OSHA PEL: 1910.1017 TWA 1 ppm C 5 ppm 15-minute
NIOSH REL: Ca See Appendix A
NIOSH IDLH: Ca N.D. See: IDLH INDEX

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation.

INHALATION RISK:
A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes . The liquid may cause frostbite. The substance may cause effects on the central nervous system . Exposure could cause lowering of consciousness. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The substance may have effects on the liver, spleen, blood andperipheral blood vessels, and tissue and bones of the fingers. This substance is carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: -13°C
Melting point: -154°C
Relative density (water = 1): 0.9 (liquid)
Density: 8 (vapour) at 15°C
g/l
Solubility in water:
none

Relative vapour density (air = 1): 2.2
Flash point:
-78°C c.c.
Auto-ignition temperature: 472°C
Explosive limits, vol% in air: 3.6-33
Octanol/water partition coefficient as log Pow: 0.6

ENVIRONMENTAL DATA

This substance may be hazardous to the environment; special attention should be given to ground water contamination.

N O T E S

Depending on the degree of exposure, periodic medical examination is suggested. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT use in the vicinity of a fire or a hot surface, or during welding. An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert. Card has been partly updated in April 2005. See section Occupational Exposure Limits.

Transport Emergency Card: TEC (R)-20S1086

NFPA Code: H 2; F 4; R 2;

ADDITIONAL INFORMATION

International Chemical Safety Cards

TOLUENE

ICSC: 0078

Methylbenzene
Toluol
Phenylmethane
$C_6H_5CH_3$ / C_7H_8
Molecular mass: 92.1

ICSC # 0078
CAS # 108-88-3
RTECS # XS5250000
UN # 1294
EC # 601-021-00-3
October 10, 2002 Peer reviewed

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	STORAGE	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	Fireproof. Separated from strong oxidants.	F symbol Xn symbol R: 11-38-48/20-63-65-67 S: 2-36/37-46-62 UN Hazard Class: 3 UN Packing Group: II

ICSC: 0078

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

TOLUENE

ICSC: 0078

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).
OSHA PEL†: TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)
NIOSH REL: TWA 100 ppm (375 mg/m^3) ST 150 ppm (560 mg/m^3)
NIOSH IDLH: 500 ppm See: 108883

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 dysrhythmiaandunconsciousness.

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.

Transport Emergency Card: TEC (R)-30S1294
NFPA Code: H 2; F 3; R 0;

ADDITIONAL INFORMATION

International Chemical Safety Cards

ETHYLBENZENE

ICSC: 0268

Ethylbenzol
Phenylethane
EB
C_8H_{10} / $C_6H_5C_2H_5$
Molecular mass: 106.2

ICSC # 0268
CAS # 100-41-4
RTECS # DA0700000
UN # 1175
EC # 601-023-00-4
March 13, 1995 Validated

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	STORAGE	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.	Fireproof. Separated from strong oxidants.	F symbol Xn symbol R: 11-20 S: 2-16-24/25-29 UN Hazard Class: 3 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0268

International Chemical Safety Cards

ETHYLBENZENE

ICSC: 0268

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). OSHA PEL†: TWA 100 ppm (435 mg/m^3) NIOSH REL: TWA 100 ppm (435 mg/m^3) ST 125 ppm (545 mg/m^3) NIOSH IDLH: 800 ppm 10%LEL See: 100414	**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. 	

N O T E S

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

Transport Emergency Card: TEC (R)-30S1175 or 30GF1-I+II
NFPA Code: H2; F3; R0

ADDITIONAL INFORMATION

IMPORTANT LEGAL NOTICE:	Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

TOLUENE

ICSC: 0078

Methylbenzene
Toluol
Phenylmethane
$C_6H_5CH_3$ / C_7H_8
Molecular mass: 92.1

ICSC # 0078
CAS # 108-88-3
RTECS # XS5250000
UN # 1294
EC # 601-021-00-3
October 10, 2002 Peer reviewed

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	STORAGE	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	Fireproof. Separated from strong oxidants.	F symbol Xn symbol R: 11-38-48/20-63-65-67 S: 2-36/37-46-62 UN Hazard Class: 3 UN Packing Group: II

ICSC: 0078

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

TOLUENE

ICSC: 0078

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).
OSHA PEL†: TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)
NIOSH REL: TWA 100 ppm (375 mg/m^3) ST 150 ppm (560 mg/m^3)
NIOSH IDLH: 500 ppm See: 108883

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 dysrhythmiaandunconsciousness.

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.

Transport Emergency Card: TEC (R)-30S1294
NFPA Code: H 2; F 3; R 0;

ADDITIONAL INFORMATION

International Chemical Safety Cards

o-XYLENE

ICSC: 0084

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

ICSC # 0084
CAS # 95-47-6
RTECS # ZE2450000
UN # 1307
EC # 601-022-00-9
August 03, 2002 Validated

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	STORAGE	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.)	Fireproof. Separated from strong oxidants strong acids	Note: C Xn symbol R: 10-20/21-38 S: 2-25 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0084

International Chemical Safety Cards

o-XYLENE

ICSC: 0084

I M P O R T A N T D A T A

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 strong oxidants

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 100 ppm as TWA 150 ppm as STEL A4 (ACGIH 2001). BEI (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).
OSHA PEL†: TWA 100 ppm (435 mg/m^3)
NIOSH REL: TWA 100 ppm (435 mg/m^3) ST 150 ppm (655 mg/m^3)
NIOSH IDLH: 900 ppm See: 95476

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.

N O T E S

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.

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

ADDITIONAL INFORMATION

IMPORTANT LEGAL NOTICE:

International Chemical Safety Cards

1,2,4-TRIMETHYLBENZENE

ICSC: 1433

Pseudocumene

C_9H_{12}

Molecular mass: 120,2

ICSC # 1433
CAS # 95-63-6
RTECS # DC3325000
UN # 1993
EC # 601-043-00-3
March 06, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Alcohol-resistant foam, dry powder, carbon dioxide.
EXPLOSION	Above 44°C explosive vapour/air mixtures may be formed.	Above 44°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	Confusion. Cough. Dizziness. Drowsiness. Headache. Sore throat. Vomiting.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Redness. Dry skin.	Protective gloves.	Rinse skin with plenty of water or shower.
•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	STORAGE	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 wash away into sewer. Do NOT let this chemical enter the environment. Personal protection: filter respirator for organic gases and vapours.	Fireproof. Separated from strong oxidants. Well closed. Keep in a well-ventilated room.	Xn symbol N symbol R: 10-20-36/37/38-51/53 S: 2-26-61 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 1433

International Chemical Safety Cards

1,2,4-TRIMETHYLBENZENE

ICSC: 1433

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** The substance decomposes on burning producing toxic and irritating fumes Reacts violently with strong oxidants causing fire and explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (as mixed isomers) 25 ppm as TWA (ACGIH 2004). MAK: (as mixed isomers) 20 ppm 100 mg/m³ Peak limitation category: II(2) Pregnancy risk group: C (DFG 2004). OSHA PEL†: none NIOSH REL: TWA 25 ppm (125 mg/m^3) NIOSH IDLH: N.D. See: IDLH INDEX	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation. **INHALATION RISK:** A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance is irritating to the eyes the skin and the respiratory tract If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. The substance may cause effects on the central nervous system **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The liquid defats the skin. Lungs may be affected by repeated or prolonged exposure , resulting in chronic bronchitis The substance may have effects on the central nervous system blood See Notes.
PHYSICAL PROPERTIES	Boiling point: 169°C Melting point: -44°C Relative density (water = 1): 0.88 Solubility in water: very poor Relative vapour density (air = 1): 4.1	Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01 Flash point: 44°C c.c. Auto-ignition temperature: 500°C Explosive limits, vol% in air: 0.9-6.4 Octanol/water partition coefficient as log Pow: 3.8
ENVIRONMENTAL DATA	The substance is toxic to aquatic organisms. Bioaccumulation of this chemical may occur in fish. 	

N O T E S

Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is suggested. See also ICSC 1155 1,3,5-Trimethylbenzene (Mesitylene), ICSC 1362 1,2,3-Trimethylbenzene (Hemimellitene), ICSC 1389 Trimethyl benzene (mixed isomers). 1,3,5-Trimethylbenzene (Mesitylene) is classified as a marine pollutant.

Transport Emergency Card: TEC (R)-30GF1-III
NFPA Code: H0; F2; R0;

ADDITIONAL INFORMATION

International Chemical Safety Cards

1,3,5-TRIMETHYLBENZENE

ICSC: 1155

Mesitylene
C_9H_{12}
Molecular mass: 120.2

ICSC # 1155
CAS # 108-67-8
RTECS # OX6825000
UN # 2325
EC # 601-025-00-5
March 06, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Alcohol-resistant foam, dry powder, carbon dioxide.
EXPLOSION	Above 50°C explosive vapour/air mixtures may be formed.	Above 50°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**	Confusion. Cough. Dizziness. Drowsiness. Headache. Sore throat. Vomiting.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•**SKIN**	Redness. Dry skin.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•**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	STORAGE	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 wash away into sewer. Do NOT let this chemical enter the environment. (Extra personal protection: filter respirator for organic gases and vapours.)	Fireproof. Separated from strong oxidants. Well closed. Keep in a well-ventilated room.	Marine pollutant. Xi symbol N symbol R: 10-37-51/53 S: 2-61 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 1155

International Chemical Safety Cards

1,3,5-TRIMETHYLBENZENE

ICSC: 1155

I M P O R T A N T D A T A	**PHYSICAL STATE; APPEARANCE:** COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** The substance decomposes on burning producing toxic and irritating fumes. Reacts violently with strong oxidants causing fire and explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV (as mixed isomers): 25 ppm; (ACGIH 2001). MAK (all isomers): 20 ppm; 100 mg/m^3; class II 1 © (2001) OSHA PEL†: none NIOSH REL: TWA 25 ppm (125 mg/m^3) NIOSH IDLH: N.D. See: IDLH INDEX **ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation. **INHALATION RISK:** A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance is irritating to the eyes the skin and the respiratory tract If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. The substance may cause effects on the central nervous system. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The liquid defats the skin. Lungs may be affected by repeated or prolonged exposure, resulting in chronic bronchitis. The substance may have effects on the central nervous system blood See Notes.
PHYSICAL PROPERTIES	Boiling point: 165°C Melting point: -45°C Relative density (water = 1): 0.86 Solubility in water: very poor Vapour pressure, kPa at 20°C: 0.25 Relative vapour density (air = 1): 4.1 Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01 Flash point: 50°C (c.c.) Auto-ignition temperature: 550°C Octanol/water partition coefficient as log Pow: 3.42
ENVIRONMENTAL DATA	The substance is harmful to aquatic organisms. Bioaccumulation of this chemical may occur in fish. 

N O T E S

Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is indicated. See ICSC 1433 1,2,4-Trimethylbenzene (Pseudocumene), ICSC 1362 1,2,3-Trimethylbenzene (Hemimellitene), ICSC 1389 Trimethyl benzene (mixed isomers).

Transport Emergency Card: TEC (R)-30S2325
NFPA Code: H0; F2; R0

ADDITIONAL INFORMATION

APPENDIX D

HOSPITAL INFORMATION AND MAP

FIELD ACCIDENT REPORT

FIELD ACCIDENT REPORT

This report is to be filled out by the designated Site Safety Officer after EVERY accident.

PROJECT NAME _____ PROJECT. NO._____

Date of Accident _____ Time _____ Report By _____

Type of Accident (Check One):

( ) Vehicular ( ) Personal ( ) Property

Name of Injured _____ DOB or Age _____

How Long Employed _____

Names of Witnesses _____

_____

Description of Accident _____

_____

_____

Action Taken _____

_____

_____

Did the Injured Lose Any Time? _____ How Much (Days/Hrs.)? _____

Was Safety Equipment in Use at the Time of the Accident (Hard Hat, Safety Glasses, Gloves, Safety Shoes, etc.)? _____

_____

(If not, it is the EMPLOYEE'S sole responsibility to process his/her claim through his/her Health and Welfare Fund.)

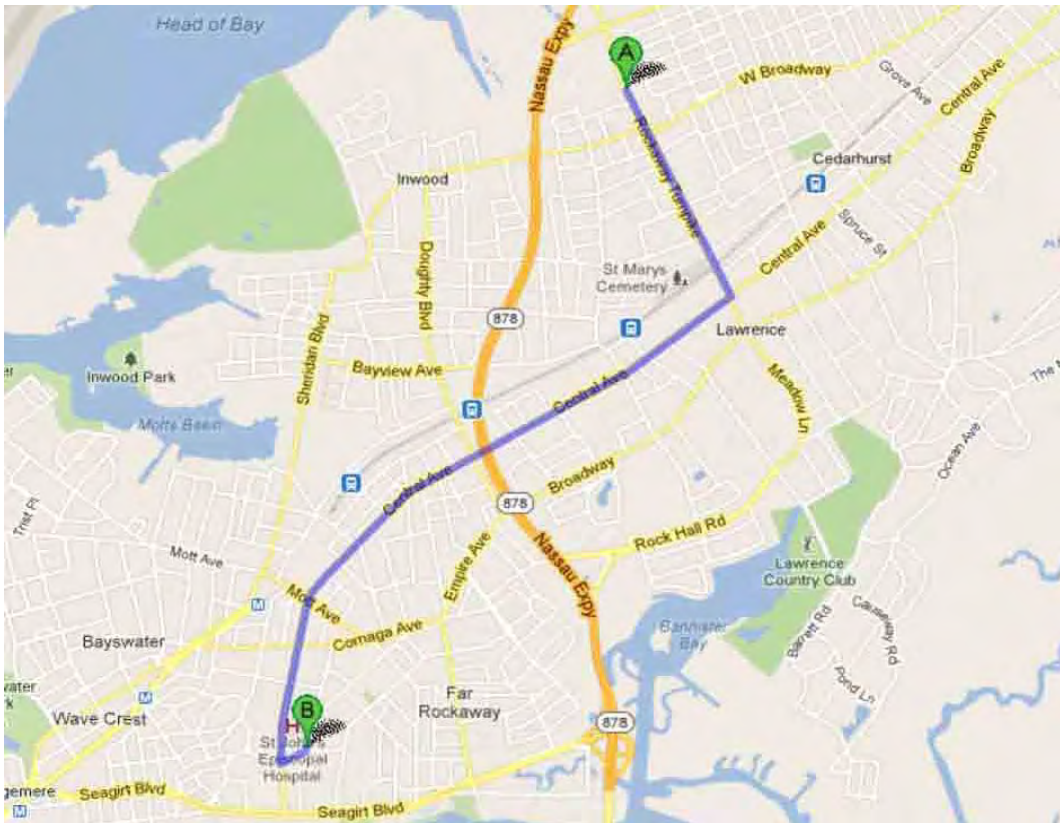
INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

HOSPITAL INFORMATION AND MAP

The hospital nearest the site is:

Saint Johns Hospital

327 Beach 19th Street
Far Rockaway
(718) 869-7000
2.7 Miles – About 8 Minutes



380 Rockaway Turnpike, Cedarhurst, NY 11516

1.	Head **south** on **Rockaway Turnpike** toward **Buena Vista Ave** About 2 mins	go 0.7 mi total 0.7 mi
2.	Turn right onto **Central Ave** About 4 mins	go 1.5 mi total 2.1 mi
3.	Continue onto **Beach 20th St** About 2 mins	go 0.5 mi total 2.6 mi
4.	Turn left onto **Plainview Ave**	go 394 ft total 2.7 mi
5.	Slight left onto **Beach 19th St** Destination will be on the left	go 75 ft total 2.7 mi

327 Beach 19th St, Queens, NY 11691

APPENDIX C

CAMP

NEW YORK STATE
INACTIVE HAZARDOUS WASTE SITE PROGRAM

COMMUNITY AIR MONITORING PLAN
(CAMP)

FORMER QUICK AND CLEAN CLEANERS SITE
SITE NO. 130198
380 ROCKAWAY TURNPIKE
CEDARHURST, NY

Prepared by:

John V. Soderberg
PO Box 263
Stony Brook, NY

July 2015

TABLE OF CONTENTS

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared for the remedial activities to be performed under an Interim Remedial Measure Work Plan (IRMWP) at the Former Quick and Clean Cleaners Site. The CAMP provides measures for protection for 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 investigative and remedial activities at the site.

Compliance with this CAMP is required during all ground intrusive activities that have the potential to generate airborne particulate matter and volatile organic compounds (VOCs). These activities include, but are not limited to; boring, soil and groundwater sampling activities. This CAMP has been prepared to ensure that remedial activities do not adversely affect passers by, residents, or workers in the area immediately surrounding the Site and to preclude or minimize airborne migration of mitigation related contaminants to off-site areas.

1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan as presented in DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC May 3, 2010). 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 (DER-10 Appendix-1a and 1b) 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

Chlorinated volatile organic compounds (VOCs) and petroleum VOCs are the constituents of concern at the Site. The appropriate method to monitor air for these constituents during remediation activities is through real-time VOC and air particulate (dust) monitoring.

2.1 Meteorological Data

At a minimum, wind direction will be evaluated at the start of each workday, noon of each workday, and the end of each workday. These readings will be utilized to position the monitoring equipment in appropriate upwind and downwind locations.

2.2 Community Air Monitoring Requirements

To establish ambient air background concentrations, air will be monitored at several locations around the site perimeter before activities begin. These points will be monitored periodically in series during the site work. When the boring area is within 20 feet of potentially exposed populations or occupied structures, the perimeter monitoring points will be located to represent the nearest potentially exposed individuals at the downwind location.

Fugitive respirable dust will be monitored using a MiniRae Model PDM-3 aerosol monitor (or equivalent). Air will be monitored for VOCs with a portable Ionscience 3000 photoionization detector (PID), or equivalent. All air monitoring data will be documented in a site log book by the designated site safety officer. The site safety officer or delegate must ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. All instruments will be zeroed daily and checked for accuracy. A daily log will be kept. If additional monitoring is required, the protocols will be developed and appended to this plan.

3.0 VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present.

The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below:

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

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

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

All readings will be recorded and made available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report, as shown in **Appendix A**, will be completed.

3.1 Potential Corrective Measures and VOC Suppression Techniques

If the 15-minute integrated VOC level at the downwind location persists at a concentration that exceeds the upwind level by more than 5 ppm but less than 25 ppm during remediation activities,

then vapor suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive organic vapors:

- Collection of purge water in covered containers;
- storage of excess samples and soils in drums or covering with plastic

4.0 PARTICULATE MONITORING

Air monitoring for particulates (i.e., dust) will be performed continuously during boring activities using both air monitoring equipment and visual observation at upwind and downwind locations. Monitoring equipment capable of measuring particulate matter smaller than 10 microns (PM_{10}) and capable of integrating (averaging) over periods of 15 minutes or less will be set up at upwind (i.e., background) and downwind locations, at heights approximately four to five feet above land surface (i.e., the breathing zone). Monitoring equipment will be MIE Data Ram monitors, or equivalent. The audible alarm on the particulate monitoring device will be set at 90 micrograms per cubic meter (ì g/m3). This setting will allow proactive evaluation of worksite conditions prior to reaching the action level of 100 ì g/m3 above background. The monitors will be calibrated at least once per day prior to work activities and recalibrated as needed thereafter. In addition, fugitive dust migration will be visually assessed during all intrusive work activities.

The following summarizes particulate action levels and the appropriate responses:

- If the downwind PM-10 particulate level is 100 ì g/m3 greater than background (upwind perimeter) for the 15-minute period, or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 ì g/m3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 ì g/m3 above the upwind level, work must be stopped and an evaluation of activities initiated. Work can resume provided that dust suppression measures (as described in Section 2.3.1 below) and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ì g/m3 of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report will be completed.

4.1 Potential Particulate Suppression Techniques

If the integrated particulate level at the downwind location exceeds the upwind level by more than 100 ì g/m3 at any time during boring activities, then dust suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive dusts:

- Placement of soils in drums or covering stockpiles with plastic;
- Misting of the boring area with a fine water spray from a hand-held spray bottle

Work may continue with dust suppression techniques provided that downwind PM_{10} levels are not more than 150 ì g/m3 greater than the upwind levels.

There may also be situations where the dust is generated by boring activities and migrates to downwind locations, but is not detected by the monitoring equipment at or above the action level. Therefore, if dust is observed leaving the working area, dust suppression techniques such as those listed above will be employed.

If dust suppression techniques do not lower particulates to below 150 ì g/m3, or visible dust persists, work will be suspended until appropriate corrective measures are identified and implemented to remedy the situation.

All air monitoring readings will be recorded in the field logbook and will be available for the NYSDEC and NYSDOH personnel to review.

5.0 DATA QUALITY ASSURANCE

5.1 Calibration

Instrument calibration shall be documented on instrument calibration and maintenance sheets or in the designated field logbook. All instruments shall be calibrated as required by the manufacturer. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

5.2 Operations

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the SSO for reference.

5.3 Data Review

The SSO will interpret all monitoring data based upon the established criteria and his/her professional judgment. The SSO shall review the data with the PM 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 all sample documentation will be periodically reviewed by the PM.

6.0 RECORDS AND REPORTING

All air readings must be recorded on daily air monitoring log sheets and made available for review by personnel from NYSDEC and NYSDOH.