68-32 MAIN STREET
KEW GARDENS, NEW YORK 11367
NYSDEC SITE: C241205

INTERIM REMEDIAL MEASURE
WORK PLAN
SOIL VAPOR EXTRACTION (SVE) SYSTEM INSTALLATION

SUBMITTED TO:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233

ON BEHALF OF:

Main Properties DM LLC; Main Properties AM LLC.
47 Hillside Avenue
Manhasset, New York 11030

PREPARED BY:

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PWGC Project Number: LMR1901

MAY 2020

INTERIM REMEDIAL MEASURE WORK PLAN
68-32 Main St., Kew Gardens, New York
NYSDEC BCP ID: C241205

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CERTIFICATION

I Paul K, Boyce, PE certify that I am currently a NYS registered professional engineer and that this Interim Remedial Measure Work Plan was prepared in accordance with applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Paul K. Boyce, PE
Name

074604
NYS PE License Number

Signature

05.15.2020
Date

PE Stamp

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1.0 INTRODUCTION

1.1 Purpose

P.W. Grosser Consulting Engineer & Hydrogeologist, PC (PWGC) has prepared the following Interim Remedial Measure Work Plan (IRMWP) for the property located at 68-32 Main Street, Kew Gardens, New York (the "Property" or "Site"). PWGC was contracted by Main Properties DM LLC; Main Properties AM LLC (Main Properties) of Manhasset, New York, the current property owner, to prepare this IRMWP. Main Properties is participating in the New York State Brownfields Cleanup Program (BCP) as a Participant as defined in ECL 27-1405(1)(a). Based on the historical use of the Property as a drycleaner and the confirmed presence of chlorinated solvents in soil and soil vapor beneath the Site, the Site was accepted into the BCP as set forth in a Brownfield Cleanup Agreement (BCA), dated May 25, 2018 with index number C241205-01-18.

A series of remedial investigations were performed to characterize and delineate potential areas of concern within the Property boundary. The remedial investigation results prompted the decision to execute an IRM at the site to address soil vapor in the locations where exceedances in the NYCDEC standards were observed.

1.2 Property Background

Fire insurance maps for the years 1903 through 2006 indicate that a one-story commercial retail building was constructed at the property by 1950. By 1981, the store unit at 68-34 Main Street was identified as a dry cleaner. The property remained substantially unchanged through 2006.

According to the New York City Department of Buildings (DOB) website, a Certificate of Occupancy dated December 23, 1958 indicates that a one-story commercial building occupied by stores and a market was located at the property. Aerial photographs from 1954 through 2015 indicate that a one-story building and large asphalt parking lot to the west remains in its original configuration.

Historical city directories for the years 1937 through 2016 indicate that Wings Laundry and Encore Cleaners, Inc. occupied 68-34 Main Street from 1962 through 1995. Encore Cleaners continued to occupy the location through 2006, followed by Lee Family Cleaners Corp until 2016.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description

The subject site is located at 68-32 Main Street, Kew Gardens, New York. The property is identified as New York City Block 6486, Lot 39. The site is bordered on the north by a commercial property, on the east by Main Street, on the west by residential properties and a cemetery, and on the south by 68th Drive.

The current property consists of one single-story retail strip building with eleven units including a basement level for each, a supermarket, and a parking lot. The entire property is approximately 42,250 square feet. The buildings were reportedly constructed in 1950. There is currently no planned change to the usage of the Site.

A Vicinity Map is included as **Figure 1**. A Site Plan is included as **Figure 2**.

2.2 Previous Environmental Investigations

Previous environmental investigations for this property were prepared by Advanced Cleanup Technologies, Inc (ACT). A summary of each investigation based on information documented by ACT is included below:

2.2.1 February 2017 Phase I (Environmental Site Assessment) ESA

A Phase I ESA dated February 14, 2017 identified the following issues:

- Historical dry cleaning operation at the Site.
- A potential vapor encroachment condition at the Site.

Based on the findings of the Phase I ESA, ACT recommended that a Tier II Vapor Encroachment Screen should be performed to determine whether a vapor encroachment condition existed at the site.

2.2.2 April 2017 Tier II Vapor Encroachment Screen

A Tier II Vapor Encroachment Screen was performed on April 19, 2017 in accordance with ASTM E2600-10. The Tier II Vapor Encroachment Screen involved the installation and sampling of five interior sub-slab vapor probes and one exterior vapor probe.

The Tier II Vapor Encroachment Screen identified elevated levels of chlorinated solvents in the vicinity of the historical dry cleaner. Tetrachloroethene (PCE) was detected in sub-slab soil vapor samples at concentrations ranging from 1,100 ug/m^3 to 990,000 ug/m^3 under the former dry cleaner space.

Trichloroethylene (TCE) was also detected in sub-slab soil vapor samples at concentrations ranging from 33 ug/m^3 to 220,000 ug/m^3.

Based on these results, ACT recommended the installation of a Sub-Slab Depressurization System (SSDS) and enrollment of the site in the NYSDEC Brownfield Cleanup Program.

2.2.3 June 2017 Phase II ESA

A Phase II ESA was performed on June 26, 2017 to determine the extent of soil vapor impacts beneath the Site and whether a source of contamination may be present. The Phase II ESA involved the installation and sampling of three additional sub-slab vapor probes and three shallow interior soil borings.

PCE, TCE, and cis-1,2-dichloroethylene (cis-1,2-DCE) were detected in sub-slab soil vapor at maximum concentrations of 43,000; 4,400, and 7,500 ug/m^3, respectively in the sample collected beneath the building. Higher sub-slab soil vapor concentrations were found to increase closer to the former dry cleaner and decreased with distance away from the former drycleaner.

PCE was detected above its Unrestricted Use Soil Cleanup Objective (SCO) of 1.3 mg/kg in shallow soil beneath the basement at 1,200 mg/kg, 3.5 mg/kg, and 3.4 mg/kg, with the high concentration from within the former dry cleaner, which exceeded Commercial Use SCO of 150 mg/kg as well. TCE was also detected above its Unrestricted Use SCO of 0.47 mg/kg in subsurface soil beneath the basement in the dry cleaner area at a concentration of 64 mg/kg. Concentrations of TCE were detected at locations away from the immediate dry cleaner area decreased below Unrestricted Use SCOs.

The Phase II ESA identified an apparent source of impact to soil, soil vapor, and potentially to groundwater beneath the northern portion of the basement.

2.2.4 June 2017 Indoor Air Survey.

On June 13, 2017, indoor air samples were collected from the north and south basements beneath 68-34 Main Street and the basement beneath 68-30 Main Street. An air sample was also collected from an office on the first

floor of 68-34 Main Street. At the same time area sampling took place, an SSDS had been installed and operating beneath 68-43 Main Street.

The indoor air sampling results indicated that PCE, TCE, cis-1,2-DCE, Carbon Tetrachloride, and Methylene Chloride were detected in all of the interior air samples. Air quality inside the first floor of 68-34 Main Street met NYSDOH Air Guidance values. However, air quality in the cellars beneath 68-30 and 68-34 Main Street exceeded acceptable NYSDOH Air Guidance.

ACT recommended installing additional SSDS's beneath adjacent commercial units to improve air quality inside the entire building for the Participant. SSDS's were subsequently also installed beneath 68-42 Main Street and 68-28 Main Street and have been operating continuously to the present date.

2.2.5 September 2017 Indoor Air Survey

On September 14, 2017, a total of eight indoor air samples were collected to determine the air quality within the building following installation of two additional sub-slab depressurization systems. The air samples were collected from the basement and first floor of Amalia Grocery (68-24 Main Street), the first floor and basement of Naomi's Kosher Pizza (68-28 Main Street), the basement and first floor of Queens Pita (68-34 Main Street), the former dry cleaner, the first floor and basement of Towne Paint & Hardware (68-38 Main Street), and Benjamin Moore Paints (68-42 Main Street).

PCE was detected in all eight indoor air samples below its interior air guidance value of 30 ug/m^3. TCE was also detected in all eight samples, with two samples (the basement of 68-28 Main St. and 1st floor of 68-38 Main St.) containing TCE slightly above the indoor air guidance value of 2 ug/m^3. Methylene chloride was also detected in all eight indoor air samples, with one sample (basement of 68-38 Main St.) detected above the indoor air guidance of 60 ug/m^3.

2.3 Descriptions of SSDSs

Three SSDS systems (SSDS-1, SSDS-2, and SSDS-3) were installed at the site in order to maintain negative pressure beneath the building foundation and mitigate volatile organic compounds VOCs from entering the building's breathing zone. The SSDS systems were installed in the fall of 2018. The information in this section is based on documentation in the November 2018 SSDS Installation Report prepared by ACT, which is included in **Appendix D**.

Each SSDS system consists of two vertical depressurization wells powered by a dedicated Radonaway HS5000 vacuum blower. SSDS-1 consists of depressurization wells DP-1 and DP-4, SSDS-2 consists of depressurization wells DP-2 and DP-5, and SSDS-3 consists of depressurization wells DP-3 and DP-6. All vertical depressurization wells are installed within holes excavated under the basement floor. The cross-section of a typical well, the locations of the wells, and the locations of the system components are detailed in Figure 1 of the November 2018 SSDS Installation Report.

At each depressurization well, the concrete floor slab was cut, and the underlying soil was excavated to a depth to approximately 2.5-feet below the bottom of the concrete slab, except DP-1 which was excavated to a depth of approximately 1.5-feet below the bottom of the concrete slab. A four-inch layer of 3/8th inch pea gravel was backfilled into the hole as a bed for the depressurization well.

DP-1, DP-2, and DP-3 were installed in the basement of Benjamin Moore Paint, Queens Pita Bakery, and Naomi's Kosher Pizza, respectively. A two-foot long section of two-inch diameter schedule 40 PVC well screen with 20-mil screen slots was installed vertically in the excavated hole with a PVC cap and bottom end. The top of the well screen was connected to a two-inch diameter schedule 40 PVC riser pipe.

DP-4, DP-5, and DP-6 were installed beneath the interior corridor in the rear of each basement at the locations indicated in Figure 1 of the 2018 SSDS Installation Report. A two-foot long piece of three-inch diameter schedule 40 PVC well screen with 20-mil screen slots was installed vertically in the excavated hole with a PVC cap at the bottom end. The top was connected to a three-inch diameter schedule 40 PVC riser pipe.

Each depressurization well was backfilled with a four-inch thick layer of 3/8th-inch pea gravel around the pipe up to the existing level of the bottom of the concrete floor slab. A later of polyethylene was placed on top of the pea gravel and the concrete slab was restored to the original finished grade. The riser piping for each SSDS well is connected to the overhead lateral piping, which leads to a three-inch header pipe connected to vacuum blowers (BL-1, BL-2, and BL-3) installed on the interior wall of the rear corridor.

The air streams exiting the vacuum blowers from SSDS-1 and SSDS-3 are discharged through a two-inch diameter exhaust pipe to three feet above the roofline of the building. The air stream exiting the vacuum blower from SSDS-2 is treated with two 180-pound vapor-phase granular activated carbon absorbers located along the western exterior wall of the building in the rear parking lot. After carbon treatment, the air stream is discharged through a two-inch diameter exhaust pipe to three feet above the roofline of the building.

2.4 Regional Geology/Hydrogeology

The geologic setting of Long Island is well documented and consists of crystalline bedrock composed of schist and gneiss overlain by layers of unconsolidated deposits. Immediately overlying the bedrock is the Raritan Formation, consisting of the Lloyd sand confined by the Raritan Clay Member. The Lloyd sand is an aquifer and consists of discontinuous layers of gravel, sand, sandy and silty clay, and solid clay. The Raritan Clay is a solid and silty clay with few lenses of sand and gravel; abundant lignite and pyrite; and gray, red or white in color.

Above the Raritan Clay lies the Magothy Formation. The Magothy Aquifer consists of layers of fine to coarse sand of moderate to high permeability, with inter-bedded lenses of silt and clay of low permeability resulting in areas of preferential horizontal flow. Therefore, this aquifer generally becomes more confined with depth. The Magothy Aquifer is overlain by the Jameco and Upper Glacial Aquifer systems. The Upper Glacial Aquifer is the water table aquifer at this location and is comprised of medium to coarse sand and gravel with occasional thin lenses of fine sand and brown clay. This aquifer extends from the land surface to the top of the Magothy and, therefore, is hydraulically connected to the Magothy Aquifer.

2.5 Site Geology/Hydrogeology

The subject site is located over the Long Island aquifer system, which underlies all of Nassau, Suffolk, Kings (Brooklyn), and Queens Counties. The unconsolidated aquifer formations form a southward-dipping wedge that attains a maximum thickness in Kings County about eight-hundred (800) feet in southeast area of Brooklyn. Overlying bedrock in the area is the Lloyd, Magothy, Jameco, and Upper Glacial aquifer systems. The Upper Glacial aquifer overlies all underlying units and is found at the surface in nearly all of Queens County.

The site overlies an interconnected aquifer system consisting of the upper glacial deposits and the underlying Magothy Formation. Depth to groundwater in the underlying glacial aquifer is approximately 60 feet below ground surface (bgs) based on previous investigations performed by ACT. Additionally, a clay lens appears to be

present approximately 20 feet below grade on the southern half of the site. This clay lens appears to support a perched water table above it which was observed approximately 18 feet below grade by ACT.

Based on USGS topographic maps and ACT, regional groundwater flow direction is estimated to be to the west towards Flushing Meadow Lake, located approximately ½ mile west of the Site.

2.6 Site Features and Use

The project site elevation is approximately 81 feet above mean sea level and is generally level. The Site is improved with a one-story commercial strip building with 11 storefronts and a partitioned full basement. The spaces of this building are occupied by the following:

- S&M Pharmacy.
- Benjamin Moore Paints.
- Mazal Salon & Spa.
- Towne Paint & Hardware.
- Queens Pita Bakery.
- Main Optical.
- Naomi's Kosher Pizza.
- On-The-Mark Dry Cleaners.
- Amalia Grocery.
- Soysauce Restaurant.
- Seasons Supermarket.

The total building area is 25,518 square feet. The remainder of the property is an asphalt paved parking lot.

3.0 DESCRIPTION OF REMEDIAL ACTION

Based on correspondence between ACT and NYSDEC on October 2, 2019, NYSDEC has directed the BCP Participant to implement an IRM at the site to enhance remedial efforts involving the chlorinated solvent impact in soils at the site. The IRM will consist of the expansion of the current SSDS within 68-34 Main Street to be upgraded with a well point located within the soil contamination "hot spot" and retrofitted with an upgraded blower system and carbon filtration units. These upgrades will convert the existing SSDS into a Soil Vapor Extraction (SVE) system.

The location of the well point which will be associated with the proposed SVE system was selected based upon previous subsurface investigations performed by ACT. A spider diagram with tetrachloroethylene (PCE), trichloroethylene (TCE), and dichloroethane (DCE) concentrations in soil and soil vapor, prepared by ACT and dated June 2017, illustrated the highest concentrations of PCE, TCE, and DCE were concentrated beneath the basement of Queens Pita Bakery and Main Optical. Soil samples collected as part of March 2019 Phase II ESA prepared by ACT documented the highest concentrations of PCE and TCE were present in the 0-2 foot interval beneath the basement of Queens Pita Bakery. Sub-slab soil vapor samples collected in July 2019 at the site indicated elevated concentrations of PCE and TCE with the highest concentrations detected in the sample collected from beneath the basement slab of Queens Pita Bakery. Based on these previous investigations, the "hot spot" is located beneath the basement floor of Queens Pita Bakery.

Data tables, figures, and spider diagrams associated with the previous environmental investigations prepared by ACT are included as **Appendix E**.

3.1 SVE System

SVE systems are a common remedial action accepted by NYSDEC to remove VOCs and SVOCs from soil using vacuum pressure. The goal of the proposed system will be to reduce chlorinated solvent impact in soil within the hot-spot to below Commercial Use Soil Cleanup Objectives (SCOs). The system will remove VOC impact from the hot spot and transport the vapors to a carbon filtration system and discharge the treated air to the atmosphere.

The proposed SVE will consist of a vacuum blower to be located behind the building in an acoustical attenuating enclosure to create vacuum pressure within the hot spot. One vapor extraction screened well point will be added

onto the current SSDS network which includes two well points (**Appendix D**) in order to upgrade the system to an SVE system. The additional screened well point will be two-inches in diameter and installed to a depth of approximately eight feet below the basement floor. The well will be installed using a small direct push rig or hand-auger and the borehole annulus around the screen will be backfilled with gravel to grade. Recovered vapor will be treated utilizing granular activated carbon (GAC) and vented above the roofline of the building. A low vacuum alarm will signal audibly and visually if the system is not providing vacuum as designed. The system will be equipped with a network of valves in order to adjust and control vacuum pressure for the system. Engineering plans for the proposed system are included as **Appendix A**.

During the installation of the SVE well, soils will be screened for the presence of VOCs using a photoionization detector (PID) continuously from grade until VOC impact is no longer observed or refusal, whichever is shallower. Soil samples will be collected for laboratory analysis from the following intervals during well installation:

- One sample from surficial soils immediately below the basement slab.
- One sample from the interval emitting the highest degree of contamination.
- One sample from the first interval where contamination is not observed, if encountered.
- One sample from the terminus of boring location.

Soil samples will be analyzed for the following parameters:

- TCL VOCs by USEPA Method 8260.
- TCL SVOCs by USEPA Method 8270.
- Pesticides/PCBs by USEPA Method 8081/8082.
- TAL Metals plus cyanide by USEPA Method 6010/7473.
- PFAS by EPA Method 537.
- 1,4-Dioxane by USEPA Method 8270 in “selective ion monitoring” (SIM) mode.

Sizing of the system’s components were based on the size of the area to be treated and PWGC’s previous experience designing SVE systems. The proposed system will utilize a regenerative blower which will be operated by a variable speed controller to allow for adjusting the system recovery flow and optimizing operation and energy use. The system is expected to operate until chlorinated solvent impact within the hot spot have been reduced to concentrations below Commercial Use SCOs. The SVE system will not be decommissioned until

written approval from NYSDEC is issued. Once NYSDEC approves of SVE system decommissioning, the components of the SVE system will be converted or incorporated in to an SSDS.

4.0 ENGINEERING SPECIFICATIONS AND CONTROLS

4.1 Engineering Specifications

4.1.1 Mobilization and Site Security

Mobilization will include the delivery of construction equipment and materials to the site. Site workers will receive site orientation and training in accordance with the site-specific Health and Safety Plan (HASP), Community Air Monitoring Plan (CAMP) and established policies and procedures to be followed during the implementation of the IRM. The remediation contractor and all associated subcontractors will each receive a copy of the IRMWP, HASP and CAMP and will be briefed on their contents.

Much of the activities required to implement the IRM will be located inside the secure building at the Site. Therefore, site security should not be an issue for contractors and subcontractors implementing the proposed IRM. Weekend work is anticipated to minimize disturbance to tenants. Equipment or materials pertaining to the IRM will either be stored inside the building or be secured within the contractor's equipment or vehicles used to mobilize to the Site each day. The remedial contractor will be responsible for providing and securing all equipment and materials to be used in implementing the proposed IRM.

Open excavations and/or trenching will be clearly marked with temporary orange construction fencing (or equivalent) during non-work hours. PWGC does not anticipate open excavations to be made during this project.

4.1.2 Waste Management and Disposal

IRM derived waste and soils (i.e.: drill cuttings) will be sampled in accordance with the procedures described under Section 5.3 of this document to meet the waste acceptance criteria of the selected disposal facility. IRM derived waste materials and soil to be removed from the site will be directly loaded into 55-gallon drums. Wastes will be transported to the disposal facility by a licensed waste transport company. No IRM waste material or excavated soil will be stored outside of 55-gallon drums.

As necessary, waste disposal will be coordinated with NYSDEC Division of Solid and Hazardous Materials, to allow for wastes to be disposed of as hazardous or non-hazardous waste based upon their characteristic qualities. Waste streams disposal facilities will be approved by NYSDEC in advance.

4.1.3 Demobilization

Following the completion of interim remedial activities at the site, equipment and excess materials will be collected and removed from the site. If solid wastes are generated during IRM activities (e.g., polyethylene sheeting), they will be properly disposed of.

4.2 Engineering Controls

4.2.1 SVE System

Installation of the SVE system will be conducted in accordance with the engineering design drawings included as **Appendix A**. The remedial contractor shall follow note specifications located on the design documents and shall field verify site conditions prior to construction. Notification will be made to building tenants prior to installation of the system.

The remedial contractor will be required to submit for approval by the project engineer equipment which deviates from that specified in the engineering drawings. Following completion of installation, as-built plans will be submitted by the contractor to the project engineer.

The SVE system will be monitored with high-level and low-level vacuum switches and with vacuum gauges at the well point and blower. The expected vacuum pressure is 40" WC at 130 CFM for the proposed system.

The remedial contractor will be required to obtain necessary permits for system installation prior to construction and will abide by requirements of this IRM Work Plan.

4.2.2 Dust Suppression

Dust generation from excavation activities and stockpiled soils will be monitored as described under Section 7.0. If dust generation approaches action levels, suppression will be accomplished by one or more of the following controls:

- Covering/capping exposed soil area with mulch, rubber mats, etc.
- Wetting equipment and excavation faces;
- Water spray dust suppression;
- Installing a temporary containment tent with a ventilation system over the immediate work zone; and,

- Impacted soils will be loaded directly into 55-gallon drums for off-site disposal to reduce the potential for generating dust during intrusive activities.

4.2.3 Odor Control

In the event odor suppression becomes necessary, techniques to be implemented for control of odors from the open excavation will include one or more of the following:

- Cover with plastic
- Cover with “clean soil”
- Application of encapsulating foam
- Limit working hours to favorable wind and temperature conditions

Encapsulating foam can be sprayed over open bore hole, as necessary. This is a highly effective method for controlling odors as the release of odors is sealed immediately at the source.

5.0 MONITORING AND MAINTENANCE

5.1 Construction Phase Monitoring

During intrusive activities, monitoring will be performed to protect the health of site workers and the surrounding community. A Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) have been developed for this project which will be followed in conjunction with additional procedures or measures presented within this workplan. These plans specify the monitoring procedures, action levels, and contingency measures that are required to protect public health and site workers. Air monitoring will include real-time measurement of VOC concentrations and dust levels within the breathable space of each active work area.

Copies of the project HASP and CAMP are included as **Appendix B** and **Appendix C**, respectively.

5.2 Waste Characterization

If necessary, waste characterization samples will be collected from excess soils generated while implementing the IRM to determine whether it must be disposed as hazardous or non-hazardous material prior to demobilization. The specific sample frequencies, and laboratory analyses for waste characterization samples will be determined based upon the requirements of the selected disposal facilities (to be determined).

5.3 SVE System Startup, Operations, and Maintenance

An Operation, Maintenance & Monitoring Plan (OM&M Plan) will be prepared for the SSDS which includes; SSDS Start-up Plan, SVE System Operation, Maintenance & Testing Requirements (OM&T), Vacuum Monitoring Schedule, Annual Certification and Notification Requirements, and requirements for termination of mitigation system operations. The OM&M Plan will be prepared at a later date prior to field work and submitted under a separate cover.

6.0 INTERIM REMEDIAL MEASURE COMPLETION REPORT PREPARATION

An IRM Construction Completion Report will be prepared to incorporate the details and findings of the IRM activities performed as outlined in this work plan consistent with NYSDEC DER-10, Section 5.8. At minimum, the report will include post-construction details for the proposed engineering controls, as-builts, and site restoration details (if any). The results of CAMP monitoring will also be provided if intrusive activities are necessary to implement the proposed IRM. In addition, if any waste materials or soils are generated during the implementation of this IRM, documentation associated with its characterization, transportation, and disposal will be provided which may include analytical data, soil/waste disposal volumes, and waste disposal manifests.

Electronic copies of the IRM Construction Completion Report will be submitted to the NYSDEC along with hard copies. Analytical results of the investigation will be submitted in the electronic data delivery (EDD) format through the Departments environmental information management system (EIMS).

7.0 HEALTH AND SAFETY PLAN

Field operations will be performed in accordance with the health and safety requirements to be provided in the site-specific HASP. The HASP outlines the requirements for training, medical surveillance, daily tailgate meetings, emergency response, and accident and injury reporting. Activities performed under the HASP will comply with applicable parts of OSHA Regulations, primarily 29 CFR Parts 1910 and 1926, and the PWGC Corporate Environmental Health and Safety policy.

The PWGC Field Team Leader will be responsible for briefing involved participants on the requirements of the HASP, completing the daily tailgate safety meetings and performing necessary Industrial Hygiene (IH) monitoring as specified in the HASP. Modifications to the HASP may be made with the approval of the PWGC Health and Safety Manager (HSM) and/or Project Manager (PM).

A copy of the project HASP is included as **Appendix B**.

8.0 COMMUNITY AIR MONITORING PLAN

A site-specific CAMP has been prepared to provide measures for protection for on-site workers and the downwind community from potential airborne contaminants as a direct result of activities which were proposed for the Remedial Investigation. The primary concerns for those working at the site will be VOCs and dust particulates.

The possible on-site exposure pathways are by ingestion, inhalation, or dermal exposure by a person on the Site. However, since the entire Site is capped by impervious surfaces (existing building foundation and asphalt paved parking lot), ingestion, and dermal exposure of workers at the Site would be unlikely unless intrusive activities are performed to implement the IRM. Therefore, the CAMP and onsite monitoring activities will only be performed when the potential for exposure and offsite migration of VOCs or potentially impacted dust could occur while performing intrusive activities. Particulate monitors and photo ionization meters will be provided to field staff overseeing the implementation of the IRM.

The CAMP will be implemented and executed in accordance with 29 CFR 1910.120(h), the New York State Department of Health's (NYSDOH) Generic CAMP, and NYSDEC DER10.

A copy of the project CAMP is included in **Appendix C**.

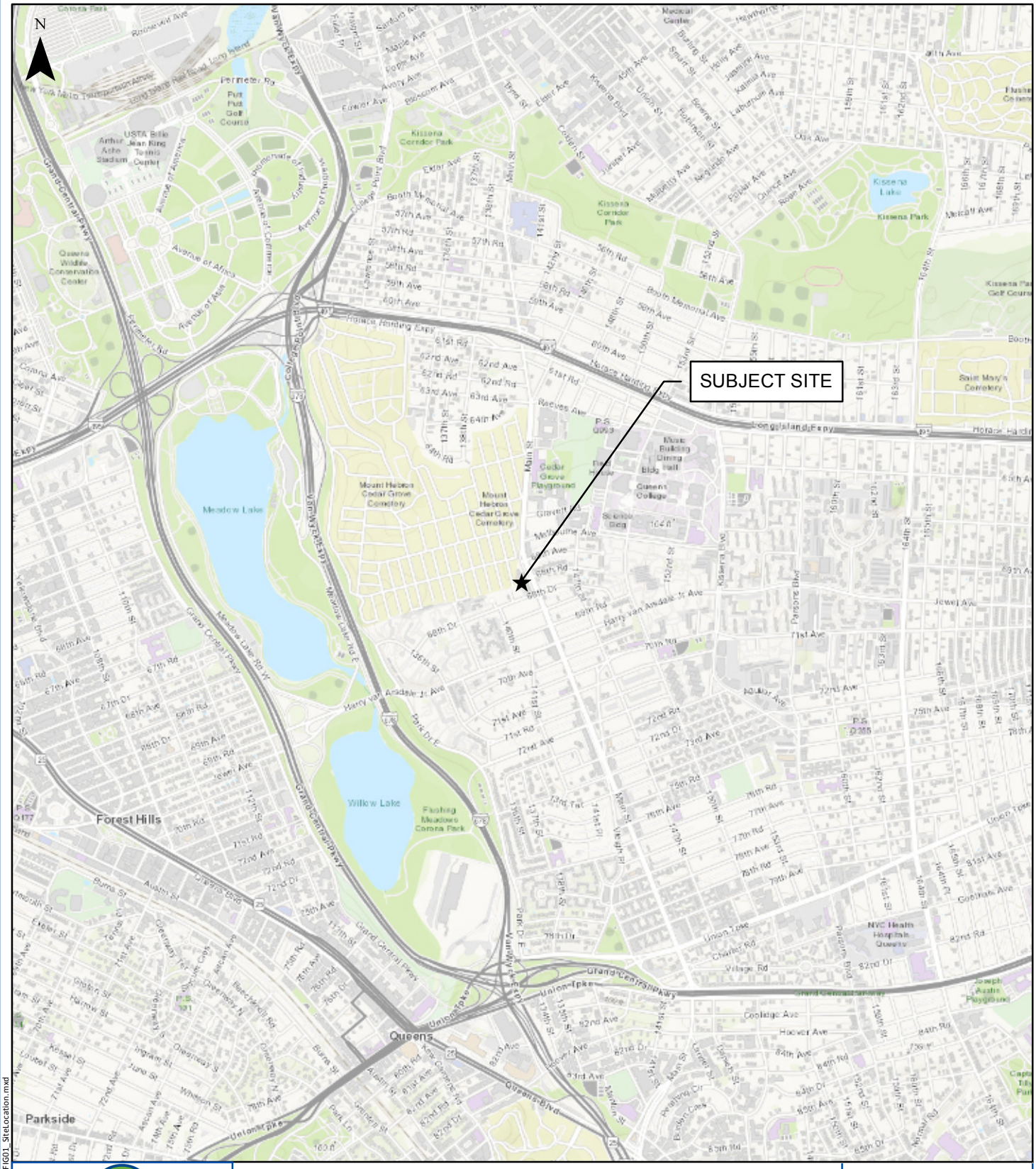
9.0 SCHEDULE

Site preparation and pre-construction activities will begin upon approval of the Final IRM Work Plan. Construction and start-up activities of the SVE is anticipated to take approximately four weeks. Upon completion of SVE installation, a Draft IRM Construction Completion Report will be submitted to NYSDEC.

10.0 REFERENCES

See section 2.2.

FIGURES



SITE LOCATION

68-34 Main St
Kew Gardens, NY

0 ¼ ½ ¾ 1 Miles

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Project:	ACT1904
Date:	11/26/2019
Designed by:	RM
Drawn by:	PH
Approved by:	RM
Figure No:	1

Document Path: W:\Projects\A-D\ACT1904\maps\FIG01_SiteLocation.mxd

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DRAWING PREPARED FOR:

REVISION	DATE	INITIAL	COMMENTS

DRAWING INFORMATION:

Project:	ACT1904	Designed by:	RM
Date:	5/13/2020	Drawn by:	PH
Scale:	AS SHOWN	Approved by:	RM

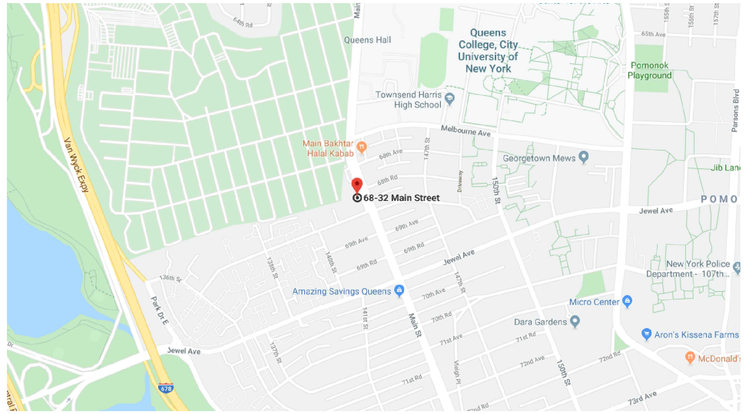
SITE PLAN

68-34 Main St
Kew Gardens, NY

FIGURE NO:

2

APPENDIX A
SVE SYSTEM DESIGN DOCUMENTS



VICINITY MAP

SCALE: NOT TO SCALE

SCOPE OF WORK

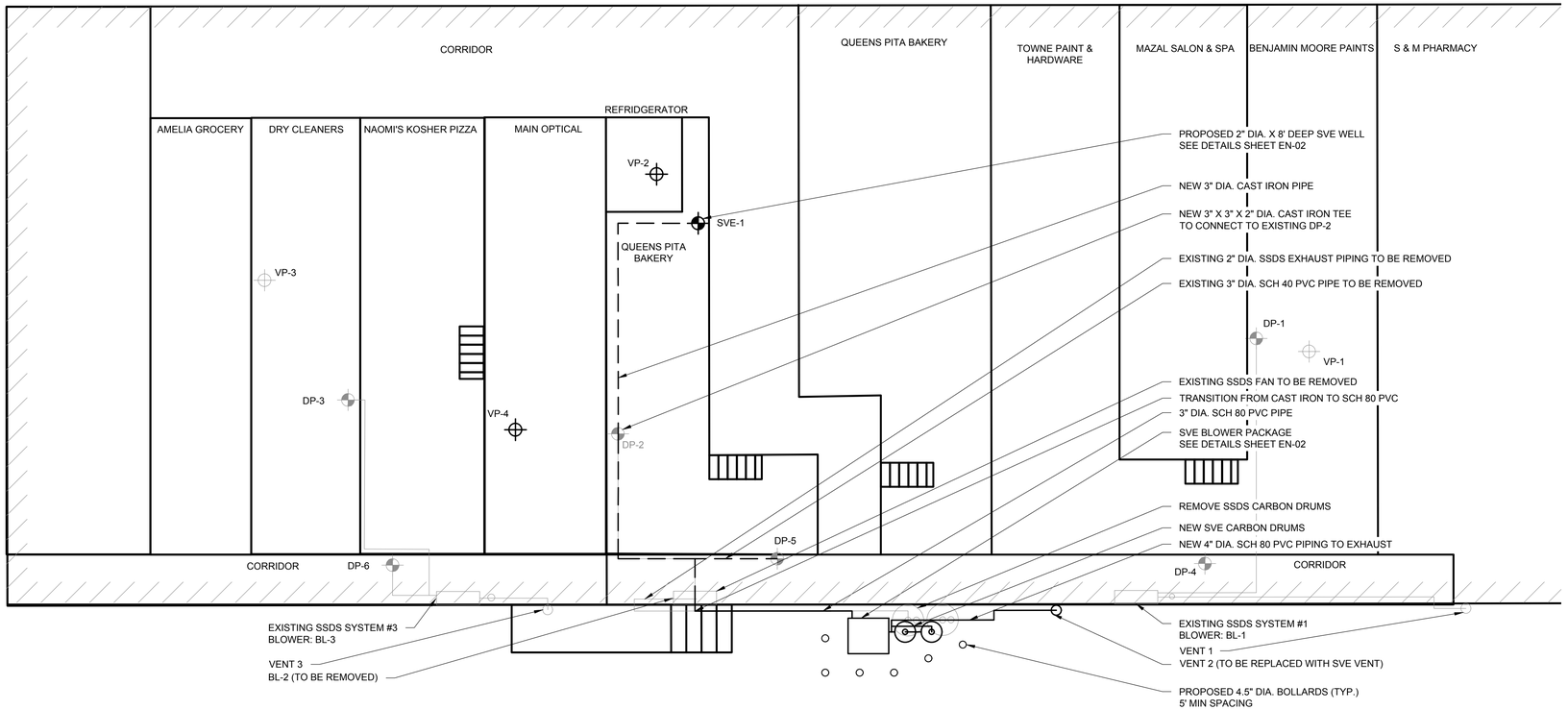
INSTALLATION OF SOIL VAPOR EXTRACTION (SVE) SYSTEM AT 68-32 MAIN STREET KEW GARDENS, NEW YORK YORK AS SHOWN ON THESE PLANS. THE BUILDING IS APPROXIMATELY 1200 SF.

THE WORK INCLUDES:

1. INSTALLATION OF SOIL VAPOR EXTRACTION (SVE) SYSTEM.
   - ONE (1) 2" DIA. SVE WELL TO EIGHT (8) FEET BELOW SLAB
   - SVE BLOWER PACKAGE.
   - INTERIOR PIPE TO BE 3" DIA. CAST IRON.
   - EXTERIOR PIPE TO BE 3" DIA. SCH 80 PVC FROM THE BUILDING TO THE SVE BLOWER PACKAGE.
   - TWO (2) TREATMENT CARBON DRUMS.
   - 4" DIA. SCH 80 PVC FROM THE BLOWER PACKAGE TO THE SYSTEM EXHAUST.
2. INTEGRATION OF SUB-SLAB DEPRESSURIZATION SYSTEM (SSDS) INTO THE SVE SYSTEM.
   - SSDS BLOWER TO BE REMOVED FROM SYSTEM.
   - 2" DIA. SSDS PIPING TO BE REMOVED.
   - SSDS WELLS DP-2 AND DP-5 TO BE INTEGRATED INTO THE NEW SVE SYSTEM.
   - THREE (3) SSDS SYSTEMS LOCATED AT THE SITE. SSDS SYSTEM #1 AND #3 ARE TO REMAIN. SSDS SYSTEM #2 TO BE REPLACED WITH THE SVE SYSTEM.

GENERAL NOTES

1. ALL LATERAL PIPING UPSTREAM OF THE BLOWER PACKAGE TO SLOPE DOWN TOWARDS WELL POINTS.
2. ALL WORK SHALL COMPLY WITH THE 2014 NYC MECHANICAL CODE AND THE 2014 NYC PLUMBING CODE.
3. ALL ELECTRICAL WORK IS TO BE PERFORMED BY A LICENSED ELECTRICIAN.
4. ALL MATERIALS TO BE REMOVED ARE TO BE LEGALLY DISPOSED OF.



SVE SITE PLAN

0 10 20

SCALE: 1" = 10'

LEGEND

- EXISTING SSDS EQUIPMENT AND PIPE
- PROPOSED SVE CAST IRON PIPE
- PROPOSED SVE SCH 80 PIPE
- SVE-1 — PROPOSED SVE WELL POINT
- DP-# — EXISTING SSDS WELL POINT
- VP-# — EXISTING SSDS VAPOR MONITORING POINT

PWGC
CLIENT DRIVEN SOLUTIONS
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7		
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3		
2		
1		

Designed By	GMG	Date Submitted	12/17/2019
Drawn By	GMG	Date Created	11/22/2019
Approved By	PKB	Scale	1" = 10'

Client:
ADVANCED CLEANUP TECHNOLGIES, INC
110 MAIN ST, STE 103
PORT WASHINGTON, NY 11050

Project:
SOIL VAPOR EXTRACTION SYSTEM

Project Address:
68-32 MAIN ST
KEW GARDENS
QUEENS, NEW YORK

County Tax Map Number:
Contract Number:
Regulatory Reference Number:

Title of Drawing:
SITE PLAN

Drawing Number:
EN-01

Sheet 1 of 3

PWGC Project Number:
ACT1904

SCOPE OF WORK

INSTALLATION OF SOIL VAPOR EXTRACTION (SVE) SYSTEM AT 68-32 MAIN STREET KEW GARDENS, NEW YORK YORK AS SHOWN ON THESE PLANS. THE BUILDING IS APPROXIMATELY 1200 SF.

THE WORK INCLUDES:

1. INSTALLATION OF SOIL VAPOR EXTRACTION (SVE) SYSTEM.
   - ONE (1) 2" DIA. SVE WELL TO EIGHT (8) FEET BELOW SLAB
   - SVE BLOWER PACKAGE.
   - INTERIOR PIPE TO BE 3" DIA. CAST IRON.
   - EXTERIOR PIPE TO BE 3" DIA. SCH 80 PVC FROM THE BUILDING TO THE SVE BLOWER PACKAGE.
   - TWO (2) TREATMENT CARBON DRUMS.
   - 4" DIA. SCH 80 PVC FROM THE BLOWER PACKAGE TO THE SYSTEM EXHAUST.
2. INTEGRATION OF SUB-SLAB DEPRESSURIZATION SYSTEM (SSDS) INTO THE SVE SYSTEM.
   - SSDS BLOWER TO BE REMOVED FROM SYSTEM.
   - 2" DIA. SSDS PIPING TO BE REMOVED.
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GENERAL NOTES

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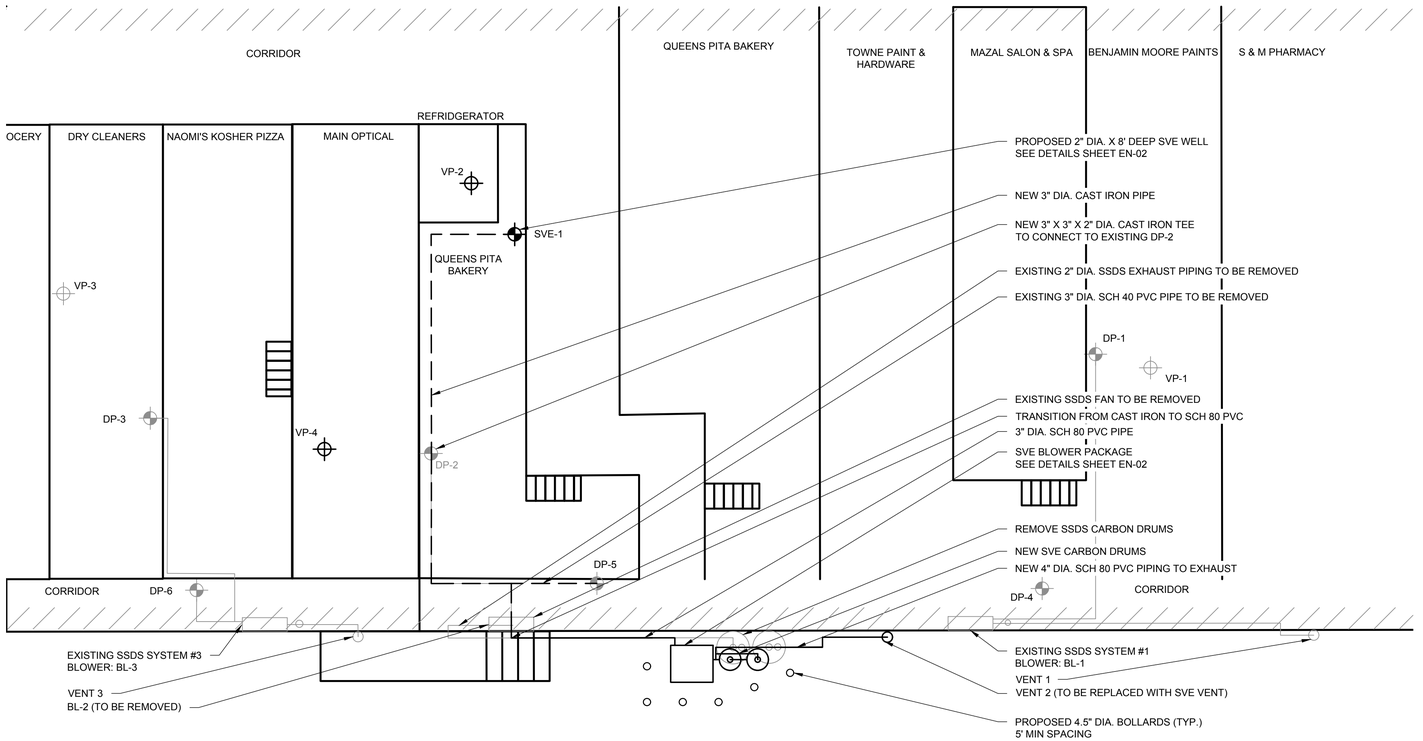
2. ALL WORK SHALL COMPLY WITH THE 2014 NYC MECHANICAL CODE AND THE 2014 NYC PLUMBING CODE.
3. ALL ELECTRICAL WORK IS TO BE PERFORMED BY A LICENSED ELECTRICIAN.
4. ALL MATERIALS TO BE REMOVED ARE TO BE LEGALLY DISPOSED OF.

MAP

SCALE



SVE SITE PLAN

0 10 20

SCALE: 1" = 10'

LEGEND

- EXISTING SSDS EQUIPMENT AND PIPE
- PROPOSED SVE CAST IRON PIPE
- PROPOSED SVE SCH 80 PIPE
- SVE-1 — PROPOSED SVE WELL POINT
- DP-# — EXISTING SSDS WELL POINT
- VP-# — EXISTING SSDS VAPOR MONITORING POINT

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110 MAIN ST, STE 103
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Project:
SOIL VAPOR EXTRACTION SYSTEM

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68-32 MAIN ST
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Drawing Number:
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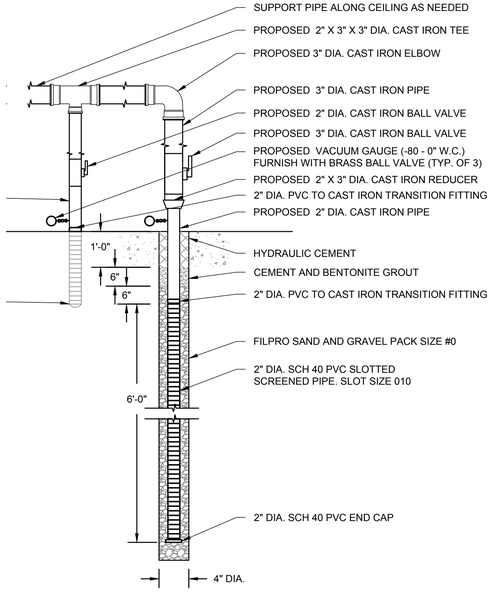
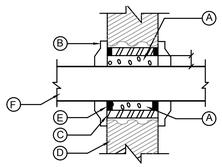


.L DETAIL

T TO SCALE



(A) ALL SPACES PACKED FULL DEPTH WITH MINERAL WOOL OR OTHER EQUALLY APPROVED FIRE RESISTIVE MATERIAL (ASBESTOS OR FIBERGLASS SHALL NOT BE USED).

(B) ESCUTCHEON BOTH SIDES.

(C) PVC SLEEVE.

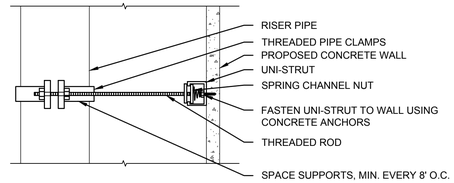
(D) EXTERIOR CMU BLOCK WALL.

(E) $\frac{3}{4}$" DEPTH FIRE STOP FINISH SEALANT.

(F) PIPE

TYPICAL PIPE PENETRATION DETAIL

SCALE: NOT TO SCALE



TYPICAL PIPE HANGING SUPPORT DETAIL

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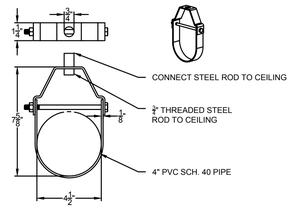

TYPICAL PIPE PENETRATION DETAIL

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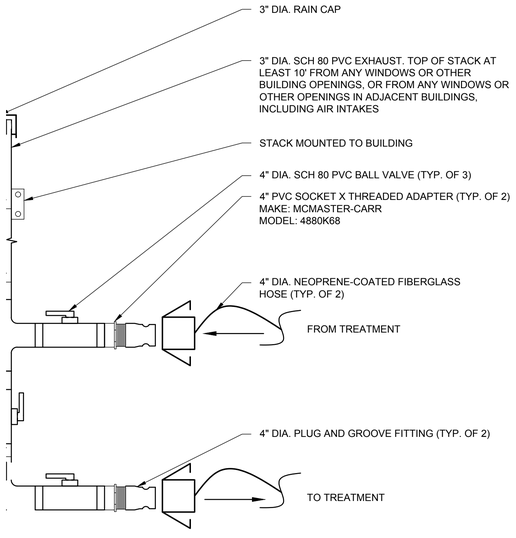

'ER PACKAGE DETAIL

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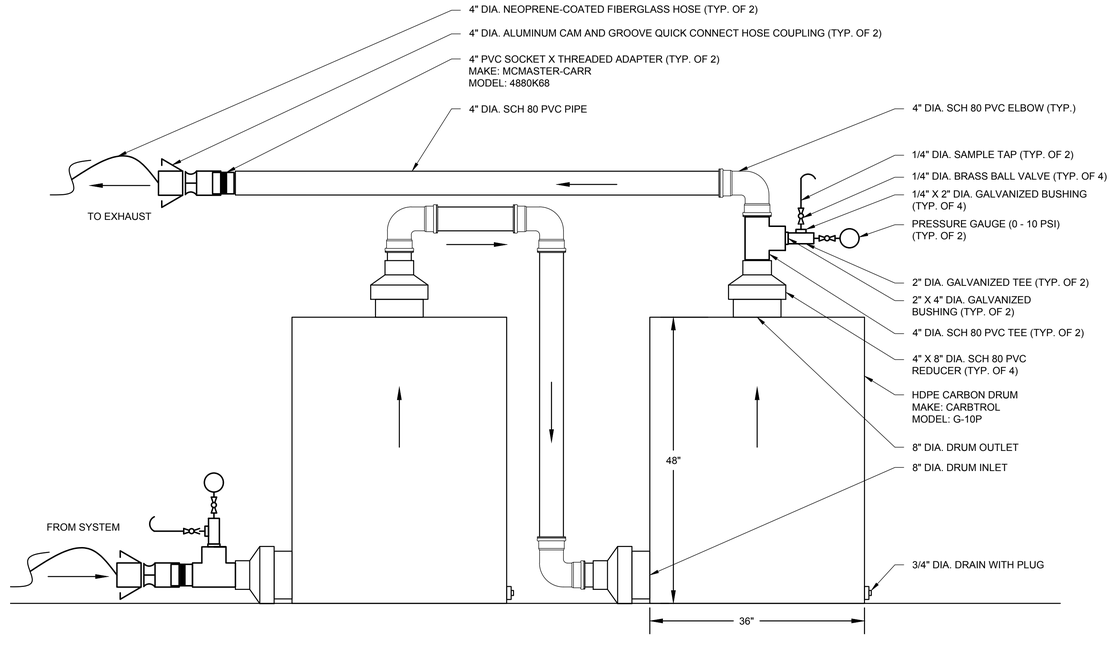

CARBON DRUMS DETAIL

SCALE: NOT TO SCALE

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Drawing Number:
EN-02

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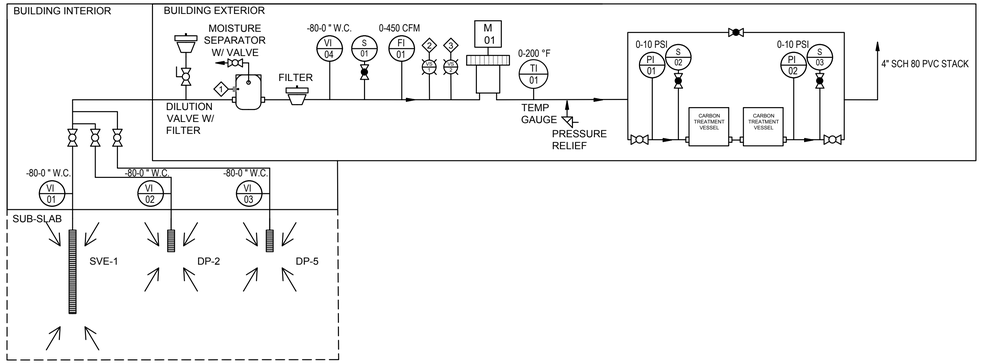
PWGC Project Number:
ACT1904



PROCESS & INSTRUMENTATION DIAGRAM

SCALE: NOT TO SCALE

ALARM INTERLOCK TABLE

ALARM INTERLOCK	ALARM DESCRIPTION	SYSTEM RESPONSE	NOTES
1	MOISTURE SEPARATOR HIGH	CRITICAL ALARM SYSTEM SHUT DOWN	
2	VACUUM HIGH	CRITICAL ALARM SYSTEM SHUT DOWN	VACUUM ABOVE 90" W.C.
3	VACUUM LOW	CRITICAL ALARM SYSTEM SHUT DOWN	VACUUM BELOW 10" W.C.

LEGEND

VALVES AND PIPING	NO	NC
BALL VALVE		
SAMPLE PORT WITH BALL VALVE		
PARTICULATE FILTER		
CARBON VESSEL		
MOISTURE SEPARATOR		
LIQUID LEVEL ALARM		
VACUUM SWITCH		

INSTRUMENT IDENTIFICATION

- INDICATING INSTRUMENT (LOCAL)
- ALARM
- ALARM INTERLOCK

EXAMPLE: SETPOINT OF INSTRUMENT; INSTRUMENT DESIGNATION (PRESSURE SWITCH); INSTRUMENT TYPE; SYSTEM POSITION NUMBER

EQUIPMENT

- CENTRIFUGAL, REGENERATIVE BLOWER

EQUIPMENT ABBREVIATIONS

- FI - FLOW INDICATOR
- M - MOTOR
- PI - PRESSURE INDICATOR
- TI - TEMPERATURE INDICATOR
- VA - VACUUM ALARM
- VI - VACUUM INDICATOR
- S - SAMPLE PORT

SYSTEM POSITION DESIGNATION

- PROPOSED

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68-32 MAIN ST
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Regulatory Reference Number:

Title of Drawing:
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Drawing Number:
EN-03

Sheet 3 of 3

PWGC Project Number:
ACT1904

APPENDIX B
HEALTH AND SAFETY PLAN

INTERIM REMEDIAL MEASURE
68-32 MAIN STREET
KEW GARDENS, NEW YORK 11367
NYSDEC SITE: C241205

INTERIM REMEDIAL MEASURE
HEALTH AND SAFETY PLAN

PREPARED FOR:

Lewis & Murphy Realty, Inc
47 Hillside Avenue
Manhasset, New York 11030

PREPARED BY:

P.W. Grosser Consulting, Inc.
630 Johnson Avenue, Suite 7
Bohemia, New York 11716
Phone: 631-589-6353
Fax: 631-589-8705

Kris Almskog, PG, Senior Vice President — KrisA@pwgrosser.com
Ryan Morley, PG, Project Manager — RyanM@pwgrosser.com

PWGC Project Number: ACT1904

DECEMBER 2019

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STATEMENT OF COMMITMENT

On-site employees may be exposed to chemical contaminants of concern identified within the soil/fill during the planned remedial activities to be performed on the Site. P.W. Grosser Consulting Inc.'s (PWGC's) policy is to minimize the possibility of work-related exposure through awareness, institutional and engineering controls, and qualified supervision, health and safety training, use of appropriate personal protective equipment, and the following activity specific safety protocols contained in this Health and Safety Plan (HASP). PWGC has established a guidance program to implement this policy in a manner that protects personnel to the maximum reasonable extent.

This HASP, which applies to PWGC personnel actually or potentially exposed to safety or health hazards, describes emergency response procedures for actual and potential chemical hazards. Contractors and suppliers are retained as independent contractors and are responsible for ensuring the health and safety of their own employees in accordance with the specific requirements detailed in this HASP at a minimum.

1.0 INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed by P.W. Grosser Consulting, Inc. (PWGC) at the request of Lewis & Murphy Realty, Inc. (Applicant) for the proposed Interim Remedial Measure (IRM) to be performed at the Site to protect on-site personnel, visitors, and the public from exposure to hazardous materials or wastes. 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 relating to each phase of site investigation and is based on the best information available. The HASP may be revised by PWGC at the request of the Applicant upon receipt of new information regarding site conditions. Changes will be documented by written amendments.

1.1 Site Safety Plan Acknowledgment and Amendments

The PWGC Field Hydrogeologist is responsible for informing personnel entering the work area of the contents of this plan.

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

1.2 Daily Safety Meetings

Each day before work begins; PWGC will hold safety (tailgate or tool box) meetings to ensure that on-site personnel understand the site conditions and operating procedures as well as addressing safety questions and concerns. Project staff will discuss and remedy health and safety issues at these meetings.

1.3 Key Personnel - Roles and Responsibilities

The following key personnel are planned for this project:

- Project Manager – Ryan Morley, PG
- Field Hydrogeologists – Janelle Cooley, Chandler Precht

The project manager is responsible for overall project administration and, with guidance from the Field Hydrogeologist, for supervising the implementation of this HASP. The Field Hydrogeologist 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 Field Hydrogeologist 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, designation of work zones and

levels of protection and emergency procedures dealing with fire and first aid.

2. Coordinating site safety decisions with the project manager.
3. 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 PWGC or appropriate key personnel.

2.0 SITE BACKGROUND AND SCOPE OF WORK

The subject site is located at 68-32 Main Street, Kew Gardens, New York. The property is identified as New York City Block 6486, Lot 39. The site is bordered on the north by a commercial property, on the east by Main Street, on the west by residential properties and a cemetery, and on the south by 68th Drive.

The current property consists of one single-story retail strip building with eleven units including a basement level for each, a supermarket, and a parking lot. The entire property is approximately 42,250 square feet. The buildings were reportedly constructed in 1950. There is currently no planned change to the usage of the Site. The IRM will include installing an eight-foot-deep, two-inch diameter well in the basement of the building using a small drill rig or hand auger. The well point will be tied into piping associated with an existing Sub Slab Depressurization System (SSDS), and two large 350-gallon carbon filters and a blower will be connected to the piping.

Based on previous investigations performed at the site, the proposed well installation is to occur in a location with chlorinated solvent impact in the shallow soil.

3.0 HAZARD ASSESSMENT

This section identifies the hazards associated with the proposed scope of work, general site operations which may also be conducted at site, and the standard operating procedures (SOPs) that should be implemented to reduce the hazards; identifies 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.

3.1 Activity-Specific Hazards and Standard Operating Procedures

3.1.1 Drilling and Probing Operations

Soil borings and soil vapor points using Geoprobe® direct push technology (or equivalent) will be installed as part of the proposed subsurface investigation. Subcontractors shall follow the Geoprobe® direct push drill rig Standard Operating Procedures (or equivalent). Hazards associated with direct push drill rigs are as follows:

- Noise is a potential hazard associated with the operation of heavy equipment, drill rigs, pumps and engines. Workers will wear hearing protection while in the work zone when these types of machinery are operating.
- When conducting drilling activities, the opportunity of encountering fire and explosion hazards may exist from encountering underground utilities, from the use of diesel engine equipment, and other potential ignition sources. During dry periods there is an increased chance of fires starting at the job site. If these conditions occur no smoking will be permitted at the site and all operations involving potential ignition sources will be monitored continuously (fire watch).
- Manual lifting of heavy objects may be required. Failure to follow proper lifting technique can result in back injuries and strains. Back injuries are a serious concern as they are the most common work place injury, often resulting in lost or restricted work time, and long treatment and recovery periods.
- A drill rig will be used to install borings where required. Working with or near heavy equipment poses many potential hazards, including electrocution, fire/explosion, being struck by or against, or pinched/caught/crushed by, and can result in serious physical harm.
- Encountering underground utilities may pose electrical hazards to workers. Additionally, overhead electrical lines can be a concern during drilling operations. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death.
- Site traffic, automobile and pedestrian, must be diverted away from the drilling work zone. Proper signage and barricading must be erected around the work zone and personnel must

be wearing high-visibility safety gear. Signage should be easily noticeable and direct traffic in a singular direction.

- Hand tools such as shovels, hammers, razor blades, heavy bars, hand augers, etc. should be used with caution and always while in Level D PPE and work gloves, at minimum.
- PWGC anticipates that Level C PPE will be used for all activities within the immediate drilling zone due to elevated concentrations of chlorinated solvents.

Soil borings using a jackhammer or a core drill along with a hand auger will be installed as part of the proposed subsurface investigation. PWGC and/or subcontractors shall follow the jackhammer/core drill Standard Operating Procedures (or equivalent), included as **Appendix B**.

3.1.2 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. As necessary, PWGC shall follow the heat and cold stress safety protocols included as **Appendix C**.

3.1.3 Dust Control and Monitoring

Dust generated during work activities may contain contaminants associated with the site characteristics. Dust generation is not anticipated during the subsurface investigation. In the event that fugitive dust is generated, PWGC shall control the dust by wetting the working surface with water, or other approved method of dust suppression.

3.2 Chemical Hazards

Historic environmental investigations at the subject site and throughout the five boroughs of New York City have identified the widespread presence of historic urban fill material, which commonly contains elevated concentrations of SVOCs and metals. In addition, the site has a documented presence of chlorinated solvents (PCE and TCE) in the shallow soils beneath the basement level.

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

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

3.2.1 Respirable Dust

The subsurface investigation activities are not anticipated to generate particulate dust; however, dust may be generated from drilling 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, PWGC will employ dust monitoring using a particulate monitor (MiniRAM or equivalent). If monitoring detects concentrations greater than 150 µg/m3 over daily background, PWGC 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 soils will be mitigated with the implementation of latex gloves, hand washing, and decontamination exercises when necessary.

4.2.2 Organic Vapors

The potential for isolated areas of VOCs impacts exists. Therefore, drilling activities may cause the release of organic vapors to the atmosphere. PWGC will monitor organic vapors with a Photoionization Detector (PID) during drilling activities to determine whether organic vapor concentrations exceed action levels shown below.

PID Response	Action
Sustained readings of 5 ppm or greater	Shut down drilling 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	Re-evaluate respiratory protection as upgrade may be required.

3.3 General Site Hazards

Applicable OSHA 29 CFR 1910.120(m) standards for illumination shall apply. Work is to be conducted during daylight hours whenever possible.

Electrical power must be provided through a ground fault circuit interrupter. Applicable OSHA 29 CFR 1926 Subpart K standards for use of electricity shall apply.

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

Protective eye wear shall be donned in Level C in the work zone, when directed by the site safety officer.

Overhead and underground utilities shall be identified, and/or inspected and appropriate safety precautions taken before conducting operations where there is potential for contact or interference.

4.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be selected in accordance with OSHA 29 CFR 1910.120(c), (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 through B is the addition of the type of respiratory protection. **It is anticipated that work will be performed in Level C 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 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 PID, 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.

The field team leader will verify if Level C is appropriate by checking organic vapor concentrations using compound and/or class-specific detector tubes. However, it is anticipated that Level C will be required in the work zone.

Personnel and visitors entering a work zone using a negative pressure air purifying respirator (APR) must have successfully passed a qualitative respirator fit test in accordance with OSHA 29 CFR 1910.134 or the American National Standards Institute (ANSI).

Fit testing documentation is the responsibility of each subcontractor. Documentation of PWGC's personnel fit-testing is maintained on file.

5.0 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 (**Figure 1**) will be posted on-site. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment. These will be outlined in the site-specific HASP.

5.1 Emergency Equipment On-site

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

5.2 Emergency Telephone Numbers

General Emergencies	911
New York City Police	911
New York Presbyterian Queens	1-718-670-2000
NYSDEC Spills Division	1-800-457-7362
NYSDEC Hazardous Waste Division	1-718-482-4994

NYCDEP	1-718-699-9811
NYC Department of Health	1-212-788-4711
NYC Fire Department	911
National Response Center	1-800-424-8802
Poison Control	1-212-340-4494
Project Manager	1-631-589-6353
Health & Safety Officer	1-631-589-6353
Alternate Health & Safety Officer	1-631-589-6353

5.3 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 PWGC Field Hydrogeologist shall act as the project manager's on-site designee and perform the following tasks:

- Take appropriate measures to protect personnel;
- 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.
-

5.4 Medical Emergencies

A person who becomes ill or injured, first aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (**Appendix E**) 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 and information on the chemical(s) to which they may have been exposed.

5.5 Fire or Explosion

In the event of a fire or explosion, the local fire department will be summoned immediately. PWGC 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 firefighting equipment available on site; or,
- remove or isolate flammable or other hazardous materials that may contribute to the fire.

5.6 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.

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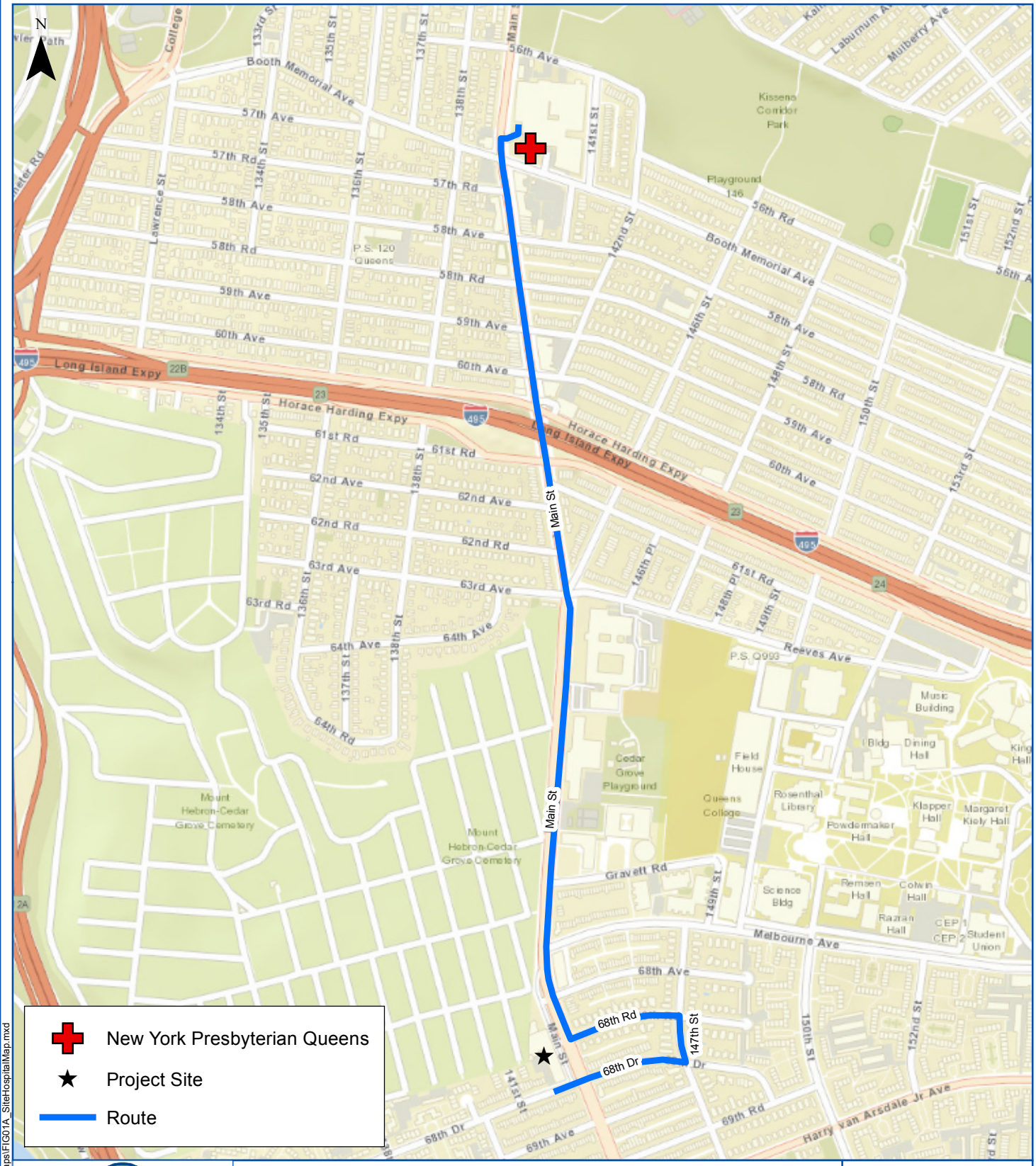
FIGURE



HOSPITAL ROUTE

68-34 Main St, Kew Gardens, NY

to

56-45 Main St, Flushing, NY

0 0.1 0.2 0.3 0.4 Miles

PWGC
CLIENT DRIVEN SOLUTIONS
P.W. Grosser Consulting, Inc.
630 Johnson Ave., Suite 7
Bohemia, NY 11716
Ph: 631-589-6353 • Fax: 631-589-8705
pwgc.info@pwgrosser.com

Project:	ACT1904
Date:	11/26/2019
Designed by:	RM
Drawn by:	PH
Approved by:	RM
Figure No:	1A

Document Path: W:\Projects\A-D\ACT\1904\maps\FIG01A_SiteHospitalMap.mxd

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APPENDIX A
SITE SAFETY AMENDMENT FORM

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SITE SAFETY PLAN AMENDMENT FORM

SITE SAFETY PLAN AMENDMENT # _____: _____

SITE NAME: _____

REASON FOR AMENDMENT: _____

_____

_____

ALTERNATIVE PROCEDURES: _____

_____

_____

REQUIRED CHANGES IN PPE: _____

_____

_____

_____ _____
PROJECT SUPERINTENDENT DATE

_____ _____
HEALTH & SAFETY CONSULTANT DATE

_____ _____
SITE SAFETY OFFICER DATE

P.W. Grosser Consulting, Inc • P.W. Grosser Consulting Engineer & Hydrogeologist, PC
630 Johnson Avenue, Suite 7 • Bohemia, NY 11716 • Branch Location - Seattle, WA
PH 631.589.6353 • FX 631.589.8705 • www.pwgrosser.com

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APPENDIX B

DRILLING AND JACKHAMMER OPERATIONS

SAFETY PROCEDURES DURING THE OPERATION OF DRILLING/PROBING MACHINESINCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

- All site personnel should know the location of the rig emergency shut-off switch prior to beginning operations.
- The rig should be inspected prior to operation to ensure that it is in proper working condition and that all safety devices are functioning.
- Each rig should have a first-aid kit and fire extinguisher which should be inspected to ensure that they are adequate.
- All operators should wear, at a minimum, hard hats, steel-toe safety shoes or boots, gloves and safety glasses. Additional clothing and protective equipment may be required at sites where hazardous conditions are likely. Clothing must be close fitting, without loose ends, straps, draw strings or belts or other unfastened parts that might catch on moving machinery.
- Work areas should be kept free of materials, debris and obstruction, and substances such as grease or oil that could cause a surface to become slick or otherwise hazardous.
- Prior to drilling, the site must be checked to determine whether it can accommodate the rig and supplies and provide a safe working area.
- The drill rig mast (derrick) must be lowered prior to moving between drilling locations.
- The drill rig masts should not be raised if the rig will not be at least 20 feet away from overhead utilities.
- The location of underground utilities should be determined prior to erecting the rig.
- The drill rigs must be properly erected, leveled and stabilized prior to drilling.
- The operator must shut down the vehicle engine before leaving the vicinity of the machine.
- All personnel not directly involved in operating the rig or in sampling should remain clear of the drilling equipment when it is in operation.
- All unattended boreholes must be adequately covered or otherwise protected to prevent trip and fall hazards. All open boreholes should be covered, protected or backfilled as specified in local or state regulations.
- When climbing to or working on a derrick platform that is higher than 20 feet, a safety climbing device should be used.
- The user of wire line hoists, wire rope and hoisting hardware should be as stipulated by the American Iron and Steel Institute Wire Rope User's Manual.
- The rig should be operated in a manner which is consistent with the manufacturers' ratings of speed, force, torque, pressure, flow, etc. The rig and tools should be used for the purposes for which they were intended.

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APPENDIX C

HEAT AND COLD STRESS

HEAT STRESS

Heat Stress (Hyperthermia)

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

1. Prior to site activity, the field team leader may make arrangements for heat stress monitoring (i.e., monitoring heart rate, body temperature, and body water loss) during actual site work if conditions warrant. In addition, the FTL is to ensure that each team member has been acclimatized to the prevailing environmental conditions, that personnel are aware of the signs and symptoms of heat sickness, that they have been adequately trained in first aid procedures, and that there are enough personnel on-site to rotate work assignments and schedule work during hours of reduced temperatures. Personnel should not consume alcoholic or caffeinated beverages but rather drink moderate levels of an electrolyte solution and eat well prior to commencing site work.

2. Although there is no specific test given during a baseline physical that would identify a person's intolerance to heat, some indicators are tobacco or medication use, dietary habits, body weight, and chronic conditions such as high blood pressure or diabetes.

3. *Heat cramps*, caused by profuse perspiration with inadequate fluid intake and salt replacement, most often afflict people in good physical condition who work in high temperature and humidity. Heat cramps usually come on suddenly during vigorous activity. Untreated, heat cramps may progress rapidly to heat exhaustion or heat stroke. First aid treatment: remove victim to a cool place and replace lost fluids with water.

4. Thirst is not an adequate indicator of heat exposure. Drinking fluid by itself does not indicate sufficient water replacement during heat exposure. A general rule, the amount of water administered should replace the amount of water lost, and it should be administered at regular intervals throughout the day. For every half pound of water lost, 8 ounces of water should be ingested. Water should be replaced by drinking 2 – 4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink split 50/50 with water.

5. Heat exhaustion results from salt and water loss along with peripheral pooling of blood. Like heat cramps, heat exhaustion tends to occur in persons in good physical health who are working in high temperatures and humidity. Heat exhaustion may come on suddenly as dizziness and collapse. Untreated, heat exhaustion may progress to heat stroke.

6. Treatment for heat exhaustion: Move the victim to a cool environment (e.g. air-conditioned room/car), lay victim down and fan him/her. If the air-conditioning is not available, remove the victim to a shaded area, remove shirt, and fan. If symptoms do not subside within an hour, notify 911 to transport to hospital.

7. Heat stroke results from the body's inability to dissipate excess heat. A true medical emergency that requires immediate care, it usually occurs when one ignores the signs of heat exhaustion and continues strenuous activities. Working when the relative humidity exceeds 60% is a particular problem. Workers in the early phase of heat stress may not be coherent of they will be confused, delirious or comatose. Changes in behavior, irritability and combativeness are useful early signs of heat stroke.

8. Treatment of heat stroke: Move the victim to a cool, air-conditioned environment. Place victim in a semi-reclined position with head elevated and strip to underclothing. Cool victim as rapidly as possible, applying ice packs to the arms and legs and massaging the neck and torso. Spray victim with tepid water and constantly fan to promote evaporation. Notify 911 to transport to hospital as soon as possible.

SYMPTOMS OF HEAT STRESS

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

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

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

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

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

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

HEAT STRESS INDICATORS

Heat stress indicator:	When to measure:	If Exceeds:	Action:
Heart rate (pulse)	Beginning of rest period	110 beats per minute	Shorten next work period by 33%
Oral temperature	Beginning of rest period	99°F (after thermometer is under tongue for 3 minutes) 100.6°F (after thermometer is under tongue for 3 minutes)	Shorten next work period by 33% Prohibit work in impermeable clothing
Body Weight	1. Before workday begins 2. After workday ends		Increase fluid intake

COLD STRESS

Cold stress (Hypothermia)

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

Prevention

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

1. Maintain body core temperature at 98.6oF or above by encouraging workers to drink warm liquids during breaks (preferably not coffee) and wear several layers of clothing that can keep the body warm even when the clothing is wet.

2. Avoid frostbite by adequately covering hands, feet and other extremities. Clothing such as insulated gloves or mittens, earmuffs and hat liners should be worn. To prevent contact frostbite (from touching metal and cold surfaces below 20°F), workers should wear gloves. Tool handles should be covered with insulating material.

3. Adjust work schedules to provide adequate rest periods. When feasible, rotate personnel and perform work during the warmer hours of the day.

4. Provide heated shelter. Workers should remove their outer layer(s) of clothing while in the shelter to allow sweat to evaporate.

5. In the event that wind barriers are constructed around an intrusive operation (such as drilling), the enclosure must be properly vented to prevent the buildup of toxic or explosive gases or vapors. Care must be taken to keep a heat source away from flammable substances.

6. Using a wind chill chart such as the one included below, obtain the equivalent chill temperature (ECT) based on actual wind speed and temperature. Refer to the ECT when setting up work warm-up schedules, planning appropriate clothing, etc. Workers should use warming shelters at regular intervals at or below an ECT of 20°F. For exposed skin, continuous exposure should not be permitted at or below an ECT of -25°F.

FROSTBITE

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

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

1. Frostnip is the incipient stage of frostbite, brought about by direct contact with a cold object or exposure of a body part to cool/cold air. Wind chill or cold water also can be major factors. This condition is not serious. Tissue damage is minor and the response to care is good. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostnip.

2. Treatment of frostnip: Care for frostnip by warming affected areas. Usually the worker can apply warmth from his/her bare hands, blow warm air on the site, or, if the fingers are involved, hold them in the armpits. During recovery, the worker may complain of tingling or burning sensation, which is normal. If the condition does not respond to this simple care, begin treatment for frostbite.

3. Frostbite: The skin and subcutaneous layers become involved. If frostnip goes untreated, it becomes superficial frostbite. This condition is serious. Tissue damage may be serious. The worker must be transported to a medical facility for evaluation. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostbite. The affected area will feel frozen, but only on the surface. The tissue below the surface must still be soft and have normal response to touch. DO NOT squeeze or poke the tissue. The condition of the deeper tissues can be determined by gently palpating the affected area. The skin will turn mottled or blotchy. It may also be white and then turn grayish-yellow.

4. Treatment of frostbite: When practical, transport victim as soon as possible. Get the worker inside and keep him/her warm. Do not allow any smoking or alcohol consumption. Thaw frozen parts by immersion, re-warming in a 100°F to 106°F water bath. Water temperature will drop rapidly, requiring additional warm water throughout the process. Cover the thawed part with a dry sterile dressing. Do not puncture or drain any blisters. NOTE: Never listen to myths and folk tales about the care of frostbite. Never rub a frostbitten or frozen area. Never rub snow on a frostbitten or frozen area. Rubbing the area may cause serious damage to already injured tissues. Do not attempt to thaw a frozen area if there is any chance it will be re-frozen.

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

Body Temp (°F)	Body Temp (°C)	Symptoms
99-96	37-35.5	Intense uncontrollable shivering
95-91	35.5-32.7	Violent shivering persists. If victim is conscious, has difficulty speaking.
90-86	32.6-30	Shivering decreases and is replaced by strong muscular rigidity. Muscle coordination is affected. Erratic or jerkey movements are produced. Thinking is less clear. General comprehension is dulled. There may be total amnesia. The worker is generally still able to maintain the appearance of psychological contact with his surroundings.
85-81	29.9-27.2	Victim becomes irrational, loses contact with his environment, and drifts into a stupor. Muscular rigidity continues. Pulse and respirations are slow and the worker may develop cardiac arrhythmias.
80-78	27.1-25.5	Victim becomes unconscious. He does not respond to the spoken word. Most reflexes cease to function. Heartbeat becomes erratic
Below 78	Below 25.5	Cardiac and respiratory centers of the brain fail. Ventricular fibrillation occurs; probably edema and hemorrhage in the lungs; death.

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

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

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

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

(1) Reproduced from American Conference of Governmental Industrial Hygienists, Threshold Limit Values and Biological Exposure Indices for 1985-1986, p.01.

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APPENDIX D

CHEMICAL HAZARDS

SAFETY DATA SHEET

Version 3.17
Revision Date 06/04/2015
Print Date 06/16/2015

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Acetone

Product Number : 650501
Brand : Sigma-Aldrich
Index-No. : 606-001-00-8

CAS-No. : 67-64-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Eye irritation (Category 2A), H319
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Repeated exposure may cause skin dryness or cracking.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C_3H_6O
Molecular weight	:	58.08 g/mol
CAS-No.	:	67-64-1
EC-No.	:	200-662-2
Index-No.	:	606-001-00-8
Registration number	:	01-2119471330-49-XXXX

Hazardous components

Component	Classification	Concentration
Acetone		
	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319, H336	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Acetone	67-64-1	TWA	500.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Hematologic effects Upper Respiratory Tract irritation Eye irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC		

		See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	500 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Hematologic effects Upper Respiratory Tract irritation Eye irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	750.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Hematologic effects Upper Respiratory Tract irritation Eye irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	750 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Hematologic effects Upper Respiratory Tract irritation Eye irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	1,000.000000 ppm 2,400.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	250.000000 ppm 590.000000 mg/m3	USA. NIOSH Recommended Exposure Limits

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Acetone	67-64-1	Acetone	50.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

Derived No Effect Level (DNEL)

Application Area	Exposure routes	Health effect	Value
Workers	Skin contact	Long-term systemic effects	186mg/kg BW/d
Consumers	Ingestion	Long-term systemic effects	62mg/kg BW/d
Consumers	Skin contact	Long-term systemic effects	62mg/kg BW/d
Workers	Inhalation	Acute systemic effects	2420 mg/m3
Workers	Inhalation	Long-term systemic effects	1210 mg/m3
Consumers	Inhalation	Long-term systemic effects	200 mg/m3

Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	33.3 mg/kg
Marine water	1.06 mg/l
Fresh water	10.6 mg/l
Marine sediment	3.04 mg/kg
Fresh water sediment	30.4 mg/kg
Onsite sewage treatment plant	100 mg/l

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
impervious clothing, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators

and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -94 °C (-137 °F)
f)	Initial boiling point and boiling range	56 °C (133 °F) at 1,013 hPa (760 mmHg)
g)	Flash point	-16.99 °C (1.42 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 13 %(V) Lower explosion limit: 2 %(V)
k)	Vapour pressure	533.3 hPa (400.0 mmHg) at 39.5 °C (103.1 °F) 245.3 hPa (184.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.791 g/mL at 25 °C (77 °F)
n)	Water solubility	completely miscible
o)	Partition coefficient: n-octanol/water	log Pow: -0.24
p)	Auto-ignition temperature	465.0 °C (869.0 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	23.2 mN/m at 20.0 °C (68.0 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Bases, Oxidizing agents, Reducing agents, Acetone reacts violently with phosphorous oxychloride.

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 5,800 mg/kg
Remarks: Behavioral:Altered sleep time (including change in righting reflex). Behavioral:Tremor. Behavioral:Headache. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

LC50 Inhalation - Rat - 8 h - 50,100 mg/m3
Remarks: Drowsiness Dizziness Unconsciousness

LD50 Dermal - Guinea pig - 7,426 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Mild skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation - 24 h

Respiratory or skin sensitisation
- Guinea pig
Result: Does not cause skin sensitisation.

Germ cell mutagenicity
No data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: AL3150000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Kidney - Irregularities - Based on Human Evidence
Skin - Dermatitis - Based on Human Evidence
Kidney - Irregularities - Based on Human Evidence
Skin - Dermatitis - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 5,540 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	LC50 - Daphnia magna (Water flea) - 8,800 mg/l - 48 h
Toxicity to algae	Remarks: No data available

12.2 Persistence and degradability

Biodegradability: Result: 91 % - Readily biodegradable
(OECD Test Guideline 301B)

12.3 Bioaccumulative potential

Does not bioaccumulate.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1090 Class: 3 Packing group: II
Proper shipping name: Acetone
Reportable Quantity (RQ): 5000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1090 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: ACETONE

IATA
UN number: 1090 Class: 3 Packing group: II
Proper shipping name: Acetone

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	2007-03-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.17 Revision Date: 06/04/2015 Print Date: 06/16/2015

SAFETY DATA SHEET

Version 4.3
Revision Date 03/05/2015
Print Date 06/16/2015

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : cis-Dichloroethylene

Product Number : 48597
Brand : Supelco
Index-No. : 602-026-00-3

CAS-No. : 156-59-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Inhalation (Category 4), H332
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H332 Harmful if inhaled.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.

P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a POISON CENTER or doctor/ physician if you feel unwell.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C2H2Cl2
Molecular weight	:	96.94 g/mol
CAS-No.	:	156-59-2
EC-No.	:	205-859-7
Index-No.	:	602-026-00-3

Hazardous components

Component	Classification	Concentration
cis-Dichloroethylene		
	Flam. Liq. 2; Acute Tox. 4; Aquatic Acute 3; Aquatic Chronic 3; H225, H332, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature 2 - 8 °C

Handle and store under inert gas. Air and moisture sensitive. Light sensitive.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
cis-Dichloroethylene	156-59-2	TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Eye irritation		

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: light yellow
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-80.0 °C (-112.0 °F)
f)	Initial boiling point and boiling range	60.0 - 61.0 °C (140.0 - 141.8 °F)
g)	Flash point	6.0 °C (42.8 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.28 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available

r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LC50 Inhalation - Rat - 13700 ppm
Remarks: Behavioral:Somnolence (general depressed activity). Liver:Fatty liver degeneration.

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: KV9420000

narcosis, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene

Poison Inhalation Hazard: No

IMDG
UN number: 1150 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: 1,2-DICHLOROETHYLENE

IATA
UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H332	Harmful if inhaled.
H402	Harmful to aquatic life.

HMIS Rating

Health hazard:	1
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	1

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.3 Revision Date: 03/05/2015 Print Date: 06/16/2015

SAFETY DATA SHEET

Version 4.5
Revision Date 06/10/2015
Print Date 06/16/2015

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Tetrachloroethylene

Product Number : 371696
Brand : Sigma-Aldrich
Index-No. : 602-028-00-4

CAS-No. : 127-18-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Skin sensitisation (Category 1), H317
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Acute aquatic toxicity (Category 2), H401
Chronic aquatic toxicity (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H351 Suspected of causing cancer.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Perchloroethylene PCE
Formula	:	C_2Cl_4
Molecular weight	:	165.83 g/mol
CAS-No.	:	127-18-4
EC-No.	:	204-825-9
Index-No.	:	602-028-00-4

Hazardous components

Component	Classification	Concentration
Tetrachloroethylene		
	Skin Irrit. 2; Eye Irrit. 2A; Skin Sens. 1; Carc. 2; STOT SE 3; Aquatic Acute 2; Aquatic Chronic 2; H315, H317, H319, H336, H351, H411	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Move out of dangerous area.Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Tetrachloroethylene	127-18-4	TWA	25.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		STEL	100.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		Potential Occupational Carcinogen Minimize workplace exposure concentrations. See Appendix A		
		See Table Z-2		
		TWA	100.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		CEIL	200.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Peak	300.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Tetrachloroethylene	127-18-4	Tetrachloroethylene	3ppm	In end-exhaled air	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Prior to shift (16 hours after exposure ceases)			
		Tetrachloroethylene	0.5000 mg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
		Prior to shift (16 hours after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 49 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -22 °C (-8 °F) - lit.
f)	Initial boiling point and boiling range	121 °C (250 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	25.3 hPa (19.0 mmHg) at 25.0 °C (77.0 °F) 17.3 hPa (13.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	1.623 g/cm3 at 25 °C (77 °F)
n)	Water solubility	0.15 g/l at 25 °C (77 °F)
o)	Partition coefficient: n-octanol/water	log Pow: 2.53 at 23 °C (73 °F)
p)	Auto-ignition temperature	No data available
q)	Decomposition	No data available

	temperature	
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	32.1 mN/m at 20 °C (68 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Strong bases

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - female - 3,005 mg/kg
(OECD Test Guideline 401)

LC50 Inhalation - Rat - male and female - 6 h - 28 mg/l

LD50 Dermal - Rabbit - 5,000 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Skin irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Mild eye irritation - 24 h

Respiratory or skin sensitisation
- Mouse
Result: May cause sensitisation by skin contact.
(OECD Test Guideline 429)

Germ cell mutagenicity
Hamster
ovary
Result: negative

OECD Test Guideline 474
Mouse - male
Result: negative

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC:	2A - Group 2A: Probably carcinogenic to humans (Tetrachloroethylene)
NTP:	Reasonably anticipated to be a human carcinogen (Tetrachloroethylene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information

Repeated dose toxicity - Mouse - female - Oral - Lowest observed adverse effect level - 390 mg/kg
RTECS: KX3850000

narcosis, Liver injury may occur., Kidney injury may occur.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 5 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 7.50 mg/l - 48 h
Toxicity to algae	static test EC50 - Skeletonema costatum - > 16 mg/l - 7 h

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 28 d Result: 11 % - Not readily biodegradable. (OECD Test Guideline 301C)

12.3 Bioaccumulative potential

Bioaccumulation	Lepomis macrochirus (Bluegill) - 21 d - 0.00343 mg/l Bioconcentration factor (BCF): 49

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1897 Class: 6.1 Packing group: III
Proper shipping name: Tetrachloroethylene
Reportable Quantity (RQ): 100 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1897 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TETRACHLOROETHYLENE
Marine pollutant: yes

IATA
UN number: 1897 Class: 6.1 Packing group: III
Proper shipping name: Tetrachloroethylene

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Tetrachloroethylene	127-18-4	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity

Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.5 Revision Date: 06/10/2015 Print Date: 06/16/2015

SAFETY DATA SHEET

Version 4.6
Revision Date 03/02/2015
Print Date 06/16/2015

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Trichloroethylene

Product Number : 251402
Brand : Sigma-Aldrich
Index-No. : 602-027-00-9

CAS-No. : 79-01-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Germ cell mutagenicity (Category 2), H341
Carcinogenicity (Category 1B), H350
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear eye protection/ face protection.
P280	Wear protective gloves.
P281	Use personal protective equipment as required.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	TCE Trichloroethene
Formula	:	C_2HCl_3
Molecular weight	:	131.39 g/mol
CAS-No.	:	79-01-6
EC-No.	:	201-167-4
Index-No.	:	602-027-00-9

Hazardous components

Component	Classification	Concentration
Trichloroethylene Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)		
	Skin Irrit. 2; Eye Irrit. 2A; Muta. 2; Carc. 1B; STOT SE 3; Aquatic Acute 3; Aquatic Chronic 3; H315, H319, H336, H341, H350, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Light sensitive. Handle and store under inert gas.
Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Trichloroethylene	79-01-6	TWA	10.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment cognitive decrement Renal toxicity Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Suspected human carcinogen		
		STEL	25.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment cognitive decrement Renal toxicity Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Suspected human carcinogen		
		Potential Occupational Carcinogen See Appendix C See Appendix A		
		See Table Z-2		
		TWA	100.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		CEIL	200.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		Peak	300.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Trichloroethylene	79-01-6	Trichloroacetic acid	15.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		Trichloroethanol	0.5000 mg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			
		Trichloroethylene		In blood	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			
		Trichloroethylene		In end-exhaled air	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -84.8 °C (-120.6 °F) - lit.
f)	Initial boiling point and boiling range	86.7 °C (188.1 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower	Upper explosion limit: 10.5 %(V)

	flammability or explosive limits	Lower explosion limit: 8 %(V)
k)	Vapour pressure	81.3 hPa (61.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	1.463 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 2.29log Pow: 5
p)	Auto-ignition temperature	410.0 °C (770.0 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Oxidizing agents, Strong bases, Magnesium

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 4,920 mg/kg

LC50 Inhalation - Mouse - 4 h - 8450 ppm

LD50 Dermal - Rabbit - > 20,000 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Severe skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation - 24 h

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.
In vitro tests showed mutagenic effects

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC:	1 - Group 1: Carcinogenic to humans (Trichloroethylene)
NTP:	Reasonably anticipated to be a human carcinogen (Trichloroethylene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: KX4550000

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Exposure to and/or consumption of alcohol may increase toxic effects., Gastrointestinal disturbance, Kidney injury may occur., narcosis
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 41 mg/l - 96.0 h
	LOEC - other fish - 11 mg/l - 10.0 d
	NOEC - Oryzias latipes - 40 mg/l - 10.0 d
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 18.00 mg/l - 48 h
Toxicity to algae	IC50 - Pseudokirchneriella subcapitata (green algae) - 175.00 mg/l - 96 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
Does not bioaccumulate.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1710 Class: 6.1 Packing group: III
Proper shipping name: Trichloroethylene
Reportable Quantity (RQ): 100 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1710 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TRICHLOROETHYLENE

IATA
UN number: 1710 Class: 6.1 Packing group: III
Proper shipping name: Trichloroethylene

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Trichloroethylene	CAS-No. 79-01-6	Revision Date 2011-09-01
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.	CAS-No. 79-01-6	Revision Date 2011-09-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H402	Harmful to aquatic life.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.6 Revision Date: 03/02/2015 Print Date: 06/16/2015

PWGC
Strategic Environmental Engineering Solutions

APPENDIX E

FIELD ACCIDENT REPORT

PWGC
Strategic Environmental Engineering Solutions

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 claims through his/her Health and Welfare Fund.)

INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

_____

_____

_____

P.W. Grosser Consulting, Inc • P.W. Grosser Consulting Engineer & Hydrogeologist, PC
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APPENDIX C
COMMUNITY AIR MONITORING PLAN

INTERIM REMEDIAL MEASURE
68-32 MAIN STREET
KEW GARDENS, NEW YORK 11367
NYSDEC SITE: C241205

INTERIM REMEDIAL MEASURE
COMMUNITY AIR MONITORING PLAN

SUBMITTED TO:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7016

PREPARED FOR:

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PWGC Project Number: ACT1904

DECEMBER 2019

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APPENDICES

1.0 INTRODUCTION

This Community Air Monitoring Plan (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 Interim Remedial Measure from potential airborne contaminant releases resulting from the Interim Remedial Measure (IRM) at 68-34 Main Street, Kew Gardens, New York (Site).

The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that the IRM did not spread contamination off-site through the air.

The primary chemicals of potential concern (COPC) to be encountered at the Site are VOCs, namely chlorinated solvents.

1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- 29 CFR 1910.120(h): This regulation specifies that air shall be monitored to identify and quantify levels of airborne hazardous substances and health hazards, and to determine the appropriate level of protection for workers.
- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan (**Appendix 1A**): 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's (NYSDEC's) Fugitive Dust and Particulate Monitoring from DER-10 Technical Guidance for Site Investigation and Remediation (**Appendix 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

The following sections contain information describing the types, frequency and location of real-time monitoring.

2.1 Real-Time Monitoring

This section addresses the real-time monitoring that will be conducted within the work area, and along the site's downwind perimeter, during all ground intrusive activities, such as excavation, soil removal and material handling.

Air monitoring data will be documented in a site log book by the designated site safety officer. PWGC's 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.

2.1.1 *Air Monitoring Equipment*

Air will be monitored for VOCs with a MiniRAE 2000 PID (or equivalent). This instrument is appropriate to measure the types of contaminants known or suspected to be present, and is capable of calculating 15-minute running average concentrations, which will be compared to the levels specified in Section 2.1.2

Fugitive respirable dust will be monitored using a MiniRAM Model PDM-3 aerosol monitor (or equivalent). This instrument is capable of measuring particulate matter less than 10 micrometers in size (PM-10), is capable of integrating over a period of 60 minutes (or less) for comparison to the airborne particulate action level and is equipped with an audible alarm to indicate exceedance of the action level specified in Section 2.1.3.

2.1.2 *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. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. VOC monitoring Action Levels are as described 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

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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 60-minute readings will be recorded and be available for NYSDEC and/or NYSDOH personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

2.1.3 *Particulate Monitoring, Response Levels, and Actions*

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. In addition, fugitive dust migration should be visually assessed during all work activities. Particulate monitoring Action Levels are as described below:

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/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 mcg/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 mcg/m3 above the upwind level, work must be stopped, and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

All 15-minute readings will be recorded and be available for NYSDEC and/or NYSDOH personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

3.0 SPECIAL REQUIREMENTS

3.1 Requirements for Work within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

3.2 Requirements for Indoor Work with Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under “Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures” except that in this instance “nearby/occupied structures” would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned

work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum. Work within enclosed structures is not anticipated for the proposed IRM.

4.0 VAPOR SUPPRESSION TECHNIQUES

Vapor suppression techniques must be employed when action levels warrant the use of these techniques.

The techniques to be implemented for control of VOCs from stockpiled soil or from the open excavation will include one or more of the following:

- cover with plastic
- cover with “clean soil”
- application of hydro-mulch material*
- limit working hours to favorable wind and temperature conditions

*This material is a seedless version of the hydro-seed product commonly used by commercial landscaping contractors to provide stabilization and rapid grow-in of grasses or wild flowers along highways, embankments and other large areas. Hydro-mulch can be sprayed over open excavation areas, temporary stockpile areas and loaded trucks, as necessary. This is a highly effective method for controlling odors, because the release of odors is sealed immediately at the source.

5.0 DUST SUPPRESSION TECHNIQUES

Reasonable dust-suppression techniques must be employed during all work that may generate dust, such as excavation, grading, material handling, and placement of clean fill. The following techniques were shown to be effective for controlling the generation and migration of dust during remedial activities:

- Wetting equipment and excavation faces;
- Spraying water on buckets during excavation and dumping;
- Hauling materials in properly covered containers; and,
- Restricting vehicle speeds to 10 mph.

Using atomizing sprays will prevent overly wet conditions, conserve water, and offer an effective means of suppressing fugitive dust. It is imperative that utilizing water for suppressing dust will not create surface runoff.

6.0 DATA QUALITY ASSURANCE

6.1 Calibration

Instrument calibration shall be documented in the designated field logbook. All instruments shall be calibrated before each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

6.2 Operations

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

6.3 Data Review

The Field Team Leader FTL/HSO will interpret all monitoring data based on the action levels specified in Sections 2.1.2 and 2.1.3 and his/her professional judgment. The FTL/HSO shall review the data with the HSM to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, comparison to direct reading instrumentation and changes in the integrated monitoring strategy.

Monitoring and sampling data, along with all sample documentation will be periodically reviewed by the HSM.

7.0 RECORDS AND REPORTING

All readings must be recorded and available for review by personnel from NYSDEC and NYSDOH. Should any of the action levels be exceeded, the NYSDEC Division of Air Resources must be notified in writing within five (5) working days.

The notification shall include a description of the control measures implemented to prevent further exceedances.

APPENDIX 1A
NYSDOH GENERIC CAMP

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

Overview

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

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

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

Community Air Monitoring Plan

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

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

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

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

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

December 2009

APPENDIX 1B
FUGITIVE DUST AND PARTICULATE MONITORING FROM DER-10 TECHNICAL GUIDANCE FOR SITE INVESTIGATIONS AND REMEDATION

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Appendix 1B
Fugitive Dust and Particulate Monitoring

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX D
ACT NOVEMBER 2018 SSDS INSTALLATION REPORT

Advanced Cleanup Technologies, Inc.

ENVIRONMENTAL CONSULTANTS

INSTALLATION REPORT

SUB-SLAB DEPRESSURIZATION SYSTEM

68-16 to 68-50 Main Street
Kew Gardens, NY 11367
Tax Map #: Block 6486, Lot 39

NYSDEC Site No. C241205
ACT Project #: 9233-KGNY

November 12, 2018

Prepared for:

Diane Macari
Main Properties DM, LLC
Main Properties AM, LLC
c/o Lewis Murphy Realty
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Website Address: actenvirons.com

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APPENDIX A

1 INTRODUCTION AND STATEMENT OF PURPOSES

1.1 Introduction

The subject property is located at 68-16 to 68-50 Main Street, Kew Gardens, NY 11367. The New York City tax map identification number is Block 6486, Lot 39. The subject property consists of a one-story commercial retail building with a full basement and an asphalt-paved parking lot. The building contains eleven commercial units, which are occupied by two hardware and paint stores, two restaurants, a pharmacy, a beauty salon, a bakery, an eyewear company, a drop-off dry cleaner, a grocery store, and a supermarket. The building has a footprint of approximately 33,705 square feet, and the property is approximately 42,250 square feet in area.

On February 14, 2017, Advanced Cleanup Technologies (ACT) produced a Phase I Environmental Site Assessment of the site. The assessment identified historical dry cleaning operations and a potential vapor encroachment condition at the subject property.

ACT performed a Phase II Investigation at the above referenced property between March 21, 2017 and May 2, 2017. Based upon this investigation, ACT confirmed the presence of soil vapor intrusion at the subject property. The most prevalent Volatile Organic Compounds (VOCs) identified in soil vapor beneath the site were Tetrachlorothene (PCE), Trichloroethene (TCE), and Cis-1,2-Dichloroethylene (DCE).

ACT was given the work assignment of installing an active Sub-Slab Depressurization Systems (SSDS's) beneath the building to prevent vapors beneath the building from impacting air quality inside the building.

1.2 Statement of Purposes

The objectives of the SSDS's are:

- Maintain a negative pressure beneath the building foundation in order to prevent VOCs from entering the building's breathing zone;

This document provides as-built plans for the SSDS installed at the site and operational guidance to keep the SSDS operating efficiently.

2 SUB-SLAB DEPRESSURIZATION SYSTEM

2.1 Description of System

According to the size of the building and previous environmental investigations, three SSDS's (SSDS-1, SSDS-2 and SSDS3) were installed at subject property. Figure 1 provides the as-built layout and elevation plans for the SSDS's installed beneath the basement floor at the property.

Each SSDS system consists of two vertical depressurization wells powered by a dedicated Radonaway HS5000 vacuum blower. SSDS-1 consists of depressurization wells DP-1 and DP-4, SSDS-2 consists of depressurization wells DP-2 and DP-5, and SSDS-3 consists of depressurization wells DP-3 and DP-6. All vertical depressurization wells are installed within holes excavated under the basement floor. The cross-section of a typical vacuum well is detailed in Figure 1.

At each depressurization well, the concrete floor slab was cut and the underlying soil was excavated to a depth of approximately 2.5-foot below the bottom of the concrete slab, except DP-1which was excavated to a depth of approximately 1.5-foot below the bottom of the concrete slab. A 4-inch layer of $^{3}/_{8}$-inch pea gravel was backfilled into the hole as a bed for the depressurization well.

DP-1, DP-2 and DP-3 were installed in the basement of Benjamin Moore Paints, Queens Pita Bakery and Naomi's Kosher Pizza, respectively. A 2-foot long section of 2-inch diameter schedule 40 PVC well screen with 20 mil screen slots was installed vertically in the excavated hole with a PVC cap at bottom end. The top of the well screen was connected to a 2-inch diameter schedule 40 PVC riser pipe.

DP-4, DP-5 and DP-6 were installed beneath the interior corridor in rear of each basement at the locations indicated in Figure 1. A 2-feet long piece of 3-inch diameter schedule 40 PVC well screen with 20 mil screen slots was installed vertically in the excavated hole with a PVC cap at bottom end. The top was connected to a 3-inch diameter schedule 40 PVC riser pipe.

Each depressurization well was backfilled with a 4-inch thick layer of $^{3}/_{8}$-inch pea gravel around the pipe up to the existing level of the bottom of the concrete floor slab. A layer of polyethylene was placed on top of the pea gravel and the concrete slab was restored to the original finished grade. The riser piping for each SSDS well is connected to overhead lateral piping, which leads to a 3-inch header pipe connected to vacuum blowers (BL-1, BL-2, and BL-3) installed on the interior wall of the rear corridor.

The air streams exiting the vacuum blowers from SSDS-1 and SSDS-3 is discharged through a 2-inch diameter exhaust pipe to 3 feet above the roofline of the building. The air stream exiting the vacuum blower from SSDS-2 is treated with two 180-pound vapor-phase

granular activated carbon adsorbers located along the western exterior wall of the building in the rear parking lot. After carbon treatment, the air stream is discharged through a 2-inch diameter exhaust pipe to 3 feet above the roofline of the building. Manufacturer equipment specifications for regenerative blower and accessories are provided in Appendix A.

2.2 Equipment and Controls

The three SSDS's are equipped with analog vacuum sensors in-line at the vacuum side of each vacuum blower. In addition, SSDS-2 was equipped with a gate valve, and a vapor treatment unit for the air stream exiting the SSDS-2 blower. The gate valve is used to regulate vacuum in the depressurization wells to prevent excessive pressure buildup on the blower or carbon treatment units.

The remote vacuum sensors installed on the vacuum side of the vacuum blower are connected to a wireless telemetry system that continuously logs vacuum maintained by each SSDS. In the event vacuum falls below 1.0 in. wc, email and text messages will be sent to the project manager indicating that the system is off. ACT personnel will use their best efforts to respond within 24 hours of the shutdown.

Three vacuum monitoring points VP-1, VP-2 and VP-3 were installed in the concrete floor to verify that each SSDS is providing adequate building depressurization and that the performance objectives of the SSDS's have been met. The locations and specifications of the vacuum monitoring points are provided in detail in Figure 1.

2.3 Current SSDS Status

2.3.1 Blowers and Vacuum

On September 7, 2017, vacuum testing was conducted on the site. During the testing, the SSDS systems were started up by turning on all three vacuum blowers and monitoring each vacuum point. To optimize the vacuums in each vacuum well, the blower vacuums were adjusted and the corresponding vacuum obtained at each vacuum point was recorded.

Once the system was fully optimized, the following operational vacuums were recorded:

Blower Number	**BL-1**	**BL-2**	**BL-3**
Vacuum (in. wc)	-14	-25.5	-22.5

Vacuums generated beneath the building from operation of the three SSDS's are summarized below. All of these vacuums exceed the NYSDOH minimum required vacuum of -0.004 in. wc.

Vacuum Point Number	**VP-1**	**VP-2**	**VP-3**
Vacuum (in. wc)	-2.833	-0.058	-0.230

The SSD system was started up on September 7, 2017 and has been operating continuously since startup. It can be seen from above that satisfactory vacuum is being maintained beneath the building with the current SSDS's operating at the site.

3 Operation, Maintenance, Monitoring and Reporting

3.1 Start-up Procedure

The SSDS has been started up for optimal performance in its current configuration. In the event the SSDS shuts down, start the SSDS using the following start-up procedure:

1. Open all valves on the individual vacuum lines to be operated.
2. Turn on the power switch to each vacuum blower.
3. Fine tune the flow rate from the individual depressurization pipe by adjusting the gate valve on the riser pipes.
4. To stop operation of the SSDS, turn the off the power to each vacuum blower.

3.2 Routine Operating Procedures

The SSDS's operate by applying a vacuum to each depressurization well which creates a vacuum beneath the basement slab of the Site, thus preventing vapors from entering the building's breathing zone. The amount of vacuum is controlled by internal adjustment of each blower and the individual gate valves located on the riser pipes for each depressurization well.

The options for operation the system are as follows:

1. Opening the gate valves on each riser pipe - will increase the vacuum and flow rate from each depressurization well.

2. Closing the gate valves on each riser pipe - will decrease the vacuum and flow rate from the individual point.

3.3 Maintenance

3.3.1 Radonaway Vacuum Blowers

The Radonaway HS5000 vacuum blowers require little or no maintenance to perform as designed. The blower is difficult to disassemble and reassemble. Therefore, the manufacturer should be consulted prior to any attempts to repair the blower.

3.3.2 Vapor Phase Carbon Units

The carbon units are relatively simple to maintain. Maintenance typically will consist of replacing spent carbon. In general, the vapor streams will be monitored in the field at the pre-, mid- and post-carbon locations on a monthly basis. The presence of VOCs at the post-carbon sampling port above emission limits constitutes breakthrough, which will initiate a change out of the carbon units. Change out will be scheduled to occur within two to three weeks of breakthrough. The spent carbon units will only be replaced with fresh carbon units.

When breakthrough occurs, disposal of the carbon will be required. All disposal documentation including the waste characterization results and completed waste manifests will be included in regular monitoring reports and kept on file by ACT.

3.3.3 Monitoring

A Netbiter wireless telemetry system is installed on a wall next to vacuum blower BL-2 to monitor vacuums in the three SSDS's. Data is continuously logged from analog pressure sensors, which provide 24/7/365 real-time proof of the SSDS's operating conditions. In the event of an alarm condition, the ACT's project manager will be instantaneously contacted by email and text alert so an emergency service call can be performed. Specifications of the wireless telemetry system are provided in Appendix A.

3.3.4 Inspections

The remediation system will be inspected in case there is a system failure, in which ACT personnel will be immediately notified via a wireless telemetry system. Upon arriving on-site, the necessary repairs and/or maintenance will be performed to ensure that the system is operating properly. Regular inspections will also be performed to verify that carbon breakthrough has not occurred.

3.3.5 Troubleshooting

3.3.5.1 Regenerative Blower

Table 1 identifies possible problems, symptoms and potential solutions that may occur while operating a vacuum blower. Once the vacuum blower is either repaired or replaced, the system should be re-started in accordance with Section 2.4.1.

3.4 Reporting

ACT will prepare status reports on an annual basis. The report will include a summary of remedial system operations, maintenance, monitoring. Included as attachments field sheets, calculation sheets (if necessary) and descriptions of the following:

- system downtime/reason;
- operational issues; and,
- maintenance log.

At a minimum, with respect to the preceding time, these progress reports shall:

1. describe the actions which have been taken during that year,
2. include all test results and all other data,
3. describe work planned for the next year with schedules relating such work to the overall project schedule for the completion of remedial activities,
4. describe problems encountered or anticipated, actual or anticipated delays, and solutions developed and implemented to address actual or anticipated problems or delays.

FIGURE 1

As-Built SSDS Layout

N

Seasons Supermarket

Soysauce Restaurant

Amalia Grocery

VP-3

On-The-Marc Dry Cleaners

Meters' Room

DP-3

Shed

Corridor

Naomi's Kosher Pizza

Corridor

DP-6

Main Optical

Refridge

BL-3

VP-4

Loading Dock

VP-2 (No Access)

DP-2

Exhaust-3

Queens Pita Bakery

BL-2

Queens Pita Bakery

DP-5

Towne Paint & Hardware

Carbon Drums

Mazal Salon & Spa

Parking Lot

Exhaust-2

BL-1

DP-4

DP-1

Benjamin Moore Paints

SSDS Piping

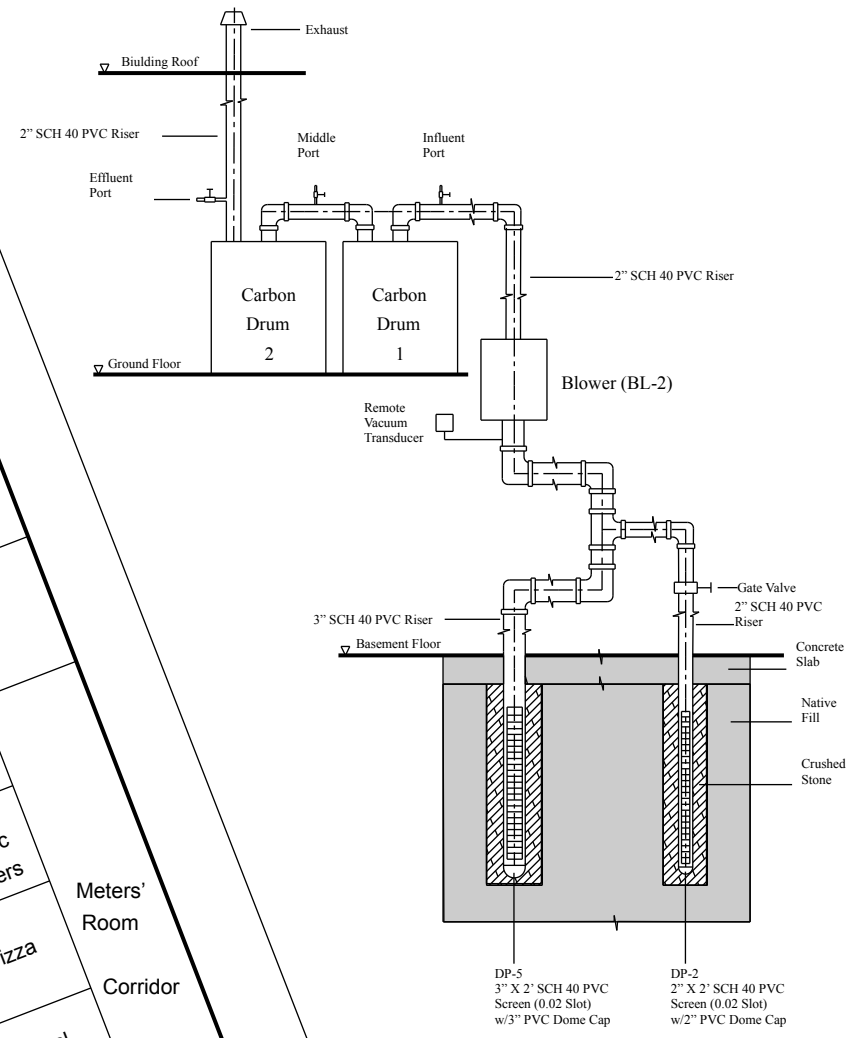
VP-1

MAIN STREET

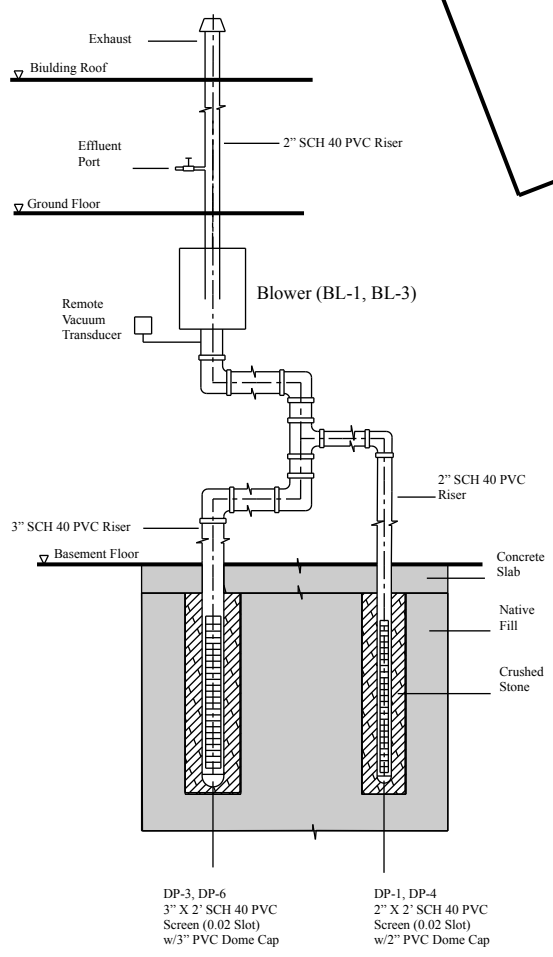
Exhaust-1

S + M Pharmacy

SSDS-2 Layout



SSDS-1 and SSDS-3 Layout



Legend

VP-1 Vacuum Point

DP-1 Sub-Slab Deprisurization Well

BL-1 Blower

AS-Built SSDS Layout

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

110 Main Street, Suite 103, Port Washington, New York 11050
Tel: 516-441-5800 Fax: 516-441-5511

Project No.: 9233-KGNY	Figure No.: 2
Date: 10/31/2018	Scale: 1inch = 30ft

TABLE 1

Troubleshooting Guide

Table 4

Troubleshooting Guidance Table

Troubleshooting

		POSSIBLE CAUSE	OUT OF WARRANTY REMEDY ***
IMPELLER DOES NOT TURN	Humming Sound	1. * One phase of power line not connected	1. Connect
		2. * One phase of stator winding open	2. Rewind or buy new motor
		3. Bearings defective	3. Change bearings
		4. Impeller jammed by foreign material	4. Clean and add filter
		5. Impeller jammed against housing or cover	5. Adjust
		6. ** Capacitor open	6. Change capacitor
	No Sound	1. * Two phases of power line not connected	1. Connect
		2. * Two pheses of stator winding open	2. Rewind or buy new motor
IMPELLER TURNS	Blown Fuse	1. Insufficient fuse capacity	1. Use time delay fuse of proper rating
		2. Short circuit	2. Repair
	Motor Overheated Or Protector Trips	1. High or low voltage	1. Check input voltage
		2. * Operating in single phase condition	2. Check connections
		3. Bearings defective	3. Check bearings
		4. Impeller rubbing against housing or cover	4. Adjust
		5. Impeller or air passage clogged by foreign material	5. Clean and add filter
		6. Unit operating beyond performance range	6. Reduce system pressure/vacuum
		7. Capacitor shorted	7. Change capacitor
		8. * One phase of stator winding short circuited	8. Rewind or buy new motor
	Abnormal Sound	1. Impeller rubbing against housing or cover	1. Adjust
		2. Impeller or air passages clogged by foreign material	2. Clean and add filter
		3. Bearings defective	3. Change bearings
	Performance Below Standard	1. Leak in piping	1. Tighten
		2. Piping and air passages clogged	2. Clean
		3. Impeller rotation reversed	3. Check wiring
		4. Leak in blower	4. Tighten cover, flange
		5. Low voltage	5. Check input voltage

3 phase units

* 1 phase units

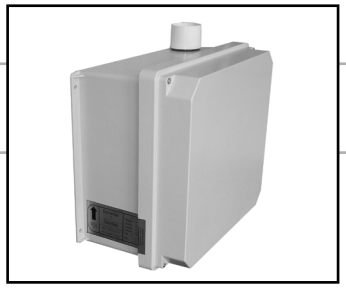
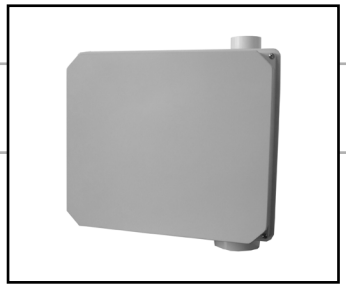
** Disassembly and repair of new blowers or motors will void the Retron warranty. Factory should be contacted prior to any attempt to field repair an in-warranty unit.

APPENDIX A

Manufacturer Equipment Specifications

RadonAway™

The World's Leading
Radon Fan Manufaturer

HS Series

Installation & Operating Instructions

RadonAway
3 Saber Way | Ward Hill, MA 01835
www.radonaway.com

P/N IN007-REV J 9/13

RadonAway Ward Hill, MA.

HS Series Fan Installation & Operating Instructions

Please Read and Save These Instructions.

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible or flammable materials.
2. **WARNING!** Do not use fan to pump explosive or corrosive gases.
   See Vapor Intrusion Application Note #AN001 for important information on VI applications. RadonAway.com/vapor-intrusion
3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.
4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.
5. **NOTICE!** There are no user serviceable parts located inside the fan unit.
   Do NOT attempt to open. Return unit to the factory for service.
6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician.
7. **WARNING!** In the event that the fan is immersed in water, return unit to factory for service before operating.
8. **WARNING!** Do not twist or torque fan inlet or outlet piping as Leakage may result.
9. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.
10. **WARNING!** TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

    a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.

    b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The HS Series Fan is intended for use by trained, certified/licensed, professional Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of the HS Series Fan. This instruction should be considered as a supplement to EPA/Radon Industry standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

1.2 ENVIRONMENTALS

The HS Series Fan is designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the HS Series Fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F. The HS Series Fan is thermally protected such that it will shut off when the internal temperature is above 104 degrees F. Thus if the HS Series Fan is idle in an area where the ambient temperature exceeds this shut off, it will not restart until the internal temperature falls below 104 degrees F.

1.3 ACOUSTICS

The HS Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. There are, however, some considerations to be taken into account in the system design and installation. When installing the HS Series Fan above sleeping areas, select a location for mounting which is as far away as possible from those areas. Avoid mounting near doors, fold-down stairs or other uninsulated structures which may transmit sound. Insure a solid mounting for the HS Series Fan to avoid structure-borne vibration or noise.

The velocity of the outgoing air must also be considered in the overall system design. With small diameter piping, the "rushing" sound of the outlet air can be disturbing. The system design should incorporate a means to slow and quiet the outlet air. The use of the RadonAway Exhaust Muffler, p/n 24002, is strongly recommended.

1.4 GROUND WATER

Under no circumstances should water be allowed to be drawn into the inlet of the HS Series Fan as this may result in damage to the unit. The HS Series Fan should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the HS Series Fan with water in installations with occasional high water tables.

In the event that a temporary high water table results in water at or above slab level, water will be drawn into the riser pipes thus blocking air flow to the HS Series Fan. The lack of cooling air will result in the HS Series Fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the HS Series Fan be disconnected until the water recedes allowing for return to normal operation.

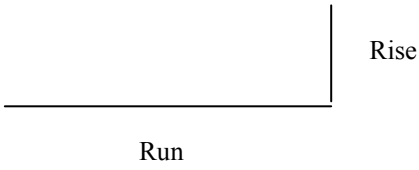
1.5 CONDENSATION & DRAINAGE

(WARNING!: Failure to provide adequate drainage for condensation can result in system failure and damage the HS Series Fan).

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation.

The use of small diameter piping in a system increases the speed at which the air moves. The speed of the air can pull water uphill and at sufficient velocity it can actually move water vertically up the side walls of the pipe. This has the potential of creating a problem in the negative pressure (inlet) side piping. For HS Series Fan inlet piping, the following table provides the minimum recommended pipe diameters as well as minimum pitch under several system conditions. Use this chart to size piping for a system.

Pipe Diam.	Minimum Rise per Foot of Run*		
	@ 25 CFM	@ 50 CFM	@ 100 CFM
4"	1/32 "	3/32 "	3/8 "
3"	1/8 "	3/8 "	1 1/2 "



*Typical operational flow rates:

HS3000, or HS5000	20 - 40 CFM
HS2000	50 - 90 CFM

All exhaust piping should be 2" PVC.

1.6 SYSTEM MONITOR AND LABEL

A properly designed system should incorporate a "System On" Indicator for affirmation of system operation. A Magnehelic pressure gauge is recommended for this purpose. The indicator should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the gauge with water in installations with occasional high water tables. A System Label (P/N 15022) with instructions for contacting the installing contractor for service and also identifying the necessity for regular radon tests to be conducted by the building occupants, must be conspicuously placed where the occupants frequent and can see the label.

1.7 SLAB COVERAGE

The HS Series Fan can provide coverage of well over 1000 sq. ft. per slab penetration. This will, of course, depend on the sub-slab aggregate in any particular installation and the diagnostic results. In general, sand and gravel are much looser aggregates than dirt and clay. Additional suction points can be added as required. It is recommended that a small pit (2 to 10 gallons in size) be created below the slab at each suction hole.

1.8 ELECTRICAL WIRING

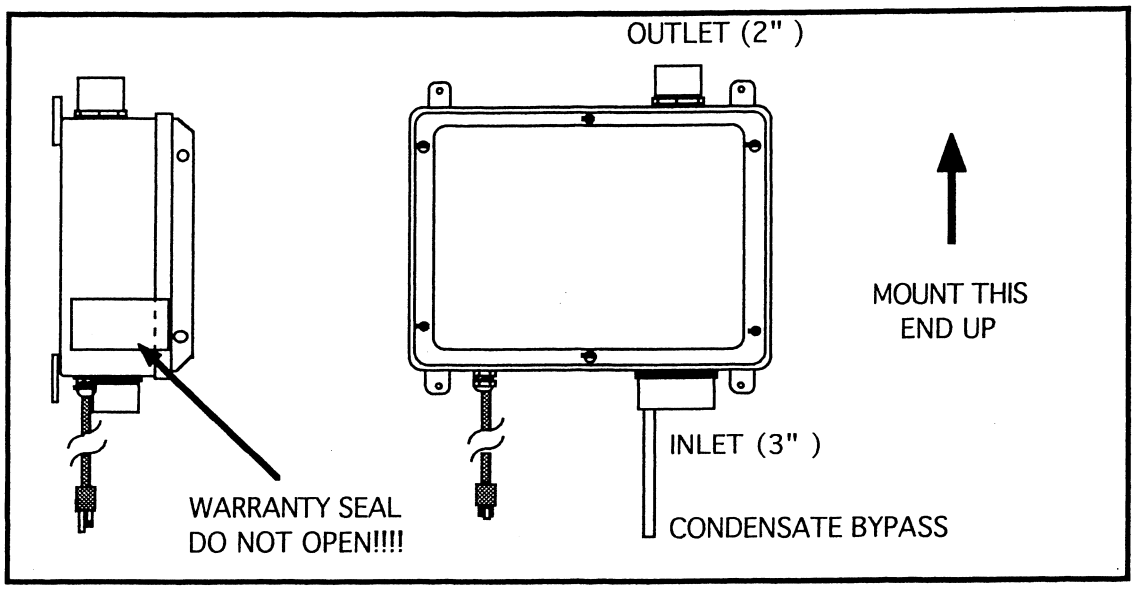
The HS Series Fan plugs into a standard 120V outlet. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly caulked to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.8a ELECTRICAL BOX (optional)

The optional Electrical Box (p/n 20003) provides a weather tight box with switch for outdoor hardwire connection. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly caulked to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.9 SPEED CONTROLS

Electronic speed controls can **NOT** be used on HS Series units.



2.0 INSTALLATION

2.1 MOUNTING

Mount the HS Series Fan to the wall studs, or similar structure, in the selected location with (4) 1/4" x 1 1/2" lag screws (not provided). Insure the HS Series Fan is both plumb and level.

2.2 DUCTING CONNECTIONS

Make final ducting connection to HS Series Fan with flexible couplings. Insure all connections are tight. Do not twist or torque inlet and outlet piping on HS Series Fan or leaks may result.

2.3 VENT MUFFLER INSTALLATION

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed above the roofline at the end of the vent pipe.

2.5 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

____ Make final operation checks by verifying all connections are tight and leak-free.

____ Insure the HS Series Fan and all ducting is secure and vibration-free.

____ Verify system vacuum pressure with Magnehelic. Insure vacuum pressure is within normal operating range and less than the maximum recommended as shown below:

HS2000	14" WC
HS3000	21" WC
HS5000	40" WC

(Above are based on sea-level operation, at higher altitudes reduce above by about 4% per 1000 Feet.) If these are exceeded, increase number of suction points.

____ Verify Radon levels by testing to EPA protocol.

PRODUCT SPECIFICATIONS

Model	Maximum Static Suction	Typical CFM vs Static Suction WC (Recommended Operating Range)						Power* Watts @ 115 VAC
		0"	10"	15"	20"	25"	35"	
HS2000	18"	110	72	40	-	-	-	150-270
HS3000	27"	40	33	30	23	18	-	105-195
HS5000	50"	53	47	42	38	34	24	180-320

*Power consumption varies with actual load conditions

Inlet: 3.0" PVC

Outlet: 2.0" PVC

Mounting: Brackets for vertical mount

Weight: Approximately 18 lbs.

Size: Approximately 15"W x 13"H x 8"D

Minimum recommended inlet ducting (greater diameter may always be used):

HS3000, HS5000 --- 2.0" PVC Pipe

HS2000 --- Main feeder line of 3.0" or greater PVC Pipe

Branch lines (if 3 or more) may be 2.0" PVC Pipe

Outlet ducting: 2.0" PVC

Storage temperature range: 32 - 100 degrees F.

Thermally protected

Locked rotor protection

Internal Condensate Bypass

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the HS Series Fan for shipping damage within 15 days of receipt. Notify **RadonAway of any damages immediately**. RadonAway is not responsible for damages incurred during shipping. However, for your benefit, RadonAway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

Install the HS Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the HS Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of one (1) year from the date of manufacture (the "Warranty Term"). Outside the Continental United States and Canada the Warranty Term is one (1) year from the date of manufacture.

RadonAway will repair any fan which fails due to defects in materials or workmanship. The Fan must be returned (at owner's cost) to the RadonAway factory. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not include damage in shipment unless the damage is due to the negligence of RadonAway.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

EXCEPT AS STATED ABOVE, THE HS SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

Record the following information for your records:

Serial No._____
Purchase Date_____

DATASHEET

Netbiter EC

REMOTE COMMUNICATION GATEWAYS

Highlights

- Netbiter gateways connect to field equipment in order to send data to the Netbiter Argos™ data service.
- Data is sent securely via the cellular network or via Ethernet.
- No need for public and fixed IP addresses, VPN tunnels and expensive M2M-specific SIM cards.

Typical Applications

- Power generators
- Telecom base stations
- Building HVAC systems
- Industrial machinery
- Tank monitoring
- Pump stations
- Renewable energy
- Security and geofencing

Realize the Industrial Internet of Things in minutes
No matter where your field equipment is located, just connect it to a Netbiter gateway and you will be able to access it online in a regular web browser. The plug-and-play functionality makes it possible to perform large-scale installations within minutes.

Connectivity to the device/machine
Netbiter EC300-series gateways connect to field equipment via several connection methods: Serial RS-232/485 Modbus RTU, Modbus-TCP or EtherNet/IP. On-board I/O ports allow sensors and additional equipment to be connected.

Two communication methods: Ethernet and cellular
Netbiter EC comes in two versions: EC310 sends data via Ethernet only, while EC350 can use both Ethernet and cellular communication (3G/GSM/GPRS).

Cloud services through Netbiter Argos™
The gateways interface with the cloud-based Netbiter Argos service via the cellular network or Ethernet. By logging into www.netbiter.net, you can access and visualize equipment data online and get alarms via email or SMS whenever certain thresholds are reached.

Configure and operate machinery remotely
The powerful feature Netbiter Remote Access allows you to open up a secure connection to remote machinery and program it remotely. For example, with a Netbiter gateway connected to your PLC, you can do debugging or re-programming remotely from your PC, using your regular configuration software.

www.netbiter.com

HMS Connecting Devices™

TECHNICAL SPECIFICATIONS		
Name	Netbiter EC310	Netbiter EC350
Connection to Argos	Ethernet only	Ethernet and 3G/GSM/GPRS
Order code	NB1007-C	NB1005-C
Ethernet	10/100 Mbit/s	10/100 Mbit/s
3G/GSM/GPRS	-	3G: Five Band UMTS/HSPA+ (WCDMA/FDD) (850/800, 900, 1900 and 2100 MHz) GPRS: Quad-Band GPRS Class 12 (850/900/1800/1900 MHz)-
Antenna connector	-	SMA female
Relay output (max 24 V, AC/DC, 1A)	1	1
Digital inputs	2 (Dry contact)	2 (Dry contact)
Analog inputs (PT100, 0-10 V or 0-20 mA)	4, all supporting 0-10 V or 0-20 mA and 2 supporting PT100	4, all supporting 0-10 V or 0-20 mA and 2 supporting PT100
Analog output (0-10 V)	-	-
Serial port #1	RS-232, 1,2 kbit/s to 115,2 kbit/s	RS-232, 1,2 kbit/s to 115,2 kbit/s
Serial port #2	RS-485, 1,2 kbit/s to 115,2 kbit/s	RS-485, 1,2 kbit/s to 115,2 kbit/s
GPS	-	Built-in (antenna** via SMA female)
Protocols	Modbus-RTU, Modbus TCP, EtherNet/IP, J1939	Modbus-RTU, Modbus TCP, EtherNet/IP, J1939
Modbus RTU to TCP conversion	YES	YES
Proxy support	SOCKS/WEB	SOCKS/WEB
Wall mounting / DIN rail*	YES/YES	YES/YES
Mechanical dimensions (L•W•H)	92 x 135 x 27 mm	92 x 135 x 27 mm
Operating temperature	-40 to +65 °C	-40 to +65 °C
Power supply	9-32 VDC	9-32 VDC
Power consumption (max at 24 Vdc)	2.5 W	4.5 W
Model name for certifications	NB301B	NB301A
Certifications	CE, CULUS, RCM	CE, CULUS, JATE, Telec, RCM, FCC, IC, PTCRB
Housing	Metal	Metal
Remote access functionality	YES	YES

*with DIN rail mounting kit **not included

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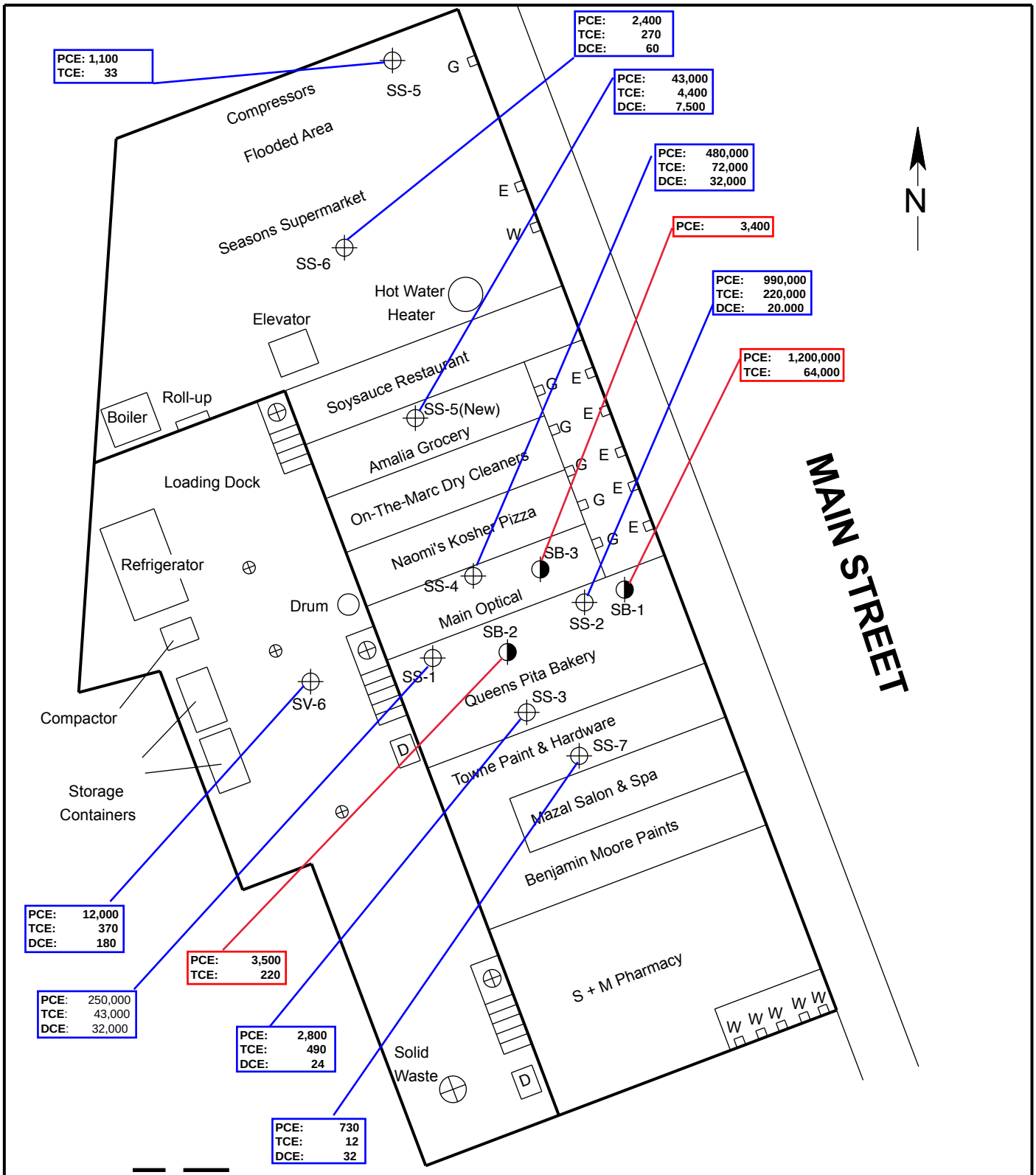
www.ewon.biz

APPENDIX E
ACT PREVIOUS INVESTIGATONS DATA AND FIGURES



Legend

SS-3 — Sub Slab Soil Vapor Sample (ug/m3)

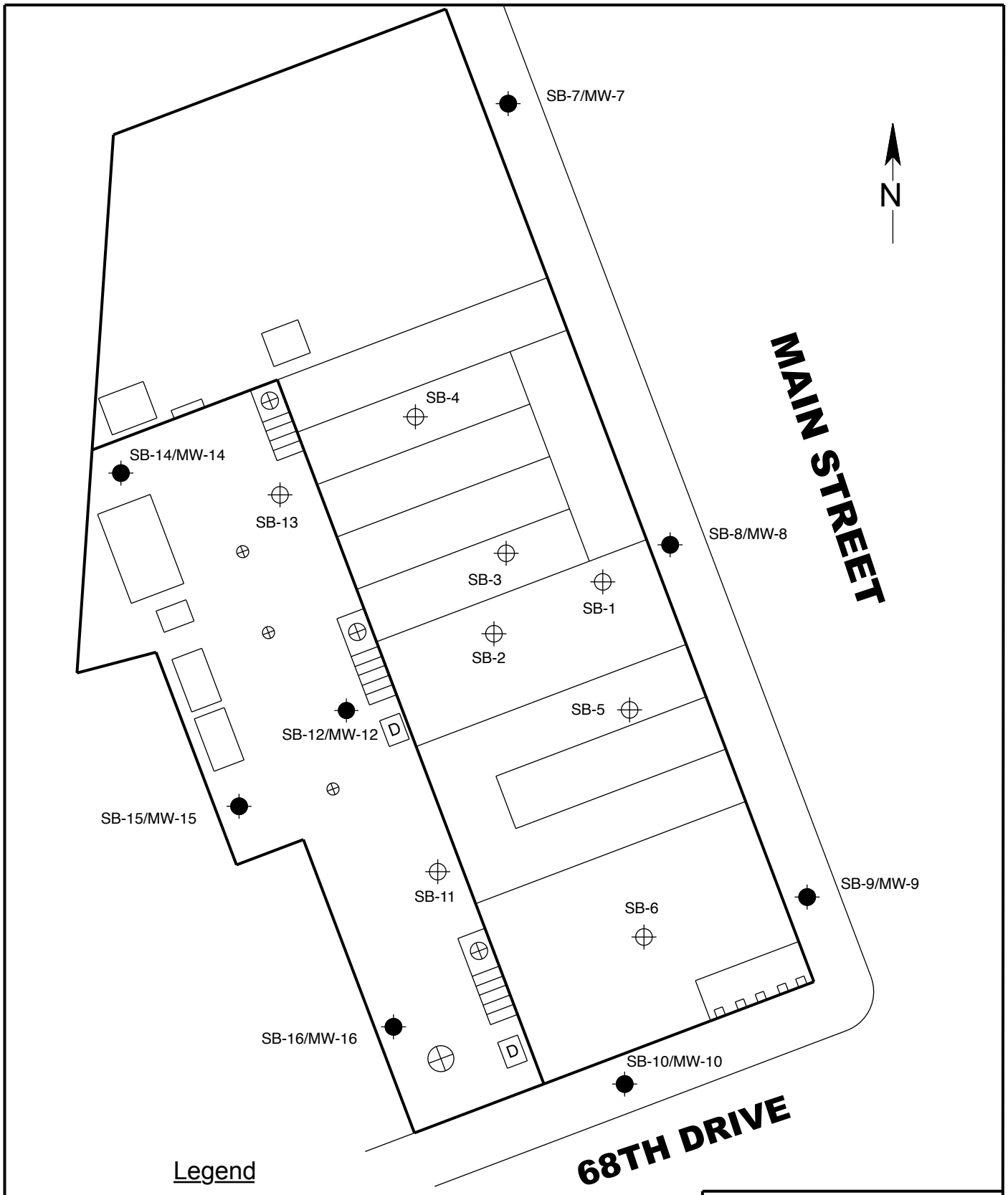
SB-1 — Subsurface Soil Sample (ug/kg)

PCE = Tetrachloroethene
TCE = Trichloroethene
DCE = Cis-1,2 Dichloroethene

CVOC Exceedances

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS
110 Main Street, Suite 103, Port Washington, New York 11050
Tel: 516-441-5800 Fax: 516-441-5511

Project No.: 9233-KGNY	Figure No.:
Date: 06/08/2017	Scale: 1" = 40'



Legend

SB-1 — Proposed Shallow Soil Boring

SB-10/MW-10 — Proposed Soil Boring and Monitoring Well Location

Proposed Soil/Groundwater Samping Diagram

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS
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Project No.: 9233-KGNY	Figure No.: 5A
Date: 03/08/2019	Scale: 1"=40'

Table 1

Volatile Organic Compounds in Soil (mg/kg)

EPA Method 8260

BCP Project No. 241205

Sample ID					SB-1 (0-2)		SB-1 (2-4)		SB-1 (8-10)		SB-1 (14-16)		SB-2 (0-2)		SB-2 (6-8)		SB-2 (10-12)		SB-2 (13-15)		SB-4 (0-2)		SB-4 (6-8)		SB-4 (10-12)		SB-4 (14-16)		SB-5 (1-3)		SB-5 (4-6)		SB-5 (8-10)		SB-5 (14-16)		SB-11 (2-4)		SB-11 (8-12)		SB-11 (13-15)		SB-11 (18-20)	
York ID					19K1085-01		19K1085-02		19K1085-03		19K1085-04		19K1085-05		19K1085-06		19K1085-07		19K1085-08		19J1315-01		19J1315-02		19J1315-03		19J1315-04		19J1255-01		19J1255-02		19J1255-03		19J1255-04		19H1151-01		19H1151-02		19H1151-03		19H1151-04	
Sampling Date					11/23/19		11/23/19		11/23/19		11/23/19		11/23/19		11/23/19		11/23/19		11/23/19		10/29/19		10/29/19		10/29/19		10/29/19		10/28/19		10/28/19		10/28/19		10/28/19		8/23/19		8/23/19		8/23/19		8/23/19	
Client Matrix					Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Compound	CAS Number	NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives	NYSDEC Part 375 Restricted Use Soil Cleanup Objectives - Restricted Residential	NYSDEC Part 375 Restricted Use Soil Cleanup Objectives- Commercial	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organics, NJDEP/TCL/Part 375 List		mg/Kg	mg/Kg	mg/Kg	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Dilution Factor					20000		1000		5000		1000		1		1		1		100		1		1		1		1		1		1		1		1		1		1		1		1	
1,1,1,2-Tetrachloroethane	630-20-6	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,1,1-Trichloroethane	71-55-6	0.68	100	500	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,1,2,2-Tetrachloroethane	79-34-5	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,1,2-Trichloroethane	79-00-5	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,1-Dichloroethane	75-34-3	0.27	26	240	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,1-Dichloroethylene	75-35-4	0.33	100	500	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,2,3-Trichlorobenzene	87-61-6	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,2,3-Trichloropropane	96-18-4	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,2,4-Trichlorobenzene	120-82-1	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	190	**0.96**	JD	**0.031**		**0.53**	D	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,2-Dibromo-3-chloropropane	96-12-8	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,2-Dibromoethane	106-93-4	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,2-Dichlorobenzene	95-50-1	1.1	100	500	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,2-Dichloroethane	107-06-2	0.02	3.1	30	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,2-Dichloropropane	78-87-5	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,3,5-Trimethylbenzene	108-67-8	8.4	52	190	0.51	U	**0.0068**		0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,3-Dichlorobenzene	541-73-1	2.4	49	280	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,4-Dichlorobenzene	106-46-7	1.8	13	130	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
1,4-Dioxane	123-91-1	0.1	13	130	10	U	0.045	U	4	U	4.1	U	0.033	U	0.03	U	0.04	U	0.043	U	0.056	U	0.054	U	0.039	U	0.033	U	0.041	U	0.044	U	0.037	U	0.039	U	0.043	U	0.048	U	0.044	U	0.039	U
2-Butanone	78-93-3	0.12	100	500	0.51	U	**0.0045**		0.2	U	0.2	U	0.0016	U	0.0015	U	**0.0076**		**0.022**		**0.0075**	JB	**0.0069**	JB	**0.0043**	JB	**0.0043**	JB	**0.0065**	JB	**0.0083**	JB	**0.0052**	JB	0.026	B	**0.0034**	JB	**0.0047**	JB	**0.0036**	JB	**0.0027**	JB
2-Hexanone	591-78-6	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
4-Methyl-2-pentanone	108-10-1	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Acetone	67-64-1	0.05	100	500	1	U	**0.039**		0.4	U	0.41	U	**0.005**	J	**0.003**	J	**0.018**		**0.058**		0.0056	U	0.0054	U	0.0039	U	**0.0039**	J	**0.022**		**0.026**		0.0037	U	**0.041**		0.0043	U	0.0048	U	0.0044	U	0.0039	U
Acrolein	107-02-8	~	~	~	1	U	0.0045	U	0.4	U	0.41	U	0.0033	U	0.003	U	0.004	U	0.0043	U	0.0056	U	0.0054	U	0.0039	U	0.0033	U	0.0041	U	0.0044	U	0.0037	U	0.0039	U	0.0043	U	0.0048	U	0.0044	U	0.0039	U
Acrylonitrile	107-13-1	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Benzene	71-43-2	0.06	4.8	44	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Bromochloromethane	74-97-5	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Bromodichloromethane	75-27-4	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Bromoform	75-25-2	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Bromomethane	74-83-9	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Carbon disulfide	75-15-0	~	~	~	0.51	U	**0.0039**	JB	0.2	U	0.2	U	0.0016	U	0.0015	U	**0.0032**	JB	**0.0036**	JB	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Carbon tetrachloride	56-23-5	0.76	2.4	22	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Chlorobenzene	108-90-7	1.1	100	500	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Chloroethane	75-00-3	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Chloroform	67-66-3	0.37	49	350	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Chloromethane	74-87-3	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
cis-1,2-Dichloroethylene	156-59-2	0.25	100	500	0.51	U	**0.016**		**0.56**	D	**0.53**	D	0.0016	U	0.0015	U	**0.047**		**0.078**		0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
cis-1,3-Dichloropropylene	10061-01-5	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Cyclohexane	110-82-7	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Dibromochloromethane	124-48-1	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Dibromomethane	74-95-3	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Dichlorodifluoromethane	75-71-8	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Ethyl Benzene	100-41-4	1	41	390	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Hexachlorobutadiene	87-68-3	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Isopropylbenzene	98-82-8	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Methyl acetate	79-20-9	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Methyl tert-butyl ether (MTBE)	1634-04-4	0.93	100	500	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Methylcyclohexane	108-87-2	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Methylene chloride	75-09-2	0.05	100	500	1	U	0.0045	U	0.4	U	0.41	U	0.0033	U	0.003	U	0.004	U	0.0043	U	0.0056	U	0.0054	U	0.0039	U	0.0033	U	0.0041	U	0.0044	U	0.0037	U	0.0039	U	0.0043	U	0.0048	U	0.0044	U	0.0039	U
n-Butylbenzene	104-51-8	12	100	500	**2.3**	D	**0.032**		**1.2**	D	**0.26**	JD	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
n-Propylbenzene	103-65-1	3.9	100	500	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
o-Xylene	95-47-6	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
p- & m- Xylenes	179601-23-1	~	~	~	1	U	0.0045	U	0.4	U	0.41	U	0.0033	U	0.003	U	0.004	U	0.0043	U	0.0056	U	0.0054	U	0.0039	U	0.0033	U	0.0041	U	0.0044	U	0.0037	U	0.0039	U	0.0043	U	0.0048	U	0.0044	U	0.0039	U
p-Isopropyltoluene	99-87-6	~	~	~	0.51	U	**0.0065**		0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
sec-Butylbenzene	135-98-8	11	100	500	0.51	U	**0.004**	J	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Styrene	100-42-5	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
tert-Butyl alcohol (TBA)	75-65-0	~	~	~	0.51	U	**0.085**		0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	**0.0034**	J	0.0028	U	0.0027	U	0.0019	U	0.0016	U	**0.0086**		**0.014**		0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
tert-Butylbenzene	98-06-6	5.9	100	500	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Tetrachloroethylene	127-18-4	1.3	19	150	**4000**	D	**56**	D	**550**	D	**95**	D	**0.0062**		**0.0039**		**0.14**		**2.3**	D	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	**0.061**		**0.0071**		0.0022	U	0.0024	U	0.0022	U	**0.002**	J
Toluene	108-88-3	0.7	100	500	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
trans-1,2-Dichloroethylene	156-60-5	0.19	100	500	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
trans-1,3-Dichloropropylene	10061-02-6	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Trichloroethylene	79-01-6	0.47	21	200	**20**	D	**1.4**	D	**5.6**	D	**1.1**	D	0.0016	U	0.0015	U	**0.064**		**0.088**		0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	**0.0034**	J	**0.005**		0.0022	U	0.0024	U	0.0022	U	0.0019	U
Trichlorofluoromethane	75-69-4	~	~	~	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Vinyl Chloride	75-01-4	0.02	0.9	13	0.51	U	0.0023	U	0.2	U	0.2	U	0.0016	U	0.0015	U	0.002	U	0.0022	U	0.0028	U	0.0027	U	0.0019	U	0.0016	U	0.002	U	0.0022	U	0.0019	U	0.002	U	0.0022	U	0.0024	U	0.0022	U	0.0019	U
Xylenes, Total	1330-20-7	0.26	100	500	1.5	U	0.0068	U	0.61	U	0.61	U	0.0049	U	0.0045	U	0.006	U	0.0065	U	0.0084	U	0.008	U	0.0058	U	0.0049	U	0.0061	U	0.0066	U	0.0056	U	0.0059	U	0.0065	U	0.0072	U	0.0066	U	0.0058	U
Xylenes, Total	1330-20-7	0.26	100	500	1.5	U	0.0068	U	0.61	U	0.61	U	0.0049	U	0.0045	U	0.006	U	0.0065	U	0.0084	U	0.008	U	0.0058	U	0.0049	U	0.0061	U	0.0066	U	0.0056	U	0.0059	U	0.0065	U	0.0072	U	0.0066	U	0.0058	U

Table 1 (continued)

Volatile Organic Compounds in Soil (mg/kg)

EPA Method 8260

BCP Project No. 241205

Sample ID		NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives	NYSDEC Part 375 Restricted Use Soil Cleanup Objectives - Restricted Residential	NYSDEC Part 375 Restricted Use Soil Cleanup Objectives- Commercial	SB-13 (2-4)		SB-13 (6-8)		SB-13 (10-12)		SB-13 (16-18)		SB-13 (22-24)	
York ID					19H1326-01		19H1326-02		19H1326-03		19H1326-04		19H1326-05	
Sampling Date					8/28/19		8/28/19		8/28/19		8/28/19		8/28/19	
Client Matrix					Soil		Soil		Soil		Soil		Soil	
Compound	CAS Number				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organics, NJDEP/TCL/Part 375 List		mg/Kg	mg/Kg	mg/Kg	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Dilution Factor					1		1		1		1		1	
1,1,1,2-Tetrachloroethane	630-20-6	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,1,1-Trichloroethane	71-55-6	0.68	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,1,2,2-Tetrachloroethane	79-34-5	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,1,2-Trichloroethane	79-00-5	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,1-Dichloroethane	75-34-3	0.27	26	240	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,1-Dichloroethylene	75-35-4	0.33	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,2,3-Trichlorobenzene	87-61-6	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,2,3-Trichloropropane	96-18-4	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,2,4-Trichlorobenzene	120-82-1	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	190	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,2-Dibromo-3-chloropropane	96-12-8	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,2-Dibromoethane	106-93-4	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,2-Dichlorobenzene	95-50-1	1.1	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,2-Dichloroethane	107-06-2	0.02	3.1	30	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,2-Dichloropropane	78-87-5	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,3,5-Trimethylbenzene	108-67-8	8.4	52	190	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,3-Dichlorobenzene	541-73-1	2.4	49	280	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,4-Dichlorobenzene	106-46-7	1.8	13	130	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
1,4-Dioxane	123-91-1	0.1	13	130	0.045	U	0.048	U	0.053	U	0.053	U	0.057	U
2-Butanone	78-93-3	0.12	100	500	**0.0041**	J	**0.0037**	J	**0.0047**	J	**0.0063**		**0.0069**	JB
2-Hexanone	591-78-6	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
4-Methyl-2-pentanone	108-10-1	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Acetone	67-64-1	0.05	100	500	0.0045	U	0.0048	U	0.0053	U	0.0053	U	0.0057	U
Acrolein	107-02-8	~	~	~	0.0045	U	0.0048	U	0.0053	U	0.0053	U	0.0057	U
Acrylonitrile	107-13-1	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Benzene	71-43-2	0.06	4.8	44	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Bromochloromethane	74-97-5	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Bromodichloromethane	75-27-4	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Bromoform	75-25-2	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Bromomethane	74-83-9	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Carbon disulfide	75-15-0	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Carbon tetrachloride	56-23-5	0.76	2.4	22	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Chlorobenzene	108-90-7	1.1	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Chloroethane	75-00-3	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Chloroform	67-66-3	0.37	49	350	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Chloromethane	74-87-3	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
cis-1,2-Dichloroethylene	156-59-2	0.25	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
cis-1,3-Dichloropropylene	10061-01-5	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Cyclohexane	110-82-7	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Dibromochloromethane	124-48-1	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Dibromomethane	74-95-3	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Dichlorodifluoromethane	75-71-8	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Ethyl Benzene	100-41-4	1	41	390	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Hexachlorobutadiene	87-68-3	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Isopropylbenzene	98-82-8	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Methyl acetate	79-20-9	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Methyl tert-butyl ether (MTBE)	1634-04-4	0.93	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Methylcyclohexane	108-87-2	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Methylene chloride	75-09-2	0.05	100	500	0.0045	U	0.0048	U	0.0053	U	0.0053	U	0.0057	U
n-Butylbenzene	104-51-8	12	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
n-Propylbenzene	103-65-1	3.9	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
o-Xylene	95-47-6	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
p- & m- Xylenes	179601-23-1	~	~	~	0.0045	U	0.0048	U	0.0053	U	0.0053	U	0.0057	U
p-Isopropyltoluene	99-87-6	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
sec-Butylbenzene	135-98-8	11	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Styrene	100-42-5	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
tert-Butyl alcohol (TBA)	75-65-0	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
tert-Butylbenzene	98-06-6	5.9	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Tetrachloroethylene	127-18-4	1.3	19	150	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Toluene	108-88-3	0.7	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
trans-1,2-Dichloroethylene	156-60-5	0.19	100	500	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
trans-1,3-Dichloropropylene	10061-02-6	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Trichloroethylene	79-01-6	0.47	21	200	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Trichlorofluoromethane	75-69-4	~	~	~	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Vinyl Chloride	75-01-4	0.02	0.9	13	0.0022	U	0.0024	U	0.0026	U	0.0026	U	0.0028	U
Xylenes, Total	1330-20-7	0.26	100	500	0.0067	U	0.0072	U	0.0079	U	0.0079	U	0.0085	U
Xylenes, Total	1330-20-7	0.26	100	500	0.0067	U	0.0072	U	0.0079	U	0.0079	U	0.0085	U

Sample ID	SB-14 (0-2)		SB-14 (8-10)		SB-14 (15-18)		SB-14 (28-30)		SB-14 Duplicate		SB-15 (0-2)	
York ID	19K0445-01		19K0445-02		19K0445-03		19K0445-04		19K0445-05		19K0447-01	
Sampling Date	11/8/19		11/8/19		11/8/19		11/8/19		11/8/19		11/11/19	
Client Matrix	Soil		Soil		Soil		Soil		Soil		Soil	
Compound	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organics, NJDEP/TCL/Part 375 List	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Dilution Factor	1		1		1		1		1		1	
1,1,1,2-Tetrachloroethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,1,1-Trichloroethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,1,2,2-Tetrachloroethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,1,2-Trichloroethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,1-Dichloroethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,1-Dichloroethylene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,2,3-Trichlorobenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,2,3-Trichloropropane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,2,4-Trichlorobenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,2,4-Trimethylbenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,2-Dibromo-3-chloropropane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,2-Dibromoethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,2-Dichlorobenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,2-Dichloroethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,2-Dichloropropane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,3,5-Trimethylbenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,3-Dichlorobenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,4-Dichlorobenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
1,4-Dioxane	0.043	U	0.04	U	0.035	U	0.05	U	0.038	U	0.046	U
2-Butanone	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
2-Hexanone	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
4-Methyl-2-pentanone	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Acetone	**0.034**		**0.0079**	J	**0.027**		**0.025**		**0.018**		**0.013**	
Acrolein	0.0043	U	0.004	U	0.0035	U	0.005	U	0.0038	U	0.0046	U
Acrylonitrile	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Benzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Bromochloromethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Bromodichloromethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Bromoform	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Bromomethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Carbon disulfide	0.0022	U	0.002	U	**0.0023**	J	0.0025	U	0.0019	U	0.0023	U
Carbon tetrachloride	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Chlorobenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Chloroethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Chloroform	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Chloromethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
cis-1,2-Dichloroethylene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
cis-1,3-Dichloropropylene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Cyclohexane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Dibromochloromethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Dibromomethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Dichlorodifluoromethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Ethyl Benzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Hexachlorobutadiene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Isopropylbenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Methyl acetate	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Methyl tert-butyl ether (MTBE)	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Methylcyclohexane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Methylene chloride	0.0043	U	**0.006**	J	0.0035	U	**0.0053**	J	0.0038	U	0.0046	U
n-Butylbenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
n-Propylbenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
o-Xylene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
p- & m- Xylenes	0.0043	U	0.004	U	0.0035	U	0.005	U	0.0038	U	0.0046	U
p-Isopropyltoluene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
sec-Butylbenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Styrene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
tert-Butyl alcohol (TBA)	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
tert-Butylbenzene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Tetrachloroethylene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Toluene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
trans-1,2-Dichloroethylene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
trans-1,3-Dichloropropylene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Trichloroethylene	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Trichlorofluoromethane	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Vinyl Chloride	0.0022	U	0.002	U	0.0018	U	0.0025	U	0.0019	U	0.0023	U
Xylenes, Total	0.0065	U	0.006	U	0.0053	U	0.0076	U	0.0057	U	0.0069	U
Xylenes, Total	0.0065	U	0.006	U	0.0053	U	0.0076	U	0.0057	U	0.0069	U

Sample ID	SB-15 (13-15)		SB-15 (23-25)		SB-15 (33-35)		SB-16 (0-2)		SB-16 (8-10)		SB-16 (18-20)	
York ID	19K0447-02		19K0447-03		19K0447-04		19K0447-05		19K0447-06		19K0447-07	
Sampling Date	11/11/19		11/11/19		11/11/19		11/11/19		11/11/19		11/11/19	
Client Matrix	Soil		Soil		Soil		Soil		Soil		Soil	
Compound	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organics, NJDEP/TCL/Part 375 List	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Dilution Factor	1		1		1		1		1		1	
1,1,1,2-Tetrachloroethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,1,1-Trichloroethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,1,2,2-Tetrachloroethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,1,2-Trichloroethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,1-Dichloroethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,1-Dichloroethylene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,2,3-Trichlorobenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,2,3-Trichloropropane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,2,4-Trichlorobenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,2,4-Trimethylbenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,2-Dibromo-3-chloropropane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,2-Dibromoethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,2-Dichlorobenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,2-Dichloroethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,2-Dichloropropane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,3,5-Trimethylbenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,3-Dichlorobenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,4-Dichlorobenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
1,4-Dioxane	0.041	U	0.04	U	0.052	U	0.038	U	0.047	U	0.042	U
2-Butanone	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
2-Hexanone	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
4-Methyl-2-pentanone	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Acetone	**0.0082**		**0.0084**		**0.008**	J	**0.005**	J	**0.021**		**0.0043**	J
Acrolein	0.0041	U	0.004	U	0.0052	U	0.0038	U	0.0047	U	0.0042	U
Acrylonitrile	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Benzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Bromochloromethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Bromodichloromethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Bromoform	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Bromomethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Carbon disulfide	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Carbon tetrachloride	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Chlorobenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Chloroethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Chloroform	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Chloromethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
cis-1,2-Dichloroethylene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
cis-1,3-Dichloropropylene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Cyclohexane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Dibromochloromethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Dibromomethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Dichlorodifluoromethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Ethyl Benzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Hexachlorobutadiene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Isopropylbenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Methyl acetate	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Methyl tert-butyl ether (MTBE)	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Methylcyclohexane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Methylene chloride	0.0041	U	0.004	U	0.0052	U	0.0038	U	**0.0055**	J	0.0042	U
n-Butylbenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
n-Propylbenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
o-Xylene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
p- & m- Xylenes	0.0041	U	0.004	U	0.0052	U	0.0038	U	0.0047	U	0.0042	U
p-Isopropyltoluene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
sec-Butylbenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Styrene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
tert-Butyl alcohol (TBA)	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
tert-Butylbenzene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Tetrachloroethylene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Toluene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
trans-1,2-Dichloroethylene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
trans-1,3-Dichloropropylene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Trichloroethylene	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Trichlorofluoromethane	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Vinyl Chloride	0.0021	U	0.002	U	0.0026	U	0.0019	U	0.0024	U	0.0021	U
Xylenes, Total	0.0062	U	0.006	U	0.0079	U	0.0057	U	0.0071	U	0.0063	U
Xylenes, Total	0.0062	U	0.006	U	0.0079	U	0.0057	U	0.0071	U	0.0063	U

Sample ID	SB-16 (28-30)		SB-17 (6-8)		SB-17 (14-16)		SB-17 (20-22)		SB-17 (28-30)	
York ID	19K0447-08		19J0806-01		19J0806-02		19J0806-03		19J0806-04	
Sampling Date	11/11/19		10/16/19		10/16/19		10/16/19		10/16/19	
Client Matrix	Soil		Soil		Soil		Soil		Soil	
Compound	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Volatile Organics, NJDEP/TCL/Part 375 List	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Dilution Factor	1		1		1		1		1	
1,1,1,2-Tetrachloroethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,1,1-Trichloroethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,1,2,2-Tetrachloroethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,1,2-Trichloroethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,1-Dichloroethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,1-Dichloroethylene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,2,3-Trichlorobenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,2,3-Trichloropropane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,2,4-Trichlorobenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,2,4-Trimethylbenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,2-Dibromo-3-chloropropane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,2-Dibromoethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,2-Dichlorobenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,2-Dichloroethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,2-Dichloropropane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,3,5-Trimethylbenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,3-Dichlorobenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,4-Dichlorobenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
1,4-Dioxane	0.047	U	0.047	U	0.036	U	0.039	U	0.035	U
2-Butanone	0.0023	U	**0.0043**	J	**0.0057**	J	**0.0047**	J	**0.004**	J
2-Hexanone	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
4-Methyl-2-pentanone	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Acetone	**0.013**		0.0047	U	0.0036	U	0.0039	U	0.0035	U
Acrolein	0.0047	U	0.0047	U	0.0036	U	0.0039	U	0.0035	U
Acrylonitrile	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Benzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Bromochloromethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Bromodichloromethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Bromoform	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Bromomethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Carbon disulfide	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Carbon tetrachloride	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Chlorobenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Chloroethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Chloroform	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Chloromethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
cis-1,2-Dichloroethylene	0.0023	U	0.0023	U	**0.004**		0.002	U	0.0017	U
cis-1,3-Dichloropropylene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Cyclohexane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Dibromochloromethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Dibromomethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Dichlorodifluoromethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Ethyl Benzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Hexachlorobutadiene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Isopropylbenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Methyl acetate	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Methyl tert-butyl ether (MTBE)	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Methylcyclohexane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Methylene chloride	0.0047	U	0.0047	U	0.0036	U	0.0039	U	0.0035	U
n-Butylbenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
n-Propylbenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
o-Xylene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
p- & m- Xylenes	0.0047	U	0.0047	U	0.0036	U	0.0039	U	0.0035	U
p-Isopropyltoluene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
sec-Butylbenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Styrene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
tert-Butyl alcohol (TBA)	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
tert-Butylbenzene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Tetrachloroethylene	0.0023	U	**0.0033**	J	0.0018	U	0.002	U	0.0017	U
Toluene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
trans-1,2-Dichloroethylene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
trans-1,3-Dichloropropylene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Trichloroethylene	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Trichlorofluoromethane	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Vinyl Chloride	0.0023	U	0.0023	U	0.0018	U	0.002	U	0.0017	U
Xylenes, Total	0.007	U	0.007	U	0.0054	U	0.0059	U	0.0052	U
Xylenes, Total	0.007	U	0.007	U	0.0054	U	0.0059	U	0.0052	U

NOTES:

Any Regulatory Exceedences are color coded by Regulation

Q is the Qualifier Column with definitions as follows:

D=result is from an analysis that required a dilution

J=analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated

U=analyte not detected at or above the level indicated

B=analyte found in the analysis batch blank

E=result is estimated and cannot be accurately reported due to levels encountered or interferences

P=this flag is used for pesticide and PCB (Aroclor) target compounds when there is a % difference for detected concentrations that exceed method dictated limits between the two GC columns used for analysis

NT=this indicates the analyte was not a target for this sample

~=this indicates that no regulatory limit has been established for this analyte

Table 1 (continued)

Volatile Organic Compounds in Soil (mg/kg)

EPA Method 8260

BCP Site No. C241205

Parameter	Brownfield Cleanup Program 375-6 Soil Cleanup Objectives			SAMPLING LOCATION																	
	Unrestricted Use	Restricted Residential	Commercial	SB-3 (2-4)		SB-3 (6-8)		SB-3 (9-11)		SB-3 (13-15)		SB-12 (0-2)		SB-12 (2-4)		SB-12 (14-16)		SB-12 (18-20)		SB-12 (20-24)	
Sampling Date				10/30/2019		10/30/2019		10/30/2019		10/30/2019		9/27/2019		9/27/2019		9/27/2019		9/27/2019		9/27/2019	
Sample Depth				2-4 Feet		6-8 Feet		9-11 Feet		13-15 Feet		0-2 Feet		2-4 Feet		14-16 Feet		18-20 Feet		20-24 Feet	
SM 2540G (% Wt)				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
% Solids	~	~	~	92.5		84.8		82.8		85.0		NT		NT		NT		NT		NT	
SW-846 8260C-D (mg/Kg)																					
1,1-Dichloroethane	0.27	26	240	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,1-Dichloroethylene	0.33	100	500	<0.0031		<0.0023		<0.0028		<0.0022		<0.0035		<0.0036		<0.0030		<0.0030		<0.0023	
1,1-Dichloropropene	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,1,1-Trichloroethane	0.68	100	500	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,1,1,2-Tetrachloroethane	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	~	~	~	<0.0078		<0.0058		<0.0071		<0.0056		<0.0088		<0.0091		<0.0076		<0.0075		<0.0057	
1,1,2-Trichloroethane	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,1,2,2-Tetrachloroethane	~	~	~	<0.00078		<0.00058		<0.00071		<0.00056		<0.00088		<0.00091		<0.00076		<0.00075		<0.00057	
1,2-Dibromo-3-chloropropane	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,2-Dibromoethane (EDB)	~	~	~	<0.00078		<0.00058		<0.00071		<0.00056		<0.00088		<0.00091		<0.00076		<0.00075		<0.00057	
1,2-Dichlorobenzene	1.1	100	500	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,2-Dichloroethane	0.02	3.1	30	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,2-Dichloropropane	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,2,3-Trichlorobenzene	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,2,3-Trichloropropane	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,2,4-Trichlorobenzene	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,2,4-Trimethylbenzene	3.6	52	190	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,3-Dichlorobenzene	2.4	49	280	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,3-Dichloropropane	~	~	~	<0.00078		<0.00058		<0.00071		<0.00056		<0.00088		<0.00091		<0.00076		<0.00075		<0.00057	
1,3,5-Trichlorobenzene	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,3,5-Trimethylbenzene	8.4	52	190	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,4-Dichlorobenzene	1.8	13	130	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
1,4-Dioxane	0.1	13	130	<0.078		<0.058		<0.071		<0.056		<0.088		<0.091		<0.076		<0.075		<0.057	
2-Butanone (MEK)	0.12	100	500	<0.031		<0.023		<0.028		<0.022		<0.035		<0.036		<0.030		<0.030		<0.023	
2-Chlorotoluene	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
2-Hexanone (MBK)	~	~	~	<0.016		<0.012		<0.014		<0.011		<0.018		<0.018		<0.015		<0.015		<0.011	
2,2-Dichloropropane	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018	V-05	<0.0018	V-05	<0.0015	V-05	<0.0015	V-05	<0.0011	V-05
4-Chlorotoluene	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
4-Methyl-2-Pentanone	~	~	~	<0.016		<0.012		<0.014		<0.011		<0.018		<0.018		<0.015		<0.015		<0.011	
Acetone	0.05	100	500	<0.078		<0.058		<0.071		<0.056		<0.088		<0.091		<0.076		<0.075		<0.057	
Acrylonitrile	~	~	~	<0.0047		<0.0035		<0.0042		<0.0034		<0.0053		<0.0054		<0.0045		<0.0045		<0.0034	
Benzene	0.06	4.8	44	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Bromobenzene	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Bromochloromethane	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Bromodichloromethane	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Bromoform	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Bromomethane	~	~	~	<0.0078	V-34	<0.0058	V-34	<0.0071	V-34	<0.0056	V-34	<0.0088	V-34	<0.0091	V-34	<0.0076	V-34	<0.0075	V-34	<0.0057	V-34
Carbon Disulfide	~	~	~	<0.0047		<0.0035		<0.0042		<0.0034		<0.0053		<0.0054		<0.0045		<0.0045		<0.0034	
Carbon Tetrachloride	0.76	2.4	22	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Chlorobenzene	1.1	100	500	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Chloroethane	~	~	~	<0.016		<0.012		<0.014		<0.011		<0.018		<0.018		<0.015		<0.015		<0.011	
Chloroform	0.37	49	350	<0.0031		<0.0023		<0.0028		<0.0022		<0.0035		<0.0036		<0.0030		<0.0030		<0.0023	
Chloromethane	~	~	~	<0.0078		<0.0058		<0.0071		<0.0056		<0.0088		<0.0091		<0.0076		<0.0075		<0.0057	
cis-1,2-Dichloroethene	0.25	100	500	<0.0016		<0.0012		**0.0041**		**0.012**		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
cis-1,3-Dichloropropene	~	~	~	<0.00078		<0.00058		<0.00071		<0.00056		<0.00088		<0.00091		<0.00076		<0.00075		<0.00057	
Dibromochloromethane	~	~	~	<0.00078		<0.00058		<0.00071		<0.00056		<0.00088		<0.00091		<0.00076		<0.00075		<0.00057	
Dibromomethane	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Dichlorodifluoromethane (Freon 12)	~	~	~	<0.016		<0.012		<0.014		<0.011		<0.018	V-05	<0.018	V-05	<0.015	V-05	<0.015	V-05	<0.011	V-05
Diethyl Ether	~	~	~	<0.016		<0.012		<0.014		<0.011		<0.018		<0.018		<0.015		<0.015		<0.011	
Diisopropyl Ether (DIPE)	~	~	~	<0.00078		<0.00058		<0.00071		<0.00056		<0.00088		<0.00091		<0.00076		<0.00075		<0.00057	
Ethylbenzene	1	41	390	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Hexachlorobutadiene	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Isopropylbenzene	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
m/p-Xylene	0.26	100	500	<0.0031		<0.0023		<0.0028		<0.0022		<0.0035		<0.0036		<0.0030		<0.0030		<0.0023	
Methyl acetate	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Methyl tert-butyl ether	0.93	100	500	<0.0031		<0.0023		<0.0028		<0.0022		<0.0035		<0.0036		<0.0030		<0.0030		<0.0023	
Methylcyclohexane	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Methylene chloride	0.05	100	500	<0.016		<0.012		<0.014		<0.011		<0.018	V-05	<0.018	V-05	<0.015	V-05	<0.015	V-05	<0.011	MS-07A, V-05
n-Butylbenzene	12	100	500	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
n-Propylbenzene	3.9	100	500	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Naphthalene	12	100	500	<0.0031		<0.0023		<0.0028		<0.0022		<0.0035		<0.0036		<0.0030		<0.0030		<0.0023	
o-Xylene	0.26	100	500	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
p-Isopropyltoluene (p-Cymene)	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
sec-Butylbenzene	11	100	500	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Styrene	~	~	~	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
tert-Amyl Methyl Ether (TAME)	~	~	~	<0.00078		<0.00058		<0.00071		<0.00056		<0.00088		<0.00091		<0.00076		<0.00075		<0.00057	
tert-Butyl Alcohol (TBA)	~	~	~	<0.031		<0.023		<0.028		<0.022		<0.035	V-05	<0.036	V-05	<0.030	V-05	<0.030	V-05	<0.023	V-05
tert-Butyl Ethyl Ether (TBEE)	~	~	~	<0.00078		<0.00058		<0.00071		<0.00056		<0.00088		<0.00091		<0.00076		<0.00075		<0.00057	
Tert-Butylbenzene	5.9	100	500	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
Tetrachloroethylene	1.3	19	150	**0.0031**		**0.0021**		**0.017**		**0.023**		<0.0018		**0.011**		<0.0015		<0.0015		<0.0011	
Tetrahydrofuran	~	~	~	<0.0078		<0.0058		<0.0071		<0.0056		<0.0088		<0.0091		<0.0076		<0.0075		<0.0057	
Toluene	0.7	100	500	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
trans-1,2-Dichloroethylene	0.19	100	500	<0.0016		<0.0012		<0.0014		<0.0011		<0.0018		<0.0018		<0.0015		<0.0015		<0.0011	
trans-1,3-Dichloropropene	~	~	~	<0.00078		<0.00058		<0.00071		<0.00056		<0.00088		<0.00091		<0.00076		<0.00075		<0.00057	
trans-1,4-Dichloro-2-butene	~	~	~	<0.0031		<0.0023		<0.0028		<0.0022		<0.0035		<0.0036		<0.0030		<0.0030		<0.0023	
Trichloroethene	0.47	21	200	<0.0016		<0.0012		<0.0014		**0.0037**		<0.0018		**0.012**		<0.0015		<0.0015		<0.0011	
Trichlorofluoromethane	~	~	~	<0.0078		<0.0058		<0.0071		<0.0056		<0.0088		<0.0091		<0.0076		<0.0075		<0.0057	
Vinyl chloride	0.02	0.9	13	<0.0078		<0.0058		<0.0071		<0.0056		<0.0088		<0.0091		<0.0076		<0.0075		<0.0057	

NOTES:
1. < in result columns indicates analyte is not detected above the lab reporting limits shown.
2. NT in result columns indicates Not Tested.
3. ~ in regulations columns indicates no New York TAGM, Brownfiels 375-6, or CP-51 limits were found
4. Values in italics exceed the TAGM Soil Cleanup Objectives.
5. Bolded values exceed the Brownfield Cleanup Program 375-6 Soil Cleanup Objectives.
6. Grey shaded values exceed the CP-51 Soil Cleanup Levels.
7. Chromium Maximum Soil Contaminant Concentrations are those established for hexavalent/trivalent chromium
8. Con-Test Laboratory is not responsible for the regulatory content, data comparisons with regulations, or decisions made
9. Q = Qualifier

Qualifiers Codes:
V-34: Initial calibration verification (ICV) did not meet method specifications and was biased on the low side for this compound. Reported result is estimated.
V-05: Continuing calibration verification (CCV) did not meet method specifications and was biased on the low side for this compound.
MS-07A: Matrix spike and spike duplicate recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of matrix effects that lead to low bias or non-homogeneous sample aliquot cannot be eliminated.

SS-8 Location:	Basement of Seasons Supermarket
PCE	1,200
TCE	80
c12-DCE	10

SS-9 Location:	Basement of Soysauce Restaurant
PCE	200
TCE	21
c12-DCE	9.9
MC	9.6

SS-10 Location:	Basement of Amalia Grocery
PCE	59
TCE	6
c12-DCE	3.4
CT	0.39
MC	3.2

SS-12 Location:	Basement of Naomi's Pizza
TCE	60
c12-DCE	20
MC	15

SS-13 Location:	Basement of Main Optical
MC	22

SS-14 Location:	Basement of Queens Pita Bakery
PCE	4,800
TCE	2,000
c12-DCE	1,900
MC	12

SS-15 Location:	Basement of Towne Paint & Benjamin Moore Paints
PCE	7
TCE	1.7
c12-DCE	1.2
11-DCE	0.75
CT	1.6
111-TCA	1
MC	34
VC	0.11

SS-16 Location:	Basement of Mazal Salon & Spa
MC	84

SS-17 Location	Basement of S&M Pharmacy
PCE	33
CT	0.73
MC	4.8

SS-8
SS-9
SS-10
SS-12
SS-13
SS-14
SS-15
SS-16
SS-17

D
D

MAIN STREET

Legend

SS-8 Sub-Slab Soil Vapor Sample

PCE: Tetrachloroethene

TCE: Trichloroethene

c12-DCE: cis-1,2-Dichloroethene

11-DCE: 1,1,-Dichloroethene

CT: Carbon Tetrachloride

111-TCA: 1,1,1-Trichloroethane

MC: Methylene Chloride

VC: Vinyl Chloride

Indicates exceedance above NYSDOH Sub-Slab Soil Vapor Screening Levels

CVOC IN SUB-SLAB SOIL VAPOR

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Project No.: 9233-KGNY	Figure No.: 1
Date: 07/24/2019	Scale: Not To Scale