HAKS

INTERIM REMEDIAL MEASURE (IRM)

WORK PLAN

Prepared For:

Tibetan Community of New York and New Jersey

32-01 57th Street

Block 1159; Lot 1

Queens, New York

Site Number: 241197

Prepared By:

HAKS Engineers, Architects, and Land Surveyors DPC

40 Wall Street, 9th Floor

New York, NY 10005

Prepared On:

18 May, 2017

CERTIFICATION

I Tarek Z. Khouri, P.E. certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Interim Remedial Measures (IRM) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Tarek Z. Khouri, P.E.

Name

Signature

18 May, 2017
Date

LIST OF ACRONYMS

Acronym	Definition
BGS	Below Grade Surface
CAMP	Community Air Monitoring Plan
CCR	Construction Completion Report
DOT	Department of Transportation
ESA	Environmental Site Assessment
ESI	Environmental Site Investigation
EZ	Exclusion Zone
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IRM	Interim Remedial Measures
NYC SCA	New York City School Construction Authority
NYS DEC	New York State Department of Environmental Conservation
NYS DOH	New York State Department of Health
OM&M	Operation, Maintenance, and Monitoring Plan
OSHA	Occupational Health and Safety
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PID	Photo Ionization Detector
PPE	Personal Protective Equipment
PPM	Parts Per Million
QEP	Qualified Environmental Professional
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
TCE	Trichloroethene
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
SB	Soil Boring
SCBA	Self-Contained Breathing Apparatus
SSDS	Sub-slab Depressurization
SSO	Site Safety Officer

SV	Soil Vapor
SVOCs	Semi-Volatile Organic Compounds
VOCs	Volatile Organic Compounds

TABLE OF CONTENTS

Figures

1. Site Location Map
2. SSDS Design and Details

Appendices

A. Health and Safety Plan and Community Air Monitoring Plan
B. Soil Management Plan
C. Specification Cut Sheets of Ventilation Fan and Related Components

1.0 EXECUTIVE SUMMARY

1.1 Background

This Interim Remedial Measures Work Plan has been prepared on behalf of Tibetan Community of New York and New Jersey (the "Tibetan Community") to document proposed Interim Remedial Measures (IRM) for the property located at 32-01 57th Street in Queens, New York, (the "Site") to address vapor concerns.

In October 2011, prior to the Tibetan Community's ownership of the Site, a Phase II Environmental Site Investigation (ESI) was prepared by AKRF, Inc. The results of the investigation indicated detections of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. Soil vapor results indicated VOC detections above the New York State Department of Health (NYSDOH) guidance for tetrachloroethene (PCE) and trichloroethene (TCE) in seven (7) boring locations. Since this ESI was performed for a prospective purchaser not associated with the Tibetan Community or the prior owner of the Site, this ESI was not reasonably available to the public or the Tibetan Community prior to its purchase of the Site.

Prior to the Tibetan Community's purchase of the Site, it retained Airtek Environmental Corporation (Airtek) to perform a Phase I Environmental Site Assessment (ESA) of the Site. In March of 2012, Airtek performed an ESA of the Site, which identified the following recognized environmental conditions (RECs):

- Fuel Oil Underground Storage Tank (UST) – 1,080 Gallon which was installed in 1968 and closed in place in 1994
- Fuel Oil UST – 3,000 Gallon which is associated with NYSDEC Spill Case #0307705. There was no direct evidence of a tank leak but the tank failed tightness testing in 2003. The spill case was subsequently closed in 2004 after the tank passed tightness testing
- Subject Property – 1950, 1962 – Subject Property identified as Akron Hardware
- Manufacturing Corporation and Forgecraft Products, Inc Hardware Manufacturing
- Neighborhood has significant industrial uses surrounding Subject Property. Most of these were identified as REC's by Airtek, from uses related to oil storage, automotive repair, manufacturing, sheet metal works, etc

A Phase II Subsurface Investigation performed by Airtek Environmental Corporation in May of 2012 included advancement of three soil borings in the parking lot portion of the site and a groundwater investigation. The report identified the following findings:

- No petroleum staining in the soil cores
- No samples exceeded CP-51 for VOCs, SVOCs, pesticides, and polychlorinated biphenyls (PCBs)
- Slight metal exceedances were noted
- Results were typical of historic fill
- Groundwater was not encountered to a depth of 25 feet below grade surface (bgs)

After performing its due diligence, the Tibetan Community purchased the Site and in 2016 began preparing the Site for renovation into a cultural assembly space with offices, classrooms, and meeting spaces. In late 2016, after it had begun construction on the Site, the Tibetan Community received notification from the NYSDEC that the Site was considered a P Site (Site Number #241197) pursuant to ECL 27-1305, allegedly based on information from the Phase II Environmental Site Investigation (ESI) prepared by AKRF, Inc. in October of 2011. This information was unbeknownst to the Tibetan Community until after it had begun renovation of the building on the Site in 2016. Nevertheless, the Tibetan Community engaged environmental counsel, an environmental consultant and an environmental engineer to investigate and remediate the Site under NYSDEC's oversight. The Tibetan Community performed all appropriate inquiry and would otherwise be eligible to investigate and remediate the Site as a Volunteer under the New York State Brownfield Program. However, due to financial and time constraints beyond its control, instead of entering into the New York State Brownfield Cleanup Program, the Tibetan Community has chosen to voluntarily implement this IRM pursuant to a consent order with the NYSDEC (the "Consent Order").

1.2 Interim Remedial Measures Work

All proposed work presented in this document will be performed in accordance with the NYSDEC requirements as set forth in the Consent Order.

This document defines the objectives, scope and means of implementation of the IRM.

This IRM addresses the following mitigation and remediation components:

1. Installation of a subsurface pit type sub-slab depressurization (SSDS) system. The SSDS will include the installation of four SSDS pits in the existing slab at the basement level. Two active venting fans will be installed to provide active subsurface vapor extraction. The system will mitigate against vapor intrusion into the indoor air space of the building by pulling accumulated vapor contaminants from beneath the slab through the piping to the exterior of the building, where they will be vented to the atmosphere.
2. Offsite sub-slab and indoor air sampling at the southern adjacent residential structure for the contaminants of concerns.
3. Soil management (testing, excavation, storage, transport and disposal) of excavated material, if found to be contaminated. **Appendix B** provides a Soil Management Plan to guide soil management practices during excavation work related to dry well installation and any other work requiring subsurface material excavation, at the Site.
4. A site management plan and an environmental easement will be implemented to ensure long-term operations, maintenance, and monitoring of the SSDS and to restrict site use.

This proposed remedy is consistent with the procedures defined in New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York dated October 2006 guidance and will also comply with all applicable Federal, State and local laws, regulations and requirements.

The following sections provide the details and specific information pertaining to the various components of the IRM.

2.0 INTRODUCTION

This Interim Remedial Measures Work Plan has been prepared for the property located at 32-01 57th Street Queens, New York (the "Site"). Limited excavation has been completed on the Site and a slab has been poured in the basement. No vapor barrier or waterproofing has been installed. This IRM provides the protocols and specifications for the proposed interim remedial measures and additional remedial investigation at the Site.

2.1 Site Description

The Site is located in the Woodside section in Queens, New York and is identified as Block 1159 and Lot 1 on the New York City Tax Map. The Site is 20,000-square feet and is bounded by 57th Street to the west, a 58th Street to the east, Woodside Towing to the south and 32nd Avenue to the north. Currently, the Site consists of a renovated one-story brick and concrete warehouse building with a basement and adjacent parking lot. **Figure 1** provides a Site location Map.

2.2 Summary of Previous Work

In 2011, prior to the Tibetan Community's ownership of the Site, AKRF Engineering, PC performed a Phase II ESI at the Site on behalf of the New York City School Construction Authority (NYCSCA). The purpose of the activities was to fully investigate and characterize the nature and extent of the RECs identified during a July 2011 Phase I ESA in order to determine whether the RECs had affected the suitability of the Site for the construction of a public school facility. Ultimately, the NYCSCA decided not to acquire the property. However, the results of these investigations were not immediately made public and were not made available to the Tibetan Community until 2016.

The Phase II ESI field activities included the following:

- A geophysical survey of accessible areas of the Site to clear proposed boring locations for subsurface utilities and to verify the location of two closed-in-place USTs identified during the Phase I ESA;
- Advancement of ten (10) soil borings at locations originally proposed in AKRF's July 22, 2011 scope of work, including four (4) borings within the on-site building (SB-1, SB-2, SB-3, and SB-10), and six (6) borings in the east-adjacent parking lot and grassy area (SB-4 through SB-9);
- Advancement of three (3) additional soil borings (SB-7-2D, SB-7-3D, and SB-7-4D) located east, north, and west of SB-7 to further investigate field evidence of contamination observed in SB-7;
- Installation of one (1) temporary groundwater sampling point (TW-5);
- Installation of seven (7) soil vapor sampling points (SV-1 through SV-5, SV-9, and SV-10); and
- Collection and laboratory analysis of 17 soil samples, one (1) groundwater sample, and seven (7) soil vapor samples.

Overall findings of the site investigation indicated sporadic detections of VOCs, SVOCs,

and metals. Soil borings indicated historic urban fill with the exception of one location (SB-7) which indicated the presence of petroleum contamination in soil media. The contamination was visual in nature and was observed at (5'-6') and at (17'-18'). Photoionization Detector (PID) readings at 5'-6' were 157.1 PPM. Step out borings were performed (SB-7/D-2), and indicated PID readings (173 PPM) and petroleum like odor at 11'-15'. PID readings were 197.3 at 16'-20'. Soil analytical results indicated spot detections of petroleum constituents (trimethylbenzene, ethyl benzene) and chlorinated compounds (trichloroethene or TCE).

The following were the noted detections:

Table 1: Summary of Soil Vapor Results

(ug/m3)	Tetrachloroethene (ug/m3)	Trichloroethene (ug/m3)
SV-1	110	370
SV-2	7000	2400
SV-3	230	1200
SV-4	230	1.5
SV-5	95	-
SV-9	280	10,000
SV-10	1400	20,000

Prior to the Tibetan Community's purchase of the Site, it retained Airtek Environmental Corporation to perform a Phase I Environmental Site Assessment at the Site. Airtek performed a Phase I at the Site in March of 2012. This assessment identified the following recognized environmental conditions (RECs):

- Fuel Oil Underground Storage Tank – 1,080 Gallon. Installed in 1968, Closed in Place in 1994.
- Fuel Oil Underground Storage Tank – 3,000 Gallon. Associated with NYSDEC Spill Case #0307705. No direct evidence tank leak but failed tightness testing in 2003. Spill case closed in 2004 after tank subsequently passed tightness test.
- Subject Property – 1950, 1962 – Subject Property identified as Akron Hardware Manufacturing Corporation and Forgecraft Products, Inc Hardware Manufacturing.
- Neighborhood has significant industrial uses surrounding Subject Property. Most of these were identified as REC's by Airtek, from uses related to oil storage, automotive repair, manufacturing, sheet metal works, etc.

Airtek also prepared a Phase II Subsurface Investigation Report in May of 2012. The subsurface investigation involved advancement of three soil borings in the parking lot portion of the Site. Groundwater was not encountered up to a depth of 25 feet below ground surface (bgs). However, according to the USGS Long Island Depth to Water Viewer, groundwater is located at a depth of approximately 79 bgs. Overall findings for this investigation indicated no petroleum odor or staining in the soil cores and no samples exceeding CP-51 for VOCs, SVOCs, pesticides, and PCBs. However, slight metals exceedances were noted. Similar to the results of the Phase II conducted in 2011, the soil

borings were typical of historic urban fill.

2.3 Environmental Setting

The Site is located in the western portion of Queens County, New York.

Queens County is located in the western portion of Long Island, which consists of a wedge-shaped mass of unconsolidated deposits that overlie ancient basement rock. The thickness of these deposits ranges from approximately 100 feet on the Island's north shore to approximately 2,000 feet in some portions of the south shore. These deposits contain ground water that is the sole source of drinking water for the Island's over 3.1 million residents.

The major landforms of Long Island of importance to the hydrologic system are the moraines and outwash plains, which originated from glacial activity. The moraines represent the farthest extent of the glacial advances. The moraines consist of till, which is a poorly sorted mixture of sand, silt, clay, gravel and boulders. The till is poor to moderately permeable in most areas. Outwash plains are located to the south of the moraines. The outwash plains were formed by the action of glacial melt water streams, which eroded the headland material of the moraines and laid down deposits of well-sorted sands, silts and gravels. These outwash deposits have a moderate to high permeability.

The **Upper Glacial Aquifer** is the uppermost hydrogeologic unit. This aquifer encompasses the moraine and outwash deposits, in addition to some localized lacustrine, marine, and reworked materials. A relatively high horizontal hydraulic conductivity and a low vertical hydraulic conductivity characterize the outwash plain portion of this unit. Since the water table is situated in the Upper Glacial Aquifer.

The **Magothy Formation** directly underlies the Upper Glacial Aquifer in the vicinity of the site. This formation is a Cretaceous coastal-shelf deposit, which consists principally of layers of sand and gravel with some interbedded clay. This formation ranges from moderate to highly permeable. A clay layer in some parts of Long Island confines the uppermost portion of the aquifer. The Magothy is Long Island's principal aquifer for public water supply. The United States Environmental Protection Agency (USEPA) has classified the Long Island aquifer system as a sole source aquifer.

The **Raritan Formation** is the deepest unit and rests directly above the bedrock units. This formation is comprised of a sand member (**Lloyd Aquifer**) and a clay member (**Raritan Clay**). The Lloyd sand extends southward from Flushing Bay to the Atlantic Ocean. The thickness of the sand member increases to the southeast and ranges in depth from 200 to 800 feet below sea level (from northwest to southeast). The clay member acts as an aquitard confining the lower Lloyd aquifer between the clay and the underlying bedrock.

The Phase II Subsurface Investigation Report prepared by Airtek in May of 2012 indicated that groundwater was not encountered down to a depth of 25 feet below grade surface. Groundwater at the site is not used as a potable source.

2.4 Objective & Project Goals

The objective of this IRM is to initiate an immediate remedial measure for the Site in order to mitigate for potential vapor intrusion impacts at the Site pursuant to the Consent Order. The scope of the IRM work plan will consist of the installation of four sub-slab vapor extraction pits at the Site. The IRM also presents provisions to investigate the presence of chlorinated solvents in soil beneath the residential property located south of the Site in order to determine any soil vapor intrusion impact of chlorinated solvents in soil vapor.

All related portions of the fieldwork associated with the IRM WP will be performed in accordance with the attached Health & Safety Plan and at a minimum, in accordance with acceptable industry standards. These acceptable industry standards include, but are not limited to, the NYSDEC CP-51/Soil Cleanup Guidance (October 2010), the NYSDEC Bureau of Spill Prevention & Response Sampling Guidelines and Protocols (March 1991), the NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (May 2010) and the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York dated October 2006.

3.0 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITY

The IRM Contractor (Contractor), the Remedial Engineer and New York State regulatory agencies will coordinate together on the implementation of the IRM. The Remedial Engineer has the ultimate responsibility for implementing this IRM for the project and for certifying that the work has been performed in accordance with this Work Plan. NYSDEC and NYSDOH personnel will provide regulatory oversight of this project. All IRM activities will be implemented in accordance with the attached Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP). **Appendix A** provides the HASP and CAMP.

The Remedial Engineer will be responsible for ensuring that all on-site IRM construction operations are performed per the IRM WP. The Remedial Engineer will manage all communication with regulatory agencies.

The Contractor with oversight by the Remedial Engineer will perform the following components of the IRM:

- Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking;
- Installation of an active SSDS;
- Monitoring of the SSDS's operational integrity prior to start-up;
- Perform subslab and indoor air sampling to investigate the potential for soil vapor intrusion impact of chlorinated solvents at the adjacent house to the south of the Site; and
- Transportation and off-Site disposal of investigation derived waste in Department of Transportation (DOT) approved 55-gallon drums at permitted facilities in accordance with applicable laws and regulations.
- Excavation, testing, transportation and off-Site disposal of subsurface material, found to be contaminated, to permitted facilities in accordance with applicable laws and regulations.

All IRM details specified herein will be submitted and approved by NYSDEC and NYSDOH prior to performance of the work. The SSDS will be installed under the oversight of a NYS-licensed Professional Engineer. The Engineer will perform a final site inspection and document the installation of the system in a Construction Completion Report (CCR). Key personnel and their assigned responsibilities for implementation of the remedial design include:

NYSDEC:
Ioana Munteanu-Ramnic, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation
47-40 21st Street
Long Island City, NY 11101
Phone: (718) 482-4065
E-mail: Ioana.munteanu-ramnic@dec.ny.gov

NYSDOH
Sarita Wagh, P.E. New York State Department of Health
Empire State Plaza, Corning Tower, Room 1787
Albany, NY 12237
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Remedial Engineer:
Tarek Z. Khouri, P.E.
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40 Wall Street, 9th Floor
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Phone: (212)-747-1997 (ext 896)
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Contractor:
TBD

4.0 SSDS DESIGN, CONSTRUCTION AND OPERATION PROCEDURES

The following sections detail the SSDS design, installation and procedures and operation protocols prior and after system start-up.

Figure 3 provides the SSDS design and details. **Appendix C** provides specification cut sheets of ventilation fan and related components.

4.1 Site Preparation

Preliminary work that will be performed by the Contractor prior to performance of IRM activities will include the following:

Site Mobilization: Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization, marking and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Utility Marker Layouts, Easement Layouts: The presence of utilities and easements on the Site or the adjacent residential structure will be fully investigated prior to the performance of invasive work such as drilling under this plan by using, at a minimum, the One-Call System (811). All invasive activities will be performed in compliance with applicable laws and regulations to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and prior to the start of drilling or other operations will retain a copy of the Mark out Ticket. Proper safety and protective measures pertaining to utilities and easements, and compliance with all laws and regulations will be employed during invasive and other work contemplated under this Plan. The integrity and safety of on-Site and off-Site structures will be maintained during drilling or other remedial activity performed under the IRM.

Equipment and Material Staging: Equipment and materials will be stored and staged on-site in a manner that complies with applicable laws and regulations. The locations of proposed equipment and material staging areas, drum storage area and the project manager will define other pertinent remedial management features during the Site preparation activities.

Decontamination: if needed, a temporary decontamination pad will be set up at the Site and will be maintained throughout ongoing IRM field activities. The decontamination pad will be used to remove waste from reusable equipment, trucks, etc.

Demobilization: Demobilization will include:

- As necessary, restoration of temporary access areas and areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access area);
- Removal of sediment from erosion control measures and disposal of materials in accordance with applicable laws and regulations;
- Equipment decontamination, and;

- Equipment will be decontaminated and demobilized at the completion of field activities. Investigation equipment and large equipment (e.g., soil excavator) will be washed at a secluded station as necessary. In addition, all investigation derived waste will be appropriately disposed.

4.2 SSDS Pit Design and Installation

In order to implement immediate remedial measures to reduce potential exposure to chlorinated solvent vapors, an active SSDS will be installed via four (4) pit type sub slab depressurization points. The SSDS will be coupled to two RadonAway ventilation fans located on the roof of the building. SSDS Pits 1-3 will be connected via a ceiling manifold system to one (1) RadonAway fan and SSDS Pit 4 will be connected via a direct roof connection from this SSDS pit location. The locations of the piping outlets to the roof will be coordinated with the Architect to avoid visual conflicts and to minimize bends, or other flow reducing impedances.

The construction of the SSDS at the Site will be performed during normal business hours. The four pits will consist of a twenty-four (24" inch wide and 24" inch deep gravel pit with an open-ended 4-inch PVC pipe below grade level, that will transition to a 4" cast iron or stainless steel pipe at the basement slab grade level. Upon the transition, SSDS Pits 1-3 will run directly to the ceiling annular space and be connected via manifold to a roof outlet. SSDS Pit 4 will be connected via direct roof connection. Both SSDS Pits 1-3 and SSDS Pit 4 will be connected to a RadonAway (RP145 or equivalent) fan located on the roof. All roof venting locations will be 10 feet away from any exhaust or air intake vents. Fans will be fed independently and directly from the main electric panel. The open ended portion of cast iron pipe in indoor spaces shall be covered with rodent screen and the exhaust termination above roof top shall be covered with an elbow and a screen/rain cap to prevent bird entry.

Upon completion of the SSDS pit installation, all excavated soils will be properly characterized for off-site disposal per applicable federal, state, and local regulations. No disturbed soils will be re-used for backfill. Any backfill requirements will be certified clean fill or gravel.

The system will then be started with 100% applied suction from the fan in order to maximize the air flow drawn from indoor space. System parameters including airflow and organic vapor concentrations at the effluents will be monitored following start-up. Vapor concentrations will be measured with the PID at the effluent. System monitoring will be conducted during the first two days of operation as follows: Hourly for 5 consecutive hours on the first day and once on the second day. System monitoring will then be performed 7 days, and 30 days following the initial startup period. The pressure gauges will be configured to read between 0 and 2" inches of water column of vacuum pressure to verify vacuum operation of the system.

Field logs will be completed during the course of system monitoring and will be submitted to the NYSDEC Project Manager before noon the next business day. A field log will be completed on a daily basis that will describe all field activities including:

- Project number, name, manager, and address;
- Description of field activities;
- Date and time of performed tasks;
- Monitoring equipment;
- Apparent weather conditions (e.g. precipitation, outdoor temperature and wind direction) of the work zone; and
- Record of monitoring data on spreadsheets with all requested parameters and point of measurements.
- Any public complaints will be sent to NYSDEC immediately.

4.3 Post-Installation Diagnostics

Post installation, the Environmental Engineer will mobilize to the site to perform post installation SSDS diagnostics. The engineer will access the SSDS riser pipes, roof vents and existing concrete slab.

The testing will consist of pressure, smoke, and general communication testing of the SSDS at four points across the Site footprint. Five pressure/smoke test probes will be installed for testing as indicated in Figure 2. The contractor will drill a small diameter (1/8-1/4") holes in the existing concrete slab in order to sufficiently verify subsurface communication and pressure differentials upon installation of the SSDS. The testing will be performed prior to and after system activation to illustrate the operational status and effectiveness. A metric of -0.002 inches of water column of pressure gradient will be used as the basis for determining operational effectiveness. For the smoke test, a smoke stick will be used to determine negative influence from the slab to illustrate the removal of smoke through the SSDS piping.

4.4 Pre- and Post- System Start-Up Air Sampling Plan

Prior to installation and start-up of the SSDS, sub-slab and indoor air sampling will be conducted at the adjacent residential property to the south of the site to investigate potential soil vapor intrusion. Sub-slab soil vapor sampling will involve the installation of one implant that is a very small hole, about 3/8 inch outer diameter, to be installed to a depth of 2 inches beneath the existing building's slab. After sampling, the floor surface will be restored to its original condition with cement. One (1) indoor air sample and one (1) ambient (outdoor) air sample will also be collected at the residential property. For the purpose of this investigation, the sub-slab air sample will be designated SS-1, the indoor air sample will be designated IA-1, and the ambient air sample will be designated OA-1.

Air sampling was performed at the residential property on April 11, 2017. The results and follow up actions will be detailed in a future off-site work plan.
Following the start-up of the SSDS installed at the Site, two indoor air samples will be collected from the basement. In addition, one (1) ambient air sample will be collected simultaneously with the indoor air samples. For the purpose of this investigation, the indoor air samples will be designated IA-1a, IA-2a, and the outdoor air sample will be

identified OA-1a. The objective of this this sampling is to verify the effectiveness of the installed mitigation system at the Site by investigating the presence of potential levels of chlorinated solvents in indoor air, which were previously detected during the remedial investigation. The sampling will be conducted on day 7 and day 30, from when the system is up and running.

If the evaluation indicates that chlorinated solvents continue to be present in indoor air at the Site or the pressure field communication testing, then additional investigative and/or remedial activities will be considered for modification or expansion of the system following consultation with the NYSDEC.

The air sampling will be conducted in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006). Indoor and ambient air sample collection will be conducted 3-5 feet above the ground to represent the breathing zone.

Table 1 - Summary of Proposed Indoor Air Sampling Locations and Analyses

Indoor, Sub-Slab, & Outdoor Air Samples	Location	Analysis
SS-1	Sub-slab in the adjacent residential property	*VOCs and via EPA Method TO-15
IA-1	Basement of the adjacent residential property	
OA-1	Ambient upwind at the adjacent residential property	
IA-1	Cellar in the vicinity of Roof Outlet #1	
IA-2	Cellar in the vicinity of Roof Outlet #2	
OA-1	Ambient Upwind	

All air samples will be collected utilizing 6 liter pre-cleaned (as certified by the laboratory), passivated and evacuated whole air Summa® Canister. Each air sampling canister will then be connected to a flow control valve set to collect the 6-L sample over a period of 8 hours at a rate of less than 0.2 liter per minute. All Summa Canisters will be labeled and sent to a laboratory certified to perform air analysis in New York State. The air samples will be analyzed for common VOCs via EPA Method TO-15.

4.5 General Considerations

- All instruments and equipment to be installed per manufacturer's requirements.

- All equipment, electrical panels, and piping of considerable weight loading to be mounted and supported by adequate supports.

- The Engineer or Contractor may modify equipment locations during system installation to allow for ease of movement and access following approval.

- All piping and electrical lines should be routed along walls or overhead or installed along floor unless instructed otherwise by the engineer.

- All piping joints must be carefully cemented.

- All sheet rock and ceiling penetrations should be finished and closed with joint compounds and finished appropriately in accordance with applicable waterproofing and fire codes.

- A sign with a contact number will be clearly posted in the building so that current tenants can contact the Contractor for immediate assistance.

- Appropriate stickers indicating the content of pipes and contact numbers in case of emergency for immediate assistance are mounted on SSDS piping in a visible casing.

- The SSDS will be operated and monitored in accordance to an Operation, Maintenance and Monitoring Plan (OM&M), to be submitted as part of the CCR.

- The SSDS will be installed at the site following system design approval by the NYSDEC.

- For the SSDS design, the Engineer will propose the use of a higher vacuum, lower velocity RadonAway fan or engineer approved equivalent. The higher vacuum fan design will operate along the general design guidelines for a SSDS to actively mitigate and withdraw air through the subsurface and vent to the atmosphere. The higher vacuum fan will also further prevent against potential vapor intrusion into the occupied spaces of the building.

5.0 OPERATION MAINTENANCE AND MONITORING OF THE SSDS

The proposed SSDS is considered an immediate but interim remedial measure for the Site. The SSDS will be operated and maintained in accordance to OM&M as prescribed below:

- The systems proper operation will be continuously monitored by the site ownership and also by the building occupants.
- Routine maintenance of the system will be required if any part if the system has failed or functioning improperly and/or the air flow is not maintained.

The system will be inspected and its performance documented annually via a Certification Letter Report (CLR). This inspection will verify the proper functioning of system Radonaway fan, the fresh air intake fan and the evaluation of individual vapor concentrations at exist from each system utilizing a PID.

The CLR will include, at a minimum:

- Date of inspections;
- Personnel conducting inspections;
- Description of the inspection activities performed;
- Any observations, conclusions, or recommendations;
- Copy of any inspection forms;
- If changes are needed to the system or controls;
- If compliance with the system operations requirements have been maintained.

6.0 REPORT OF FINDINGS & PROJECT SCHEDULE

6.1 Report of Findings

The final as built design of the SSDS including all modifications will be documented in a Construction Completion Report (CCR). The CCR will be prepared 45 days after system start up and will include post-startup system operational data (flow rate and PID reading). The CCR also include the as-built drawings of the system, plus cut sheets for system component. An OM&M Plan will also be included as an appendix in the CCR.

6.2 Project Schedule

The proposed IRM activities associated with the construction of the SSDS will be completed following NYSDEC approval of system design. Once NYSDEC approval of the system design has been granted, it is anticipated that the SSDS installation will be conducted concurrent with the ongoing building renovation. The building renovation is ongoing and is anticipated to be substantially completed by May 2017.

7.0 OFF-SITE VAPOR INTRUSION IMPACT ASSESSMENT

A vapor intrusion impact assessment will be performed beneath the adjacent house located to the south of the Site. This investigation will be performed as per a NYSDEC requirement, which were communicated verbally via a site walk-through on January 25, 2017 and it is intended to evaluate whether chlorinated solvents are impacting indoor air in this facility.

When permission to the facility is granted, an interior inspection of the basement floor will be performed prior to the vapor intrusion investigation in order to determine the appropriate location of at least one (1) sub-slab vapor sampling point. Sub-slab soil vapor sampling will involve the installation of one implant that is a very small hole, about 3/8 inch outer diameter, to be installed to a depth of 2 inches beneath the existing building's slab. After sampling, the floor surface will be restored to its original condition with cement. One (1) indoor air sample and one (1) ambient (outdoor) air sample will also be collected at the residential property.

All air samples will be collected utilizing 6 liter pre-cleaned (as certified by the laboratory), passivated and evacuated whole air Summa® Canister. Each air sampling canister will then be connected to a flow control valve set to collect the 6-L sample over a period of 8 hours at a rate of less than 0.2 liter per minute. All Summa Canisters will be labeled and sent to a laboratory certified to perform air analysis in New York State. The air samples will be analyzed for common VOCs via EPA Method TO-15.

The vapor intrusion investigation will be conducted in accordance with NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York dated October 2006 guidance. An investigation work plan providing details of the scope of the sub-slab vapor investigation will be submitted to NYSDEC for approval. The findings of this investigation will be documented in an Off-Site Soil vapor Intrusion Investigation Letter Report and will include recommendations for mitigation as per NYSDOH air guidelines, if needed.

8.0 REFERENCES

- Phase II Environmental Site Investigation, AKRF, Inc. 32-01 57th Street, Woodside, NY, October 31, 2011.
- Phase I Environmental Site Assessment, Airtek Environmental Corporation, 32-01 57th Street, Woodside, NY, March 12, 2012.
- Phase II Subsurface Investigation Report, Airtek Environmental Corporation, 32-01 57th Street, Woodside, NY, May 30, 2012.

FIGURES

HAKS

FIGURE 1: SITE LOCATION MAP

32-01 57TH St, Queens NY

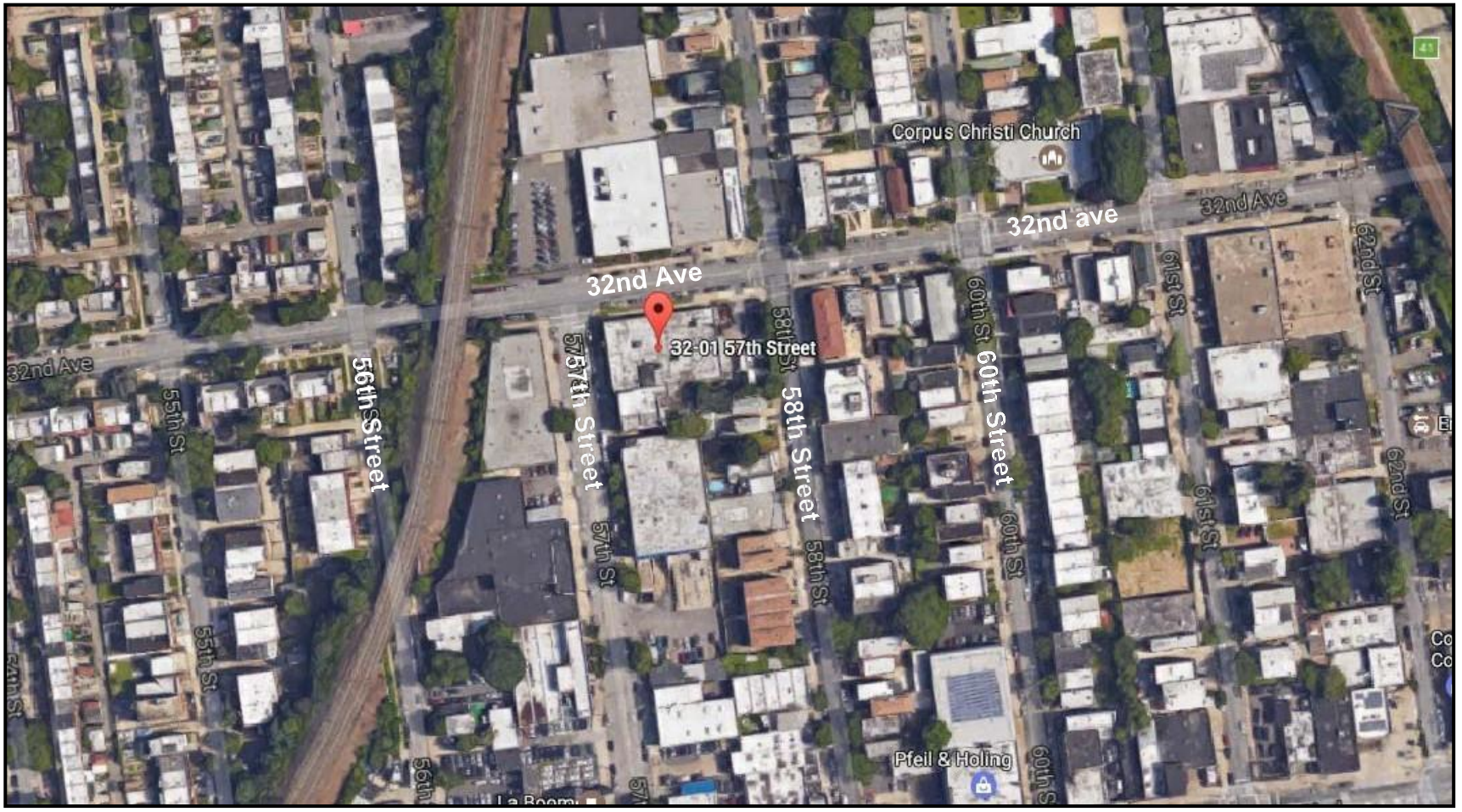
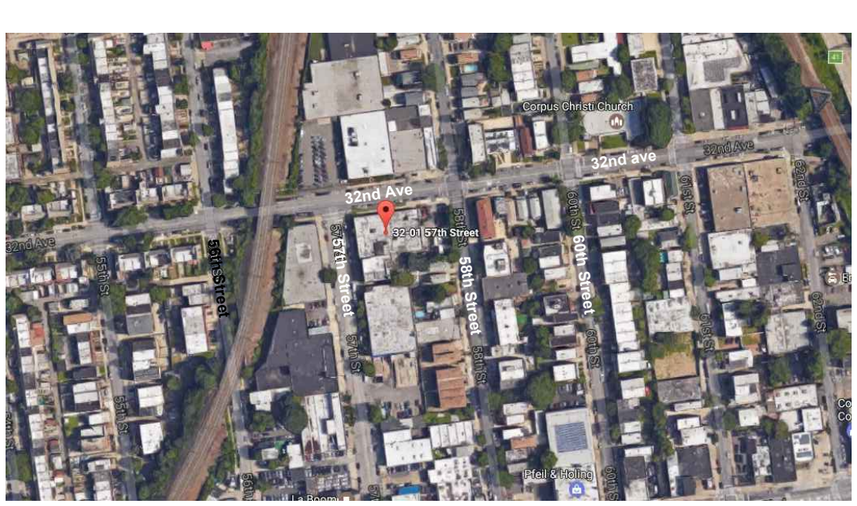


FIGURE 2 – SSDS DESIGN AND DETAILS

DESIGN DRAWINGS
SUB-SLAB DEPRESSURIZATION SYSTEM
TIBETAN COMMUNITY OF NEW YORK AND NEW JERSEY
32-01 57TH STREET , QUEENS, NY
MAY 2017



1. COVER SHEET WITH SITE LOCATION MAP
2. PROPOSED CELLAR PLAN
3. ROOF PLAN
4. DETAILS
5. NOTES

HAKS PROJECT NO.

TIBETAN COMMUNITY OF NEW YORK and NEW JERSEY
32–01 57th St. Queens, NY

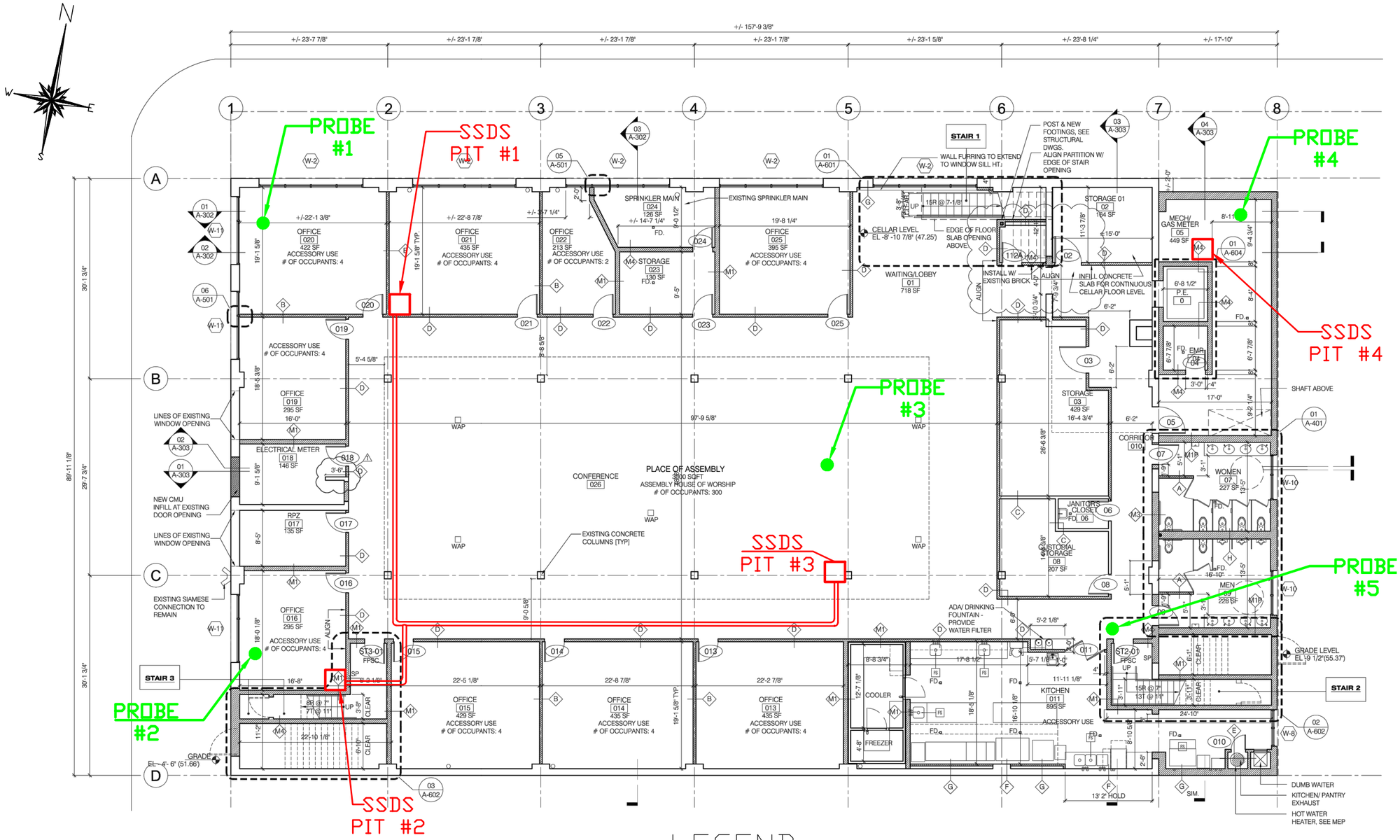
Site Location Map

DWG. NO.	SCALE	DATE	SHEET
1	N.T.S.	MAY 2017	1 OF 5

HAKS
40 Wall St., 11th Floor,
New York, NY 10005

PREPARED BY: HAKS
IN CHARGE TZK
DESIGNER TZK
DRAFTER BR
CHECKER DA

BASE DRAWING FROM:
NANDINEE PHOOKAN ARCHITECTS
45 Main St, Brooklyn, NY 11201



LEGEND

- **SSDS PIT**
  SPECS: 24" X 24" X 24"
- **SSDS PIPING**
  4" Cast Iron Piping (above grade) or
  4" PVC (below grade).
  Vertical Riser Pipes run throughout the building to the roof. Locations are estimates and will be finalized by Architect of Record
- **LOCATION OF SMOKE/PRESSURE PROBE**

HAKS PROJECT NO.

TIBETAN COMMUNITY OF NEW YORK and NEW JERSEY
32-01 57th St. Queens, NY

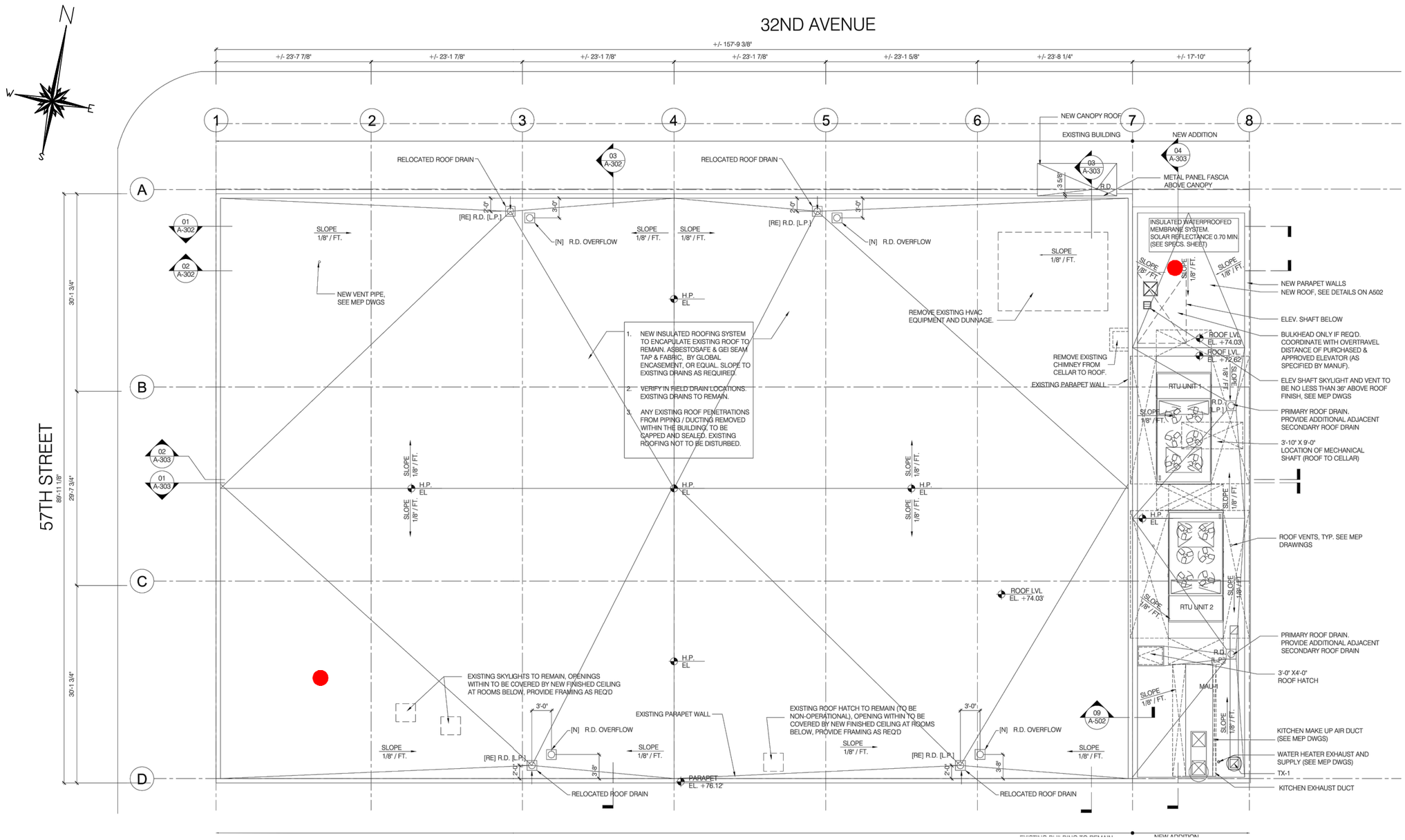
PROPOSED CELLAR PLAN

DWG. NO.	SCALE	DATE	SHEET
1	1/16" = 1' - 0"	MAY 2017	2 OF 5

HAKS
40 Wall St., 11th Floor,
New York, NY 10005

PREPARED BY: HAKS
IN CHARGE TZK
DESIGNER TZK
DRAFTER BR
CHECKER DA

BASE DRAWING FROM:
NANDINEE PHOOKAN ARCHITECTS
45 Main St, Brooklyn, NY 11201



LEGEND

Roof Penetration to SSDS fan

- Locations are estimates ; to be finalized by Architect of Record

HAKS PROJECT NO.

TIBETAN COMMUNITY OF NEW YORK and NEW JERSEY

32-01 57th St. Queens, NY

ROOF PLAN

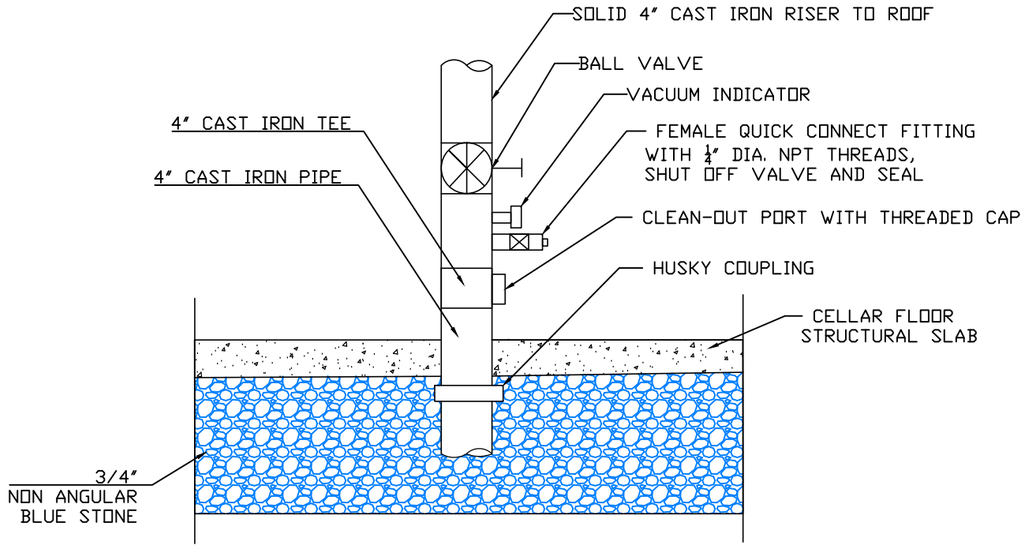
DWG. NO.	SCALE	DATE	SHEET
1	1/16" = 1' - 0"	MAY 2017	3 OF 5

HAKS
40 Wall St., 11th Floor,
New York, NY 10005

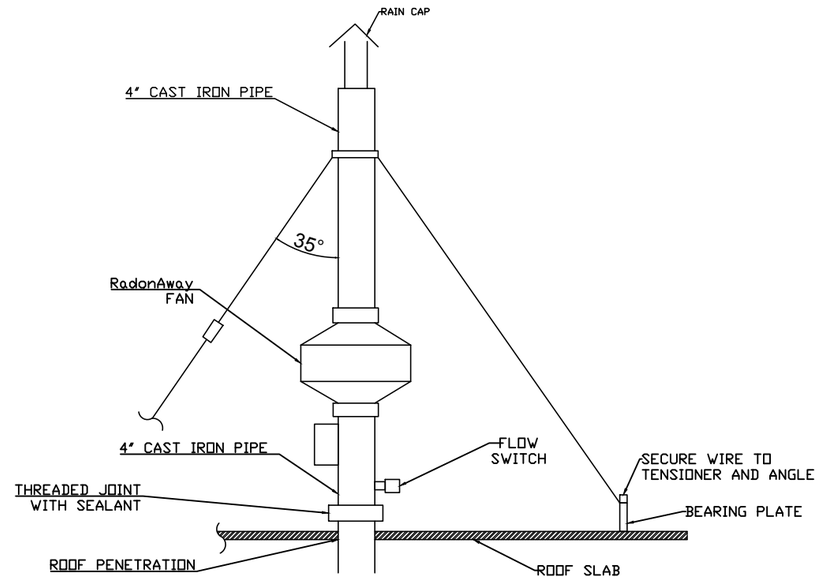
PREPARED BY: HAKS
IN CHARGE TZK
DESIGNER TZK
DRAFTER BR
CHECKER DA

BASE DRAWING FROM:

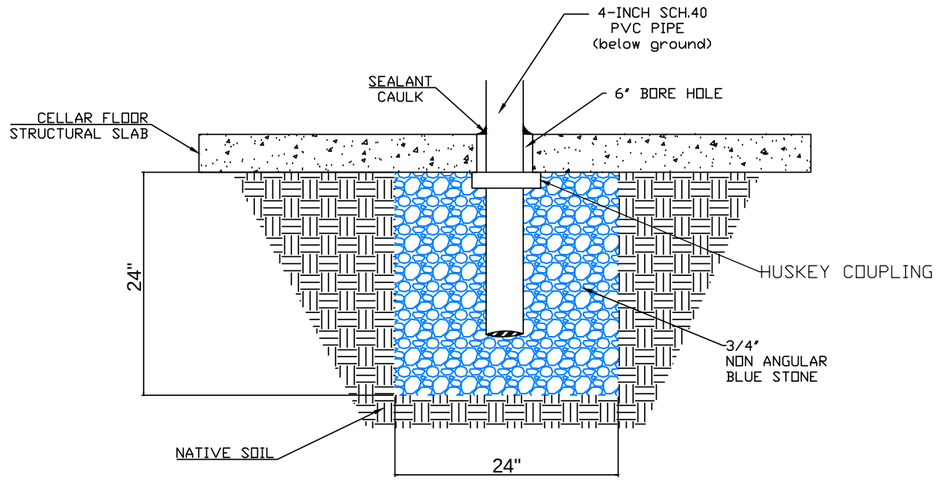
NANDINEE PHOOKAN ARCHITECTS
45 Main St, Brooklyn, NY 11201



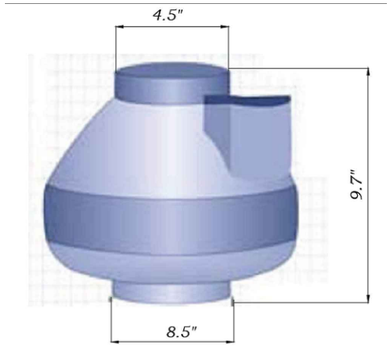
SSDS VENT RISER AT CELLAR
(TYPICAL COSNTRUCTION)



SSDS VENT RISER AT ROOF
(TYPICAL CONSTRUCTION)



SSDS PITS 1 -4
(SEE ABOVE DETAIL)



RadonAway Fan (x2)

HAKS PROJECT NO.

TIBETAN COMMUNITY OF NEW YORK and NEW JERSEY
32-01 57th St. Queens, NY

HAKS
40 Wall St., 11th Floor,
New York, NY 10005

PREPARED BY: HAKS
IN CHARGE TZK DRAFTER BR
DESIGNER TZK CHECKER DA

BASE DRAWING FROM:
NANDINEE PHOOKAN ARCHITECTS
45 Main St, Brooklyn, NY 11201

DETAILS

DWG. NO.	SCALE	DATE	SHEET
1	N.T.S	MAY 2017	4 OF 5

DRAWING NOTES

General Notes:

1. The work depicted on these drawings shall be performed by an experienced contractor who has working knowledge of applicable code standards and industry accepted standard good practice. Not every condition or element is or can be explicitly shown on these drawings.
2. The contractor shall confer with and seek the approval of the engineer and/or Architect of Record for the final locations of all venting system components.
3. The contractor will provide an as-built drawing of the installed venting system upon completion.
4. All inspections required by the building code shall be provided by an independent inspection company or the local building department where applicable.
5. The venting system shall be in compliance with New York City Mechanical Code, Chapter 5 Section MC-512 Subslab exhaust systems.
6. Vertical piping runs shall be marked "Soil Vapor Venting System - Do Not Tamper with or Disturb". The labels shall be easily read within three (3) feet.
7. All piping shall be supported according to all applicable codes.
8. Provide 120V AC 20 AMP electrical service with a dedicated circuit breaker to within five (5) feet of the location of the venting fan for roof installation options.
9. Smoke Testing - Smoke testing will be performed at the five probe locations as defined on the figure. A small diameter (1/4") pilot hole will be drilled through the existing concrete floor slab into the gravel base layer. The testing will be conducted by lighting a smoke stick at the probe location to illustrate the negative influence of the SSDS system. Photographs of the smoke entering the probe location will be collected during the testing.
10. Pressure Testing - A small diameter (1/4") pilot hole will be drilled through the existing concrete floor slab into the gravel base layer. A manometer will be used to analyze the pressure beneath the slab at the pilot hole location. A negative pressure reading will indicate the influence of the SSDS system at each probe location and confirm communication from the SSDS pit to the probe location.

Venting Fan Notes:

1. Ventilation Fan to be specified as RadonAway RP 145, Part Number 23030-1, or engineer approved equivalent. One (1) ventilation fan is to be installed for SSDS #1-3 and one (1) ventilation fan for SSDS #4 as identified in the Contract drawings.
2. Electrical connection to be provided per Radon Away Specifications.
3. Selected contractor must conform to all installation instructions as provided per the included RadonAway installation instructions.
4. Fan to be mounted to roof or roof ledger using Radonaway fan mounting bracket, SKU 25007.

Contractor Notes

1. The Contractor shall furnish all labor, material, equipment, supplies and incidentals required for the installation of the RadonAway fan (or engineer approved equivalent) system as shown on the Drawings. The work shall include, but not limited to the following: installation in basement, associated piping and mechanical and electrical appurtenances in their entirety, fan installation, grouting and restoration to existing conditions and in accordance with all applicable federal, state and local requirements. Final restoration of all disturbances to existing conditions.
2. The Contractor shall be responsible to comply with all local, state, and federal rules and regulations concerning emissions and disposal of solids and other materials generated by the work. Containment, handling and disposal of materials, and means and methods employed by the Contractor are the responsibility of the Contractor.
3. Compliance assurance shall be the responsibility of the Contractor. Communication between Contractor and governing authorities, regulatory agencies, and similar entities, shall be coordinated through the Owner.
4. All permits, bonds, easements, or licenses required to perform the Work shall be obtained by the Contractor.
5. The Contractor shall coordinate with the Owner to ensure all permits are in place prior to the Contractor starting work.
6. Determination of license and permit requirements shall be the responsibility of the Contractor.
7. Copies of all executed permits and licenses shall be transmitted to the Owner upon receipt.

Pipe Notes:

1. Hubless Cast Iron pipe and fittings shall be manufactured from gray cast iron and shall conform to ASTM A 888 and CISPI Standard 301. The Charlotte Pipe and Foundry Company hubless Cast Iron Soil Pipe shall be specified, or approved equivalent. All piping to be 4" inches diameter unless otherwise noted.
2. All pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute ® and listed by NSF® International.
3. Hubless Couplings shall conform to CISPI Standard 310 and be certified by NSF® International.
4. Heavy Duty couplings shall conform to ASTM C 1540 and shall be used if indicated. Gaskets shall conform to ASTM C 564.
5. The cast iron riser shall be installed vertically to the exterior of the building to the roof and shall terminate a minimum of one (1) foot above the roof line and at least ten (10) feet from HVAC RTU air intakes, doors, windows, or other openings into the occupied space of the building or adjacent buildings.

HAKS PROJECT NO.

TIBETAN COMMUNITY OF NEW YORK and NEW JERSEY
32-01 57th St. Queens, NY

HAKS
40 Wall St., 11th Floor,
New York, NY 10005

PREPARED BY: HAKS
IN CHARGE TZK
DESIGNER TZK
DRAFTER BR
CHECKER DA

BASE DRAWING FROM:
NANDINEE PHOOKAN ARCHITECTS
45 Main St, Brooklyn, NY 11201

NOTES

DWG. NO.	SCALE	DATE	SHEET
1	N.T.S	MAY 2017	5 OF 5

APPENDIX A – HEALTH AND SAFETY PLAN AND COMMUNITY AIR MONITORING PLAN

HEALTH AND SAFETY PLAN AND COMMUNITY AIR MONITORING PLAN

Prepared For:

Tibetan Community of New York and New Jersey

32-01 57th Street

Block 1159; Lot 1

Queens, New York

Site Number: 241197

Prepared By:

HAKS Engineers, Architects and Land Surveyors DPC

40 Wall Street, 9th Floor

New York, NY 10005

Prepared On:

18 May, 2017

TABLE OF CONTENTS

Figures
Figure 1: Directions to Hospital

Attachments
Attachment A: Safety Data Sheets

1.0 INTRODUCTION

This Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) has been prepared as a part of the Interim Remedial Measures for the property located at 32-01 57th Street in Queens, New York, designated as (the "Site").

This HASP will conform to applicable regulations, safe work practices and the project's requirements, and addresses those activities associated with the installation of Soil Vapor Extraction system and the performance of a remedial investigation.

Compliance with this HASP is required of all persons and third parties who perform the scope of work documented for this project. The content of this HASP may change or undergo revisions based upon additional information that is made available to health and safety personnel, monitoring results, or changes in the technical scope of work.

It should be noted that this HASP does not apply to any other scopes of work that may be performed at the Site that are not specifically outlined in this report. Due to the nature of this Site and the activities occurring thereon, it is not possible to discover, evaluate and provide protection for all possible hazards that may be encountered. Only those portions of this HASP that specifically apply to the activities at the Site will be enacted by authorized personnel. Strict adherence to the applicable portions of these health and safety guidelines set forth herein will reduce, but not eliminate the potential for injury at this Site. The health and safety guidelines in this HASP were prepared specifically for this Site and should not be utilized for any other site without prior research and evaluation by trained health and safety specialists.

2.0 SCOPE OF WORK

This HASP has been prepared as a part of the IRM to be implemented during the upcoming proposed interim remedial measures at the Site. A Phase II Environmental Site Investigation was performed in 2011 and the results of the investigation indicated spot detections of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. Soil vapor results indicated VOC detections above the New York State Department of Health (NYSDOH) guidance for tetrachloroethene (PCE) and trichloroethene (TCE) in seven (7) boring locations. The portions of the construction activities specifically addressed in this HASP will include the following and will be performed in the following sequence:

1. Excavation of the parking lot area, along 58th Street, for dry well placement purposes.

2. Installation of a subsurface pit type sub-slab depressurization system (SSDS). The SSDS will include the installation of four SSDS pits in the existing slab at the basement level. Two active venting fans will be installed to provide active subsurface vapor extraction. The pits will mitigate against vapor intrusion into the indoor air space of the building by pulling accumulated vapor contaminants from beneath the slab through the piping to the exterior of the building where they will be vented to the atmosphere.

3. Offsite sub-slab and indoor air sampling at the adjacent residential structure, to the south, for the contaminants of concerns.

3.0 STAFFING

This section briefly describes the personnel involved in Site remedial activities, their contact information and their health and safety responsibilities. This section also provides directions to hospital in the case of a health emergency.

EMERGENCY NUMBERS

Emergency Numbers	Contact Phone Number
Elmhurst Hospital (NYC Health + Hospitals – Elmhurst)	(718) 334-4000
EMS	911
Police	911
Fire	911
National Response Center	800-424-8802
Poison Information Center	800-562-8816
Chemtree	800-424-9555

4.0 CHEMICAL & WASTE DESCRIPTION/CHARACTERIZATION

The following list of compounds is based on the results of prior Site investigations:
Chlorinated Solvents of concern in soil, groundwater and soil vapor:

- Tetrachloroethylene
- Trichloroethylene

Appendix A contains Material Safety Data Sheets

5.0 HAZARD ASSESSMENT AND MITIGATION

The potential hazards associated with planned site activities include chemical, physical and biological hazards associated with the construction. This section discusses those hazards that are anticipated to be encountered during the activities listed in the scope of work.

The potential to encounter chemical hazards is dependent upon the work activity performed (invasive or non-invasive), the duration, and location of the work activity. Such hazards could include inhalation or skin contact with chemicals that could cause: dermatitis, skin burn, being overcome by vapors, or asphyxiation. In addition, the handling of contaminated materials and chemicals could result in fire and/or explosion.

The potential to encounter physical hazards during site work includes: heat stress, exposure to excessive noise, loss of limbs, being crushed, head injuries, cuts and bruises, and other physical hazards due to motor vehicle operation, heavy equipment and power tools.

Each member of the team working on-site will have 40-Hours OSHA training and annual 8-Hour HAZWOPER Refresher training.

5.1 Chemical Hazards

The potential for personnel and subcontractors to come in contact with chemical hazards may occur during the following tasks:

- Installation of aboveground piping for aeration and ventilation of indoor air

5.1.1 Exposure Pathways

Exposure to these compounds during ongoing activities may occur through inhalation ofcontaminated dust particles, inhalation of volatile vapor fume compounds, by way of dermal absorption, and accidental ingestion of the contaminant by either direct or indirect cross contamination activities (eating, smoking, poor hygiene).

5.1.2 Dust Suppression

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

1. Wetting equipment and excavation faces.
2. Spraying water on buckets during excavation and dumping.
3. Hauling materials in properly sealed or watertight containers.
4. Covering excavated areas and material after excavation activity ceases.

To evaluate the effectiveness if the dust suppression measures, air monitoring utilizing

real-time dust-monitoring equipment will be performed. The requirements for air monitoring during post-remediation soil disturbance activities are presented in Section 5.0.

5.1.3 Additional Precautions

Dermal absorption or skin contact with chemical compounds is possible during invasive activities at the Site, including the excavation and/or capping of soils. The use of PPE in accordance with Section 9.0 and strict adherence to proper decontamination procedures should significantly reduce the risk of skin contact.

The potential for accidental ingestion of potentially hazardous chemicals is expected to be remote, when good hygiene practices are used. Unauthorized personnel, including all children, will not be allowed access to the Site.

6.0 PHYSICAL HAZARDS

A variety of physical hazards may be present during Site activities. These hazards are similar to those associated with any construction type project and include digging or boring operations and excavation. These physical hazards are due to heavy equipment operation, the use of improper use of power and hand tools, misuse of pressurized cylinders, walking on objects, tripping over objects, working on surfaces which have the potential to promote falling, mishandling and improper storage of solid and hazardous materials, skin burns, crushing of fingers, toes, limbs, hit on the head by falling objects or hit one's head due to not seeing the object of concern, temporary loss of one's hearing and/or eyesight. Theses hazards are not unique and are generally familiarly to most hazardous waste site workers at construction sites. Additional task specific safety requirements will be covered during safety briefings.

7.0 TRAINING

7.1 General Health and Safety Training

In accordance with 29 CFR 1910.120, all construction personnel involved with the portions of the scope of work described in Section 2.0 will be briefed by the Project Manager on the potential hazards and the overall requirements in meeting the specifications of this HASP.

7.2 Manager/Supervisor Training

In accordance with 29 CFR 1910.120, on-Site management and supervisors who will be directly responsible for, or who supervise employees engaged in hazardous waste operation shall receive training as required in this HASP and at least eight (8) additional hours of specialized training on managing such operations at the time of job assignment.

7.3 Site Specific Training

Prior to commencement of field activities, all personnel assigned to the project will be provided training that will specifically address the activities, procedures, monitoring, and equipment for the site operations. It will include Site and facility layout, hazards, and emergency services at the Site, and will highlight all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

Additional training may be required for participation in certain field tasks during the course of the project. Such additional training could be in the safe operation of heavy or power tool equipment or hazard communication training.

7.4 HAZWOPER Training

All remedial personnel that will be in direct contact with the native soil/fill materials must complete an initial 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and, where necessary, a current 8-hour refresher course.

8.0 SITE CONTROL, PPE & COMMUNICATIONS

8.1 Site Control

The area where the activities of the scope of work will be performed is considered to be the Exclusion Zone (EZ). All areas where excavation and handling of contaminated materials take place are considered the EZ. This zone will be clearly delineated by cones, tape, or other means.

- Personnel are not allowed in the EZ without:
- A buddy
- Appropriate personal protective equipment (as necessary)

8.2 General

PPE Specifications

For tasks requiring Level C PPE, the following equipment shall be used:

- Cotton or disposable coveralls
- Disposable outer coveralls (Poly-coated Tyvek)
- Gloves, inner (latex)
- Gloves, outer (Nitrile)
- Boots (PVC), steel toe/shank
- Boot covers (as needed)
- Hard Hat
- Hearing protection (as needed)
- Splash suit and face shield for decontamination operations (as needed)
- For tasks requiring Level D PPE, the following equipment shall be used:
- Cotton or disposable coveralls
- Gloves, inner (latex)
- Gloves, outer (Nitrile)
- Boots (PVC) steel toe/shank
- Boot covers (as needed)
- Hard hat
- Hearing protection (as needed)
- Safety glasses
- For tasks requiring Level D PPE, the following equipment shall be used:
- Cotton or disposable coveralls
- Gloves, inner (latex)
- Gloves, outer (Nitrile)
- Boots (PVC) steel toe/shank
- Boot covers (as needed)
- Hard hat
- Hearing protection (as needed)
- Safety glasses

For tasks requiring respiratory protection, the following equipment shall be used:

Level B - An airline respirator or a self-contained breathing apparatus (SCBA)
Level C - A full-face air-purifying respirator equipped with organic vapor/pesticide-HEPA cartridges
Level D - No respiratory protective equipment necessary except for a dust mask

8.3 Communications

Communications is the ability to talk with others. While working in Level C Protection, personnel may find that communication become a more difficult task and process to accomplish. This is further complicated by distance and space. In order to address this problem, electronic instruments, mechanical devices or hand signals will be used as follows:

- Walkie-Talkies - Hand held radios would be utilized as much as possible by field teams for communication between downrange operations and the Command Post base station.
- Telephones - A mobile telephone will be located in the Command Post vehicle in the Support Zone for communication with emergency support services/facilities. If a telephone is demobilized, the nearest public phones will be identified.
- Air Horns - A member of the downrange field team will carry an air horn and another will be evident in the Support Zone to alert field personnel to an emergency situation.
- Hand Signals - Members of the field team using the buddy system will employ this communication method. Signals become especially important when in the vicinity of heavy moving equipment and when using Level B respiratory equipment. The signals shall become familiar to the entire field team before site operations commence and they will be reinforced and reviewed during site-specific training.

9.0 SAFETY CONSIDERATIONS

9.1 General

In addition to the specific requirements of this HASP, common sense should be used at all times. The general safety rules and practices below will be in effect at the Site at the discretion of the
Project Manager or other authorized personnel.

- The site will be suitably marked or barricaded as necessary to prevent unauthorized visitors but not hinder emergency services if needed.
- As needed, all open holes, trenches, and obstacles will be properly barricaded in accordance with local site requirements. These requirements will be determined by proximity to traffic ways, both pedestrian and vehicular, and site of the hole, trench, or obstacle. If holes are required to be left open during non-working hours, they will be adequately decked over or barricaded and sufficiently lighted.
- Either workers or other people will enact dust-mitigating procedures when the potential for the inhalation of dust particles is present.
- The act of smoking and/or ignition sources in the vicinity of potentially flammable or contaminated material is strictly prohibited.
- Drilling, boring, and use of cranes and drilling rigs, erection of towers, movement of vehicles and equipment and other activities will be planned and performed with consideration for the location, height, and relative position of aboveground utilities and fixtures, including signs; canopies; building and other structures and construction; and natural features such as trees, boulders, bodies of water, and terrain.
- All tools and equipment provided must be properly bonded and/or grounded. Metal buttons and zippers are prohibited on safety clothing for areas that may contain a flammable or explosive atmosphere.
- Approved and appropriate safety equipment (as specified in this HASP), such as eye protection, hard hats, foot protection, and respirators, must be worn in areas where required. In addition, eye protection must be worn when sampling soil or water that may be contaminated.
- No smoking, eating, chewing tobacco, gum chewing, or drinking will be allowed in the contaminated areas. Contaminated tools and hands must be kept away from the face.
- Personnel must use personal hygiene safe guards (washing up) at the end of the shift or as soon as possible after leaving the Site.
- Work while under the influence of intoxicants, narcotics, or controlled substances is prohibited.

9.2 Posted Signs

Posted danger signs will be used where an immediate hazard exists. Caution signs will be posted to warn against potential hazards and to caution against unsafe practices. Traffic control methods and barricades will be used as needed. Wooden stakes and flagging tape, or equally effective material will be used to demarcate all restricted areas.

Other postings may include the OSHA poster, emergency hospital route, and telephone numbers of contact personnel.

9.3 Invasive Operations

During invasive (excavation/drilling activities) operations:

- No personnel will enter any excavations for any reasons.
- All non-essential personnel will stay at least 10 feet back from the edge of the excavation and out of the swing radius of the backhoe.
- No drums or other potential sources will be sampled or removed during this phase without further additions to the HASP.
- The proximity of water, sewer, and electrical lines will be identified prior to invasive operations.
- The possibility of the presence of underground conduits or vessels containing materials under pressure will also be investigated prior to invasive operations.
- Properly-sized containment systems will be utilized and consideration of the potential volume of liquid or waste released during operations will be discussed with members of the field team to minimize the potential for spills and provide a method for collection of waste materials.
- Emergency evacuation procedures and the location of safety equipment will be established prior to start up operations.
- The use of protective clothing, especially hard hats, boots, and gloves will be required during drilling and other heavy equipment work.

10.0 DECONTAMINATION AND DISPOSAL PROCEDURES

10.1 Contamination Prevention

One of the most important aspects of decontamination is the prevention of contamination. Good contamination prevention should minimize worker exposure and help ensure valid sample results by precluding cross-contamination. Procedures for contamination avoidance include:

Personnel:
Do not walk through areas of obvious or known contamination.
Do not directly handle or touch contaminated materials.
Make sure that there are no cuts or tears on PPE.
Fasten all closures in suits; cover with tape if necessary.
Particular care should be taken to prevent any skin injuries.
Stay upwind of airborne contaminants.
Do not carry cigarettes, cosmetics, gum, etc. into contaminated areas.

Heavy Equipment:
Care should be taken to limit the amount of contamination that comes in contact with heavy equipment (tires). Dust control measures may be needed on roads inside the site boundaries.

10.2 Equipment Decontamination

Equipment used at the Site that is potentially contaminated shall be decontaminated to prevent hazardous materials from leaving the Site. All heavy equipment will be decontaminated at the decontamination pad and inspected before it leaves the Site.

The decontamination area will provide for the containment of all wastewater from the decontamination process. Respirators, airline and any other personnel equipment that comes in contact with contaminated soils shall pass through a field wash.

11.0 EMERGENCY PLAN

11.1 Emergency Plan

The potential for the development of an emergency situation is low considering the low concentrations of hazardous substances at the work site. Nevertheless, an emergency situation could occur.

All personnel, prior to the start of work, will know the emergency plan outlined in this section. The emergency plan will be available for use at all times during site work.

Various individual site characteristics will determine preliminary actions taken to assure that this emergency plan is successfully implemented in the event of a site emergency. Careful consideration must be given to the proximity of neighborhood housing or places of employment, and to the relative possibility of site fire, explosion or release of vapors or gases that could affect the surrounding community.

The Project Manager shall make contact with local fire, police, and other emergency units prior to beginning work on site. In these contacts, the Project Manager will inform the emergency units about the nature and duration of work expected to the Site and the type of contaminants and the possible health or safety effects of emergencies involving these contaminants.

At this time, the Project Manager and the emergency response units shall make the necessary arrangements to be prepared for any emergencies that could occur.
The Project Manager shall implement the contingency plan whenever conditions at the Site warrant such action.
The Project Manager will be responsible for coordination of the evacuation emergency treatment, and transportation of site personnel as necessary, and notification of emergency response units and the appropriate management staff.

11.2 Evacuation

In the event of an emergency situation, such as fire, explosion, or significant release of toxic gases, an air horn or other appropriate device will be sounded for approximately 10 second intervals indicating the initiation of evacuation procedures. All personnel will evacuate and assemble near the entrance to the site. The location shall be upwind of the Site where possible.

For efficient and safe site evacuation and assessment of the emergency situation, the Project Manager will have authority to initiate action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The SSO or designated SSO must ensure that access for emergency equipment is provided and that all combustion apparatuses have been shut down once the alarm has been sounded. Once the safety of all personnel is established, the Fire Department and other emergency response groups as necessary will be notified by telephone of the emergency.

11.3 Potential or Actual Fire or Explosion

Immediately evacuate the Site (air horn will sound for 10-second intervals), notify the local fire and police departments, and other appropriate emergency response groups if an actual fire or explosion has taken place.

11.4 Personnel Injury

Emergency first aid shall be applied on site as deemed necessary. If necessary, the individual shall be decontaminated and transported to the nearest medical facility.
The ambulance/rescue squad shall be contacted for transport as necessary in an emergency. However, since some situations may require transport of an injured party by other means, the hospital route is identified below.
A map to this facility provided with this HASP in Section

11.5 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the employer of the injured party must be immediately notified of any incident. Written confirmation of verbal reports is to be submitted within 24 hours. A standard report form entitled "Accident Data Report" is to be used for this purpose.
Any information released from the health care provider, which is not deemed confidential patient information, is to be attached to the appropriate form. Any medical information that is released by patient consent is to be filed in the individuals' medical records and treated as confidential.

12.0 SANITATION

Since sanitary sewer connection has not been established, provisions shall be made for access to sanitary systems by using nearby public facilities consistent with provisions of governing local ordinance codes. This will include the use of outside firms providing and maintaining "Porta Potties" or similar devices.

13.0 COMMUNITY AIR MONITORING PLAN

13.1 Introduction

The Community Air Monitoring Plan (CAMP) has been prepared to monitor the air quality during the intrusive activities proposed as a part of the Interim Remedial Measures (IRM) work plan activities at the property located at 32-01 57th Street, Queens, New York. Levels of VOCs and dust in the air will be monitored continuously and periodically utilizing a Photo Ionization Detector (PID) and Real-Time Particulate Dust Tracker, respectively. For this investigation, the PID will be calibrated at the beginning of each day to the compound isobutylene, which is published by the manufacturer. The PID has a minimum detection limit of 0.1 parts per million (ppm). The Dust Tracker provides real-time measurement based on 90° light scattering. The Dust Tracker has a minimum detection limit of 0.001 mg/m3.

Continuous real-time air monitoring for VOCs and particulate levels at the perimeter of the exclusion zone or work area will be performed for all ground intrusive activities. Ground intrusive activities include, but are not limited to the installation of soil vapor extraction pits and load-off of soil slated for off-site disposal.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as during the collection of soil samples. For instance, periodic monitoring
during sample collection will consist of taking a reading upon arrival at a sample location, monitoring while overturning soil, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Exceedances of action levels observed during performance of the CAMP will be reported to the NYSDEC and recorded in a field daily log. A summary of daily logs/reports will be provided in the Remedial Investigation Report (RIR).

13.2 VOCs Monitoring, Response Levels and Actions

VOCs will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using a PID, which will be calibrated at least daily for to the compound isobutylene. The PID will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

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

If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will 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.

Activities will be shut down if the organic vapor level at the perimeter of the work area is above 25 ppm.

All 15-minute readings must be recorded in a daily field log. Instantaneous readings, if any, used for decision purposes will also be recorded.

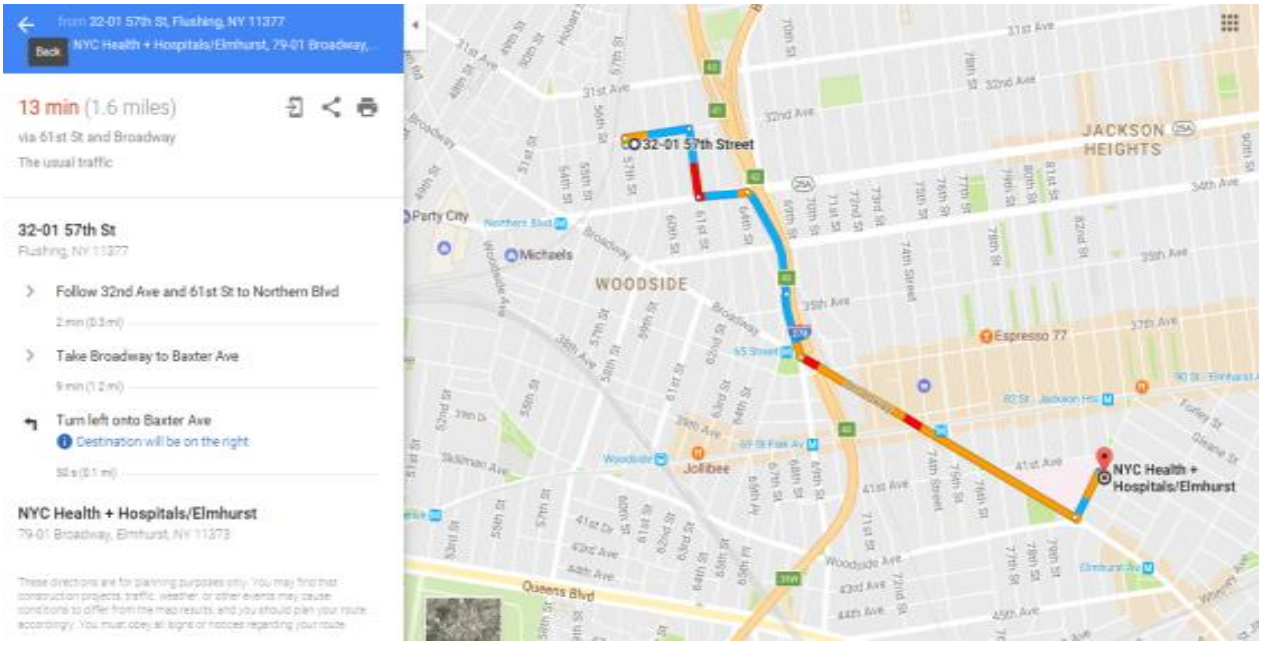
13.3 PM Monitoring, Response Levels and Actions

Particulate concentrations will be monitored continuously at the downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using a Dust Tracker 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 will 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.

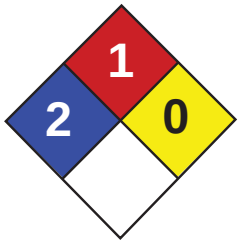
If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels are not 150 mcg/m3 or greater 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 150 mcg/m3 or greater above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will 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 readings will be recorded in a daily field log.

FIGURE 1: DIRECTIONS TO HOSPITAL



ATTACHEMENT A: SAFETY DATA SHEETS



Health	2
Fire	1
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Trichloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Trichloroethylene

Catalog Codes: SLT3310, SLT2590

CAS#: 79-01-6

RTECS: KX4560000

TSCA: TSCA 8(b) inventory: Trichloroethylene

CI#: Not available.

Synonym:

Chemical Formula: C2HCl3

Contact Information:

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

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

Order Online: ScienceLab.com

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

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

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

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Trichloroethylene	79-01-6	100

Toxicological Data on Ingredients: Trichloroethylene: ORAL (LD50): Acute: 5650 mg/kg [Rat]. 2402 mg/kg [Mouse]. DERMAL (LD50): Acute: 20001 mg/kg [Rabbit].

Section 3: Hazards Identification

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

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes ith running ater for at least 15 minutes, keeping eyelids open. Cold ater may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact ith skin, ash immediately ith plenty of ater. Gently and thoroughly ash the contaminated skin ith running ater and non-abrasive soap. e particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin ith an emollient. If irritation persists, seek medical attention. ash contaminated clothing before reusing.

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

Inhalation: Allo the victim to rest in a ell ventilated area. Seek immediate medical attention.

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

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or aistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 420 C (788 F)

Flash Points: Not available.

Flammable Limits: LO ER: 8 UPPER: 10.5

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

Fire Hazards in Presence of Various Substances: Not available.

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

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical po der. LARGE FIRE: Use ater spray, fog or foam. Do not use ater et.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb ith an inert material and put the spilled material in an appropriate aste disposal.

Large Spill:
Absorb ith an inert material and put the spilled material in an appropriate aste disposal. e careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and ith local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep a ay from heat. Keep a ay from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all e uipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/

spray. ear suitable protective clothing In case of insufficient ventilation, ear suitable respiratory e uipment If ingested, seek medical advice immediately and sho the container or the label. Avoid contact ith skin and eyes

Storage:
Keep container dry. Keep in a cool place. Ground all e uipment containing material. Carcinogenic, teratogenic or mutagenic materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors belo their respective threshold limit value. Ensure that eye ash stations and safety sho ers are proximal to the ork-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. e sure to use an approved/certified respirator or e uivalent. Gloves.

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

Exposure Limits:
T A: 50 STEL: 200 (ppm) from ACGIH (TLV) T A: 269 STEL: 1070 (mg/m3) from ACGIH Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Li uid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 131.39 g/mole

Color: Clear Colorless.

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

Boiling Point: 86.7 C (188.1 F)

Melting Point: -87.1 C (-124.8 F)

Critical Temperature: Not available.

Specific Gravity: 1.4649 (ater 1)

Vapor Pressure: 58 mm of Hg (20 C)

Vapor Density: 4.53 (Air 1)

Volatility: Not available.

Odor Threshold: 20 ppm

Water/Oil Dist. Coeff.: The product is e ually soluble in oil and ater log(oil/ ater) 0

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in ater, methanol, diethyl ether, acetone.

Solubility:
Easily soluble in methanol, diethyl ether, acetone. Very slightly soluble in cold ater.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity:
Extremely corrosive in presence of aluminum. Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 2402 mg/kg [Mouse]. Acute dermal toxicity (LD50): 20001 mg/kg [Rabbit].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract.

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

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Passes through the placental barrier in human. Detected in maternal milk in human.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

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

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Trichloroethylene : UN1710 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the follo ing ingredients for hich the State of California has found to cause cancer, birth defects or other reproductive harm, hich ould re uire a arning under the statute: Trichloroethylene California prop. 65: This product contains the follo ing ingredients for hich the State of California has found to cause cancer hich ould re uire a arning under the statute: Trichloroethylene Pennsylvania RTK: Trichloroethylene Florida: Trichloroethylene Minnesota: Trichloroethylene Massachusetts RTK: Trichloroethylene Ne ersey: Trichloroethylene TSCA 8(b) inventory: Trichloroethylene CERCLA: Hazardous substances.: Trichloroethylene

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1 : Material causing immediate and serious toxic effects (TOXIC). CLASS D-2 : Material causing other toxic effects (TOXIC).

DSCL (EEC):
R36/38- Irritating to eyes and skin. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: h

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

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. e sure to use an approved/certified respirator or e uivalent. ear appropriate respirator hen ventilation is inade uate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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Last Updated: 11/01/2010 12:00 PM

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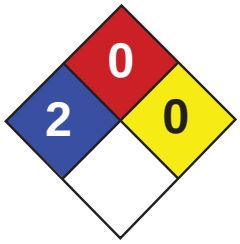


Health	2
Fire	0
Reactivity	0
Personal Protection	G

Material Safety Data Sheet
Tetrachloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Tetrachloroethylene

Catalog Codes: SLT3220

CAS#: 127-18-4

RTECS: KX3850000

TSCA: TSCA 8(b) inventory: Tetrachloroethylene

CI#: Not available.

Synonym: Perchloroethylene; 1,1,2,2-Tetrachloroethylene; Carbon bichloride; Carbon dichloride; Ankilostin; Didakene; Dilatin PT; Ethene, tetrachloro-; Ethylene tetrachloride; Perawin; Perchlor; Perclene; Perclene D; Percosolvel; Tetrachloroethene; Tetraleno; Tetralex; Tetravec; Tetroguer; Tetropil

Chemical Name: Ethylene, tetrachloro-

Chemical Formula: C2-Cl4

Contact Information:

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

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

Order Online: ScienceLab.com

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

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

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

Section 2: Composition and Information on Ingredients

Composition:

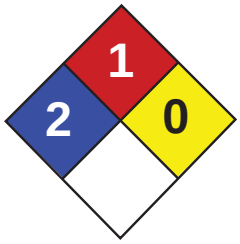
Name	CAS #	% by Weight
Tetrachloroethylene	127-18-4	100

Toxicological Data on Ingredients: Tetrachloroethylene: ORAL (LD50): Acute: 2629 mg/kg [Rat]. DERMAL (LD): Acute: >3228 mg/kg [Rabbit]. MIST(LC50): Acute: 34200 mg/m 8 hours [Rat]. VAPOR (LC50): Acute: 5200 ppm 4 hours [Mouse].

Section 3: Hazards Identification

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

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (anticipated carcinogen) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, peripheral nervous system, respiratory tract, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.



Health	2
Fire	1
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Trichloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Trichloroethylene

Catalog Codes: SLT3310, SLT2590

CAS#: 79-01-6

RTECS: KX4560000

TSCA: TSCA 8(b) inventory: Trichloroethylene

CI#: Not available.

Synonym:

Chemical Formula: C2HCl3

Contact Information:

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

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

Order Online: ScienceLab.com

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

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

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

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Trichloroethylene	79-01-6	100

Toxicological Data on Ingredients: Trichloroethylene: ORAL (LD50): Acute: 5650 mg/kg [Rat]. 2402 mg/kg [Mouse]. DERMAL (LD50): Acute: 20001 mg/kg [Rabbit].

Section 3: Hazards Identification

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

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes ith running ater for at least 15 minutes, keeping eyelids open. Cold ater may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact ith skin, ash immediately ith plenty of ater. Gently and thoroughly ash the contaminated skin ith running ater and non-abrasive soap. e particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin ith an emollient. If irritation persists, seek medical attention. ash contaminated clothing before reusing.

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

Inhalation: Allo the victim to rest in a ell ventilated area. Seek immediate medical attention.

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

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or aistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 420 C (788 F)

Flash Points: Not available.

Flammable Limits: LO ER: 8 UPPER: 10.5

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

Fire Hazards in Presence of Various Substances: Not available.

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

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical po der. LARGE FIRE: Use ater spray, fog or foam. Do not use ater et.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb ith an inert material and put the spilled material in an appropriate aste disposal.

Large Spill:
Absorb ith an inert material and put the spilled material in an appropriate aste disposal. e careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and ith local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep a ay from heat. Keep a ay from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all e uipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/

spray. ear suitable protective clothing In case of insufficient ventilation, ear suitable respiratory e uipment If ingested, seek medical advice immediately and sho the container or the label. Avoid contact ith skin and eyes

Storage:
Keep container dry. Keep in a cool place. Ground all e uipment containing material. Carcinogenic, teratogenic or mutagenic materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors belo their respective threshold limit value. Ensure that eye ash stations and safety sho ers are proximal to the ork-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. e sure to use an approved/certified respirator or e uivalent. Gloves.

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

Exposure Limits:
T A: 50 STEL: 200 (ppm) from ACGIH (TLV) T A: 269 STEL: 1070 (mg/m3) from ACGIH Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Li uid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 131.39 g/mole

Color: Clear Colorless.

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

Boiling Point: 86.7 C (188.1 F)

Melting Point: -87.1 C (-124.8 F)

Critical Temperature: Not available.

Specific Gravity: 1.4649 (ater 1)

Vapor Pressure: 58 mm of Hg (20 C)

Vapor Density: 4.53 (Air 1)

Volatility: Not available.

Odor Threshold: 20 ppm

Water/Oil Dist. Coeff.: The product is e ually soluble in oil and ater log(oil/ ater) 0

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in ater, methanol, diethyl ether, acetone.

Solubility:
Easily soluble in methanol, diethyl ether, acetone. Very slightly soluble in cold ater.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity:
Extremely corrosive in presence of aluminum. Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 2402 mg/kg [Mouse]. Acute dermal toxicity (LD50): 20001 mg/kg [Rabbit].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract.

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

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Passes through the placental barrier in human. Detected in maternal milk in human.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

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

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Trichloroethylene : UN1710 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the follo ing ingredients for hich the State of California has found to cause cancer, birth defects or other reproductive harm, hich ould re uire a arning under the statute: Trichloroethylene California prop. 65: This product contains the follo ing ingredients for hich the State of California has found to cause cancer hich ould re uire a arning under the statute: Trichloroethylene Pennsylvania RTK: Trichloroethylene Florida: Trichloroethylene Minnesota: Trichloroethylene Massachusetts RTK: Trichloroethylene Ne ersey: Trichloroethylene TSCA 8(b) inventory: Trichloroethylene CERCLA: Hazardous substances.: Trichloroethylene

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1 : Material causing immediate and serious toxic effects (TOXIC). CLASS D-2 : Material causing other toxic effects (TOXIC).

DSCL (EEC):
R36/38- Irritating to eyes and skin. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: h

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

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. e sure to use an approved/certified respirator or e uivalent. ear appropriate respirator hen ventilation is inade uate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:54 PM

Last Updated: 11/01/2010 12:00 PM

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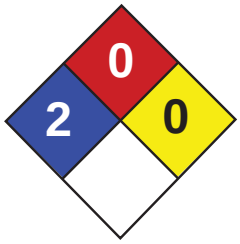

Health	2
Fire	0
Reactivity	0
Personal Protection	G

Material Safety Data Sheet
Tetrachloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Tetrachloroethylene

Catalog Codes: SLT3220

CAS#: 127-18-4

RTECS: KX3850000

TSCA: TSCA 8(b) inventory: Tetrachloroethylene

CI#: Not available.

Synonym: Perchloroethylene; 1,1,2,2-Tetrachloroethylene; Carbon bichloride; Carbon dichloride; Ankilostin; Didakene; Dilatin PT; Ethene, tetrachloro-; Ethylene tetrachloride; Perawin; Perchlor; Perclene; Perclene D; Percosolvel; Tetrachloroethene; Tetraleno; Tetralex; Tetravec; Tetroguer; Tetropil

Chemical Name: Ethylene, tetrachloro-

Chemical Formula: C2-Cl4

Contact Information:

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

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

Order Online: ScienceLab.com

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

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

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

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Tetrachloroethylene	127-18-4	100

Toxicological Data on Ingredients: Tetrachloroethylene: ORAL (LD50): Acute: 2629 mg/kg [Rat]. DERMAL (LD): Acute: >3228 mg/kg [Rabbit]. MIST(LC50): Acute: 34200 mg/m 8 hours [Rat]. VAPOR (LC50): Acute: 5200 ppm 4 hours [Mouse].

Section 3: Hazards Identification

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

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (anticipated carcinogen) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, peripheral nervous system, respiratory tract, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. ash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

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

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

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

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

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

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

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

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

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. e careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with skin. ear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory e uipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protection:
Safety glasses. Lab coat. Vapor respirator. e sure to use an approved/certified respirator or e uivalent. Gloves.

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

Exposure Limits:
T A: 25 (ppm) from OSHA (PEL) [United States] T A: 25 STEL: 100 (ppm) from ACGIH (TLV) [United States] T A: 170 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Li uid.

Odor: Ethereal.

Taste: Not available.

Molecular Weight: 165.83 g/mole

Color: Clear Colorless.

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

Boiling Point: 121.3 C (250.3 F)

Melting Point: -22.3 C (-8.1 F)

Critical Temperature: 347.1 C (656.8 F)

Specific Gravity: 1.6227 (ater 1)

Vapor Pressure: 1.7 kPa (20 C)

Vapor Density: 5.7 (Air 1)

Volatility: Not available.

Odor Threshold: 5 - 50 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) 3.4

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Miscible with alcohol, ether, chloroform, benzene, hexane. It dissolves in most of the fixed and volatile oils. Solubility in water: 0.015 g/100 ml 25 deg. C It slowly decomposes in water to yield Trichloroacetic and Hydrochloric acids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Oxidized by strong oxidizing agents. Incompatible with sodium hydroxide, finely divided or powdered metals such as zinc, aluminum, magnesium, potassium, chemically active metals such as lithium, beryllium , barium. Protect from light.

Special Remarks on Corrosivity: Slowly corrodes aluminum, iron, and zinc.

Polymerization: ill not occur.

Section 11: Toxicological Information

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

Toxicity to Animals:
ARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE ASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2629 mg/kg [Rat]. Acute dermal toxicity (LD50): 3228 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5200 4 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (Some evidence.) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, liver, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS).

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

Special Remarks on Toxicity to Animals:
Lowest Publishe Lethal Dose/Conc: LDL [Rabbit] - Route: Oral; Dose: 5000 mg/kg LDL [Dog] - Route: Oral; Dose: 4000 mg/kg LDL [Cat] - Route: Oral; Dose: 4000 mg/kg

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects(teratogenic). May affect genetic material (mutagenic). May cause cancer.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation with possible dermal blistering or burns. Symtoms may include redness, itching, pain, and possible dermal blistering or burns. It may be absorbed through the skin with possible systemic effects. A single prolonged skin exposure is not likely to result in the material being absorbed in harmful amounts. Eyes: Contact causes transient eye irritation, lacrimation. Vapors cause eye/con unctival irritation. Symptoms may include redness and pain. Inhalation: The main route to occupational exposure is by inhalation since it is readily absorbed through the lungs. It causes respiratory tract irritation, . It can affect behavior/central nervous system (CNS depressant and anesthesia ranging from slight inebriation to death, vertigo, somnolence, anxiety, headache, excitement, hallucinations, muscle incoordination, dizziness, lightheadness, disorentiation, seizures, enotional instability, stupor, coma). It may cause pulmonary edema Ingestion: It can cause nausea, vomiting, anorexia, diarrhea, bloody stool. It may affect the liver, urinary system (proteinuria, hematuria, renal failure, renal tubular disorder), heart (arrhythmias). It may affect behavior/central nervous system with symptoms similar to that of inhalation. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may result in excessive drying of the skin, and irritation. Ingestion/Inhalation: Chronic exposure can affect the liver(hepatitis,fatty liver degeneration), kidneys, spleen, and heart (irregular heartbeat/arrhythmias, cardiomyopathy, abnormal EEG), brain, behavior/ central nervous system/peripheral nervous system (impaired memory, numbness of extremeties, peripheral neuropathy and other

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 18.4 mg/l 96 hours [Fish (Fatthead Minnow)]. 18 mg/l 48 hours [Daphnia (daphnia)]. 5 mg/l 96 hours [Fish (Rainbow Trout)]. 13 mg/l 96 hours [Fish (luegill sunfish)].

BOD5 and COD: Not available.

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

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

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

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

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Tetrachloroethylene UNNA: 1897 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would re uire a warning under the statute: Tetrachloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would re uire a warning under the statute: Tetrachloroethylene Connecticut hazardous material survey.: Tetrachloroethylene Illinois toxic substances disclosure to employee act: Tetrachloroethylene Illinois chemical safety act: Tetrachloroethylene New York release reporting list: Tetrachloroethylene Rhode Island RTK hazardous substances: Tetrachloroethylene Pennsylvania RTK: Tetrachloroethylene Minnesota: Tetrachloroethylene Michigan critical material: Tetrachloroethylene Massachusetts RTK: Tetrachloroethylene Massachusetts spill list: Tetrachloroethylene New ersey: Tetrachloroethylene New ersey spill list: Tetrachloroethylene Louisiana spill reporting: Tetrachloroethylene California Director s List of Hazardous Substances: Tetrachloroethylene TSCA 8(b) inventory: Tetrachloroethylene TSCA 8(d) H and S data reporting: Tetrachloroethylene: Effective date: 6/1/87; Sunset date: 6/1/97 SARA 313 toxic chemical notification and release reporting: Tetrachloroethylene CERCLA: Hazardous substances.: Tetrachloroethylene: 100 lbs. (45.36 kg)

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

Other Classifications:

WHMIS (Canada):
CLASS D-1 : Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R40- Possible risks of irreversible effects. R51/53- Toxic to a uatic organisms, may cause long-term adverse effects in the a uatic environment. S23- Do not breathe gas/fumes/vapour/spray S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37- ear suitable gloves. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: g

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

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. e sure to use an approved/certified respirator or e uivalent. ear appropriate respirator when ventilation is inade uate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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APPENDIX B – SOIL MANAGEMENT PLAN

SOIL MANAGEMENT PLAN

Prepared For:

Tibetan Community of New York and New Jersey

32-01 57th Street

Block 1159; Lot 1

Queens, New York

Site Number: 241197

Prepared By:

HAKS Engineers, Architects and Land Surveyors DPC

40 Wall Street, 9th Floor

New York, NY 10005

Prepared On:

18 May, 2017

TABLE OF CONTENTS

1.0 INTRODUCTION

This Soil Management Plan (SMP) has been prepared to provide procedures to guide soil management during excavation work related to dry well installation and any other work requiring subsurface material excavation, at the site located at 32-01 57th Street, Woodside NY.

This SMP is part of the Interim Remedial Measures Work Plan prepared on behalf of Tibetan Community of New York and New Jersey to document proposed interim remedial measures (IRM).

1.1 Site Description

The Site is located in the Woodside section in Queens, New York and is identified as Block 1159 and Lot 1 on the New York City Tax Map. The Site is 20,000-square feet and is bounded by 57th Street to the west, a 58th Street to the east, Woodside Towing to the south and 32nd Avenue to the north. Currently, the Site consists of a renovated one-story brick building surrounded by a paved yard, to be potentially used as parking lot.

1.2 History

This Interim Remedial Measures Work Plan has been prepared on behalf of Tibetan Community of New York and New Jersey (the "Tibetan Community") to document proposed Interim Remedial Measures (IRM) for the property located at 32-01 57th Street in Queens, New York, (the "Site") to address vapor concerns.

In October 2011, prior to the Tibetan Community's ownership of the Site, a Phase II Environmental Site Investigation (ESI) was prepared by AKRF, Inc. The results of the investigation indicated detections of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. Soil vapor results indicated VOC detections above the New York State Department of Health (NYSDOH) guidance for tetrachloroethene (PCE) and trichloroethene (TCE) in seven (7) boring locations. Since this ESI was performed for a prospective purchaser not associated with the Tibetan Community or the prior owner of the Site, this ESI was not reasonably available to the public or the Tibetan Community prior to its purchase of the Site.

Prior to the Tibetan Community's purchase of the Site, it retained Airtek Environmental Corporation (Airtek) to perform a Phase I Environmental Site Assessment (ESA) of the Site. In March of 2012, Airtek performed an ESA of the Site, which identified the following recognized environmental conditions (RECs):

- Fuel Oil Underground Storage Tank – 1,080 Gallon. Installed 1968, Closed in Place in 1994.
- Fuel Oil Underground Storage Tank – 3,000 Gallon. Associated with NYSDEC Spill Case #0307705. No direct evidence tank leak but failed tightness testing in

2003. Spill case closed in 2004 after tank subsequently passed tightness test.

- Subject Property – 1950, 1962 – Subject Property identified as Akron Hardware Manufacturing Corporation and Forgecraft Products, Inc Hardware Manufacturing.
- Neighborhood has significant industrial uses surrounding Subject Property. Most of these were identified as REC's by Airtek, from uses related to oil storage, automotive repair, manufacturing, sheet metal works, etc.

Airtek also prepared a Phase II Subsurface Investigation Report in May of 2012. The subsurface investigation involved advancement of three soil borings in the parking lot portion of the Site. Groundwater was not encountered up to a depth of 25 feet below ground surface (bgs). Overall findings for this investigation indicated no petroleum odor or staining in the soil cores and no samples exceeding CP-51 for VOCs, SVOCs, pesticides, and PCBs. However, slight metals exceedances were noted. Similar to the results of the Phase II conducted in 2011, the soil borings were typical of historic urban fill.

2.0 OBJECTIVES

This SMP provides procedures for the effective handling of soil during Site excavation, confirmation sampling, and backfilling activities. This SMP will provide guidance and procedures to control the exposure of Site workers and the general public to dust, vapors, and/or odors associated with these operations.

The proposed excavation plan includes 50 cubic yards of soil removal in the parking lot area adjacent to the main building to install a concrete dry well that will serve for storm water retention purposes and four smaller excavations (2 ft x 2 ft x 4 ft) in the existing slab at the basement level to install 4 sub-slab depressurization (SSDS) pits (SSDS-1 to SSDS-4) as part of sub-slab depressurization system (SSDS). Any subsurface soil excavation will also be governed by this SMP.

Once the proposed excavation is completed, the bottom and sides of the excavation shall be screened with a photo-ionization detector.
A confirmatory sampling round will be collected, if warranted, based on elevated PID readings and/or olfactory or visual observation of contamination. All material removed from site will be subject to waste characterization.

If undocumented stained and/or odorous soil or other unregulated features are discovered at the Site will be assessed or mitigated using on-site equipment. As a result, the excavation boundaries might be extended past the anticipated limits to ensure the extent of impact has been reached. Confirmation samples will be collected, if warranted based on PID readings and/or olfactory or visual observation of contamination.

The confirmatory soil sampling shall include one sample from the surface of each wall and one bottom sample. The samples are to be analyzed for VOCs. All sampling shall be analyzed by an approved laboratory. Samples will be logged and transported to a laboratory under chain of custody for analysis.

All excavated material will be characterized in compliance with NYS DEC DER-10, the disposal site required analysis and shall include the toxicity characteristic leaching procedure (TCLP) analysis. All excavated soil shall be stockpiled and properly covered if there is no live loading. The soil will be disposed of approved offsite facility upon the waste characterization analysis results.

3.0 SITE WORKER PREPARATION ACTIVITIES

Site worker preparation activities will be conducted to minimize down time and interruptions of on-site activities if unknown environmental features are encountered. These preparation activities are intended to identify health and safety issues, and prepare and coordinate Site individuals with their respective responsibilities.

3.1 Health and Safety Plan

HAKS has prepared a HASP to protect workers and subcontractors from chemical hazards that might be encountered. Field personnel will review and sign the HASP prior to commencing field activities. A copy of the HASP will be provided and present onsite at all times. Appendix B of the IRM WP document provides a copy of the HASP and NYSDOH CAMP.

3.2 Air Monitoring

The air-monitoring program will include sufficient monitoring of air quality in work zones and other on-site areas to assess levels of employee exposure, determine that the work zone designations are valid, and verify that the respiratory protection being worn by personnel is adequate. The air-monitoring program is also designed to ensure that contaminants are not migrating off site to minimize exposure of nearby populations and/or workers. Air monitoring will be conducted at 15 minute intervals, unless it is determined that air monitoring may occur at less frequent intervals. These less frequent intervals would be the result of ambient air movement (wind) or through the reduction of the air threat through verification monitoring. Such changes to plan will be logged.

Monitoring will be conducted:

- When work begins on a different portion of the site.
- When contaminants other than those previously identified are being handled.
- When a different type of operation is initiated.
- If a sufficient reasonable interval has passed so that exposures may have significantly increased.
- Measurements will be taken at the anticipated source and in the breathing zone of site personnel.

Instruments will only be used by employees who have been trained in the proper operation, use limitation, and calibration of the monitoring instrument and who have demonstrated the skills necessary to operate the instrument.

3.3 Dust and Odor Control Measures

The field coordinator will monitor excavation operations for fugitive dust and direct the general contractor to take measures, as necessary, such as the application of water or a change in operations or equipment in order reduce the potential of dust leaving the Site. Water for dust control will be applied at a rate that prevents runoff and discharge to the storm drain.

4.0 SOIL MANAGEMENT ACTIVITIES

4.1 Stockpiling and Staging of Waste Materials

Stockpile management includes measures to minimize erosion and sediment transport from soil stockpiles. Stockpile management should be used when soils or other erodible materials are stored at the construction site.

Locate stockpiles away from all drainage system components including storm sewer inlets. Where practical, choose stockpile locations that that will remain undisturbed for the longest period of time as the phases of construction progress. Place sediment control around the perimeter of the stockpile, such as sediment control logs, rock socks, silt fence, straw bales and sand bags.

Stockpiling and staging of waste materials will be performed as follows:

- All excavated materials that are not direct loaded are to be stored within a staging area.
- Wastes being stored in the staging area will be kept covered and protected from the weather at all times except for actual loading and unloading. Stockpiles will be managed in a manner so as to minimize the generation of dust and odors.
- The staging areas will be lined with 6 mil, minimum, poly sheeting. All staged materials will be promptly tarped to prevent dust migration and infiltration of stormwater.
- Waste materials may also be bulked and stored in containers or drums to facilitate Waste transportation. Containers will be lined, covered, and sealed.
- All hazardous waste materials temporarily stockpiled on site, as determined through waste characterization sampling, must be properly labeled identifying the type of waste being stored and date of generation.
- During project closeout, the staging areas will be disassembled and all materials and equipment either properly cleaned/decontaminated and/or disposed of.

4.2 Waste Characterization

Waste characterization sampling will be performed on the stockpile using composite or grab sampling techniques. Waste characterization will be performed as follows:

- The Contractor will characterize the waste material for proper transport, recycling or disposal in accordance with all applicable federal, state and local laws, orders, rules and regulations. The Contractor will also obtain approvals from the disposal facilities for the various waste streams prior to mobilization.

- The Contractor will conduct all analytical testing necessary to properly characterize the waste in order to obtain approval from the recycling and disposal facilities.

- Sampling of stockpiled soils for Waste Classification:

    - Contractor will collect samples of stockpiled soil for waste characterization analysis to properly classify the soil for off-site disposal. Soil sampling will be analyzed for the parameters specified by the disposal facility.

    - Samples will be logged and transported to a laboratory under chain of custody for analysis in accordance with approved disposal site acceptance criteria.

- The Contractor will contract with approved, certified, eligible disposal facilities for the disposal of all remedial related waste streams, in compliance with all applicable Federal, state and local requirements. The disposal facility must be able to accept waste at a rate that would not limit the rate at which the Contractor can excavate and transport the material to the facility. The Contractor must submit the name of the chosen landfill with all pertinent information and certifications for review and approval before the work begins

- The Contractor may use more than one disposal facility to dispose of the remedial waste materials so long as each are approved, certified, eligible disposal facilities.

4.3 Loading and Transporting of Material

The Contractor responsible for loading and transport of excavated soil will comply with the following:

- The Contractor will carefully load the transport vehicles to insure there is no spillage. All transport vehicles will be properly lined prior to loading.

- Excavated materials should be neither in a liquid state, nor exhibiting any free water, when they are placed in hauling equipment. Excavated materials not

meeting the above criteria should be dewatered to an acceptable level prior to transport off-site.

- The Contractor is responsible for ensuring that all loaded vehicles are within DOT weight restriction limits.

- Prior to off-site transport, vehicles will be decontaminated. After decontamination, while the vehicle is on the decontamination pad, the Contractor will inspect the vehicle, and cover the load as required by the regulations.

- All vehicles hauling wastes from the site will be inspected prior to leaving the site. No vehicle that is dripping or leaking any quantity of material will be allowed to leave the site. Vehicles transporting soils will be lined and securely covered. Contractor will be responsible for ensuring that no vehicle is dripping or leaking any quantity of materials even after vehicle leaves the site.

- All vehicles leaving the site will be inspected to ensure that no excess soil adheres to its wheels or undercarriage. All excess soil and waste material detected will be removed at the decontamination area. Contractor will be responsible for ensuring no excess soils adhered to its wheel or undercarriage even after vehicle leaves the site.

- A waste manifest will be prepared for all loads taken off-site. The Contractor will complete the track and waste shipment manifest required by the NYSDEC, RCRA and the state where the treatment/disposal facility is located.

- The Contractor will provide a load receipt for each waste load taken off-site to include the empty weight of the truck, the estimated loaded weight of each truck upon leaving the site, and the loaded weight of the truck upon arrival at the off-site facility.

- Each truck carrying materials off-site will be covered with tarpaulin, free of rips or tears.

Disposal facility records will be maintained as follows:

- Each truck will be weighed once it arrives at the disposal facility. After removal of the waste material, the empty truck will again be weighed at the disposal facility. The disposal facility will complete the manifest or bill of lading and mail all copies to the appropriate regulatory agencies.

4.4 Disposal Facilities

- The facility must have all applicable permits required by federal, state and local agencies to operate and permitted to accept the type of waste material to be shipped from the Project Site.
- The facility must not have any significant violations or other environmental conditions.
- The facility must be approved by the Engineer prior to use.

APPENDIX C – SPECIFICATION CUT SHEETS OF VENTILATION FAN AND RELATED COMPONENTS

RadonAway®
The world's leading radon fan manufacturer

RP Series

Radon Mitigation Fan

All RadonAway® fans are specifically designed for radon mitigation. RP Series Fans provide superb performance, run ultra-quiet and are attractive. They are ideal for most sub-slab radon mitigation systems.

Features

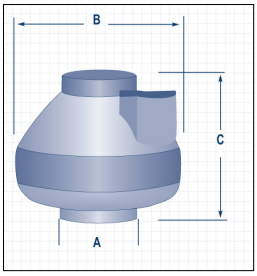
- Energy efficient
- Ultra-quiet operation
- Meets all electrical code requirements
- Water-hardened motorized impeller
- Seams sealed to inhibit radon leakage (RP140 & RP145 double snap sealed)
- ETL Listed - for indoor or outdoor use
- Thermally protected motor
- Rated for commercial and residential use

MODEL	P/N	FAN DUCT DIAMETER	WATTS	MAX. PRESSURE"WC	TYPICAL CFM vs. STATIC PRESSURE WC				
					0"	.5"	1.0"	1.5"	2.0"
RP140	23029-1	4"	15-21	0.8	135	70	-	-	-
RP145	23030-1	4"	41-72	2.1	166	126	82	41	3
RP260	23032-1	6"	50-75	1.6	272	176	89	13	-
RP265	23033-1	6"	91-129	2.3	334	247	176	116	52
RP380	28208	8"	95-152	2.3	497	353	220	130	38

Made in USA with US and imported parts

ETL Listed

All RadonAway inline radon fans are covered by our 5-year, hassle-free warranty



Model	A	B	C
RP140	4.5"	9.7"	8.5"
RP145	4.5"	9.7"	8.5"
RP260	6"	11.75"	8.6"
RP265	6"	11.75"	8.6"
RP380	8"	13.41"	10.53"

For Further Information Contact

8/15
P/N 02008

RadonAway®

The World's Leading
Radon Fan Manufacturer



RP Series

Installation & Operating Instructions

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

P/N IN020-REV R 08/15

RadonAway Ward Hill, MA.

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!** WARNING! For General Ventilating Use Only. Do Not Use to Exhaust Hazardous, Corrosive or Explosive Materials, Gases or Vapors. See Vapor Intrusion Application Note #AN001 for important information on VI applications. RadonAway.com/vapor-intrusion
2. **WARNING!** NOTE: Fan is suitable for use with solid state speed controls however use of speed controls is not generally recommended.
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. **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.
7. **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.

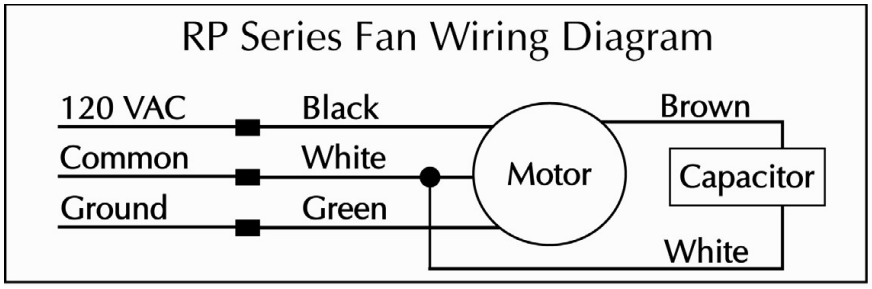
   c) Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire rated construction.

   d) Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent back drafting. Follow the heating equipment manufacturers guideline and safety standards such as those published by the National Fire Protection Association, and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.

   e) When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.

   f) Ducted fans must always be vented to outdoors.

   g) If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application and be connected to a GFCI (Ground Fault Circuit Interrupter) - protected branch circuit.



RP Series

RP140	**p/n 23029-1**
RP145	**p/n 23030-1**
RP260	**p/n 23032-1**
RP265	**p/n 23033-1**
RP380	**p/n 28208**

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1. INTRODUCTION

The RP Series Radon Fans are intended for use by trained, professional, certified/licensed Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of an RP 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. FAN SEALING

The RP Series Fans are factory sealed, no additional caulk or other materials are required to inhibit air leakage.

1.3. ENVIRONMENTALS

The RP Series Fans are 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 fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F.

1.4. ACOUSTICS

The RP Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

(To ensure quiet operation of ENERGY STAR qualified in-line and remote fans, each fan shall be installed using sound attenuation techniques appropriate for the installation. For bathroom and general ventilation applications, at least 8 feet of insulated flexible duct shall be installed between the exhaust or supply grille(s) and the fan). RP Series fans are not suitable for kitchen range hood remote ventilation applications.

1.5. GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes thus blocking air flow to the RP Series Fan. The lack of cooling air may result in the 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 fan be turned off until the water recedes allowing for return to normal operation.

1.6. SLAB COVERAGE

The RP Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the RP Series Fan best suited for the sub-slab material can improve the slab coverage. The RP140/145/155 are best suited for general purpose use. The RP260 can be used where additional airflow is required and the RP265/380 is best suited for large slab, high airflow applications. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.7. CONDENSATION & DRAINAGE

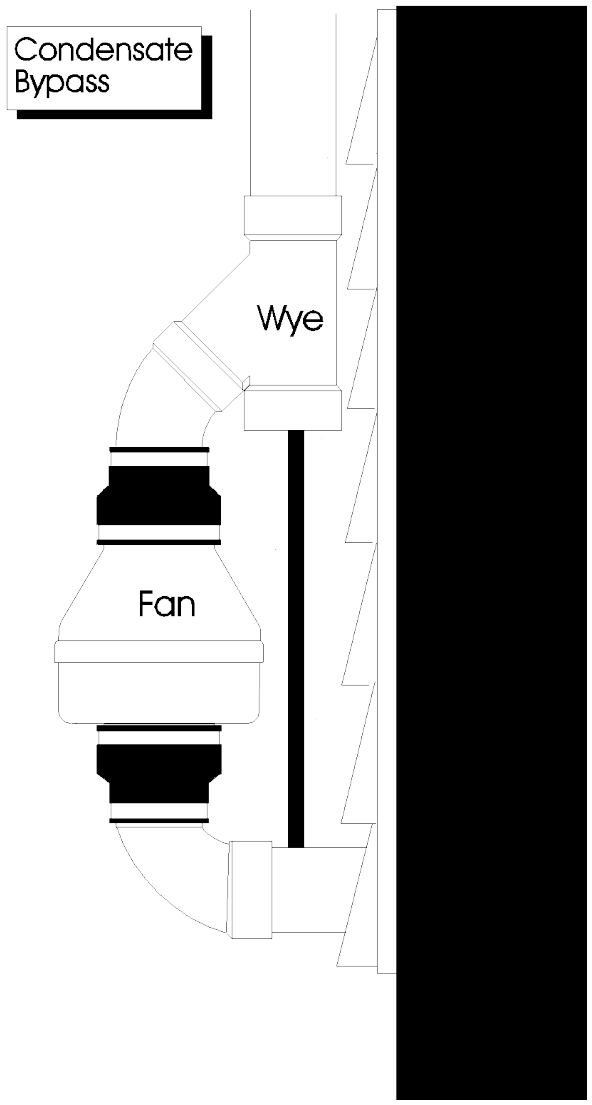
Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The RP Series Fan **MUST** be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The RP Series Fans are **NOT** suitable for underground burial.

For RP Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

Pipe Dia.	Minimum Rise per Ft of Run*				
	@25 CFM	@50 CFM	@100 CFM	@200 CFM	@300 CFM
6"	-	3/16	1/4	3/8	3/4
4"	1/8	1/4	3/8	2 3/8	-
3"	1/4	3/8	1 1/2	-	-

*Typical RP1xx/2xx Series Fan operational flow rate is 25 - 90 CFM 0n 3" and 4" pipe. (For more precision, determine flow rate by measuring Static Pressure, in WC, and correlate pressure to flow in the performance chart in the addendum.)

Under some circumstances in an outdoor installation a condensate bypass should be installed in the outlet ducting as shown. This may be particularly true in cold climate installations which require long lengths of outlet ducting or where the outlet ducting is likely to produce large amounts of condensation because of high soil moisture or outlet duct material. Schedule 20 piping and other thin-walled plastic ducting and Aluminum downspout will normally produce much more condensation than Schedule 40 piping. Schedule 40 piping is preferred for radon mitigation, all joints should fully sealed using the appropriate pipe cement on socket type fittings or flexible coupling firmly attached via worm drive screw clamps. Sealing ducting or pipe with duct tape is not acceptable on radon mitigation installations. No pipe penetrations are permitted, other than the condensation bypass. Silicon caulk is permitted for sealing purposes.



The bypass is constructed with a 45 degree Wye fitting at the bottom of the outlet stack. The bottom of the Wye is capped and fitted with a tube that connects to the inlet piping or other drain. The condensation produced in the outlet stack is collected in the Wye fitting and drained through the bypass tube. The bypass tubing may be insulated to prevent freezing.

1.8. SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50017) or audible alarm (P/N 28001-2) is required to notify the occupants of a fan system malfunction. A System Label (provided with Manometer P/N 50017) 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.

1.9. VENTILATION

If used as a ventilation Fan any type of ducting is acceptable, however, flexible nonmetallic ducting is recommended for easy installation and quieter operation. Insulated flexible ducting is highly recommended in cold climates to prevent the warm bathroom air from forming condensation in the ducting where it is exposed to colder attic air. The outlet of the fan should always be ducted to the outside. Avoid venting the outlet of the fan directly into an attic area. The excess moisture from the bathroom can cause damage to building structure and any items stored in the attic. Multiple venting points may be connected together using a "T" or "Y" fitting. Ideally Duct should be arranged such that equal duct lengths are used between intake and "T" or "Y" fitting, this will result in equal flow rates in each intake branch. If adjustable intake grilles are used on multi-intake systems then the opening on each grill should be equal in order to minimize noise and resistance. Straight smooth runs of rigid metal ducting will present the least resistance and maximize system performance. The Equivalent Length of Rigid Metal Ducting resulting in .2" WC pressure loss for each Fan Model is provided in the specification section of these Instructions. Flexible ducting, if used, must always be as close to being fully extended as possible. Formed rigid metal duct elbows will present the least resistance and maximize system performance, recommended bend radius of elbow is at least 1.5 x duct diameter.

RP Series fans are not suitable for kitchen range hood remote ventilation applications. For quietest performance, the fan should be mounted further away from the inlet duct, near the outside vent. A minimum distance of 8 feet is recommended between the fan or T/Y of a multi-intake system and intake grille(s).

Backdraft dampers allow airflow in only one direction preventing cold/hot drafts from entering the vented area and minimize possible condensation and icing within the system while the fan is not operating. Backdraft dampers are highly recommended at each intake grille for bathroom ventilation in all cold climate installations. Installation instructions are included with Spruce backdraft dampers.

The ducting from this fan to the outside of the building has a strong effect on the airflow, noise and energy use of the fan. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated airflow.

1.10. ELECTRICAL WIRING

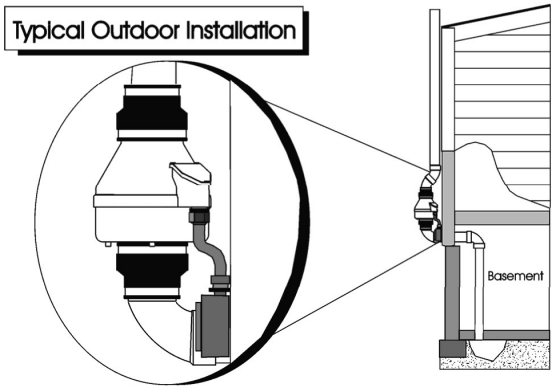
The RP Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must 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 sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.11. SPEED CONTROLS

The RP Series Fans are rated for use with electronic speed controls, however, they are generally not recommended. If used, the recommended speed control is Pass & Seymour Solid State Speed Control Cat. No. 94601-I.

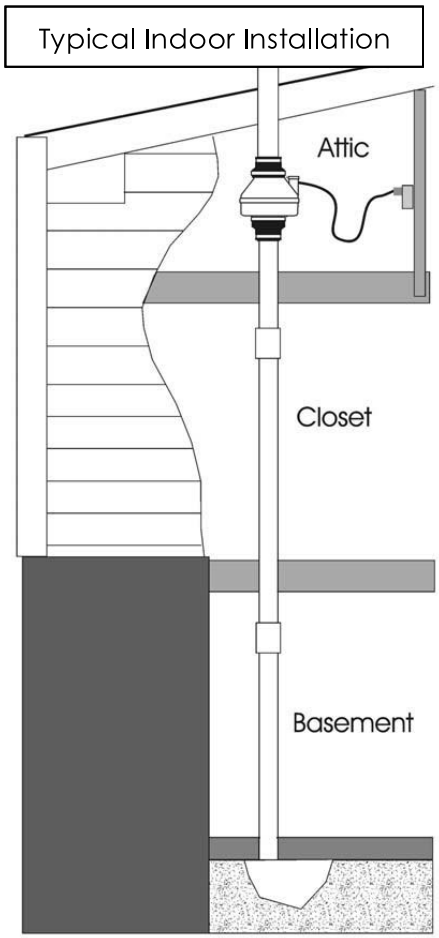
2.0 INSTALLATION

The RP Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The RP Series Fan may be mounted directly on the system piping or fastened to a supporting structure by means of optional mounting bracket



2.1 MOUNTING

Mount the RP Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.



2.2 MOUNTING BRACKET (optional)

The RP Series Fan may be optionally secured with the RadonAway P/N 25007 (25033 for RP385) mounting bracket. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as means of disconnect for servicing the unit and vibration isolation. Used as a Radon Fan the fan is typically outside of the building thermal boundary, and is venting to the outside, installation of insulation around the fan is not required. If used as a ventilation fan insulation may be installed around the fan and duct work, insulation should be sized appropriately for the duct size used and secured with duct tape.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.10). Note that the fan is not intended for connection to rigid metal conduit.

Fan Wire	Connection
Green	Ground
Black	AC Hot
White	AC Common

2.5 VENT MUFFLER (optional)

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

2.6 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

_____**Verify** all connections are tight and **leak-free**.

_____**Insure** the RP Series Fan and all ducting is secure and vibration-free.

_____**Verify** system vacuum pressure with manometer. **Insure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.

(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 Feet.)
(Further reduce Maximum Operating Pressure by 10% for High Temperature environments)
See Product Specifications. If this is exceeded, increase the number of suction points.

_____**Verify Radon levels by testing to EPA protocol.**

RP SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the RP Series Fan:

Typical CFM Vs Static Pressure "WC									
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
RP140	135	103	70	14	-	-	-	-	-
RP145	166	146	126	104	82	61	41	21	3
RP260	272	220	176	138	103	57	13	-	-
RP265	334	291	247	210	176	142	116	87	52
RP380*	497	401	353	281	220	176	130	80	38

* Tested with 6" inlet and discharge pipe.

Power Consumption 120 VAC, 60Hz 1.5 Amp Maximum		Maximum Recommended Operating Pressure* (Sea Level Operation)**	
RP140	17 - 21 watts	RP140	0.8" W.C.
RP145	41 - 72 watts	RP145	1.7" W.C.
RP260	52 - 72 watts	RP260	1.5" W.C.
RP265	91 - 129 watts	RP265	2.2" W.C.
RP380	95 - 152 watts	RP380	2.0" W.C.

**Reduce by 10% for High Temperature Operation*
***Reduce by 4% per 1000 feet of altitude*

	Size	Weight	Inlet/Outlet	L.2
RP140	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)	25
RP145	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)	15
RP260	8.6H" x 11.75" Dia.	5.5 lbs.	6.0" OD	48
RP265	8.6H" x 11.75" Dia.	6.5 lbs.	6.0" OD	30
RP380	10.53H" x 13.41" Dia.	11.5 lbs.	8.0" OD	57

L.2 = Estimated Equivalent Length of Rigid Metal Ducting resulting in .2in WC pressure loss for Duct Size listed. Longer Equivalent Lengths can be accommodated at Flows Lower than that at .2in WC pressure loss (see CFM Vs Static Pressure "WC Table).

Recommended ducting: 3" or 4" RP1xx/2xx, 6" RP380, Schedule 20/40 PVC Pipe

Mounting: If used for Ventilation use 4", 6" or 8" Rigid or Flexible Ducting

Mount on the duct pipe or with optional mounting bracket.

Storage temperature range: 32 - 100 degrees F.

Normal operating temperature range: -20 - 120 degrees F.

Maximum inlet air temperature: 80 degrees F.

Continuous Duty

Class F Insulation [RP140 Class B]

Class B Insulation

Thermally Protected

3000 RPM

Rated for Indoor or Outdoor Use

LISTED
Electric Fan

Intertek
77728

Conforms to
UL STD. 507

Certified to
CAN/CSA STD.
C22.2 No.113

ENERGY STAR
RP140 Only

TESTED/CERTIFIED
2100
Home Ventilating Institute

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the GP/XP/XR/RP/SF 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 GP/XP/XR/RP/SF 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

RadonAway® warrants that the GPX01/XP/XR/RP/SF Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 90 days from the date of purchase (the "Warranty Term").

RadonAway® will replace any Fan which fails due to defects in materials or workmanship during the Warranty Term. The Fan must be returned (at Owner's cost) to the RadonAway® factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. 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 cover damage in shipment unless the damage is due to the negligence of RadonAway®.

5 YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway® will extend the Warranty Term of the fan to five (5) years from date of purchase or sixty-three (63) months from the date of manufacture, whichever is sooner, if the Fan is installed in a professionally designed and professionally installed active soil depressurization system or installed as a replacement fan in a professionally designed and professionally installed active soil depressurization system by a qualified installer. Proof of purchase and/or proof of professional installation may be required for service under this warranty. Outside the Continental United States and Canada the extended Warranty Term is limited to one (1) year from the date of manufacture.

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

LIMITATION OF WARRANTY

EXCEPT AS STATED ABOVE, THE GPx01/XP/XR/RP 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 costs, including insurance, to and from factory.

RadonAway® 3 Saber Way
Ward Hill, MA 01835 USA TEL (978) 521-3703
FAX (978) 521-3964
Email to: Returns@RadonAway.com

Record the following information for your records:

Serial No._____
Purchase Date_____