Sub-Slab Depressurization Work Plan

for the Atlas Graphics Site

567 Main Street
Westbury, Nassau County, New York

Site # 130043B

Prepared for:

H.D.P Printing Industries Corporation
2459 Broadmoor Lane
Spring Hill, Florida 34606

Prepared by:

Tyll Engineering and Consulting, PC
169 Commack Road, Suite 173
Commack, New York 11725

January 2023

TYLL ENGINEERING & CONSULTING PC

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1.0 INTRODUCTION

Tyll Engineering and Consulting, PC (TEC) has prepared this Sub-Slab Depressurization Work Plan (SSDWP) for the Atlas Graphics Site on behalf of H.D.P. Printing Industries Corp. to detail the scope of work for the installation of an active sub-slab depressurization system (SSDS) beneath the existing building located at 567 Main Street, Westbury, New York (Site). The Site location map is provided as **Figure 1**.

The Site is currently listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 130043B with a Classification "2". In 2005, the Site was designated as an SVI legacy Site and required an evaluation of the potential for soil vapor under the building. In 2010, a NYSDEC Contractor collected three samples, 2 from within the building and 1 from outside the building. Tetrachloroethylene (PCE) was detected in indoor air within the Site building at concentrations of 27 and 28 micrograms per cubic meter (ug/m^3). At the time, these concentrations were below the NYSDOH indoor air guideline of 100 ug/m^3 but were near the current NYSDOH indoor air guideline of 30 ug/m^3. Trichloroethylene (TCE) was detected in the indoor air at concentrations of 1.9 and 1.6 ug/m^3. The current NYSDOH indoor air guideline for TCE is 2 ug/m^3. In addition, PCE and TCE were detected at (maximum of 4,200 ug/m^3 and 31 ,000 ug/m respectively) in soil vapor beneath the building.

On March 11, 2021, an additional sampling event was completed that included the collection of sub-slab, indoor air and outdoor ambient air. PCE was detected in indoor air within the building at concentrations of 1.7 at VP-1 and 1.5 ug/m^3 at VP-2. These concentrations were below the NYSDOH indoor air guideline of 30 ug/m^3. TCE was detected in the indoor air at concentrations of 2.0 at VP-1 and 1.4 ug/m^3 at VP-2. The current NYSDOH indoor air guideline for TCE is 2 ug/m^3. PCE and TCE were detected at maximum concentrations of 360 ug/m^3 and 1800 ug/m^3 in soil vapor beneath the building slab. TCE was not detected in the outside (ambient) air sample but PCE was detected at 2.7 ug/m^3 (higher concentration than the two indoor air samples).

The comparison of indoor air and sub-slab soil vapor in VP-1 and VP-2 for TCE yielded "MITIGATE" on the NYSDEH Decision Matrices while the results for VP-1 and VP-2 for TCE yielded "No further Action".

The SSDS is being installed to address soil vapor intrusion of TCE documented to be present in the indoor air and soil vapor beneath the Site.

This SSDWP Work Plan has been prepared in accordance with New York State Department of Environmental Conservation (NYSDEC) procedures set forth in the document titled DER-10 Technical Guidance for Site Investigation and Remediation, dated May 2010, and complies with all applicable Federal, State and local laws, regulations and requirements.

1.1 Objectives and Scope of the SSDWP Work Plan

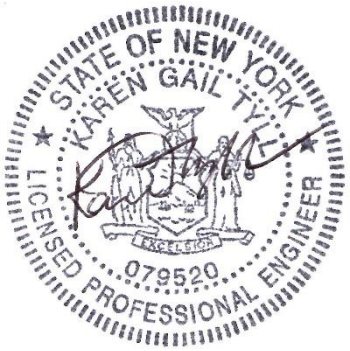
The proposed SSDWP will retrofit the existing Commercial building, shown on **Figure 2**, with an SSDS capable of creating a negative pressure under the building slab and collecting potentially contaminated vapor for discharge to the atmosphere above the roof of the Subject building. This SSDWP is a component of the overall investigation and remediation of the Site. It will address the soil vapor intrusion issues.

1.2 Certification

CERTIFICATION

I, Karen Tyll, P.E., certify that I am currently a New York State registered professional engineer as defined in 6 NYCRR part 375 and that this Sub-Slab Depressurization Work Plan (SSDWP) 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).

Date signed and sealed: 01/06/23



Karen G. Tyll, P.E.
NY License #079520

In order to address full compliance with New York State Education Laws, all engineering work is performed by Tyll Engineering and Consulting, P.C., under direct contract to H.D.P. Printing Industries Corp.. Tyll Engineering and Consulting, P.C. is a fully licensed and authorized engineering firm in New York State.

It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by a New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

2.0 SITE BACKGROUND

2.1 Site Description and History

The site is located at 567 Main Street, in Westbury, Nassau County, New York and is identified as Section 11, Block 164 and Lot 68 on the Nassau County Tax Map. **Figure 1** is a site location map. The Site is 9,183-square feet and has a 2,950 square foot building. The Site is bounded by a computer supplier to the north, Main Street and Saf-T-Swim and a church to the south, a commercial building to the east, and Swalm Street and a sandwich shop to the west. There are no sensitive receptors such as schools, hospitals, and day care facilities within a 250 to 500-foot radius of the Site.

Currently, the site contains a two-story commercial building, constructed in 1952. A parking lot is present at the front, western and rear (northern side) of the building. The site is approximately The Site is shown on **Figure 2**.

2.1.1 Site Operations

Currently, the site contains a two-story commercial building, and associated parking lots occupied by an automobile customization shop.

2.1.2 Topography/Hydrogeology

The Site's and surrounding area's geology is generally considered "urban land" and is characterized by a non-homogenous distribution of soil and fill types. No bedrock outcroppings are present at the site. Review of local maps prepared by the United States Geological Survey (USGS) (**Figure 1**) indicated that the site is located approximately 107 feet above mean sea level; the depth to groundwater in the area of the property is estimated to be approximately 50 feet below ground surface (bgs). Groundwater is estimated to flow in a southerly direction.

2.2 Summary of Previous Environmental Investigations

In 2010, a NYSDEC Contractor collected three samples, 2 from within the building and 1 from outside the building. Tetrachloroethylene (PCE) was detected in indoor air within the Site building at concentrations of 27 and 28 micrograms per cubic meter (ug/m3). At the time, these concentrations were below the NYSDOH indoor air guideline of 100 ug/m^3 but were near the current NYSDOH indoor air guideline of 30 ug/m^3. Trichloroethylene (TCE) was detected in the indoor air at concentrations of 1.9 and 1.6 ug/m^3. The current NYSDOH indoor air guideline for TCE is 2 ug/m^3. In addition, PCE and TCE were detected at (maximum of 4,200 ug/m^3 and 31 ,000 ug/m^3 respectively) in soil vapor beneath the building.

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3.0 INTERIM REMEDIAL MEASURES

The most effective mitigation methods for soil vapor include a combination of limiting any infiltration points and actively manipulating the pressure differential between the buildings' interior and exterior. The proposed SSDS can mitigate vapor intrusion into the building envelope from below the building floor slab by creating negative pressure below the floor.

The scope of work for the SSDWP consists of the following tasks:

- Site Reconnaissance and notification
- Site mobilization and Site preparation;
- Installation of the SSDS components;
- Waste disposal (assumed to be minimal); and
- Documentation.

Implementation of the SSDWP will be in accordance with the Soils/Materials Management Plan (SMMP) included in **Section 4** of this SSDWP Work Plan.

3.1 Mobilization and Site Preparation

A project kick-off meeting will be conducted with NYSDEC, OWNERS, TEC and the selected Contractor prior to the commencement of any intrusive activities, if requested by NYSDEC. The Contractor will supply any labor (HAZWOPER Certified in accordance with OSHA 1910.120) and materials required for the implementation of the SSDWP scope of work. In addition, necessary permits, insurance, bonds, and licenses required to complete the work will be obtained and fees necessary to obtain these permits will be paid. Mobilization and Site preparation activities include:

1. Mobilization of equipment to the work area;
2. Installation of work area delineation zones;
3. Installation of sub-slab suction points and laterals;
4. Installation of horizontal piping, riser pipes, and roof leaders;
5. Installation of blowers in basements;
6. Testing of the SSDSs; and
7. Demobilization of equipment.

Pre-Installation Building Inspection

Prior to any ground intrusive activity or SSDS component installation, a thorough inspection of the site building interior, including building slab and small sub-grade basement walls will be performed, to determine the presence of any cracks or fissures that may promote vapor migration into the building, and that would ultimately negatively affect the operation and efficiency of the SSDS. All observed cracks and fissures should be sealed with an air-tight

product (e.g., bentonite, grout, or other similar product). In addition, a public utility mark out of the property will be completed.

3.2 SSDS Installation

As stated in Section 2.2, the concentrations of TCE that were found in the sub-slab vapor and/or indoor air within the building when compared with indoor air samples yielded "MITIGATE" on the NYSDOH Decision Matrices. Therefore, an active SSDS was requested by the NYSDEC to be installed beneath the existing building slab as shown on **Figure 2** to address potential exposure pathways.

The proposed active SSDS for the Site, when complete, will consist of a network of 4" diameter horizontal perforated PVC suction pipes creating a vacuum influence beneath the building slab shown on **Figure 2**. The SSDS layout and piping details are provided on **Figure 2**. A description of the proposed active SSDS is provided below.

- One Network of SSDS piping will be installed within the existing concrete slab to create the required vacuum influence below the concrete slab of the Site building. The location of the SSDS piping on **Figure 2** is approximate and will be determined in the field.

- The concrete slab will be saw cut for the perforated collection piping.

- One, horizontal suction lateral will be installed to create the required vacuum influence below the concrete slab in the Site building. The suction piping will consist of 4-inch fabric wrapped, perforated PVC piping. The 4" diameter perforated PVC piping will be trenched under the concrete slab, exit from under the slab, travel up the interior wall of the building, and penetrate the wall of the building.

- The riser pipe on the exterior of the building will be connected to a SSDS fan with an exhaust stack leading up to the roof. Interior and exterior piping will be supported appropriately. The discharge stack will extend a minimum of 4 feet above the roof line, will have a rain cap or gooseneck, and will be supported as necessary. The discharge points will be located a minimum of 10 feet from any adjoining or adjacent buildings, HVAC air inlets and windows.

- The SSDS piping will be pitched to the extent practical.
- SSDS piping will be bedded on and trenches will be backfilled with minimum ¾" clean gravel or stone (no fines) (See **Section 4.9**)
- The system will have a sampling port and vacuum gauge on the interior of the building at eye-level or above.
- One (1) Radon Away RP265 **(Appendix B)** will be provided for the SSDS. **Figure 2** shows

the horizontal laterals and piping associated with the SSDS. The fan will be located on the exterior of the building (assessable by ladder), so that electric wiring installation is easier and they will not interfere with the building's operations.

- Four sub-slab soil vapor monitoring points will be installed near the building corners to monitor the performance of the SSDS. The four new monitoring points (MP-1 through MP-4) will be installed as shown on **Figure 2**.
- Following the completion of the SSDS, pressure alarm, sample tap, and Magnehelic vacuum gauge will be installed on the PVC riser piping within the building. The pressure alarm will have a red light that will illuminate, and an alarm that will sound, should the system fail. Magnehelic vacuum gauges will provide visual indication of the systems ongoing operation. The alarm system will be accompanied by a sticker/label showing contact information for the property management company, should the failure alarms sound. Prior to the startup of the SSDS, building occupants/tenants will be instructed on the failure alarms location, operation, and what to do and who to contact should the alarm sound.
- Upon completion of system installation, the existing and repaired concrete Cellar slabs (including, as necessary, floor/wall interface) will be properly sealed to enhance system effectiveness.

3.3 SSDS Startup and Testing

Prior to the initiation of the active SSDS, a start-up test will be performed to determine sub-slab pressure readings under static non-operational conditions, and to establish the efficacy of the SSDS. The following sections describe the scope of work of the startup test.

3.3.1 Pre-Operation Sub-Slab Pressure Readings

Prior to SSDS operation, pressure readings will be collected from the 4 sub-slab soil vapor monitoring points installed as part of the construction, using a digital manometer, to determine the pressure differentials beneath the building slab under static conditions.

3.3.2 System Efficacy Testing

Initially, the SSDS will be activated and left to run for approximately 60-minutes, after which pressure differential readings will be collected from associated test points in the building slab using a digital manometer, to ensure pressure readings of at least -0.004 wci are achieved throughout the building footprint. Once the recommended pressure readings are achieved, the SSDS fans will be deactivated for a minimum of 15-minutes.

Once the blower has been confirmed to be running effectively, it will be left to operate. Pressure readings from across the entire Site will be collected using a digital manometer, to ensure pressure readings of at least -0.004 wci are achieved in all sample ports. The SSDS will then remain active. During full SSDS operation, pressure readings will be collected and

recorded from the sample port installed in the effluent portion of the system.

3.4 SSDS Operation, Maintenance and Monitoring (O, M &M)

O, M & M procedures for the are outlined below. Typically, OM&M is performed on an annual basis for a period of at least 1-3 years, or until such time that subsequent sub-slab soil vapor and indoor air sample results deem that active SSDS is no longer required by the NYSDEC/NYSDOH.

3.4.1 System Operation: Non-Routine Equipment Maintenance

OM&M of the SSDS will include the following:

1. Inspect and test warning lights/alarms;
2. Inspect visible SSDS piping to confirm piping and fan condition;
3. Inspect vacuum/pressure gauges for proper operation.

In the event that a condition warranting system component maintenance is identified, the appropriate reporting and maintenance should be conducted immediately. Manufacturer's recommendations for maintenance, if available, are included in the documentation in **Appendix B**. Although SSDS fans do not require maintenance, any inspections/maintenance completed for the SSDS fans should be documented in the Maintenance Log included in **Appendix C**.

3.4.2 System Operation: Non-Routine Equipment Maintenance

Non-routine equipment maintenance consists of maintenance activities that will be performed with less frequency than the routine maintenance (i.e., semi-annually) on several system components. Specific non- routine maintenance tasks are outlined below:

- Verify operation of SSDS Fan,
- Inspect and test alarms;
- Test and repair/replace of vacuum/pressure gauges (if required); and
- Check condition of exterior piping

Most damage or problems associated with SSDS components will trigger one of the alarms. Damage to any SSDS components will be noted during the routine and detailed system inspections and remedied upon identification.

3.5 Waste Disposal

All wastes generated during the installation of the SSDS will be handled, transported and disposed of in a manner consistent with Federal, State and local laws and regulations. However, based on results of soil samples collected during RI activities, soil containing elevated concentration of CVOCs is not anticipated to be encountered during SSDS installation and is

expected to be declassified as non-hazardous and disposed of as non-hazardous waste, pending NYSDEC approval.

3.6 Documentation

Detailed information regarding the SSDWP (e.g., as-built drawings, waste disposal documentation, backfill documentation, photographs, etc.) will be included in the Construction Completion Report (CCR) described in Section 5

4.0 SOIL/MATERIALS MANAGEMENT PLAN

Although the amount of earthwork is expected to be very limited, the following sections provide the SMMP to be implemented during the SSDWP, as necessary.

4.1 Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed during SSDS installation activities under the supervision of TEC (or designee) personnel.

4.2 Containerization of Waste Soils

All soil generated during SSDS installation will be containerized in labeled, New York State Department of Transportation (NYSDOT) rated 55-gallon drums, which will be fitted with tight fitting covers. If waste is determined to be hazardous, it will be disposed of at an approved hazardous waste disposal facility within 90 days of generation.

4.3 Characterization of Excavated Materials

Soil/fill or other excavated media that will be transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations.

4.4 Materials Excavation and Load Out

TEC (or designee) will oversee all invasive work and the excavation and load-out of all excavated material. The quantity of waste is expected to be very limited and it will be containerized in drums for disposal. Loadout and trucking of bulk waste is not expected.

4.5 Materials Transport Off-Site

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded. Truck routes should take into account: (a) limiting transport through residential areas and past sensitive sites; (b) prohibiting off-Site queuing of trucks entering the facility; (c) limiting total distance to major highways; (d) promoting safety in access to highways; and (e) overall safety in transport. To the extent possible, trucks will travel to/from the Site using these approved truck routes.

Trucks will avoid stopping and idling in the neighborhood outside the project Site, to the extent practicable. Queuing of trucks will be performed on-Site.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during the SSDWP implementation.

4.6 Materials Disposal Off-Site

All soil/fill/solid waste excavated and removed from the Site will be disposed of in accordance with regulatory requirements based on the levels of contamination found to be present in waste characterization samples collected.

The following documentation will be obtained and reported for each disposal location used in this project to demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws:

(1) a letter or facility-specific waste profile/application from TEC or Owner to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter/profile/application will state that material to be disposed is contaminated material generated at an environmental remediation Site in New York State. The letter will provide the project identity and the name and phone number of TEC or Owner. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data);
(2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the CCR; and
(3) a Contained-In Determination approval from the NYSDEC declassifying the waste as non-hazardous, unless waste characterization sampling indicates the waste is characteristically hazardous.

The CCR will include an accounting of the destination of all material removed from the Site during this SSDWP. This information will also be presented in a tabular form in the CCR.

A Bill of Lading system or equivalent will be used for off-Site movement of non-hazardous wastes and contaminated soils. This information will be reported in the CCR.

Hazardous and non-hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable local, State, and Federal regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in compliance with all applicable local, State and Federal regulations.

Waste characterization will be performed for off-Site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. All data available for soil/material to be disposed at a facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

4.7 Materials Reuse On-Site

Soil reuse is not expected as part of the SSDWP.

4.8 Fluids Management

We do not expect any fluids to be generated during SSDWP activities. Liquids (if any) to be removed from the Site will be handled, transported and disposed in accordance with applicable laws and regulations. Liquid waste manifests will be reported to NYSDEC in the CCR.

4.9 Backfill from Off-Site Sources

All materials proposed for import onto the Site will be approved by TEC and will be in compliance with provisions in this SSDWP prior to receipt at the Site.

Material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the Site. Solid waste will not be imported onto the Site.

All imported soils will meet NYSDEC approved backfill or cover soil quality objectives for this Site. These NYSDEC approved backfill or cover soil quality objectives are the lower of the protection of groundwater or the protection of public health soil cleanup objectives for Commercial or higher use as set forth in Table 375- 6.8(b) of 6 NYCRR Part 375. Non-compliant soils will not be imported onto the Site.

Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Nothing in this SSDWP Work Plan should be construed as an approval for this purpose.

In accordance with DER-10, the following material may be imported, without chemical testing, to be used as backfill beneath pavement, buildings or as part of the final Site cover, provided that it contains less than 10% by weight material which would pass through a size 80 sieve and consists of:

- Gravel, rock or stone, consisting of virgin material from a NYSDEC permitted mine or quarry; or
- Recycled concrete or brick from a NYSDEC registered construction and demolition debris processing facility if the material conforms to the requirements of Section 304 of the New York State Department of Transportation *Standard Specifications Construction and Materials Volume 1* (2002).

Trucks entering the Site with imported materials will be securely covered with tight fitting covers.

4.10 Stormwater Pollution Prevention

Although disturbance of soil outside the building footprint is not expected to be part of the scope, if changes to the scope require soil disturbance outside the building footprint, applicable laws and regulations pertaining to stormwater pollution prevention will be addressed. If necessary, erosion and sediment control measures (silt fences, barriers, and/or hay bale checks) will be installed, as appropriate, around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs to erosion and sediment controls shall be made immediately. Accumulated sediments will be removed, as required, to keep the barrier and hay bale practice functional. Undermining or erosion of the silt fence anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

4.11 Contingency Plan

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during implementation of the SSDWP. Due to the nature of the proposed work, discovery of previously unknown USTs is extremely unlikely.

If previously unidentified contaminant sources are found during implementation of the SSDWP, sampling will be performed on potentially contaminated source material and surrounding soils and reported to the NYSDEC. Chemical analytical work will be for full suite of parameters (target compound list [TCL] VOCs, TCL semi-volatile organic compounds [SVOCs], target analyte list [TAL] metals, TCL polychlorinated biphenyls [PCBs], pesticides and herbicides). Any sampling completed will require low-level reporting limits of 1.0 ug/m^3 for all sub-slab samples, 0.2 ug/m^3 for cis 1,2-Dichloroethane, Trichloroethene and Vinyl Chloride, and 1.0 ug/m^3 for Tetrachloroethene and 1, 1, 1-Trichloroethane.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will also be included in weekly and periodic electronic reports.

4.12 Odor, Dust and Nuisance Control Plan

4.12.1 Odor Control Plan

All necessary means will be employed to prevent on- and off-Site odor nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor

nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEP's certifying this remedial plan.

Odor controls will be employed to prevent on- and off-Site odor nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) use of odor suppressants to cover exposed odorous soils.

4.12.2 Dust Control Plan

Due to the nature of the project, with excavation occurring in the basement of the existing building, generation of nuisance dust at the sidewalk level surrounding the Site will not occur. The HASP will contain specific measures to address potential worker exposure to airborne particulates during the SSDWP implementation. A dust suppression plan that addresses dust management during invasive on-Site work, will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of water for wetting excavation areas. Water will be available on-Site at suitable supply and pressure for use in dust control.

4.12.3 Other Nuisances

Noise control will be exercised during SSDWP activities.

5.0 REPORTING

5.1 Daily Reporting During Site Activities

Daily reports to NYSDEC and NYSDOH will be submitted during the days when remedial installation activities take place. Daily reports will include an update of progress made during the reporting period; locations of work and quantities of material imported and exported from the Site; a summary of any and all complaints with relevant details (names, phone numbers); a summary of CAMP readings, and an explanation of notable Site conditions, etc. If any issues arise (i.e., issues with the CAMP), NYSDOH and NYSDEC will be notified immediately. Discussions with the NYSDEC/NYSDOH will include all exceedances including odors, what was exceeded and what steps were taken to address the exceedance.

5.2 Construction Completion Report (CCR)

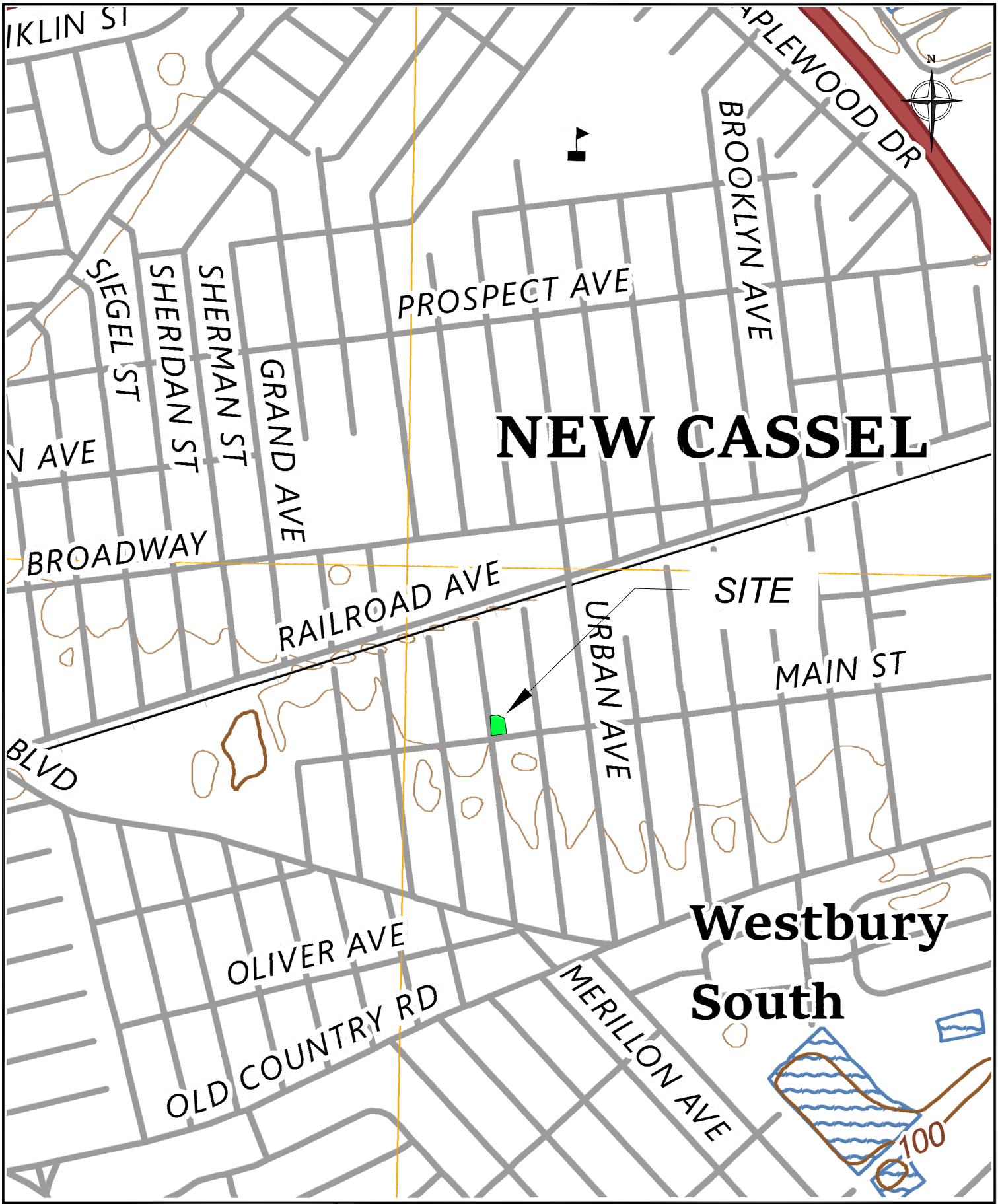
Detailed information regarding the SSDWP (e.g., general description of the construction activities, as-built of the SSDS, waste disposal documentation, backfill documentation, photographs, etc.) will be included in the CCR. The CCR will be submitted within 60 days after the data usability summary report (DUSR) is complete for any vapor samples collected during the SSDS start-up.

6.0 SSDWP IMPLEMENTATION SCHEDULE

Below is a schedule for the above scope of work. This SSDWP Work Plan is anticipated to begin in the third and fourth quarters of 2022 and will require approximately four to six weeks to complete. It is anticipated that the actual on-Site duration of major remedial construction tasks will be completed as follows (time frames are not necessarily consecutive, subject to change):

- Site Mobilization and Preparation .....one day
- SSDS Installation .....three weeks
- SSDS Startup and Testing .....three days
- Transportation and Off-Site Disposal .....one day
- Site Restoration and Demobilization .....one day
- Submittal of CCR After Startup and Testing Completed .....60 days from obtaining DUSR

FIGURES

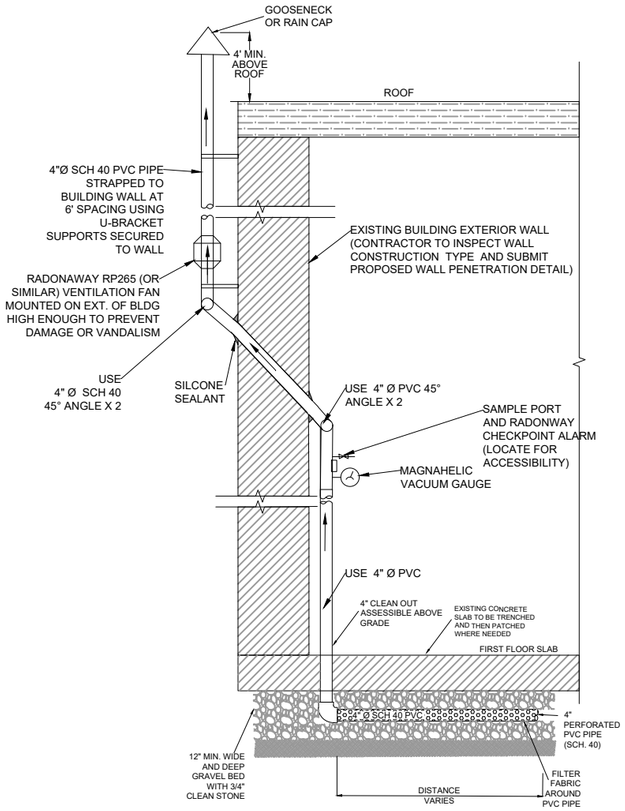


PREPARED BY:	**TITLE:**		
TYLL ENGINEERING & CONSULTING PC 169 Commack Road, Suite H173, Commack, NY 11725 PHONE: (631) 629-5373 Info@tyllengineering.com	**SITE LOCATION MAP** 567 MAIN STREET WESTBURY, NEW YORK		

DRAWN:	SCALE:	DATE:	PROJECT NO.:
-	NTS	8-30-2022	HDP2201
CHECKED:	**APPROVED:**	**REVISION:**	**NOTES:**
KT	KT	-	-
FIGURE NO.:	1		

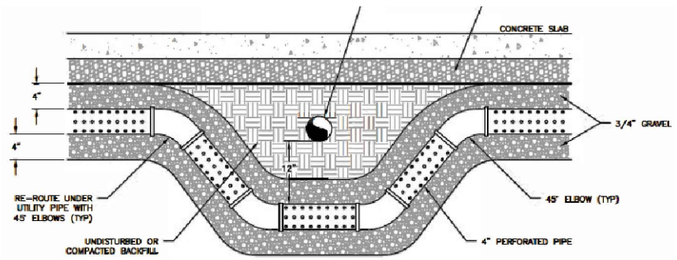
LEGEND

- 4" PERFORATED PVC SSDS HORIZONTAL PIPING
- VACUUM MONITORING POINT
- 4" Ø SCH 40 PVC SSDS RISER PIPE ON EXTERIOR OF BUILDING



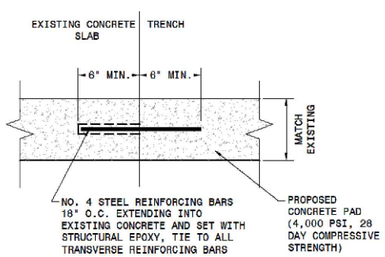
TYPICAL SSDS PROFILE AND SUCTION PIT DETAIL

SCALE: NTS



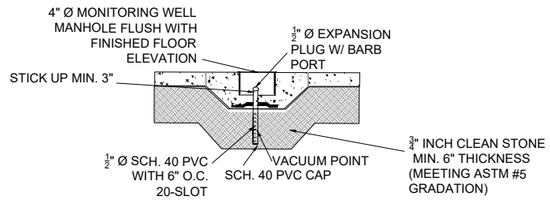
TYPICAL SSDS AND PIPE CROSSING DETAIL

SCALE: NTS



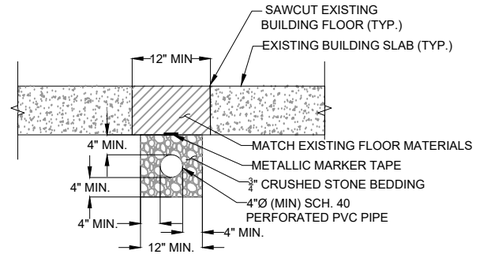
TYPICAL TRENCH REPAIR DETAIL

SCALE: NTS



TYPICAL VACUUM MONITORING POINT

SCALE: NTS



TYPICAL PIPE TRENCH DETAIL

SCALE: NTS

NOTES

1. DEPICTED LOCATIONS OF VACUUM MONITORING POINTS ARE APPROXIMATE AND SHOULD BE COORDINATED WITH OWNER, ARCHITECT, AND TYLL ENGINEERING.
2. ALL PENETRATIONS THROUGH THE SLAB) SHALL BE SEALED USING A SILICONE BASED WATERPROOF SEALANT OR EQUIVALENT.
3. SUCTION LATERALS OF THE SUB-SLAB DEPRESSURIZATION SYSTEM (SSDS) SHOULD BE PITCHED AWAY FROM EXTRACTION POINTS TO PREVENT POOLING OF CONDENSATE IN THE BOTTOM OF VERTICAL RISERS, TO THE EXTENT PRACTICAL
4. PROVIDE ELECTRICAL/CONTROL CONDUIT TO SSDS FANS. COORDINATE WITH ELECTRICIAN.
5. ELECTRICAL REQUIREMENTS INCLUDE A 110 VOLT POWER OUTLET, FOR EACH SSDS FAN.
6. THE BLOWER DISCHARGES SHALL BE LOCATED A MINIMUM OF 10 FEET FROM HVAC AIR INLJETS, AND PROPERTY LINE.
7. THE SSDS FANS SHALL BE A RADONAWAY MODEL RP145 OR APPROVED EQUAL.
8. THE RADONAWAY CHECKPOINT IIa ALARM SIGNAL SHALL BE AUDIBLE.
9. PROVIDE ALL NECESSARY PIPE SUPPORTS FOR RISER PIPES FROM THE BASEMENT TO THE EXHAUST POINT ON THE ROOF.

SSDS PLAN

FORMER ATLAS GRAPHICS SITE

567 MAIN STREET
WESTBURY, NEW YORK

TYLL ENGINEERING & CONSULTING PC
169 Commack Road, Suite H173, Commack, NY 11725
PHONE: (631) 629-5373 info@tyllengineering.com

SHEET TITLE:	SSDS LAYOUT PLAN		
DESIGNED BY:	KT	SCALE:	AS SHOWN
REVIEWED BY:	KT	DATE:	rev1 JANUARY 4, 2023
PLAN SHEET BY:	KT	PROJECT NO:	HDP2201

1

APPENDICES

A. New York State Department of Health Soil Vapor/Indoor Air Matrices
B. Sub-Slab Depressurization System Component Specifications
C. Sub-Slab Depressurization System Operations and Maintenance Log
D. Health and Safety Plan

APPENDIX A

Site SPecific Decision Matrices Table

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New York State Department of Health Soil Vapor/Indoor Air Matrices

May 2017

SVI Site-Specific Decision Matrices

NYSDOH Decision Matrix A Sample Location VP-1			Indoor Air Concentration - TRICHLOROETHENE (TCE) (µg/m³)		
			< 0.2	0.2 to < 1	1 and Above
					2
Sub-Slab Concentration - TRICHLOROETHENE (TCE) (ug/m3)	< 6		1. No further Action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
	6 to < 60		4. No Further Action	5. MONITOR	6. MITIGATE
	60 and Above	**710**	7. MITIGATE	8. MITIGATE	9. MITIGATE

NYSDOH Decision Matrix B Sample Location VP-1			Indoor Air Concentration - Tetrachloroethene (PCE) (µg/m³)		
			< 3	3 to < 10	10 and Above
			1.70		
Sub-Slab Concentration - Tetrachloroethene (PCE) (ug/m3)	< 100	**34.0**	1. No further Action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
	100 to < 1,000		4. No Further Action	5. MONITOR	6. MITIGATE
	1,000 and Above		7. MITIGATE	8. MITIGATE	9. MITIGATE

NYSDOH Decision Matrix A Sample Location VP-2			Indoor Air Concentration - TRICHLOROETHENE (TCE) (µg/m³)		
			< 0.2	0.2 to < 1	1 and Above
					1.4
Sub-Slab Concentration - TRICHLOROETHENE (TCE) (ug/m3)	< 6		1. No further Action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
	6 to < 60		4. No Further Action	5. MONITOR	6. MITIGATE
	60 and Above	**1800**	7. MITIGATE	8. MITIGATE	9. MITIGATE

NYSDOH Decision Matrix B Sample Location VP-2			Indoor Air Concentration - Tetrachloroethene (PCE) (µg/m³)		
			< 3	3 to < 10	10 and Above
			1.50		
Sub-Slab Concentration - Tetrachloroethene (PCE) (ug/m3)	< 100		1. No further Action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
	100 to < 1,000	**360.0**	4. No Further Action	5. MONITOR	6. MITIGATE
	1,000 and Above		7. MITIGATE	8. MITIGATE	9. MITIGATE

Soil Vapor/Indoor Air Matrix A

May 2017

Analytes Assigned:
Trichloroethene (TCE), *cis*-1,2-Dichloroethene (*c*12-DCE), 1,1-Dichloroethene (11-DCE), Carbon Tetrachloride

	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m^3)		
SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m^3)	< 0.2	0.2 to < 1	1 and above
< 6	1. No further action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
6 to < 60	4. No further action	5. MONITOR	6. MITIGATE
60 and above	7. MITIGATE	8. MITIGATE	9. MITIGATE

No further action: No additional actions are recommended to address human exposures.

Identify Source(s) and Resample or Mitigate: We recommend that reasonable and practical actions be taken to identify the source(s) affecting the indoor air quality and that actions be implemented to reduce indoor air concentrations to within background ranges. For example, if an indoor or outdoor air source is identified, we recommend the appropriate party implement actions to reduce the levels. In the event that indoor or outdoor sources are not readily identified or confirmed, resampling (which might include additional sub-slab vapor and indoor air sampling locations) is recommended to demonstrate that SVI mitigation actions are not needed. Based on the information available, mitigation might also be recommended when soil vapor intrusion cannot be ruled out.

Monitor: We recommend monitoring (sampling on a recurring basis), including but not necessarily limited to sub-slab vapor, basement air and outdoor air sampling, to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or to evaluate temporal influences. Monitoring might also be recommended to determine whether existing building conditions (e.g., positive pressure heating, ventilation and air-conditioning systems) are maintaining the desired mitigation endpoint and to determine whether changes are needed. The type and frequency of monitoring is determined based on site-, building- and analyte-specific information, taking into account applicable environmental data and building operating conditions. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

Mitigate: We recommend mitigation to minimize current or potential exposures associated with soil vapor intrusion. The most common mitigation methods are sealing preferential pathways in conjunction with installing a sub-slab depressurization system and changing the pressurization of the building in conjunction with monitoring. The type, or combination of types, of mitigation is determined on a building-specific basis, taking into account building construction and operating conditions. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusion until contaminated environmental media are remediated.

These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX A

This matrix summarizes actions recommended to address current and potential exposures related to soil vapor intrusion. To use the matrix appropriately as a tool in the decision-making process, the following should be noted:

[1] The matrix is generic. As such, it may be appropriate to modify a recommended action to accommodate analyte-specific, building-specific conditions (e.g., dirt floor in basement, crawl spaces, thick slabs, current occupancy, etc.), and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, collection of additional samples may be recommended when the matrix indicates "no further action" for a particular building, but the results of adjacent buildings (especially sub-slab vapor results) indicate a need to take actions to address exposures related to soil vapor intrusion. Mitigation might be recommended when the results of multiple contaminants indicate monitoring is recommended. Proactive actions may be proposed at any time. For example, the party implementing the actions may decide to install sub-slab depressurization systems on buildings where the matrix indicates "no further action" or "monitoring." Such an action might be undertaken for reasons other than public health (e.g., seeking community acceptance, reducing costs, etc.). However, actions implemented *in lieu* of sampling will typically be expected to be captured in the final engineering report and site management plan, and might not rule out the need for post-implementation sampling (e.g., to document effectiveness or to support terminating the action).

[2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of soil vapor contamination, nor does it preclude remediating contaminated soil vapor or the source of soil vapor contamination.

[3] Appropriate care should be taken during all aspects of sample collection to ensure that high quality data are obtained. Since the data are being used in the decision-making process, the laboratory analyzing the environmental samples must have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte and environmental matrix combinations. Furthermore, samples should be analyzed by methods that can achieve a minimum reporting limit of 0.20 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples and dirt floor soil vapor samples, a minimum reporting limit of 1 microgram per cubic meter is recommended.

[4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion is considered to be the greatest (i.e., worst-case conditions). If samples are collected at other times (typically, samples collected outside of the heating season), then resampling during worst-case conditions might be appropriate to verify that actions taken to address exposures related to soil vapor intrusion are protective of human health.

[5] When current exposures are attributed to sources other than soil vapor intrusion, the agencies should be given documentation (e.g., applicable environmental data, completed indoor air sampling questionnaire, digital photographs, etc.) to support a proposed action other than that provided in the matrix box and to support agency assessment and follow-up.

[6] The party responsible for implementing the recommended actions will differ depending upon several factors, including but not limited to the following: the identified source of the volatile chemicals, the environmental remediation program, and analyte-specific, site-specific and building-specific factors.

Soil Vapor/Indoor Air Matrix B

May 2017

Analytes Assigned:
Tetrachloroethene (PCE), 1,1,1-Trichloroethane (111-TCA), Methylene Chloride

	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m^3)		
SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m^3)	< 3	3 to < 10	10 and above
< 100	1. No further action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
100 to < 1,000	4. No further action	5. MONITOR	6. MITIGATE
1,000 and above	7. MITIGATE	8. MITIGATE	9. MITIGATE

No further action: No additional actions are recommended to address human exposures.

Identify Source(s) and Resample or Mitigate: We recommend that reasonable and practical actions be taken to identify the source(s) affecting the indoor air quality and that actions be implemented to reduce indoor air concentrations to within background ranges. For example, if an indoor or outdoor air source is identified, we recommend the appropriate party implement actions to reduce the levels. In the event that indoor or outdoor sources are not readily identified or confirmed, resampling (which might include additional sub-slab vapor and indoor air sampling locations) is recommended to demonstrate that SVI mitigation actions are not needed. Based on the information available, mitigation might also be recommended when soil vapor intrusion cannot be ruled out.

Monitor: We recommend monitoring (sampling on a recurring basis), including but not necessarily limited to sub-slab vapor, basement air and outdoor air sampling, to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or to evaluate temporal influences. Monitoring might also be recommended to determine whether existing building conditions (e.g., positive pressure heating, ventilation and air-conditioning systems) are maintaining the desired mitigation endpoint and to determine whether changes are needed. The type and frequency of monitoring is determined based on site-, building- and analyte-specific information, taking into account applicable environmental data and building operating conditions. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

Mitigate: We recommend mitigation to minimize current or potential exposures associated with soil vapor intrusion. The most common mitigation methods are sealing preferential pathways in conjunction with installing a sub-slab depressurization system and changing the pressurization of the building in conjunction with monitoring. The type, or combination of types, of mitigation is determined on a building-specific basis, taking into account building construction and operating conditions. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusion until contaminated environmental media are remediated.

These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX B

This matrix summarizes actions recommended to address current and potential exposures related to soil vapor intrusion. To use the matrix appropriately as a tool in the decision-making process, the following should be noted:

[1] The matrix is generic. As such, it may be appropriate to modify a recommended action to accommodate analyte-specific, building-specific conditions (e.g., dirt floor in basement, crawl spaces, thick slabs, current occupancy, etc.), and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, collection of additional samples may be recommended when the matrix indicates "no further action" for a particular building, but the results of adjacent buildings (especially sub-slab vapor results) indicate a need to take actions to address exposures related to soil vapor intrusion. Mitigation might be recommended when the results of multiple contaminants indicate monitoring is recommended. Proactive actions may be proposed at any time. For example, the party implementing the actions may decide to install sub-slab depressurization systems on buildings where the matrix indicates "no further action" or "monitoring." Such an action might be undertaken for reasons other than public health (e.g., seeking community acceptance, reducing costs, etc.). However, actions implemented *in lieu* of sampling will typically be expected to be captured in the final engineering report and site management plan, and might not rule out the need for post-implementation sampling (e.g., to document effectiveness or to support terminating the action).

[2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of soil vapor contamination, nor does it preclude remediating contaminated soil vapor or the source of soil vapor contamination.

[3] Appropriate care should be taken during all aspects of sample collection to ensure that high quality data are obtained. Since the data are being used in the decision-making process, the laboratory analyzing the environmental samples must have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte and environmental matrix combinations. Furthermore, samples should be analyzed by methods that can achieve a minimum reporting limit of 1 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples and dirt floor soil vapor samples, a minimum reporting limit of 1 microgram per cubic meter is recommended.

[4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion is considered to be the greatest (i.e., worst-case conditions). If samples are collected at other times (typically, samples collected outside of the heating season), then resampling during worst-case conditions might be appropriate to verify that actions taken to address exposures related to soil vapor intrusion are protective of human health.

[5] When current exposures are attributed to sources other than soil vapor intrusion, the agencies should be given documentation (e.g., applicable environmental data, completed indoor air sampling questionnaire, digital photographs, etc.) to support a proposed action other than that provided in the matrix box and to support agency assessment and follow-up.

[6] The party responsible for implementing the recommended actions will differ depending upon several factors, including but not limited to the following: the identified source of the volatile chemicals, the environmental remediation program, and analyte-specific, site-specific and building-specific factors.

Soil Vapor/Indoor Air Matrix C

May 2017

Analytes Assigned:
Vinyl Chloride

	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m^3)	
SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m^3)	< 0.2	0.2 and above
< 6	1. No further action	2. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
6 to < 60	3. MONITOR	4. MITIGATE
60 and above	5. MITIGATE	6. MITIGATE

No further action: No additional actions are recommended to address human exposures.

Identify Source(s) and Resample or Mitigate: We recommend that reasonable and practical actions be taken to identify the source(s) affecting the indoor air quality and that actions be implemented to reduce indoor air concentrations to within background ranges. For example, if an indoor or outdoor air source is identified, we recommend the appropriate party implement actions to reduce the levels. In the event that indoor or outdoor sources are not readily identified or confirmed, resampling (which might include additional sub-slab vapor and indoor air sampling locations) is recommended to demonstrate that SVI mitigation actions are not needed. Based on the information available, mitigation might also be recommended when soil vapor intrusion cannot be ruled out.

Monitor: We recommend monitoring (sampling on a recurring basis), including but not necessarily limited to sub-slab vapor, basement air and outdoor air sampling, to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or to evaluate temporal influences. Monitoring might also be recommended to determine whether existing building conditions (e.g., positive pressure heating, ventilation and air-conditioning systems) are maintaining the desired mitigation endpoint and to determine whether changes are needed. The type and frequency of monitoring is determined based on site-, building- and analyte-specific information, taking into account applicable environmental data and building operating conditions. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

Mitigate: We recommend mitigation to minimize current or potential exposures associated with soil vapor intrusion. The most common mitigation methods are sealing preferential pathways in conjunction with installing a sub-slab depressurization system and changing the pressurization of the building in conjunction with monitoring. The type, or combination of types, of mitigation is determined on a building-specific basis, taking into account building construction and operating conditions. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusion until contaminated environmental media are remediated.

These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX C

This matrix summarizes actions recommended to address current and potential exposures related to soil vapor intrusion. To use the matrix appropriately as a tool in the decision-making process, the following should be noted:

[1] The matrix is generic. As such, it may be appropriate to modify a recommended action to accommodate analyte-specific, building-specific conditions (e.g., dirt floor in basement, crawl spaces, thick slabs, current occupancy, etc.), and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, collection of additional samples may be recommended when the matrix indicates "no further action" for a particular building, but the results of adjacent buildings (especially sub-slab vapor results) indicate a need to take actions to address exposures related to soil vapor intrusion. Mitigation might be recommended when the results of multiple contaminants indicate monitoring is recommended. Proactive actions may be proposed at any time. For example, the party implementing the actions may decide to install sub-slab depressurization systems on buildings where the matrix indicates "no further action" or "monitoring." Such an action might be undertaken for reasons other than public health (e.g., seeking community acceptance, reducing costs, etc.). However, actions implemented *in lieu* of sampling will typically be expected to be captured in the final engineering report and site management plan, and might not rule out the need for post-implementation sampling (e.g., to document effectiveness or to support terminating the action).

[2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of soil vapor contamination, nor does it preclude remediating contaminated soil vapor or the source of soil vapor contamination.

[3] Appropriate care should be taken during all aspects of sample collection to ensure that high quality data are obtained. Since the data are being used in the decision-making process, the laboratory analyzing the environmental samples must have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte and environmental matrix combinations. Furthermore, samples should be analyzed by methods that can achieve a minimum reporting limit of 0.20 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples and dirt floor soil vapor samples, a minimum reporting limit of 1 microgram per cubic meter is recommended.

[4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion is considered to be the greatest (i.e., worst-case conditions). If samples are collected at other times (typically, samples collected outside of the heating season), then resampling during worst-case conditions might be appropriate to verify that actions taken to address exposures related to soil vapor intrusion are protective of human health.

[5] When current exposures are attributed to sources other than soil vapor intrusion, the agencies should be given documentation (e.g., applicable environmental data, completed indoor air sampling questionnaire, digital photographs, etc.) to support a proposed action other than that provided in the matrix box and to support agency assessment and follow-up.

[6] The party responsible for implementing the recommended actions will differ depending upon several factors, including but not limited to the following: the identified source of the volatile chemicals, the environmental remediation program, and analyte-specific, site-specific and building-specific factors.

APPENDIX B

Sub-Slab Depressurization System Component Specifications

RadonAway
The world's leading radon fan manufacturer

RP PRO SERIES

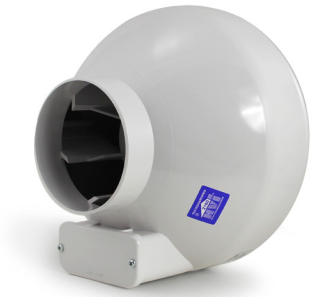
Installs white, stays white

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

- Eternalast™ polycarbonate plastic housing
- 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
- HVI certified fan performance



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"

MODEL	P/N	FAN DUCT DIAMETER	WATTS	RECOM. MAX. OP. PRESSURE "WC	TYPICAL CFM vs. STATIC PRESSURE WC					
					0"	.2"	.5"	1.0"	1.5"	2.0"
RP140†	28460	4"	14-19	0.6	152	120*	64*	-	-	-
RP145	28461	4"	34-66	1.7	169	150*	124*	81*	42	4
RP260	28462	6"	47-65	1.3	251	210*	157	70	-	-
RP265	28463	6"	96-136	2.3	375	340*	282*	204*	140	70
RP380	28464	8"	96-138	2.0	531	490*	415*	268*	139	41

*HVI Certified Values. †Energy Star® Rated.

MADE IN USA

ETL Listed
Intertek

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

ENERGY STAR
RP140 Only

For Further Information, Contact Your Radon Professional:

Rev G 0322
P/N 02047

RP, GP, XP Pro Series Installation 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!** 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. **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 ensure 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. (See Warranty, p. 8, for details.)

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. (See p. 8.)

   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 backdrafting. Follow the heating equipment manufacturers' guidelines and safety standards such as those published by any National Fire Protection Association, and the American Society for Heating, Refrigerating 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.

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The RP, GP and XP Pro Series Radon Fans are intended for use by trained, professional, certified/licensed radon mitigators. The purpose of these instructions is to provide additional guidance for the most effective use of RP, GP and XP Series Fans. These instructions should be considered supplemental to EPA/radon industry standard practices, state and local building codes and regulations. In the event of a conflict, those codes, practices and regulations take precedence over these instructions.

1.2 FAN SEALING

The RP, GP and XP Pro Series Radon Fans are factory sealed; no additional caulk or other materials are required to inhibit air leakage.

1.3 ENVIRONMENTALS

The RP, GP and XP Pro Series Radon 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, GP and XP Pro Series Radon Fans, when installed properly, operate 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 inline 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(s). The RP, GP and XP Pro Series Radon 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, GP and XP Pro Series Radon Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff. 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

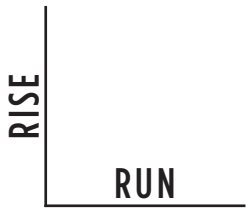
The RP, GP and XP Pro Series Radon Fans can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the RP, GP and XP Pro Series Radon Fan best suited for the sub-slab material can improve the slab coverage. The RP, GP and XP Pro Series Radon Fans have a wide range of models to choose from to cover a wide range of sub-slab materials. The RP140 and 145 are best suited for general purpose use. The RP260 can be used where additional airflow is required, and the RP265 and RP380 are 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, GP and XP Pro Series Radon 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, GP and XP Pro Series Radon Fans are NOT suitable for underground burial.

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

Pipe Diameter	Minimum Rise per Ft of Run*		
	@25 CFM	@50 CFM	@100 CFM
4”	1/8”	1/4”	3/8”
3”	1/4”	3/8”	1 1/2”



*See p. 7 for detailed specifications.

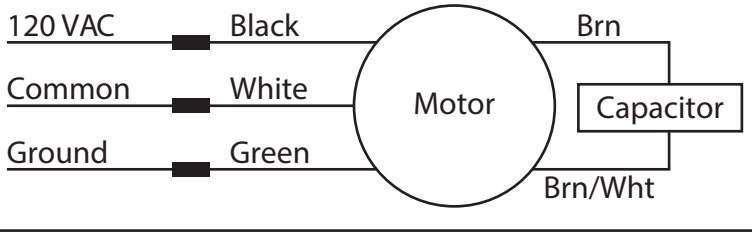
1.8 SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50017) or audible alarm (P/N 28535, 28001-2, 28001-4 or 28421), 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 identifying the necessity for regular radon tests to be conducted by the building occupants must be conspicuously placed in a location where the occupants frequent and can see the label.

1.9 ELECTRICAL WIRING

The RP, GP and XP Pro Series Radon Fans operate on standard 120V, 60Hz AC. All wiring must be performed in accordance with National Fire Protection (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 UL 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.

The RP, GP and XP Pro Series Radon Fan Wiring Diagram



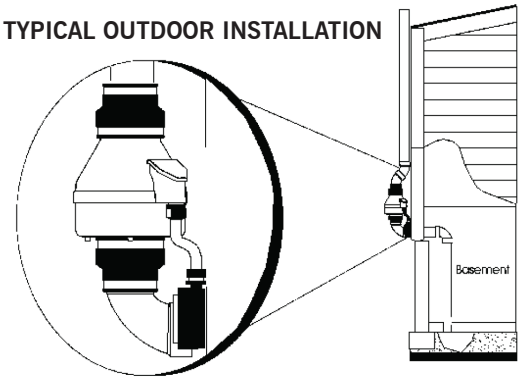
1.10 SPEED CONTROLS

The RP, GP and XP Pro Series Radon Fans are rated for use with electronic speed controls; however, speed controls are generally not recommended. If used, the recommended speed control is Pass & Seymour Solid State Speed Control (Cat. No. 94601-1).

2.0 INSTALLATION

The RP, GP and XP Pro Series Radon Fans can be mounted indoors or outdoors. (It is suggested that EPA and radon mitigation standards recommendations be followed in choosing the fan location.) The GP fans have an integrated mounting bracket; the RP, GP and XP Pro Series Radon Fans may be mounted directly on the system piping or fastened to a supporting structure by means of an optional mounting bracket. The ducting from the fan to the outside of the building has a strong effect on noise and fan energy use. 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.

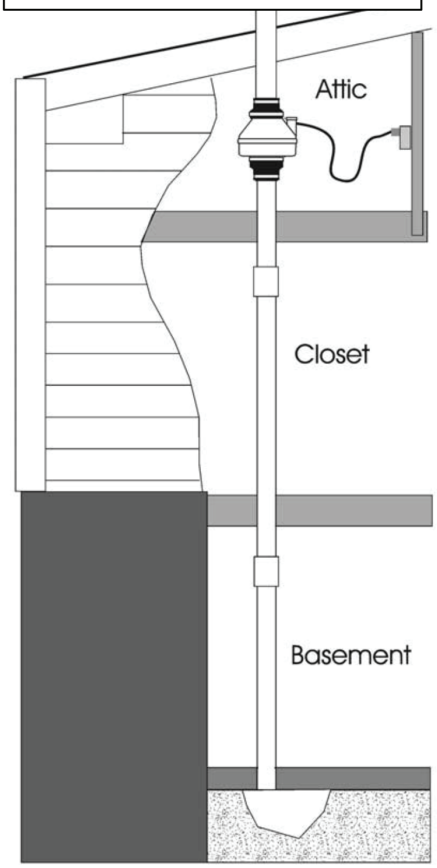
TYPICAL OUTDOOR INSTALLATION



2.1 MOUNTING

Mount the RP, GP and XP Pro Series Radon Fan vertically with outlet up. Ensure 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.

TYPICAL INDOOR INSTALLATION



2.2 MOUNTING BRACKET (optional)

The RP, GP and XP Pro Series Radon Fans may be optionally secured with the RadonAway Fan Mounting Bracket (P/N 25007). 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 a means of disconnect for servicing the unit and for vibration isolation. As 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.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.9). Note that the fan is not intended for connection to rigid metal conduit.

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**.

_____ **Ensure** the RP, GP and XP Pro Series Radon Fan and all ducting are **secure and vibration-free**.

_____ **Verify system vacuum pressure** with manometer. **Ensure** 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 and applicable testing standards.

THE FOLLOWING CHARTS SHOW THE PERFORMANCE OF THE RP, GP AND XP PRO SERIES RADON FANS

RP Pro Series Product Specifications

Typical CFM Vs. Static Pressure "WC									
Model	**0"**	**.2"**	**.5"**	**.75"**	**1.0"**	**1.25"**	**1.5"**	**1.75"**	**2.0"**
RP140	152	120*	64*	-	-	-	-	-	
RP145	169	150*	124*	101	81*	61	42	22	4
RP260	251	210*	157	117	70	26	-	-	-
RP265	375	340*	282*	238	204*	170	140	108	70
RP380	531	490*	415*	340	268*	200	139	84	41

**Denotes HVI certified values.*

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
RP140	14 - 19 watts	0.6" WC
RP145	34 - 66 watts	1.7" WC
RP260	47-65 watts	1.3" WC
RP265	96 - 136 watts	2.3" WC
RP380	96 - 138 watts	2.0" WC

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

Model	Size	Weight	Inlet/Outlet	L.2
RP140	8.5"H x 9.7" Dia.	5.5 lbs	4.5"OD (4.0" PVC Sched 40 size compatible)	25
RP145	8.5"H x 9.7" Dia.	5.5 lbs	4,5" OD	15
RP260	8.6"H x 11.75" Dia.	5.5 lbs	6.0" OD	48
RP265	8.6"H x 11.75" Dia.	6.5 lbs	6.0" OD	30
RP380	10.53"H x 13.41" Dia.	11.5 lbs	8.0" OD	57

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

XP Pro Series Product Specifications

Typical CFM Vs. Static Pressure "WC						
	0"	**.5"**	**1.0"**	**1.5"**	**1.75"**	**2.0"**
XP151	167	127	77	-	-	-
XP201	126	98	66	26	-	-

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
XP151	53-70 watts	1.4" WC
XP201	38-74 watts	1.6" WC

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

Model	Size	Weight	Inlet/Outlet
XP151	9.5"H x 8.5" Dia.	6 lbs	4.5"OD (4.0" PVC Sched 40 size compatible)
XP201	9.5"H x 8.5" Dia.	6 lbs	4.5" OD

GP Pro Series Product Specifications

Typical CFM Vs. Static Pressure "WC							
	1.0"	1.5"	2.0"	2.5"	3.0"	3.5"	4.0"
GP201	54	42	11	-	-	-	-
GP301	64	54	41	4	-	-	-
GP401	-	61	52	44	22	-	-
GP501	-	-	66	58	50	27	4

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
GP201	31-67 watts	1.8" WC
GP301	56-100 watts	2.3" WC
GP401	62-128 watts	3.0" WC
GP501	68 - 146 watts	3.8" WC

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

Model	Size	Weight	Inlet/Outlet
GP201	13"H x 12.5" Dia.	12 lbs	3.5"OD (3.0" PVC Sched 40 size compatible)
GP301	13"H x 12.5" Dia.	12 lbs	3.5" OD
GP401	13"H x 12.5" Dia.	12 lbs	3.5" OD
GP501	13"H x 12.5" Dia.	12 lbs	3.5" OD

RP, XP and GP Pro Series Additional Specifications

Model	Recommended Duct	PVC Pipe Mounting	Thermal Cutout	Insulation Class
RP140	3" or 4" Schedule 20/40 PVC	Mount on the duct pipe or with optional mounting bracket. For Ventilation: 4", 6" or 8" Rigid or Flexible Ducting.	130°C/266°F	Class B Insulation
RP145			130°C/266°F	Class F Insulation
RP260			150°C/302°F	
RP265			150°C/302°F	
RP380	6" Schedule 20/40 PVC Pipe		150°C/302°F	
XP151	3" or 4" Schedule 20/40 PVC	Fan may be mounted on the duct pipe or with integral flanges.	120°C/248°F	Class B Insulation
XP201				
GP201	3" or 4" Schedule 20/40 PVC	Fan may be mounted on the duct pipe or with integral flanges.	120°C/248°F	Class B Insulation
GP301				
GP401				
GP501				

Continuous Duty
3000 RPM
Thermally Protected
RP, GP Residential and Commercial
XP Residential Only
Rated for Indoor or Outdoor Use

ENERGY STAR
RP140 Only

LISTED
Electric Fan

Intertek
77728

Conforms to UL STD. 507
Certified to CAN/CSA STD. C22.2 No.113

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the RP, GP and XP Pro Series Radon 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 the housing.** Return unit to factory. (See Warranty below).

Install the RP, GP and XP Pro Series Radon Fan in accordance with all EPA, ANSI/AARST standard practices, and state and local building codes and 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 RP, GP (excluding GP500) and XP Pro Series Radon Fan (the "Fan") will be free from defects in materials and workmanship for a period of 12 months from the date of purchase or 18 months from the date of manufacture, whichever is sooner (the "Warranty Term").

RadonAway® will replace any fan which fails due to defects in materials or workmanship during the Warranty Term. 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®.

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.

5-YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway® will extend the Warranty Term of the fan to 60 months (5 years) from date of purchase or 66 months from date of manufacture, whichever is sooner, provided that the fan is installed by a professional radon mitigation contractor. Proof of purchase and/or proof of professional installation may be required for service under this warranty. No extended warranty is offered outside the Continental United States and Canada beyond the standard 12 months from the date of purchase or18 months from the date of manufacture, whichever is sooner.

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

LIMITATION OF WARRANTY

EXCEPT AS STATED ABOVE, THE RP, GP (excluding GP500) and XP PRO SERIES RADON 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.

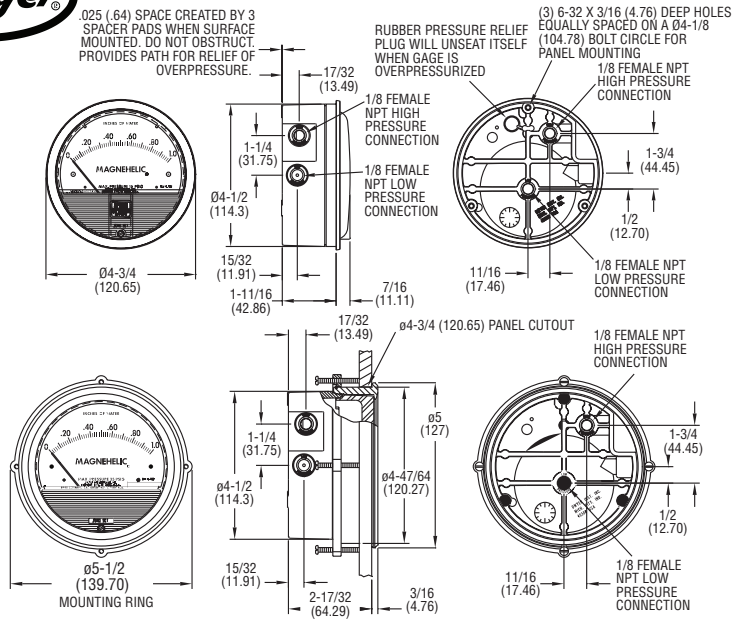
RadonAway® 3 Saber Way
Ward Hill, MA 01835 USA TEL (978) 521-3703
FAX (978) 521-3964
Email to: Returns@RadonAway.com

Record the following information for your records:

Serial Number: _____ Purchase Date: _____

Bulletin A-27

Magnehelic® Differential Pressure Gage



**The blowout plug is not used on models above 180 inches of water pressure, medium or high pressure models, or on gages which require an elastomer other than silicone for the diaphragm.*

STANDARD GAGE ACCESSORIES: Two 1/8″ NPT plugs for duplicate pressure taps, two 1/8″ pipe thread to rubber tubing adapters and three flush mounting adapters with screws.

MP AND HP GAGE ACCESSORIES: Mounting ring and snap ring retainer substituted for 3 adaptors, 1/4" compression fittings replace 1/8" pipe thread to rubber tubing adaptors.

OVERPRESSURE PROTECTION: Standard Magnehelic® Differential Pressure Gages are rated for a maximum pressure of 15 psig and should not be used where that limit could be exceeded. Models employ a rubber plug on the rear which functions as a relief valve by unseating and venting the gage interior when over pressure reaches approximately 25 psig (excludes MP and HP models). To provide a free path for pressure relief, there are four spacer pads which maintain .023″ clearance when gage is surface mounted. Do not obstruct the gap created by these pads.

SPECIFICATIONS

Service: Air and non-combustible, compatible gases. (Natural Gas option available.)
Wetted Materials: Consult factory.
Housing: Die cast aluminum case and bezel, with acrylic cover. (MP model has polycarbonate cover).
Accuracy: 2% of full scale (±3% on -0, -100PA, -125PA, -10MM and ±4% on -00, -60PA, -6MM), throughout range at 70°F (21.1°C); High accuracy version: ±1% on full scale (±1.5% on -0, -100PA, -125PA, -10MM and ±2% on -00, -60PA, -6MM).
Pressure Limits: -20″ Hg to 15 psig.† (-0.677 bar to 1.034 bar); MP option: 35 psig (2.41 bar), HP option: 80 psig (5.52 bar).
Enclosure Rating: IP67.
Overpressure: Relief plug opens at approximately 25 psig (1.72 bar), standard gages only. The blowout plug is not used on models above 180 inches of water pressure, medium or high pressure models, or on gages which require an elastomer other than silicone for the diaphragm.
Temperature Limits: 20 to 140°F (-6.67 to 60°C). *Low temperature models available as special option.
Size: 4″ (101.6 mm) diameter dial face.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.
Process Connections: 1/8″ female NPT duplicate high and low pressure taps - one pair side and one pair back.
Weight: 1 lb 2 oz (510 g), MP & HP 2 lb 2 oz (963 g).
Agency Approvals: RoHS.

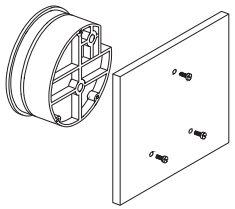
†For applications with high cycle rate within gage total pressure rating, next higher rating is recommended. See Medium and High pressure options.

Note: May be used with hydrogen when ordering Buna-N diaphragm. Pressure must be less than 35 psi.

INSTALLATION

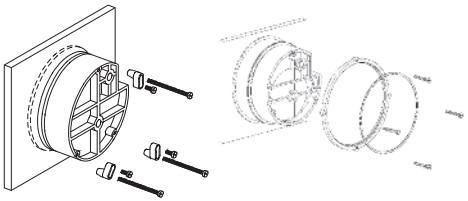
Select a location free from excessive vibration and where the ambient temperature will not exceed 140°F (60°C). Also, avoid direct sunlight which accelerates discoloration of the clear plastic cover. Sensing lines may be run any necessary distance. Long tubing lengths will not affect accuracy but will increase response time slightly. Do not restrict lines. If pulsating pressures or vibration cause excessive pointer oscillation, consult the factory for ways to provide additional damping.
All standard Magnehelic® Differential Pressure Gages are calibrated with the diaphragm vertical and should be used in that position for maximum accuracy. If gages are to be used in other than vertical position, this should be specified on the order. Many higher range gages will perform within tolerance in other positions with only rezeroing. Low range models of 0.5" w.c. plus 0.25" w.c. and metric equivalents must be used in the vertical position only.

SURFACE MOUNTING



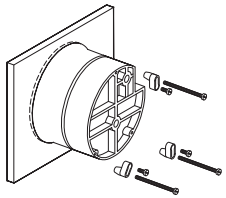
Locate mounting holes, 120° apart on a 4-1/8" dia. circle. Use No. 6-32 machine screws of appropriate length.

FLUSH MOUNTING



Provide a 4-9/16" dia. (116 mm) opening in panel. Provide a 4-3/4" dia. (120 mm) opening for MP and HP models. Insert gage and secure in place with No. 6-32 machine screws of appropriate length, with adapters, firmly secured in place.

FOR -SS BEZEL INSTALLATION



Provide a 4-9/16″ opening in panel. Insert gage and secure with supplied mounting hardware.

PIPE MOUNTING

To mount gage on 1-1/4" - 2" pipe, order optional A-610 pipe mounting kit.

TO ZERO GAGE AFTER INSTALLATION

Set the indicating pointer exactly on the zero mark, using the external zero adjust screw on the cover at the bottom. Note that the zero check or adjustment can only be made with the high and low pressure taps both open to atmosphere.

OPERATION

Positive Pressure: Connect tubing from source of pressure to either of the two high pressure ports. Plug the port not used. Vent one or both low pressure ports to atmosphere.
Negative Pressure: Connect tubing from source of vacuum or negative pressure to either of the two low pressure ports. Plug the port not used. Vent one or both high pressure ports to atmosphere.
Differential Pressure: Connect tubing from the greater of two pressure sources to either high pressure port and the lower to either low pressure port. Plug both unused ports.
When one side of the gage is vented in dirty, dusty atmosphere, we suggest an A-331 Filter Vent Plug be installed in the open port to keep inside of gage clean.

A. For portable use of temporary installation use 1/8" pipe thread to rubber tubing adapter and connect to source of pressure with flexible rubber or vinyl tubing.
B. For permanent installation, 1/4" O.D., or larger, copper or aluminum tubing is recommended.

MAINTENANCE

No lubrication or periodic servicing is required. Keep case exterior and cover clean. Occasionally disconnect pressure lines to vent both sides of gage to atmosphere and re-zero. Optional vent valves should be used in permanent installations. The Series 2000 is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.

WARNING

Attempted field repair may void your warranty. Recalibration or repair by the user is not recommended.

TROUBLE SHOOTING TIPS

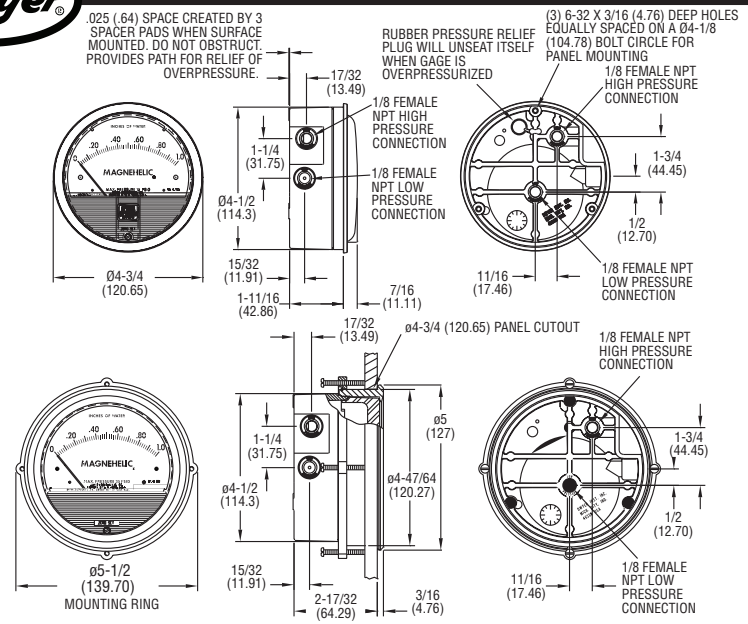
Gage won't indicate or is sluggish.

1. Duplicate pressure port not plugged.
2. Diaphragm ruptured due to overpressure.
3. Fittings or sensing lines blocked, pinched, or leaking.
4. Cover loose or "O"ring damaged, missing.
5. Pressure sensor, (static tips, Pitot tube, etc.) improperly located.
6. Ambient temperature too low. For operation below 20°F (-7°C), order gage with low temperature, (LT) option.

DWYER INSTRUMENTS, INC.
P.O. BOX 373 • MICHIGAN CITY, INDIANA 46360 U.S.A.
Phone: 219/879-8000 Fax: 219/872-9057
www.dwyer-inst.com e-mail: info@dwyer-inst.com

DWYER INSTRUMENTS, INC.
P.O. BOX 373 • MICHIGAN CITY, INDIANA 46360 U.S.A.
Phone: 219/879-8000 Fax: 219/872-9057
www.dwyer-inst.com e-mail: info@dwyer-inst.com

Magnehelic® Differential Pressure Gage
INSTRUCCIONES Y LISTA DE PARTES



(El tapón de goma no es usado en los modelos sobre 180 pulgadas de presión de agua, modelos de presión media o alta, o en instrumentos que requieren un elastizado en cualquier otro material que no sea silicona para el diafragma.)

Accesorios: Tapones 1/8" NPT para las conexiones duplicadas, dos adaptadores de rosca 1/8" NPT a tubo de goma; y tres adaptadores para montaje al ras y tornillos.

Accesorios para Los Modelos MP y HP: El anillo de montaje y el retensor del anillo de presión son substituidos por 3 adaptadores, accesorios de compresión de 1/4" remplazan a los adaptadores de rosca 1/8" a tubo de goma.

Protección Para Sobrepresión: Los Manómetros Diferenciales Magnehelic Estándar están clasificados para una presión máxima de 15 psi y no se deberían de usar donde el límite puede excederse. Los modelos emplean un tapón de goma en el trasero que funciona como una válvula de alivio desmontándose y ventilando el interior del instrumento cuando la sobrepresión alcanza aproximadamente 25 psig. (Los modelos MP y HP son excluidos) Para proveer un camino libre para el alivio de presión, el instrumento viene con rodilleras que mantienen un espacio de .023" cuando el instrumento es montado en superficie. No bloque el espacio creado por estas rodilleras.

† Para aplicaciones con alto ciclo de velocidad dentro de la clasificación de presión total del instrumento, la próxima clasificación mas alta es recomendada. Vea las opciones de media y alta presión.

El instrumento puede ser usado con hidrogeno cuando se ordena con diafragma de Buna-N. La presion tiene que ser menos de 35 psi.

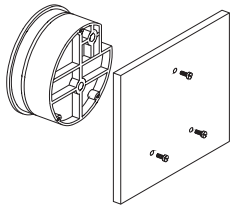
ESPECIFICACIONES

Servicio: aire y gases no combustibles, gases compatibles. (ópcion disponible para uso con gas natural).
Materiales Mojados: Consulte con la fábrica.
Carcasa: Caja y anillo de retención de aluminio fundido a presión con tapadera de acrílico. (El modelo MP tiene la tapadera de policarbonato.)
Exactitud: ±2% de la escala completa (±3% en los márgenes de -0, -100PA, -125PA y -10MM y ±4 % en los márgenes de -00, -60PA y -6MM), en todo el margen a 21.1 °C (70 °F); Versión de alta precisión: ±1% de la escala completa (±1.5% en los márgenes de -0, -100PA, -125PA, -10MM y ±2% en los márgenes de -00, -60PA, -6MM).
Límite de Presión: -20 Hg. a 15 psig. † (-0.677 bar a 1,034 bar); opción MP: 35 psig (2.41 bar), opción HP: 80 psig (5.52 bar).
Clasificación de gabinete: IP67.
Sobrepresión: El tapón de alivio se abre aproximadamente a los 25 psig, modelos estandard únicamente. El tapón de goma no es usado en los modelos sobre 180 pulgadas de presión de agua, modelos de presión media o alta, o en instrumentos que requieren un elastizado en cualquier otro material que no sea silicio para el diafragma.
Límite de Temperatura: -6.67 a 60ºC. * Modelos de baja temperatura disponibles como opción especial.
Dimensiones: diám. 120,65 mm x 55,6 prof.
Orientación de Montaje: El diafragma debe ser usado solo en posición vertical. Consulte con la fábrica para otras orientaciones de posición.
Conexiones: 1/8" NPT para alta y baja presión, duplicadas (atrás, a los lados).
Peso: 510 g, MP y HP 963 g.
Aprobación de la agencia: RoHS.

Instalacion

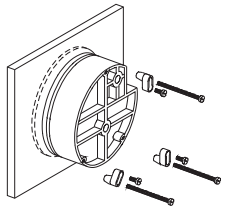
Seleccione un lugar libe de exceso de vibraciones, y donde la temperatura ambiente no supere los 60°C. Evite luz solar directa, para evitar decoloración de la cubierta plástica. Las conexiones de proceso pueden tener cualquier longitud sin afectar la exactitud, pero pueden extender el tiempo de respuesta del instrumento. Si hay pulsación de presión o vibración, consulte a fábrica sobre medios de amortiguación.
Los MAGNEHELIC han sido calibrados con el diafragma vertical, y deben ser usados en esas condiciones. Para otras posiciones, se debe especificar en la orden de provisión. Los de rango elevado pueden ser usados en diversas posiciones, pero se debe reajustar el cero. Los modelos de la serie 2000-00 y equivalentes métricos deben ser usados solo verticalmente.

Montaje en Superficie



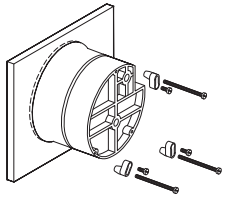
Perfore tres orificios separados 120° sobre una circunferencia de 105 mm de diám. y sostenga el instrumento con tres tornillos 6-32 de long. apropiada.

Montaje alineado



Perfore un circulo de 115 mm de diám. en el panel, y sostenga el instrumento mediante los.

Para instalar el bisel de acero inoxidable



Haga una apertura de 4-9/16 pulgadas en el panel. Inserte el medidor y asegure con los herrajes de montaje provistos.

Montaje Sobre Pipa

Para montar el instrumento sobre pipas de 32 a 50 mm de diám., ordene el adaptador opcional A-610.

Puesta a Cero Después de Instalar

Deje las conexiones de presión abiertas a atmósfera y ajuste a cero desde tornillo del panel frontal.

Operacion

Presión Positiva: Conecte la tubería desde la fuente de presión a cualquiera de las dos conexiones de alta presión (HIGH), bloqueando la no usada; Las conexiones de baja (LOW) presión pueden dejarse uno o los dos abiertos a la atmósfera.
Presión Negativa: Repita el procedimiento anterior, conectado en este caso las conexiones de baja presión (LOW). Deje las otras conexiones abiertas.
Presión diferencial: Conecte el tubo correspondiente a la presión más positiva al cualquiera de los conectores de alta presión (HIGH) bloqueando el no usado, y la más baja presión o presión negativa (vacío) al conector de baja presión (LOW). Puede usarse cualquier conector de cada par, dejando siempre uno bloqueado. Si se deja una conexión abierta a la atmósfera, se recomienda el uso de un filtro tipo A-331 en el lugar correspondiente para mantener limpio el interior del instrumento. Para uso portable, o instalación temporaria, uso adapta dores para rosca de tubo de 1/89 a tubo flexible, y conecte a proceso mediante una tubería de goma, o equivalente. Para instalación permanente, se recomienda el uso de tubo de cobre o aluminio de por lo menos 1/4" de diám. exterior.

No se requiere mantenimiento específico alguno, ni lubricación. Periódicamente, desconecte el instrumento, ventee la presión acumulada, y reajuste el cero. Para instalaciones permanentes, se debe usar un juego de válvulas de montaje permanente para el venteo.
El instrumento de Serie 2000 no puede ser re parado en el campo y debería de ser regresado si reparos son necesarios (Reparos en el campo no deben de ser intentados y pueden cancelar la garantía.). Asegurarse de incluir una descripción breve del problema más cualquier notas pertinentes a la aplicación para devolución de productos antes de enviar el instrumento.

Cuidado! : La recalibración en campo puede invalidar la garantía. No se recomienda la recalibracion por parte del usuario. En caso necesario envie el instrumento con transporte pago a:

Localización De Fallas

• *El instrumento no indica, o es lento en reacción.*
1. Conexión duplicada abierta.
2. Diafragma roto por sobrepresión.
3. Tubería de conexión perforada, con pérdidas o pinchazos.
4. Anillo de retención flojo, u "O " ring dañado.
5. Conexión a proceso indebida o inadecuada.
6. Temperatura muy baja. Para este caso ordene tipos LT (baja temperatura).

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DWYER INSTRUMENTS, INC.
P.O. BOX 373 • MICHIGAN CITY, INDIANA 46360 U.S.A.
Phone: 219/879-8000 Fax: 219/872-9057
www.dwyer-inst.com e-mail: info@dwyer-inst.com

DWYER INSTRUMENTS, INC.
P.O. BOX 373 • MICHIGAN CITY, INDIANA 46360 U.S.A.
Phone: 219/879-8000 Fax: 219/872-9057
www.dwyer-inst.com e-mail: info@dwyer-inst.com

INSTALLATION & OPERATING INSTRUCTIONS
Instruction P/N IN015 Rev E
FOR *CHECKPOINT IIa* TM P/N 28001-2 & 28001-3
RADON SYSTEM ALARM

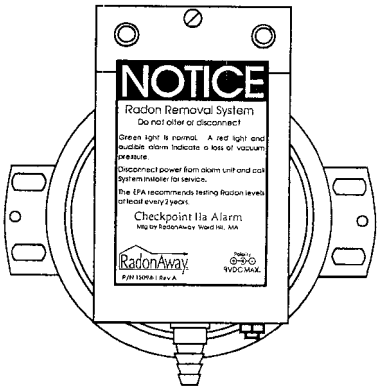
INSTALLATION INSTRUCTIONS
(WALL MOUNTING)

Select a suitable wall location near a vertical section of the suction pipe. The unit should be mounted about four or five feet above the floor and as close to the suction pipe as possible. Keep in mind that with the plug-in transformer provided, the unit must also be within six feet of a 120V receptacle. **NOTE: The Checkpoint IIa is calibrated for vertical mounting, horizontal mounting will affect switchpoint calibration.**

Drill two ¼" holes 4" apart horizontally where the unit is to be mounted.

Install the two ¼" wall anchors provided.

Hang the CHECKPOINT IIa from the two mouting holes located on the mounting bracket. Tighten the mounting screws so the unit fits snugly and securely against the wall.



Drill a 5/16" hole into the side of the vent pipe about 6" higher than the top of the unit.

Insert the vinyl tubing provided about 1" inside the suction pipe.

Cut a suitable length of vinyl tubing and attach it to the pressure switch connector on the CHECKPOINT IIa.

CALIBRATION AND OPERATION.

The CHECKPOINT IIa units are calibrated and sealed at the factory to alarm when the vacuum pressure falls below the factory setting and should not normally require field calibration. Factory Settings are:
28001-2 -.25" WC Vacuum
28001-3 -.10" WC Vacuum

To Verify Operation:

With the exhaust fan off or the pressure tubing disconnected and the CHECKPOINT IIa plugged in, both the red indicator light and the audible alarm should be on.

Turn the fan system on or connect the pressure tubing to the fan piping. The red light and the audible alarm should go off. The green light should come on.

Now turn the fan off. The red light and audible alarm should come on in about two or three seconds and the green light should go out.

WARRANTY INFORMATION

Subject to applicable consumer protection legislation, RadonAway warrants that the CHECKPOINT IIa will be free from defective material and workmanship for a period of (1) year from the date of purchase. Warranty is contingent on installation in accordance with the instructions provided. This warranty does not apply where repairs or alterations have been made or attempted by others; or the unit has been abused or misused. Warranty does not include damage in shipment unless the damage is due to the negligence of RadonAway. All other warranties, expressed or written, are not valid. To make a claim under these limited warranties, you must return the defective item to RadonAway with a copy of the purchase receipt. RadonAway is not responsible for installation or removal cost associated with this warranty. In no case is RadonAway liable beyond the repair or replacement of the defective product FOB RadonAway.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. THERE IS NO WARRANTY OF MERCHANTIBILITY. ALL OTHER WARRANTIES, EXPRESSED OR WRITTEN, ARE NOT VALID.

For service under these warranties, 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 to and from factory.

Manufactured by:
RadonAway
Ward Hill, MA

APPENDIX C

Sub-Slab Depressurization System Operations and Maintenance Log

SSDS Suction Pipe Vacuum Readings

Date	Time	Initials	Normal Range	Fan 1 (SP-2) (Col Q-16)	Fan 2 (SP-5) (Col Q-19)		Visual Inspection of Piping	COMMENTS
			TBD					
			TBD					
			TBD					
			TBD					
			TBD					
			TBD					
			TBD					
			TBD					
			TBD					
			TBD					
			TBD					
			TBD					

Notes:
* Document readings at least monthly.
* Pressure reading ranges to be determined after construction
* Readings are in Inches of Water Column (in.w.c.).
* If reading is out of range email or call Contacts within one business day.
* See Figure for suction points and fan locations.

SSD System
Annual Inspection

Date	Time	Initials	Fan 1	Fan 2		Comments

Date	Time	Initials	V-1	V-2	V-3	V-4	Comments

Visual Inspection of System:

Recommendation Actions:

Description of Past Year Activities:

Notes:

* **Readings are in Inches of Water Column (in.w.c.)**
* **See Figure for monitoring points and fan locations**

APPENDIX D

Health and Safety Plan

Construction Health and Safety Plan

567 Main Street
Westbury, New York

September 2022

Prepared by:

Tyll Engineering and Consulting, PC
169 Commack Road, Suite H173
Commack, New York
Karen G. Tyll, PE
(631) 629-5373 / Karen@tyllengineering.com

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1.0 INTRODUCTION

This section of the Health and Safety Plan (HASP) document defines general applicability and general responsibilities with respect to compliance with Health and Safety programs. This plan has been prepared for invasive remediation activities to be conducted in the future.

1.1 Scope and Applicability of the Site Health and Safety Plan

The purpose of this HASP is to define the requirements and designate protocols to be followed during future excavation/remediation activities at the site. Applicability extends to all government employees, contractors, subcontractors, and visitors.

All personnel on site, contractors and subcontractors included, shall be informed of the site emergency response procedures and any potential fire, explosion, health, or safety hazards of the operation. This HASP summarizes those hazards in Table 3.1 and defines protective measures planned for the site.

This plan must be reviewed and an agreement to comply with the requirements must be signed by all personnel prior to entering the exclusion zone or contamination reduction zone.

During development of this plan, consideration was given to current safety standards as defined by the Environmental Protection Agency (EPA)/Occupational Health and Safety Administration (OSHA)/National Institute of Occupational Safety and Health (NIOSH), health effects and standards for known contaminants, and procedures designed to account for the potential for exposure to unknown substances. Specifically, the following reference sources have been consulted:

- OSHA 29 CFR 1910.120 and EPA 40 CFR 311
- USEPA, Office of Emergency and Remedial Response, Emergency Response Team, Standard Operating Safety Guides
- NIOSH/OSHA/USCG/EPA Occupational Health and Safety Guidelines

- American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values

2.0 KEY PERSONNEL/IDENTIFICATION OF HEALTH AND SAFETY

2.1 Key Personnel

The organizational structure will be reviewed and updated periodically by the site supervisor.

Team Representatives:

1. Andrew Finkelstein, Property Manager
2. Sam of the Jeep Store
3. Karen G. Tyll, PE

2.2 Site Specific Health and Safety Personnel

The SHSO at the site with respect to any remedial activities is:

Karen Tyll, PE

Tyll Engineering and Consulting, PC

Designated alternates include:

TO BE DETERMINED

2.3 Organizational Responsibility

1. The SHSO of the site will conduct site inspections throughout the project making sure the Health and Safety Plan is followed. Their main concern is the personal protection of the workers.

3.0 TASK SAFETY AND HEALTH RISK ANALYSIS

3.1 Historical Overview of Site

567 Main Street (Section 11, Block 164 and Lot 68 on the Nassau County Tax Map) Currently, the Lot is 9,183 square feet and contains one, 2,950 (gross) square foot, two-story commercial/residential building constructed in 1952. The Site is bounded by a computer supplier to the north, Main Street and Saf-T-Swim and a church to the south, a commercial building to the east, and Swalm Street and a sandwich shop to the west. There are no sensitive receptors such as schools, hospitals, and day care facilities within a 250 to 500-foot radius of the Site.

In 2010, a NYSDEC Contractor collected three samples, 2 from within the building and 1 from outside the building. Tetrachloroethylene (PCE) was detected in indoor air within the Site building at concentrations of 27 and 28 micrograms per cubic meter (ug/m3). At the time, these concentrations were below the NYSDOH indoor air guideline of 100 ug/m3 but were near the current NYSDOH indoor air guideline of 30 ug/m3. Trichloroethylene (TCE) was detected in the indoor air at concentrations of 1.9 and 1.6 ug/m3. The current NYSDOH indoor air guideline for TCE is 2 ug/m3. In addition, PCE and TCE were detected at (maximum of 4,200 ug/m3 and 31 ,000 ug/m3 respectively) in soil vapor beneath the building.

On March 11, 2021, an additional sampling event was completed that included the collection of sub-slab, indoor air and outdoor ambient air. PCE was detected in indoor air within the building at concentrations of 1.7 at VP-1 and 1.5 ug/m3 at VP-2. These concentrations were below the NYSDOH indoor air guideline of 30 ug/m3. TCE was detected in the indoor air at concentrations of 2.0 at VP-1 and 1.4 ug/m3 at VP-2. The current NYSDOH indoor air guideline for TCE is 2 ug/m3. PCE and TCE were detected at maximum concentrations of 360 ug/m3 and 1800 ug/m3 in soil vapor beneath the building slab. TCE was not detected in the outside (ambient) air sample but PCE was detected at 2.7 ug/m^3 (higher concentration than the two indoor air samples).

3.2 Task-by-Task Risk Analysis

The evaluation of hazards will be based upon the knowledge of the site background presented in Section 3.1 above, and anticipated risks posed by the specific tasks to be performed.

The following subsections describe each task/operation in terms of the specific hazards associated with it. In addition, the protective measures to be implemented during completion of future tasks are also identified.

Table 3.1 provides a summary of task analysis and chemical hazards potentially encountered at the Site.

TABLE 3.1 TASK ANALYSIS POTENTIAL CHEMICAL HAZARDS OF CONCERN			
Contaminant	**PEL/TLV**	**LEL (%)**	**IDLH**
VOCs			
Benzene	1/0.5ppm	1.2	500 ppm
Toluene	200/50 ppm	1.1	500 ppm
Xylenes	100/100 ppm	~1	900 ppm
Ethyl benzene	100/100ppm	0.8	800 ppm
MTBE	NE/50ppm	NE	NE
Diesel Fuel	NE/100mg/m^3		Ca (exhaust)
Gasoline	NE/300	1.4	Ca
Lead	0.05/0.05 mg/m^3	N/A	100 mg/m^3
PCBs	0.5-1 mg/m3	N/A	5 mg/m^3
PAHs	0.2 mg/m^3	N/A	1750 mg/m^3
tetrachlorethylene	100 ppm/25	N/A	150 ppm
Trichloroethylene	100 ppm/24 hr	N/A/	25 ppm
Pesticides	Variable	N/A	N/A
Arsenic	0.01 mg/m^3	N/A	5 mg/m^3
Mercury	0.025 mg/m^3	N/A	10 mg/m^3
Barium		N/A	0.5 mg/m3

NE – not established N/A-not appropriate
Ca - Cancer

Notes:

1. TLV = Threshold Limit Value
2. IDLH = Immediately Dangerous to Life and Health

3.3 Chemical Hazards

3.3.1 Hazard Identification and Prevention

- Safety related work practices would be used to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts. Overhead power lines, buried cables and electrical equipment used on site all pose a danger of shock or electrocution if workers contact or sever them during field operations.

- New York State law requires that a utility mark out to be performed at a site at least 72 hours prior to starting any subsurface work. The tank removal contractor will contact New York City One Call (1-800-272-4480) to request a mark out of underground utilities in the proposed excavation and drilling areas. Work will not begin until the required utility clearances have been completed.
- Public utilities typically do not mark-out utility lines that are located on private property. Therefore, contractors must exercise due diligence and try to identify the location of any private utilities at the site. A private utility contractor will clear on-site subsurface disturbance locations for utilities prior to the commencement of any such work. Contractors will also use as-built drawings for the area being investigated, perform a line locating survey, and identify a no-dig/drill zone and hand dig if there is insufficient data to determine the location of utility lines.
- Care must be taken to ensure loose clothing does not get tangled in any moving equipment while borings are being drilled.
- There may be slip or trip hazards associated with rough, slippery or elevated work surfaces at the site. The sampling sites could contain a number of slip, trip and fall hazards for site workers, such as: holes, pits, or ditches; excavation faces and slippery surfaces (steep grades, uneven grades, snow and ice and sharp objects).
- Drilling or excavating is dangerous during electrical storms. All field activity must terminate when thunderstorms are evident. Extreme heat and cold, ice and heavy rain can produce unsafe conditions for drilling work. Such conditions, when present, will be evaluated on a case-by-case basis to determine if work shall terminate.
- The use of an excavator and other equipment that are gasoline or fuel powered presents the possibility of encountering fire and explosion hazards.
- Plants and animals that are known to be hazardous to humans may affect work that takes place. Spiders, bees, wasps, hornets, ticks, poison oak and poison ivy are only some of the hazards that may be encountered. Individuals who may potentially be exposed to these hazards should be made aware of their existence and instructed in their identification. Emergencies resulting from contact with a natural hazard should be

handled through the normal medical emergency channels. Individuals who are sensitive to these types of "natural" hazards should indicate their susceptibility to the SHSO.

- Work on-site will involve the use of heavy construction equipment such as an excavator. The unprotected exposure of site workers to this noise during field activities can result in noise induced hearing loss. The SHSO will monitor the noise exposure for the initial trip and determine whether noise protection is warranted for each of the team members. The SHSO will ensure that either ear muffs or disposable foam earplugs are made available to all personnel and are used by the personnel in the immediate vicinity of the field operation as required.

3.3.1 General Description

There is Trichloroethylene and Tetrachloroethylene found in the soil vapor under the concrete slab on Site.

Potential chemical hazards below the building slab are evaluated below. It is anticipated that printing/dry cleaning compounds and dust could be of concern if the concrete slab is opened. The potential for exposure to vapors, contaminated dusts, and contaminated soil/groundwater is of utmost concern.

3.3.2 First Aid

If soil comes in contact with the eyes immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Contact lenses should not be worn but can be protected by safety glasses/goggles. If lead contaminated soil comes in contact with the skin, wash the skin with soap and water prior to leaving the site. If a person breathes in large amounts of dust, move the exposed person to fresh air at once. If contaminated soil has been swallowed, get medical attention immediately (NIOSH, 1987).

4.0 PERSONNEL TRAINING REQUIREMENTS

Consistent with OSHA 29 CFR 1910.120 regulation covering Hazardous Waste Operations and Emergency Response, all site personnel will be required to be trained in accordance with the standard. At a minimum, all personnel will be required to be trained to recognize the hazards on-site, the provisions of this HASP, and the responsible personnel. The SHSO at the site pre-entry briefing(s) or periodic site briefings will discuss this plan.

5.0 PERSONNEL PROTECTIVE EQUIPMENT TO BE USED

This section describes the general requirements of the EPA designated Levels of Protection (A through D), and the specific levels of protection required for each task at the Site.

5.1 Levels of Protection

Personnel will wear the appropriate protective equipment when response activities involve known or suspected atmospheric contamination, vapors, gases, or particulates may be generated by site activities, or when direct contact with skin-affecting substances may occur. Full face piece respirators protect lungs, gastrointestinal tract, and eyes against airborne toxicants. Chemical-resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals.

The specific levels of protection and necessary components for each have been divided into four categories according to the degrees of protection afforded:

Level A: Should be worn when the highest level of respiratory, skin, and eye protection is needed.

Level B: Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection. Level B is the primary level of choice when encountering unknown environments.

Level C: Should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.

Level D: Should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards.

Modifications of these levels are permitted, and routinely employed during site work activities to maximize efficiency. For example, Level C respiratory protection and Level D skin protection may be required for a given task. Likewise, the type of chemical protective ensemble (i.e., material, format) will depend upon contaminants and degrees of contact.

The Level of Protection selected is based upon the following:

- Type and measured concentration of the chemical substance in the ambient atmosphere and its toxicity.
- Potential for exposure to substances in air, liquids, or other direct contact with material due to work being done.

- Knowledge of chemicals on-site along with properties such as toxicity, route of exposure, and contaminant matrix.

In situations where the type of chemical, concentration, and possibilities of contact are not known, the appropriate Level of Protection must be selected based on professional experience and judgment until the hazards can be better identified.

5.2 Level D Personnel Protective Equipment:

- Disposable Tyvek^{R} coveralls (as needed)
- Disposable Nitrile Exam gloves (as needed)
- Disposable Tyvek^{R} booties (as needed)
- Steel-tipped work boots
- Safety glasses
- Hard hat
- 3M N95 Dust Masks with Exhalation Valves (if needed)

5.3 Reassessment of Protection Program

The Level of Protection provided by PPE selection shall be upgraded or downgraded based upon changes in site conditions or investigation findings. When a significant change occurs, the hazards should be reassessed. Some indicators of the need for reassessment are:

- Commencement of a new work phase.
- Change in job tasks during a work phase.
- Change of season/weather
- When temperature extremes or individual medical considerations limit the effectiveness of PPE.
- Change in work scope, which affects the degree of contact with contaminants.

5.4 Work Mission Duration

Before the workers actually begin work in their PPE ensembles, the anticipated duration of the work mission will be established. Several factors limit mission length, including:

- Air supply consumption (SCBA use)-Not Applicable.
- Suit/Ensemble permeation and penetration rates for chemicals-Not Applicable.
- Ambient temperature and weather conditions (heat stress/cold stress).
- Capacity of personnel to work in PPE.

5.5 Personal Protective Equipment Recommended for Site

The following specific clothing materials are recommended for the site:

Soil Sampling and Excavation – Level D

Site activities will require PPE as follows: hardhat, disposable Tyvek^{R} coveralls (if needed), disposable Tyvek^{R} booties (if needed), safety glasses and chemical resistant gloves. Particulate respirator-3M N95 Dust Masks with exhalation valves will be available.

5.6 SOP for Personal Protective Equipment

Proper inspection of PPE features several sequences of inspection depending upon specific articles of PPE and its frequency of use. The different levels of inspection are as follows:

- Inspection and operation testing of equipment received from the factory or distributor.
- Inspection of equipment as it is issued to workers.
- Inspection after use or training and prior to maintenance.
- Periodic inspection of stored equipment.
- Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.
    - The primary inspection of the PPE in use for activities at the Site will occur prior to immediate use and will be conducted by the user. This ensures

that the specific device or article has been checked-out by the user and that the user is familiar with its use.

TABLE 5.1

SAMPLE PPE INSPECTION CHECKLIST CLOTHING

Before use:

- Determine that the clothing material is correct for the specified task at hand.
- Visually inspect for:
- Imperfect seams
- Non-uniform coatings
- Tears
- Malfunctioning closures
- Hold up to light and check for pinholes.
- Flex product:
- Observe for cracks
- Observe for other signs of shelf deterioration
- If the product has been used previously, inspect inside and out for signs of chemical attack:
- Discoloration
- Swelling
- Stiffness During the work task:
- Evidence of chemical attack such as discoloration, swelling, stiffening, and softening.

Keep in mind, however, that chemical permeation can occur without any visible effects.

- Closure failure.
- Tears.
- Punctures.
- Seam Discontinuities.

GLOVES

Before use:

- Visually inspect for:
- Imperfect seams
- Tears
- Non-uniform coating
- Pressurize glove with air; listen for pinhole leaks.

6.0 FREQUENCY AND TYPES OF AIR MONITORING/SAMPLING

This section explains the general concepts of an air-monitoring program and specifies the surveillance activities that will take place during future invasive work at the Site.

The purpose of air monitoring is to identify and quantify airborne contaminants in order to verify and determine the level of worker protection needed. Initial screening for identification is often qualitative, i.e., the contaminant, or the class to which it belongs, is demonstrated to be present, but the determination of its concentration (quantification) must await subsequent testing. Two principal approaches are available for identifying and/or quantifying airborne contaminants:

- The on-site use of direct-reading instruments.
- Laboratory analysis of air samples obtained by a gas-sampling bag, collection media (i.e., filter, sorbent) and/or wet-contaminant collection methods.

6.1 Direct-Reading Monitoring Instruments

Unlike air sampling devices, which are used to collect samples for subsequent analysis in a laboratory, direct-reading instruments provide information at the time of sampling, enabling rapid decision-making. Data obtained from the real-time monitors are used to assure proper selection of personnel protection equipment, engineering controls, and work practices. Overall, the instruments provide the user the capability to determine if site personnel are being exposed to concentrations that exceed exposure limits or action levels for specific hazardous materials.

Of significant importance, especially during initial entries, is the potential for IDLH conditions or oxygen deficient atmospheres. Real-time monitors can be useful in identifying any IDLH conditions, toxic levels of airborne contaminants, flammable atmospheres, or radioactive hazards. Periodic monitoring of conditions is critical, especially, as exposures may have increased since initial monitoring or if new site activities have commenced.

6.2 Site Air Monitoring and Sampling Program

1. **Air Monitoring Instruments**

    - **Organic Vapor Monitoring**

Instrument: Photoionization Detector (PID) with for use during all intrusive activities (10.6 Ev lamp).

- **Dust Monitoring**

Instrument: TSI DustTrak Model 8520 (or equivalent)

If required, continuous dust monitoring during all site activities will be conducted with readings taken every 15 minutes. Dust mitigation must be employed should readings exceed 10 mg/m^3.

Calibration and Record keeping

Equipment used will be calibrated in accordance with the manufacturers' specifications. The PID and CGI will be calibration checked before and after use under approximately the same conditions at which the instrument will be used. Calibration information will be kept in the field notebook or instrument log. The date, time, location, instrument serial number, calibration gas and concentration, will be noted.

A. Action Levels

TABLE 6.1

SITE AIR MONITORING AND SAMPLING PROGRAM SUMMARY

Instrument	Action Level	Action
PID (10.6 ev)	Continuous readings to 9ppm	Remain in level D PPE.
PID	Continuous reading of 10 to 100 ppm above background	Level D PPE
PID	Continuous reading over 100 ppm background	Stop Work. Reevaluate work conditions and procedures, Contact SHSO prior to continuing for authorization.
Dust Monitor	Continuous reading >10.0 mg/m^3	Suppress by spraying the dusty area with water.

Notes: PEL = Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit
REL = National Institute of Occupational Safety and Health (NIOSH) Recommended Exposure Limit TLV = American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value

B. Reporting Format

1 Air Monitoring Log

7.0 SITE CONTROL MEASURES

The following section defines measures and procedures for maintaining site control. Site control is an essential component in the implementation of the site health and safety program.

7.1 Buddy System

During all Level B, C or D activities or when some conditions present a risk to personnel, the implementation of a buddy system is recommended if not mandatory. A buddy system requires at least two (2) people to work as a team, each looking out for each other. Table 8.1 lists those tasks, which require a buddy system and any additional site control requirements.

TABLE 7.1

PERSONNEL REQUIREMENTS

Task	Control Measures
Soil Sampling	Line of sight, buddy system
Excavation	Line of sight, buddy system

7.2 Site Communications Plan

Successful communications between field teams and personnel in the support zone is essential. The following communications systems will be available during activities at the Site.

- Hand Signals
- Direct Vocal Communication
- For hand signal communications, the following definitions will apply during activities at the Site:

TABLE 7.2

HAND SIGNAL DEFINITIONS

Signal	Definition
Hands clutching throat	Out of air/cannot breath
Hands on top of head	Need assistance
Thumbs up	OK/I am all right/I understand
Thumbs down	No/Negative
Arms waving upright	Send backup support
Grip partners wrist	Exit area immediately

7.3 Work Zone Definition

The three general work zones established at the Site are the Exclusion Zone, Contamination Reduction Zone, and Support Zone. One of the basic elements of effective site soil remediation activities is the delineation of work zones. The purpose of establishing work zones is to:

- Reduce the accidental spread of hazardous substances by workers or equipment from the contaminated areas to the clean areas;
- Confine work activities to the appropriate areas, thereby minimizing the likelihood of accidental exposures;
- Facilitate the location and evacuation of personnel in case of an emergency; and
- Prevent unauthorized personnel from entering controlled areas.

Although a site may be divided into as many zones as necessary to ensure minimal employee exposure to hazardous substances, this plan uses the three most frequently identified zones in similar projects. These zones are the Exclusion Zone, the Decontamination Zone, and the Support Zone (sometimes referred to by others as the “clean zone”). Movement of personnel and equipment between these zones should be minimized and restricted to specific access control points to minimize the spreading of contamination, if encountered.

7.3.1 Exclusion Zone

The Exclusion Zone is the area where contamination is either known or expected to occur and where the greatest potential for exposure exists. No contamination is actually known to exist on this site. Therefore, the following protective measures will be taken in the Exclusion Zone.

Unprotected onlookers will be restricted from suspicious pre-screened soils requiring sampling such that they are 25 feet upwind or 50 feet downwind of excavation or drilling activities.

Those conducting activities and sampling in the Exclusion Zone will wear the applicable Personal Protective Equipment (PPE). The actions to be taken and PPE to be worn in the Exclusion Zone if VOCs are determined with the PID to be above background are described in Section 6 and Table 6.1.

7.3.2 Decontamination Zone

A Decontamination Zone will be established between the Exclusion Zone and the Support Zone, and will include the personnel, equipment and supplies that are needed to decontaminate equipment and personnel. The size will be selected by the SHSO to be sufficient to conduct the necessary decontamination activities. Personnel and equipment in the Exclusion Zone must pass through this zone before leaving or entering the Support Zone. This zone should always be established and maintained upwind of the Exclusion Zone.

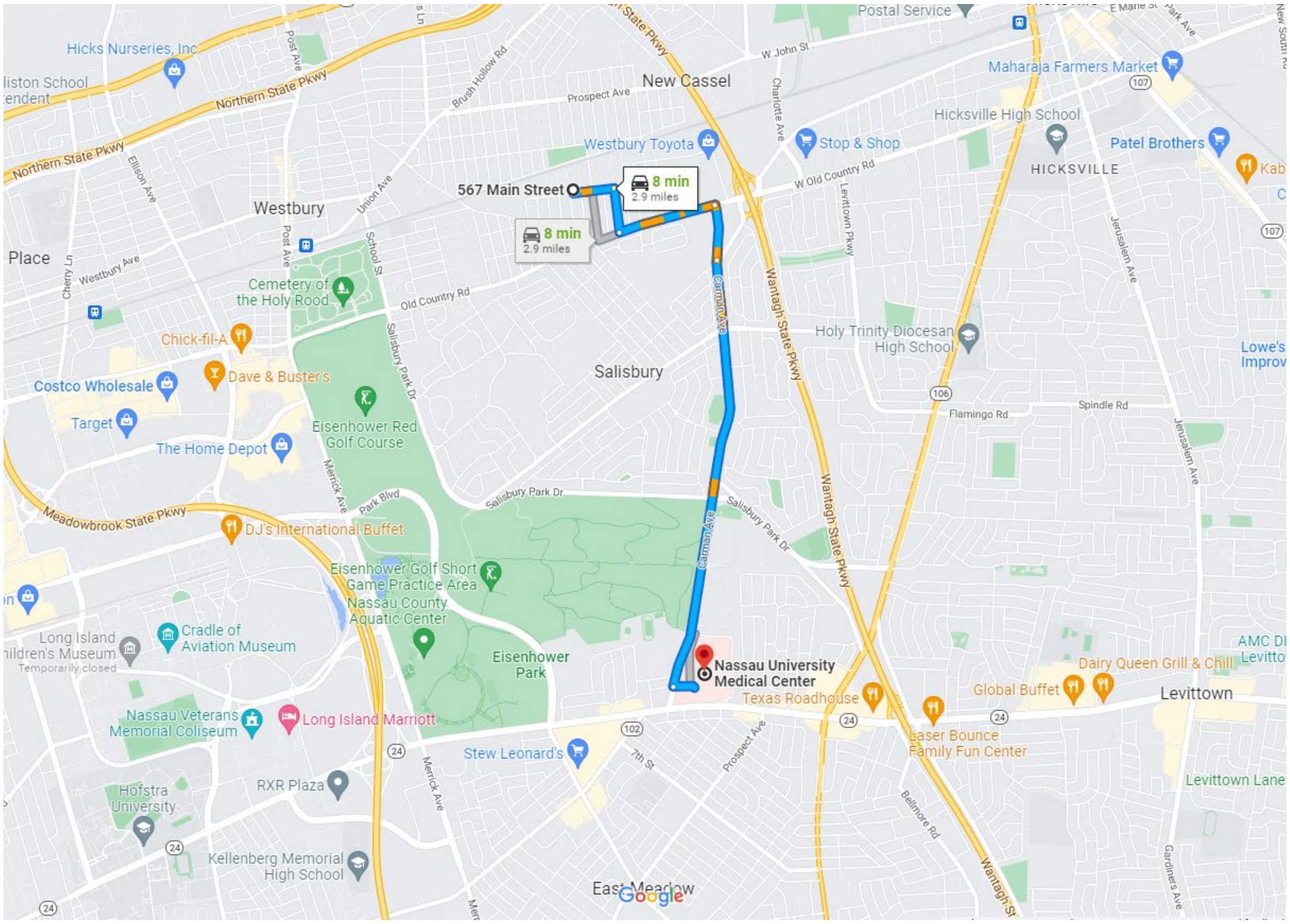
7.3.3 Support Zone

The Support Zone will surround the Decontamination Zone and the Exclusion Zone. Break areas, operational direction and support facilities will be located in this area. Eating, smoking and drinking will be allowed only in this area.

7.4 Nearest Medical Assistance

Figure 7.1 shows a map of the route to the Nassau University Medical Center located at 2201 Hempstead Turnpike, East Meadow, NY 11554 (516) 572-0123), which is the nearest hospital that can provide emergency care for individuals who may experience an injury or exposure on site. The route to the hospital will be verified by the SHSO and will be familiar to all site personnel.

FIGURE 7.1


567 Main Street
8 min
2.9 miles
8 min
2.9 miles
Nassau University
Medical Center
Westbury
New Cassel
Salisbury
Hicksville
Levittown
East Meadow
Eisenhower Park
Northern State Pkwy
Meadowbrook State Pkwy
Wantagh State Pkwy
Old Country Rd
Carman Ave
Google

7.5 Safe Work Practices

Table 7.3 provides a list of standing orders for the Exclusion Zone.

Table 7.4 provides a list of standing orders for the Decontamination Zone.

7.6 Emergency Alarm Procedures

The warning signals described in Section 9.4 "Evacuation Routes and Procedures," will be deployed in the event of an emergency. Communication signals will also be used according to Section 7.2.

TABLE 7.3

STANDING ORDERS FOR EXCLUSION ZONE

- No smoking, eating, or drinking in this zone.
- No horseplay.
- No matches or lighters in this zone.
- Check-in on entrance to this zone.
- Check-out on exit from this zone.
- Implement the communications system.
- Line of sight must be in position.
- Wear the appropriate level of protection as defined in the HASP.

TABLE 7.4

STANDING ORDERS FOR CONTAMINATION REDUCTION ZONE

- No smoking, eating, or drinking in this zone.
- No horseplay.
- No matches or lighters in this zone.
- Wear the appropriate level of protection.

8.0 DECONTAMINATION PLAN

Consistent with the levels of protection required, the decontamination table(s) provides a step-by-step representation of the personnel decontamination process. These procedures should be modified to suit site conditions and protective ensembles in use.

8.1 Standard Operating Procedures

Decontamination involves the orderly controlled removal of contaminants. Standard decontamination sequences are presented in Table 8.1. All site personnel should minimize contact with contaminants in order to minimize the need for extensive decontamination. Personnel shall clean on-site as much gross contamination from clothing and equipment, as possible.

8.2 Levels of Decontamination Protection Required for Personnel

The levels of protection required for personnel assisting with decontamination will be Level D. The SHSO is responsible for monitoring decontamination procedures and determining their effectiveness.

8.3 Equipment Decontamination

Sampling equipment will be dedicated to each sample as practicable. Appendix A is the decontamination protocol for equipment. After on-site decontamination, non-disposable materials, such as gloves and booties, will be placed in plastic bags and for proper disposal off site.

8.4 Disposition of Decontamination Wastes

Contaminated disposable materials will be left in a secured condition on-site.

TABLE 8.1

LEVEL D DECONTAMINATION STEPS	
Step 1	Remove outer garments (i.e., coveralls) and boots
Step 2	Remove gloves
Step 3	Wash hands and face

9.0 EMERGENCY RESPONSE/CONTINGENCY PLAN

This section describes contingencies and emergency planning procedures to be implemented at the Site. This plan is compatible with local, state and federal disaster and emergency management plans, as appropriate.

9.1 Pre-Emergency Planning

During the site briefing held periodically/daily, all employees will be trained in and reminded of provisions of the emergency response plan, communication systems, and evacuation routes. Table 9.1 identifies potential hazards associated with site activities, along with the available emergency prevention/control equipment and its location. The plan will be reviewed and revised, if necessary, on a regular basis by the SHSO. This will ensure that the plan is adequate and consistent with prevailing site conditions.

TABLE 9.1

EMERGENCY RECOGNITION/CONTROL MEASURES

HAZARD	PREVENTION/CONTROL	LOCATION
Fire/Explosion	Fire Extinguisher	Site Trailer and Heavy Equipment. mounted
Spill	Sorbent Materials	Not Applicable
Air Release	Evacuation Routes	Not Applicable

9.2 Personnel Roles and Lines of Authority

The Site Supervisor has primary responsibility for responding to and correcting emergency situations. This includes taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may involve evacuation of personnel from the site area, and evacuation of adjacent residents. He/she is additionally responsible for ensuring that corrective measures have been implemented, appropriate authorities notified and follow-up reports completed. The SHSO may be called upon to act on the behalf of the site supervisor, and will direct responses to any medical emergency. The individual contractor organizations are responsible for assisting the project manager in his/her mission within the parameters of their scope of work.

9.3 Emergency Recognition/Prevention

Table 3.1 provides a listing of chemical and physical hazards on-site. Additional potential hazards associated with site activities are listed in Table 9.1, along with the available emergency

prevention/control equipment and its location. Personnel will be familiar with techniques of hazard recognition from pre-assignment training and site- specific briefings. The SHSO is responsible for ensuring that prevention devices and equipment are available to personnel.

9.4 Evacuation Routes/Procedures

In the event of an emergency which necessitates an evacuation of the site, the following alarm procedures will be implemented:

- Insure that a predetermined location is identified off-site in case of an emergency, so that all personnel can be accounted for.

- Personnel will be expected to proceed to the closest site exit with their buddy, and mobilize to the safe distance area associated with the evacuation route. Personnel will remain at that area until the re-entry alarm is sounded or an authorized individual provides further instructions.

9.5 Emergency Contact/Notification System

The following list provides names and telephone numbers for emergency contact personnel. In the event of a medical emergency, personnel will take direction from the SHSO and notify the appropriate emergency organization(s). In the event of a fire or spill, the site supervisor will notify the appropriate local, state and federal agencies.

TABLE 9.2

List of Emergency Contacts

Organization	Contact	Telephone
Police	NYPD	911
Fire	FDNY	911
Hospital	Flushing Hospital Medical Center	(516) 572-0123
EPA Emergency Response Team		800-424-8802
NYSDEC	Spill Hotline	800-457-7362
National Response Center		800-424-8802
Center for Disease Control		404-488-4100
Chemtrec		800-424-9555

9.6 Emergency Medical Treatment Procedures

Any person who becomes ill or injured in the Exclusion Zone must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket.) First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the Site Supervisor.

Any person being transported to a clinic or hospital for treatment should take with them information on the chemical(s) they have been exposed to at the site. This information is included in Table 3.1.

Any vehicle used to transport contaminated personnel will be treated and cleaned as necessary.

9.7 Fires or Explosion

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the project manager or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on site.

If it is safe to do so, site personnel may:

- Use firefighting equipment available on site to control or extinguish the fire; and,
- Remove or isolate flammable or other hazardous materials, which may contribute to the fire.

9.8 Spill or Leaks

In the event of a spill or a leak from excavation or drilling equipment, including containers, site personnel will:

- Inform their supervisor immediately;
- Locate the source of the spillage and stop the flow if it can be done safely; and,
- Begin containment and recovery of the spilled materials.

9.9 Emergency Equipment/Facilities

The following emergency equipment/facilities will be utilized on-site.

TABLE 9.3
LIST OF EMERGENCY EQUIPMENT/FACILITIES

List of Emergency Equipment/Facilities	Storage Location
First Aid Kit	Support Zone
Fire Extinguisher	Support Zone
Spill Kits	Support Zone
Berm Materials	Support Zone
Eye Wash	Support Zone
Real Time Air Equipment	Exclusion Zone

10.0 REFERENCES

1. *Aldrich Chemical Book*, RTECS
2. *American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values*
3. *Chemical Protective Clothing Performance Index Book,* Forsburg
4. *Dangerous Properties of Industrial Materials*, SAX and Lewis
5. *Emergency Response Guide Book,* DOT P 5800.5, 1990
6. *EPA 40 CFR 311 Health and Safety Regulations*
7. *EPA/Office of Emergency and Remedial Response/Environmental Response Team Standard Operating Safety Guide*
8. *Extremely Hazardous Substances,* EPA, Noyes
9. *Guide to Occupational Exposure Values* – 1992
10. *Guidelines for the Selection of Chemical Protective Clothing*, Little
11. *Handbook of Toxic and Hazardous Chemicals and Carcinogens*, Sittig, np (Noyes)
12. *Hazardous Chemicals Data Book*, G. Weiss, ndc (Noyes)
13. *Hazardous Chemicals Desk Reference*
14. *NIOSH/OSHA/USCG/EPA Occupational Health and Safety Guidelines*
15. *OHMTADS Database*
16. *OSHA 29 CFR 1910.120 Health and Safety Regulations*
17. *The Merck Index, an Encyclopedia of Chemicals, Drugs, and Biologicals*, Merck & Co., Inc.
18. *Threshold Limit Values and Biological Exposure Indices, ACGIH*, 1991-1992

APPENDIX A

EQUIPMENT CLEANING AND DECONTAMINATION PROCEDURES

STANDARD OPERATING PROCEDURES

EQUIPMENT CLEANING AND DECONTAMINATION PROCEDURES

Summary

Equipment, tools, materials, etc. used in the excavation/remediation and collection of samples at the site must be properly prepared and cleaned/decontaminated during and after each sampling event. The degree of cleaning/decontamination will be dependent upon site conditions and the nature and type of contamination, if present, the intent and goal(s) of the remediation, and data quality objectives, as well as other site-specific requirements. The importance of this action must be impressed upon the sampling team and those assisting the team, such as a backhoe or drill rig operator.

Procedure

1 Heavy Equipment Decontamination

All equipment, tools and materials associated with sampling events must be cleaned or decontaminated prior to usage. Items such as drill rigs, auger flights, trackhoes, and backhoes all present potential sources of contamination to environmental samples. Therefore, all heavy equipment utilized at a site must undergo the following decontamination procedures:

- the equipment will first be high pressure, hot washed or steam-cleaned with potable water; and,
- the equipment will be rinsed thoroughly with potable water.

Contain, collect and dispose of all decontamination fluids in accordance with site/project- specific requirements. The bucket of trackhoes and backhoes may be cleaned over the excavation allowing high pressure decontamination wash water to return to the excavation.

2 Cleaning of Field Sampling Equipment

All equipment and tools used to collect samples for chemical analyses, including spatulas, spoons, scoops, trowels, split-spoons, augers, etc. will be decontaminated using the following procedures:

- non-phosphate detergent wash;

- potable water or distilled/deionized water rinse; and
- air or oven-dry.

If the equipment, listed above, is to be stored for future use, allow to dry and then wrap in aluminum foil (shiny-side out) or seal in plastic bags. Collect or dispose of all decontamination fluids in accordance with site/project-specific requirements.

3 Personal Clothing Decontamination

All footwear worn in and around a contamination area will be washed down using soap and water to remove any soil or oily residue remnants. If disposable gloves, booties or suits (such as Tyvek® suits) are worn, these suits or booties are to be removed and disposed of in a designated 55-gallon drum on site for future disposal. Any other clothing that comes in contact with contaminated soil should not be worn again.