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New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7014

Soil Vapor Mitigation Pre-Design Investigation Summary &
Sub-Slab Depressurization Design Report
Greenpoint Energy Center Former Manufactured Gas Plant
287 Maspeth Avenue, Brooklyn, New York
Site No. 224052

Dear Ms. White:

This report presents a summary of the recently conducted soil vapor mitigation pre-design investigation (PDI) in four buildings: Building 11, Building C-Stores (Stores), Building D-Transportation (Transportation) and Building 21-Facilities (Facilities), on the Greenpoint Former Manufactured Gas Plant (MGP) site (the Site). Also included is an evaluation regarding potential installations of active sub-slab depressurization systems (SSDSs) at the buildings where system installation has been previously recommended. Mitigation was previously recommended for each of the buildings with the exception of the Facilities building due to elevated concentrations of chlorinated volatile organic compounds (CVOCs) detected in the sub-slab soil vapor (SS) samples during the Remedial Investigation (RI). The initial recommendation for the three buildings is in accordance with the current decision matrices within the New York State Department of Health (NYSDOH) "Guidance for Evaluating Soil Vapor Intrusion in the State of New York, with updates" (SVI Guidance). The recommendation for mitigation was also included in the Draft Remedial Investigation Report (RIR) for the Site submitted on January 16, 2020.

Facilities was resampled in February 2021, based on the recommendation for resampling included in the Draft RIR due to a variation in results from previous sampling events in March and June 2019. Consistent with the prior event, the current recommendation was also for continued monitoring; however, National Grid was planning to install a mitigation system in the building as a conservative safety measure pending the outcome of the PDI.

The purpose of the PDI was to collect additional SS samples to further delineate the portions of the buildings recommended for mitigation, perform soil communication pilot tests to obtain necessary design information for the SSDSs, and collect effluent samples during the pilot testing to determine if treatment of the effluent is required.

A summary of the PDI scope of work, results and recommendations are provided below.

PDI Scope of Work

The PDI consisted of collecting additional SS samples and performing soil communication pilot tests and collecting effluent samples from all four buildings.

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A geophysical investigation was conducted in each of the four buildings to locate any utilities present in the area prior to the installation of SS sample points and the pilot test extraction and monitoring points. Prior to conducting intrusive activities, New York 811 was contacted to have all utilities on the adjacent public rights-of-way were located and marked as required.

The PDI was conducted in accordance with the SVI Guidance and the work plan dated July 29, 2021 excluding the addition new pilot test locations in the Stores and Transportation Buildings. The additional locations were chosen based on the SS sampling results and a discussion between representatives of GEI, National Grid, NYSDEC and NYSDOH.

Sub-Slab Soil Vapor Sampling

The SS sampling work was conducted on August 25 and September 3 and 4, 2021. A total of eight SS samples were collected from Building C-Stores, one each from the GPEC-SV319/320 locations and six from temporary points. A total of seven SS samples were collected from Building D-Transportation, one from the GPEC-SV316 location and five from temporary points in the vicinity of the mitigation area. One additional sample was collected farther to the north in between the GPEC-SV315 and GPEC-SV318 locations to determine if any impacts requiring mitigation are present in this area. One additional SS sample was collected between the two existing locations (GPEC-SV309/310) in Building 11 and one additional sample was collected from within the footprint of Building 21-Facilities. Sample locations are shown on Figure 1.

The GPEC-SV316/319/320 locations were installed as permanent sub-slab soil vapor points as described in the RIR. The temporary sub-slab soil vapor points were installed by drilling a hole through the concrete floor slab, fitting the point with Teflon tubing, and sealing the point with VOC-free clay.

Each SS sample was collected using a batch-certified 6-liter SUMMA® canister with a laboratory-supplied flow controller that was calibrated to a two-hour collection period. Each SUMMA canister was shipped to an approved NYSDOH Environmental Laboratory Approval Program (ELAP) registered laboratory for analysis. The samples were analyzed for VOCs and naphthalene using the United States Environmental Protection Agency (USEPA) method TO-15. The sample tubing in the permanent points were capped and the temporary points were removed, and the slab sealed with concrete, following sample collection.

Building inventory information was not collected since no indoor air (IA) or outdoor air (OA) samples were collected, but the remainder of the building questionnaire was completed for each building in general accordance with the NYSDOH Center of Environmental Health's Indoor Air Quality Questionnaire and Building Form that is provided as Appendix B of the SVI Guidance. Indoor air samples were previously collected during the Remedial Investigation. Exceedances of the NYSDOH Air Guideline Values were limited to trichloroethene (TCE) in several samples taken at Facilities. There were no TCE exceedances in follow-up sampling conducted after an inventory review and the removal of potential TCE sources

The results of the sampling are provided on Table 1**.** Concentrations which are within the monitor/mitigate or mitigate range, using previous indoor air concentrations for comparison in the SVI Guidance matrices are shown on Table 1. The findings are summarized below:

Monitor/Mitigate

- 1,1,1-Trichloroethane (1,1,1-TCA)
  - Stores Building: SB-DP-2, SB-DP-3 and SB-DP-6
  - Facilities Building: FAC-DP-1
- 1,1 – Dichloroethene (1,1-DCE)
  - Building 11: Bldg11-DP-1
- TCE
  - Building 11: Bldg11-DP-1

Mitigate

- 1,1,1-Trichloroethane (1,1,1-TCA)
  - Stores Building: SB-DP-4, GPEC-SV319 and GPEC-SV-320
  - Transportation Building: TB-DP-4
- Tetrachloroethene (PCE)
  - Stores Building: SB-DP-3

These results were generally consistent with the previous sampling results from the RI. Exceptions include an additional area where mitigation was recommended in the Transportation Building, as well as decreases in concentrations of chlorinated compounds in the southeastern area of the Transportation Building, and expansion of the affected area of 1,1,1-TCA concentrations in the Stores Building. A summary of the results and the estimated mitigation areas can be shown on Figure 2.

Soil Communication Pilot Test and Effluent Sampling

Following the receipt of the SS results, a conference call was held between representatives of GEI, National Grid, NYSDEC and NYSDOH to discuss the results and confirm the pilot test locations. Based on the sampling results, additional pilot test locations were added in the Stores and Transportation Buildings. In general, pilot testing was conducted at the most impacted locations identified during the sampling event. The purpose of the pilot test was to evaluate the radius of influence of the extraction points, to size the SSDS fans, and to determine if the effluent will require treatment.

Testing was conducted on March 15, 16, 17 and 19, 2022 at one location in Facilities and Building 11 and at two locations in the Stores and Transportation buildings. A temporary soil gas extraction point was installed by coring a hole through the concrete floor slab in order to create an open space to install the extraction well point. A 2-inch PVC well point was constructed within the opening and backfilled with sand and cemented at the surface. The properties of the fill beneath the slab (soil type, compaction) and the thickness of the slab were noted. The pilot test extraction and Vacuum Monitoring Points (VMPs) for each building are shown on Figure 2.

A regenerative vacuum blower was connected to the extraction point via a flexible hose and sealed prior to applying the vacuum. VMPs were installed by drilling holes through the slab, inserting tubing through the hole, and sealing the annular space. VMPs were located at varying distances and directions radially outward from each extraction point.

At each extraction point, four step tests were conducted at various applied vacuums. The vacuum response was measured at each VMP using a digital manometer. Results from each test are provided on Table 2. At the conclusion of the testing, the well point and all tubing was removed and the floor sealed.

An effluent sample was collected at the conclusion of each pilot test to evaluate the need for effluent treatment. The effluent samples were collected in batch-certified 6-liter SUMMA® canisters and shipped to an approved NYSDOH ELAP-registered laboratory and analyzed for VOCs and naphthalene using USEPA method TO-15. Effluent data was compared to the NYSDEC DAR-1 "Guidelines for the Evaluation and Control of Ambient Air Contaminants Under Part 212" Annual Guideline Concentrations (AGCs) is provided on Table 3.

A photo log from PDI activities is included as Attachment 1. Laboratory reports are included as Attachment 2.

PDI Summary and Recommendations

As presented above, the PDI analytical results for sub-slab vapor are within the mitigation range at the Stores and Transportation Buildings. The PDI sub-slab detections in Building 11 and Facilities were within the monitor/mitigate range. These recommendations are based on the use of previous indoor air concentrations for comparison. The previous RI findings for Building 11 were within the mitigation range. Based on these current and previous results, National Grid intends to evaluate mitigation at Building 11 and Facilities as a conservative safety measure. It is important to note that based on RI results, indoor air quality has not been affected by the elevated sub-slab vapor detected beneath any of the buildings.

National Grid conducted pilot testing to evaluate SSDS parameters including radius of influence (ROI), anticipated flow rates, and effluent concentrations. The ROI measured during the PDI is the distance from an extraction well at which a sufficient vacuum and vapor flowrate can be induced. In the case of low flow systems (SSD), a sustained negative pressure at all points under the slab is needed for adequate performance of the system. As a practical matter SSD systems are normally designed to achieve a pressure differential of at least 0.02 inch of water (5 Pascal), during the worst case season, to provide an adequate safety factor for long-term variations [USEPA, Engineering Issue: Indoor Air Vapor Intrusion Mitigation Approaches, (p.15)]. As such, an acceptable ROI is considered to be the distance from the extraction well at which a vacuum of at least 0.02 H_2O in was observed. The ROI for each building was estimated by interpreting readings for each extraction well during the step tests against radial distances of the monitoring points. The table below summarizes the results of the pilot testing with the ROI selected for each proposed treatment area.

Table A. Pilot Test Summary

Treatment Area	Pilot Step Test	Vacuum (inH20) at Wellhead	Extraction Flowrate (scfm)	Approximate ROI (ft)
Stores – PT-1	Step 3	41	30	15
Stores – PT 2	Step 3	57	59	15
Transportation – PT-1	Step 3	26	12	30
Transportation – PT-2	Step 3	30	11	30
Building 11	Step 3	14	74	40
Facilities	Step 3	20	21	35

As shown in the table above, the ROIs in the Transportation Building, Building 11 and Facilities were a minimum of 30 feet. The ROI at the Stores building was significantly smaller, at 15 feet.

As part of this effort, National Grid evaluated the feasibility of installing SSDSs at each of these locations. Factors considered included occupancy and use of the buildings, slab thickness, ROIs, indoor air quality, and the building insulation envelope (tighter the envelope, the more likely soil vapor could be pulled into the building due to vacuums generated during the heating season).

Building 11 and Facilities

SSDSs are recommended for Building 11 and Facilities for the following reasons:

- The buildings are used primarily for offices and storage.
- Pilot testing indicated adequate ROIs will be generated and due to the larger ROIs, construction of the systems will be minimally intrusive.
- Buildings have a standard/moderate building envelope for their usage and age of construction.

Transportation and Stores Buildings

Periodic monitoring is recommended for the Transportation Building and the Stores Building. This recommendation is based on the following factors:

- The buildings are used primarily for fleet maintenance (Transportation Building) and Storage (Stores Building).
- Pilot testing indicated limited ROIs will be generated. Due to the larger building footprints and limited ROIs, construction of the systems will be very intrusive and require between 500 (Transportation Building) and 1000 feet (Stores Building) of horizontal trenching cut through each buildings floor slab.
- The buildings have very loose building envelopes due to the presence of multiple garage doors and industrial type windows, age of construction, high ceilings, and poor insulation.
- Slab thicknesses - generally a minimum of 8-inches in the Transportation Building and 18-inches in the Stores Building, providing protection from vapor intrusion and making saw cutting infeasible at the Stores Building.
- Operational schedules in the two buildings which are conducted a minimum of six days a week and are critical to National Grid Gas Operations.
- Lack of usable support columns to route system piping.

Due to the size and complexity of the potential system installations, the duration of the system installations in these buildings could be significant. The extended duration of installation could potentially create an exposure pathway to indoor air, which is not currently affect, during and potentially after installation is completed.

As stated above, periodic monitoring in lieu of system installation is recommended for the Transportation and Stores Building. Annual monitoring in the heating season is proposed for the Transportation Building and the eastern half of the Stores Building. Semi-annual monitoring is proposed for the western portion of the Stores Building due to elevated concentrations of 1,1,1-TCA

in sampling points GPEC-SV319 and GPEC-SV320. Concentrations of 1,1,1-TCA reached a maximum of 13,000 ug/m^3 and 11,000 ug/m^3 in the two points respectively, during the RI. Concentrations at these locations during the PDI were 8,100 ug/m^3 and 12,000 ug/m^3, respectively.

The periodic monitoring in these buildings will be conducted at the following points in each building along with indoor and outdoor ambient air sampling.

Transportation Building

- GPEC-SV316 (annual)
- TB-DP-4* (annual)

Stores Building

- GPEC-SV319 (semi-annual)
- GPEC-SV320 (semi-annual)
- SB-DP-3* (annual)
- SB-DP-4* (annual)

*: New permanent point to be installed at location

Should the result of the periodic monitoring indicate a significant and persistent change in sub-slab concentrations, or if indoor air becomes affected, additional actions including the installation of smaller-scale SSDSs to target specific areas of concern, will be considered. A summary report for each monitoring event will be provided to NYSDEC and NYSDOH upon completion. Should the use of either of the two buildings change, the current plan will also be revisited.

System installations in the Building 11 and Facilities are recommended. Preliminary design information for the two buildings is provided below.

SSDS Design

The proposed SSDSs will utilize subsurface collection trenches or well points connected to in-line ventilation fans to facilitate removal of VOC-containing soil vapor within the treatment areas. The layout of collection trenches or well points within each treatment area was configured using ROI data collected during the pilot tests as presented above. The use of well points or trenches were selected to achieve the required coverage most efficiently considering radius of influence, presence of columns or walls to run piping, and concrete slab thickness.

The collection trenches will consist of fabric wrapped, perforated schedule 40 3-inch PVC pipe connected to 3-inch schedule 80 PVC riser pipes that penetrate the slab and travel through the building to the roof. Well points will consist of 3-inch PVC schedule 40 riser with schedule 40, 20-slot well screen from a depth of 2 to 5 feet beneath the concrete floor. Annular space around the well screen will be backfilled with #2 silica sand. Well points will penetrate the slab and travel to the ventilation fans via 3-inch schedule 80 PVC riser pipes. The riser pipes will be finished above the roof line with a rain cap to prevent rain infiltration. The SSDS ventilation fan will be hardwired and will include a vacuum gauge, effluent sample port and alarm located in an accessible area. The HS2750 or HS5500 fan manufactured by RadonAway®, or National Gridapproved equivalent, will be installed as part of the SSDSs.

Design drawings depicting the layout of each of the SSDSs as well as typical sections and construction details are shown in Attachment 3. Specifications for the RadonAway® HS2750 and HS5500 in-line ventilation fans are included as Attachment 4.

Building 11

The SSDS system will consist of a single horizontal collection trench that stubs up along the center wall. The stub up will be fitted with a gate valve, vacuum indicator and sample port between the stub up and the in-line ventilation fan. The in-line ventilation fan will be mounted to the wall at the stub-up location shown on Drawing C-02. The stack will be mounted to the center wall above the fan and then be routed out of the building to the stack location located along the northern wall and extend a minimum of 2 feet above the roofline and fitted with a rain cap. This SSDS system will utilize a RadonAway® model HS2750, or equivalent. Effluent data presented in Table 3 exceed DAR-1 Annual Guideline Concentrations (AGCs); however, dispersion modeling as presented in Attachment 5 indicate that effluent treatment is not required. Exact locations of the piping runs will be fitted in the field.

Facilities

The SSDS system will consist of two well points that stub up along the walls and routed to combine to a single in-line ventilation fan. Each stub up will be fitted with a gate valve, vacuum indicator, and sample port between the stub up and the in-line ventilation fan. The in-line ventilation fan will be mounted to the wall at the stub-up location shown on Drawing C-04. The stack will be mounted to the wall above the fan and then be routed out of the building to the stack location located along the northern most wall and extend a minimum of 2 feet above the roofline and fitted with a rain cap. This SSDS system will utilize a RadonAway® model HS2750, or equivalent. Effluent data presented in Table 3 exceed DAR-1 ACGs; however, dispersion modeling as presented in Attachment 5 indicate that effluent treatment is not required. Exact locations of the piping runs will be fitted in the field.

Trench Backfill and Restoration

All SSDS system trenches will be backfilled to the base of the existing concrete slab with $^{3}/_{4}$-inch crushed stone. The concrete floor will be restored to original condition, including matching original strength (3000 PSI minimum) and reinforcement. Well points will be backfilled, and ground surface will be restored in accordance with details presented on Drawing D-01 in Attachment 3.

Air Monitoring

During times of ground-intrusive activities, work zone monitoring will be conducted within each building as included in the Health and Safety Plan (HASP) provided in the Interim Site Management Plan (ISMP) for the Site. VOCs, combustible gases, oxygen level, hydrogen cyanide (HCN) and hydrogen sulfide (H2S) and respirable particulates (PM-10) will be monitored on a continuous basis. The HASP includes Alert Levels, Action Levels, and specific response activities to be implemented during working hours if an exceedance of an Alert Limit or Action Limit for a measured compound occurs. The response actions, potentially including work stoppage, are intended to prevent or significantly reduce the migration of airborne contaminants from the Site.

If the real-time Action Limits are exceeded or significant nuisance odors are noted, National Grid, the Engineer, and the Contractor will consult to determine what type of emission control action is appropriate.

Waste Management

The Contractor will dispose of all waste materials generated as a result of these activities in accordance with all applicable laws and regulations at a National Grid-approved disposal facility. In the event that impacted materials are encountered, the procedures outlined below and in the ISMP will be followed for all derived wastes.

All manifests and/or bills of lading for all shipments will be submitted to the Engineer prior to any vehicle departing the Site. All manifests and/or bills of lading will be reviewed by the Engineer and signed by National Grid or a designated National Grid representative.

All material transportation vehicles leaving the Site must be watertight and will be decontaminated prior to departing the Site. In addition, all vehicles transporting impacted soil from the Site must have lined beds to prevent leakage, bed covers, and watertight gates.

Impacted Soils and Bulky Waste

All excavated material will be stockpiled, characterized, and then transported directly to an appropriately licensed National Grid-approved disposal facility. The Contractor will have a primary and an alternate receiving facility prepared to receive the impacted soils prior to excavation. Vehicles containing excavated soils will be covered with a solid plastic tarp.

Uncontaminated Bulky Waste

Uncontaminated bulky waste (i.e., asphalt pavement sections, concrete, and debris) will be separated, if possible, from impacted soil upon excavation, immediately placed in a roll-off container or temporarily placed in a stockpile for future loading and transported for disposal as construction debris at an approved facility/landfill.

Decontamination Water

Contaminated liquids from decontamination of equipment and personnel will be pumped into drums and disposed of off-Site. The Contractor will retain a licensed liquid waste hauler to remove this liquid from the Site and properly dispose of this material in accordance with all applicable regulations.

It is not anticipated that groundwater will be encountered during this work. However, if groundwater is collected, it will be containerized for off-Site disposal.

Decontamination

If impacted soil is encountered, a personnel decontamination station where workers can drop equipment and remove personal protective equipment (PPE) will be set up on-Site during construction activities as detailed in the HASP. It will be equipped with basins for water and detergent, and trash bags or cans for containing disposable PPE and discarded materials. Hand tools and miscellaneous small equipment that come in contact with excavated soils will be decontaminated on a temporary decontamination pad in buckets of water and detergent.

Operation and Maintenance Activities

Following SSDS start-up, operation & maintenance (O&M) activities will be performed daily for the first week to ensure the systems are operating within design parameters. Fan vacuum and flow readings and vacuum readings will be collected at each of the vapor monitoring points with a digital

manometer. The SSDSs will be balanced so that the in-line ventilation fans will be operated at speeds sufficient to induce a continuous minimum vacuum of -0.02 inches H2O at all vapor monitoring points. At the conclusion of the first week of operation, SSDS effluent samples will be collected and submitted for laboratory analysis of VOCs via USEPA Method TO-15. The results will be compared to the NYSDOH Air Guidance Values included in the SVI Guidance.

Following the first week, O&M activities will be conducted quarterly. The O&M activities will be summarized in an annual Operation, Maintenance and Monitoring report.

Operation of the active SSDS will not be discontinued unless prior written approval is granted by the NYSDEC and the NYSDOH project managers. If monitoring data indicates that one or more of the SSDSs may no longer be required, a proposal to discontinue the SSDS will be submitted by the remedial party to the NYSDEC and NYSDOH project managers.

Schedule

A preliminary schedule for the installation of the SSDSs is presented below. This schedule is subject to change based on facility access and other factors.

- NYSDEC Review and Approve Conceptual Design: 2 months
- Contractor Procurement: 2 months
- Installation of the SSDSs: 2 to 4 weeks
- System Startup O&M Activities: 1 week

Reporting

Summary reports for the SVI monitoring to be conducted at Transportation and Stores will be prepared and submitted after each event.

A construction completion report will be prepared following the completion of the IRM. Following installation and start-up and annual O&M report will be prepared. The report will include system monitoring and performance data as well as any recommendations for future actions.

If you have any questions, feel free to contact me at (617) 699-3152 or by email at reeti.doshi@nationalgrid.com.

Sincerely,

Christopher Morris, P.G.
On behalf of
Reeti Doshi
Project Manager

Attachment

cc: D. Terry (GEI)
J. Parillo (GEI)

TABLES

Table 1
SSDS PDI Soil Vapor Sampling Results
Soil Vapor Mitigation Pre-Design INvestigation Summary and Sub-Slab Depressurization Design Report
Greenpoint Energy Center Former MGP Site

	Stores Building								Transportation Building							Bldg 11	Facilities
Analyte	SB-DP-1 8/25/2021	SB-DP-2 8/25/2021	SB-DP-3 8/25/2021	SB-DP-4 8/25/2021	SB-DP-5 8/25/2021	SB-DP-6 9/3/2021	GPEC-SV319 8/25/2021	GPEC-SV320 8/25/2021	TB-DP-1 9/3/2021	TB-DP-2 9/3/2021	TB-DP-3 9/4/2021	TB-DP-4 9/4/2021	TB-DP-5 9/3/2021	TB-DP-6 9/4/2021	GPEC-SV316 9/4/2021	BLDG11-DP-1 9/3/2021	FAC-DP-1 9/3/2021
1,1,1-Trichloroethane	ND	390	460	1300	ND	990	8100	12000	25	ND	ND	1200 J	25	72 J	ND	23	360
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56 J	0.43 J	ND	ND	ND
1,1,2-Trichloroethane	ND	2.3 J	ND	ND	ND	ND	ND	ND	ND	ND	720 J	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	6.2 J	ND	16	ND	ND	57 J	8.7 J	1.2 J	ND	280 J	17	0.16 J	1.3	140 J	5.2 J	13
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.0 J	ND	ND	ND	14	ND
1,2,3-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	9.3 J	13	ND	ND	ND	ND	ND	1.0 J	ND	ND	ND	2.2	1.5	ND	ND	ND
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	1.9 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5 J	0.86 J
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.093 J	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	2.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	4.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.83 J	0.51	ND	ND	ND
1,3-Butadiene	ND	2.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.33 J	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	0.27 J	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.17 J	ND	ND	ND
1,4-Dioxane	ND	ND	6.2 J	ND	ND	ND	33 J	ND	ND	ND	ND	ND	ND	0.28 J	ND	ND	ND
1-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2,4-Trimethylpentane	ND	3.6 J	3.0 J	ND	1.4 J	ND	ND	ND	1.5 J	78000	150000	1.7 J	18	5.4	91000	4.2 J	0.54 J
2-Butanone (MEK)	ND	15 J	12 J	ND	ND	ND	ND	ND	10	ND	ND	ND	0.96 J	16	ND	57	8.0 J
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.21 J	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND	ND	R	ND	ND	R	R	ND	ND	R	ND	ND	R	R
3-Chloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Ethyltoluene	ND	4.9 J	4.5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.93 J	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.69 J	0.97	ND	ND	ND
Acetone	ND	230	150	ND	ND	ND	ND	ND	190 J	ND	ND	ND	54 J	160	ND	510 J	35 J
Benzene	380 J	31	57	17	1.6 J	1.3 J	ND	8.8 J	3.5	ND	190 J	2.4 J	6.4	7.7	130 J	3.8 J	1.2 J
Benzyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	2.1 J	ND	ND	ND	0.68 J	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.50 J	ND	ND	ND	ND
Butane	ND	9.3 J	12	ND	ND	ND	ND	ND	4.7	950 J	3500	ND	11	1.2	2500	34	ND
Carbon disulfide	82 J	15 J	20	21 J	ND	19 J	ND	17 J	5.0 J	270 J	210 J	6.1 J	9.3	13	190 J	17	4.0 J
Carbon tetrachloride	ND	ND	1.6 J	ND	ND	ND	ND	ND	0.47 J	ND	ND	ND	0.54	0.36 J	ND	ND	ND
Chlorobenzene	ND	ND	ND	3.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	2.4	ND	ND	ND	0.89	ND	ND	ND	ND
Chloroform	ND	2.9 J	4.7 J	ND	ND	ND	ND	ND	10	ND	ND	2.5 J	1.8	0.74	ND	ND	0.88 J
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	ND	ND	8.6 J	4.0 J	ND	ND	ND	ND	ND	820 J	4500	ND	6	1.7	12000	3.6 J	ND
Decane	ND	ND	ND	ND	ND	69 J	ND	ND	9.1 J	ND	ND	ND	5.0 J	5.5	ND	ND	9.1 J
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.16 J	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	2.3 J	ND	3.0 J	ND	ND	ND	3.4 J	ND	ND	ND	2.1	ND	ND	2.5 J	2.9 J
Dodecane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.9	ND	ND	ND
Ethanol	250000	1600	310	510	96	ND	ND	2000	500 J	ND	ND	3300	ND	570	ND	28000 J	150 J
Ethylbenzene	ND	6.1 J	7.2 J	3.0 J	1.6 J	ND	16 J	ND	1.1 J	ND	ND	3.6 J	3.7	2	ND	5.0 J	1.8 J
Heptane	ND	4.1 J	4.7 J	ND	ND	ND	ND	ND	0.58 J	ND	ND	ND	7.4	2.6	970 J	4.4 J	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexane	ND	5.8 J	7.2 J	ND	ND	ND	ND	ND	4.7 J	300 J	640 J	ND	9.7	6.5	4800	8.7 J	1.6 J
Isopropyl alcohol	8600	320	220	69 J	780	ND	350 J	150 J	41	ND	ND	140	21	26	ND	1300	60
Methyl tert-butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	37	ND	ND	ND	ND	1.4 J	ND	ND	ND
m-Xylene & p-Xylene	ND	18	27	8.6 J	3.2 J	ND	39 J	21 J	3.2 J	ND	ND	ND	11	4.8	ND	12	5.2
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.42 J	ND	ND	ND
Nonane	ND	ND	4.6 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3 J	0.79 J	ND	2.3 J	ND
Octane	ND	ND	3.4 J	ND	ND	31 J	ND	ND	8.3	ND	ND	ND	5.3	2.4	ND	9.8 J	18
o-Xylene	ND	7.7 J	11	3.5 J	ND	ND	20 J	11 J	1.4 J	ND	ND	ND	3.8	1.9	ND	3.6 J	1.7 J
Pentane	ND	12 J	ND	ND	ND	ND	ND	ND	5.8 J	ND	5200 J	ND	18	14	6600	24 J	ND
Styrene	ND	ND	5.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.30 J	ND	ND	ND
tert-Butyl alcohol	ND	ND	3.6 J	ND	ND	ND	ND	ND	2.5 J	ND	ND	ND	4.3	6.9	ND	42	3.9 J
Tetrachloroethene	ND	8.1 J	2000	ND	1.9 J	ND	ND	26 J	22	ND	ND	ND	0.93 J	0.50 J	ND	5.8 J	2.0 J
Toluene	ND	31	61	16 J	ND	16 J	ND	ND	7.9	ND	ND	ND	29	11	ND	36	8.5
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	5.4	ND	ND	ND	ND	ND	0.89 J	ND	ND	ND	0.39 J	0.24	ND	6.7	ND
Trichlorofluoromethane	ND	ND	2.0 J	ND	2.0 J	ND	ND	ND	3.0 J	ND	ND	ND	1.8	1.1	ND	ND	12
Undecane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.76 J	1.2 J	ND	ND	ND
Vinyl bromide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
J - The reported value is estimated as-is is between the lab's lower detection limit and reporting limit.
ND - The analyte was not detected at the reported detection limit.
ug/m3 - Microgram/Cubic meters

Concentration fall within the monitor/mitigate range based on previous indoor air detections
Concentration fall within the mitigate range based on previous indoor air detections

Table 2. Pilot Test Vacuum Response Testing
Remedial System Design
Soil Vapor Mitigation Pre-Design Investigation Summary and Sub-Slab Depressurization Design Report
Greenpoint Energy Center Former MGP Site

Extraction Well ID	Step Test	Time	Vacuum (inH_2O) at Wellhead	Extraction Flowrate (scfm)	PID Reading (ppm)	Measured Vacuum (inH_2O) at Monitoring Points (Distance in feet from Extaction Well)					
						VMP-1 (5 ft)	VMP-2 (10 ft)	VMP-3 (20 ft)	VMP-4 (30 ft)	VMP-5 (40 ft)	VMP-6 (50 ft)
Stores - PT-1	Step 1	8:49	76.00	56.00	11.40	0.97	0.29	0.02	0.02	0.02	0.02
	Step 2	9:18	48.00	41.60	--	0.67	0.21	0.01	0.02	0.01	0.01
	Step 3	9:35	41.00	30.00	--	0.59	0.18	0.01	0.01	0.01	0.01
	Step 4	9:43	11.00	22.10	1.10	0.14	0.05	0.00	0.00	0.00	0.00
Stores - PT-2	Step 1	11:20	68.00	132.20	2.40	3.35	1.49	0.02	0.01	0.00	0.00
	Step 2	11:32	64.00	98.30	--	2.71	1.26	0.01	0.00	0.00	0.00
	Step 3	11:38	57.00	59.10	1.70	2.79	1.29	0.02	0.00	0.00	0.00
	Step 4	11:48	18.00	29.50	--	0.39	0.23	0.00	0.00	0.00	0.00
Transportation - PT-1*	Step 1	11:47	66.00	22.90	--	2.07	2.04	0.52	0.04	0.02	0.01
	Step 2	11:56	54.00	17.80	--	1.69	1.70	0.44	0.04	0.01	0.00
	Step 3	12:08	26.00	11.70	--	0.76	0.82	0.20	0.02	0.01	0.00
	Step 4	12:17	13.00	5.90	--	0.32	0.38	0.08	0.01	0.00	0.00
Transportation - PT-2**	Step 1	8:04	72.00	20.79	--	2.49	0.61	0.12	0.03	0.00	0.00
	Step 2	8:21	70.00	15.18	--	2.57	0.61	0.12	0.03	0.00	0.00
	Step 3	8:32	30.00	10.52	--	1.17	0.27	0.05	0.02	0.00	0.00
	Step 4	8:41	22.00	5.64	--	0.96	0.22	0.04	0.01	0.00	0.00
Bldg 11 - PT-1	Step 1	8:00	34.00	144.56	2.50	14.62	6.32	6.28	1.62	0.24	0.22
	Step 2	8:12	22.00	111.02	2.30	10.60	4.58	4.57	1.01	0.07	0.17
	Step 3	8:19	14.00	73.98	--	6.62	2.90	2.87	0.64	0.04	0.11
	Step 4	8:28	6.00	37.92	--	3.11	1.37	1.35	0.30	0.02	0.05
Facilities - PT-1	Step 1	11:18	60.00	40.15	0.30	7.56	1.09	1.00	3.64	--	--
	Step 2	11:25	40.00	30.86	--	5.86	0.81	0.73	2.57	--	--
	Step 3	11:31	20.00	20.96	--	3.25	0.43	0.40	1.40	--	--
	Step 4	11:37	8.00	10.04	--	1.26	0.17	0.13	0.56	--	--

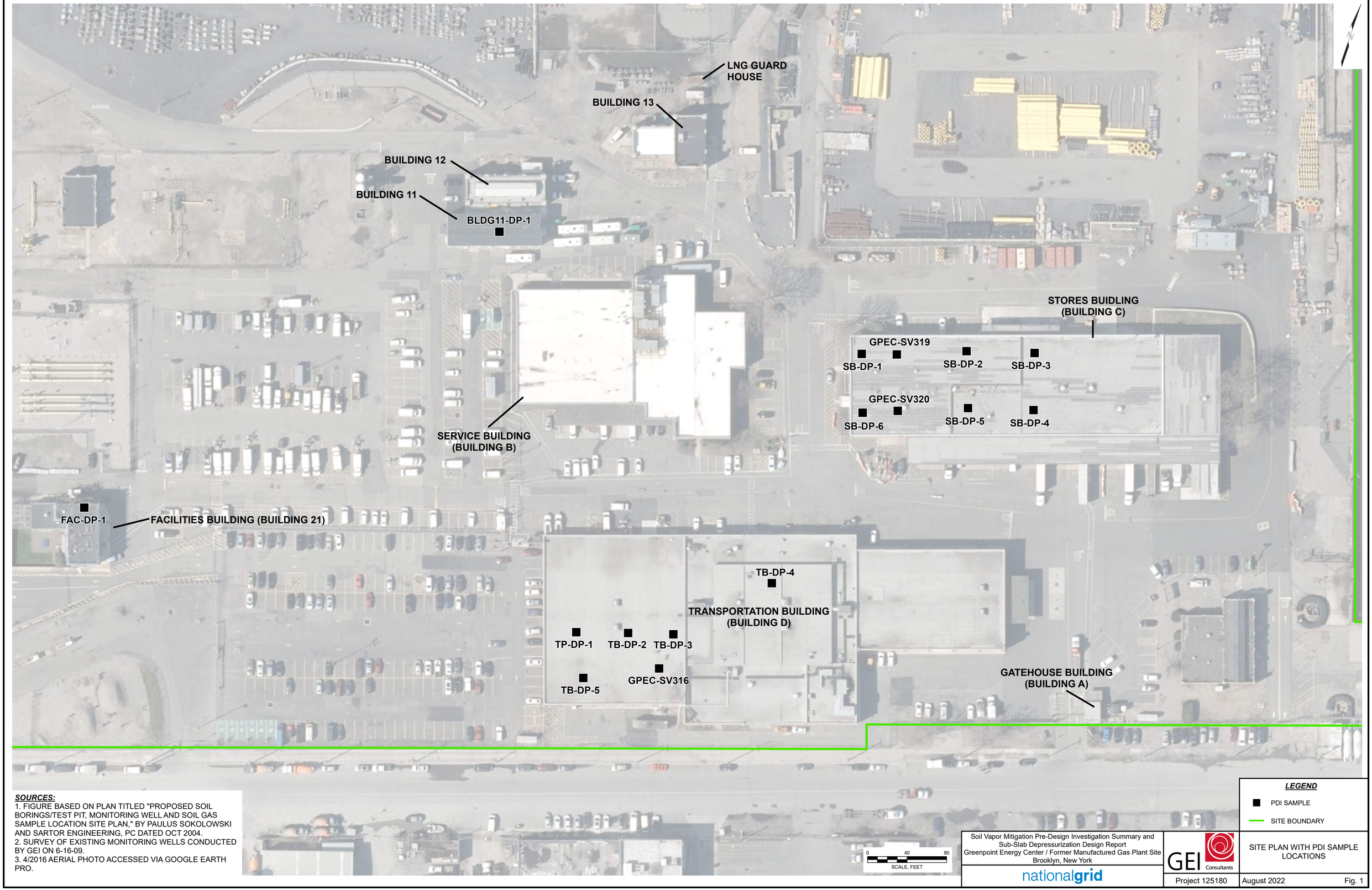
Notes:
ft - feet
inH_2O - inches of water
scfm - standard cubic feet per minute
ppm - parts per million

Table 3. Effluent Sample Results
SSDS Pilot Test
Soil Vapor mitigation Pre-Design Investigation Summary and Sub-Slab Depressurizations Design Report
Greenpoint Energy Center Former MGP Site

Analyte	Units	DAR-1 AGC	STORES BUILDING - PT-1 EFFLUENT 3/16/2022		STORES BUILDING - PT-2 EFFLUENT 3/16/2022		BUILDING 11 - PT1 - EFFLUENT 3/17/2022		FACILITIES BUILDING - PT-1 EFFLUENT 3/17/2022		FLEET MANAGEMENT PT-1 EFFLUENT 3/19/2022		WEST GARAGE - PT-1 - EFFLUENT 3/19/2022	
1,1,1-Trichloroethane	ug/m3	5,000	5		150		4600		4.5		210			ND
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/m3	180,000	0.60	J	0.55	J	2.3		0.61			ND		ND
1,1,2-Trichloroethane	ug/m3	1.4	0.11	J	0.086	JB	12			ND		ND		ND
1,1-Dichloroethane	ug/m3	0.63	0.21	J	0.087	J	210		0.5		7.6			ND
1,1-Dichloroethene	ug/m3	200		ND		ND	55			ND		ND		ND
1,2,3-Trimethylbenzene	ug/m3	60	8.3		12	12	1.5		1.1		5			ND
1,2,4-Trichlorobenzene	ug/m3	35	0.55	J	0.3	J	0.35	J		ND		ND		ND
1,2,4-Trimethylbenzene	ug/m3	60	22		28		3.9		3.9		12		15	J
1,2-Dibromoethane (EDB)	ug/m3	0.0017		ND	0.11	JB		ND	0.11	JB	0.96	JB		ND
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ug/m3	17000	0.16	J	0.11	J	0.12	J	0.12	JB		ND		ND
1,2-Dichloroethane	ug/m3	0.038	0.18	J	0.16	J	5.8		0.14	JB		ND		ND
1,2-Dichloropropane	ug/m3	4	0.085	J		ND			0.068	JB		ND		ND
1,3,5-Trimethylbenzene	ug/m3	60	9.3		9.9		1.1		1.1		3.9			ND
1,3-Butadiene	ug/m3	0.033		ND		ND			1.9			ND		ND
1,3-Dichlorobenzene	ug/m3	10	0.17	J	0.14	J				ND		ND		ND
1,4-Dichlorobenzene	ug/m3	0.091		ND	0.24	JB		ND	0.16	JB		ND		ND
1,4-Dioxane	ug/m3	0.2		ND	0.16	JB		ND	0.23	JB	1.3	JB	12	JB
1-Methylnaphthalene	ug/m3	7.1	2.0	J	5.1	J	2.4	J	2.5	J		ND		ND
2,2,4-Trimethylpentane	ug/m3	3300	0.38	J	0.78	J	0.81	J	1.1		13		4900	
2-Butanone (MEK)	ug/m3	5000	3.7		22		26		4.2		12		13	J
2-Chlorotoluene	ug/m3	620		ND	0.14	JB		ND	0.1	JB	1.5	J	8.4	J
2-Hexanone	ug/m3	30		ND	0.25	J	0.28	J	0.3	J		ND		ND
2-Methylnaphthalene	ug/m3	7.1		ND	6.6			ND		ND		ND		ND
4-Ethyltoluene	ug/m3	-	12		11		1.4			ND	4.2	J	10	J
4-Methyl-2-pentanone (MIBK)	ug/m3	3000	0.46	J	0.41	J	0.45	J	0.45	J	2.5	J		ND
Acetone	ug/m3	30,000	12		23	J	20	J	12		28	J		ND
Benzene	ug/m3	0.13	13		1.5		2.3		27		15	ND	86	
Benzyl chloride	ug/m3	0.02	1.3			ND	0.24	J		ND		ND		ND
Butane	ug/m3	-	5.8		7.4		5.9		14		64	ND	130	
Carbon disulfide	ug/m3	700	0.31	J	0.11	J	0.31	J	0.81			ND		ND
Carbon tetrachloride	ug/m3	0.17	0.51		0.57		0.71		0.58			ND		ND
Chlorobenzene	ug/m3	60	0.37	ND	0.12	JB		ND	0.12	JB	1.1	JB		ND
Chloroethane	ug/m3	10000		ND		ND	1.3			ND		ND		ND
Chloroform	ug/m3	14.7	0.19	J	0.25	J	16		0.35	J	1.2	J		ND
Chloromethane	ug/m3	90	1.7		1.6		0.9		1.9		3.5	J		ND
cis-1,2-Dichloroethene	ug/m3	63		ND		ND	5.4			ND		ND		ND
Cyclohexane	ug/m3	6,000	0.41	J	0.39	J	0.57	J	1		3.8	J	1200	CI
Decane	ug/m3	700	1.7	J	2.6		1.1	J	1.2	J	20	J	16	J
Dichlorodifluoromethane	ug/m3	12,000	1.8		1.6		1.7		1.7		3	J		ND
Dodecane	ug/m3	-	3.1		2.1	J	1.4	J	2.1	J	15	J		ND
Ethanol	ug/m3	45,000	22		23		8.9		26		49	ND		ND
Ethylbenzene	ug/m3	1,000	20		7.7	B	7.9		2.8	B	4.7	B	35	B
Heptane	ug/m3	3,900	0.60	J	0.64	J	0.91		1.8		2.6	J	260	
Hexane	ug/m3	700	1.2		1.3		1.3		3.5		6.1	J	310	
Isopropyl alcohol	ug/m3	7,000	4.6		7.2		6.4		2.9		15	J		ND
Methylene Chloride	ug/m3	46	1.1	J	1.3	J	1.4		1.5			ND		ND
m-Xylene & p-Xylene	ug/m3	100	32		17		7.8		11		11		30	
Naphthalene	ug/m3	3	33		110		27		17		10	J		ND
Nonane	ug/m3	25000	0.84	J	1.1		1.7		0.8	J	3.6	J	78	CI
Octane	ug/m3	3300	0.49	J	0.82		6.6		0.89		2.2	J	110	
o-Xylene	ug/m3	100	25		13	B	2.1		3.2	B	4.5	B	14	JB
Pentane	ug/m3	70250	2		2.2		2.9		7.1		15		280	
Styrene	ug/m3	1000	2.7		1.6		0.32	J	1.3		1.6	J		ND
tert-Butyl alcohol	ug/m3	720	0.50	J	0.58	J	0.96	J	0.52	J	1.1	J		ND
Tetrachloroethene	ug/m3	3.8	0.63		50		250		0.93		23			ND
Toluene	ug/m3	5000	18		6.9		59		22		17		16	J
trans-1,2-Dichloroethene	ug/m3	63	0.084	J		ND	0.23	J		ND		ND		ND
Trichloroethene	ug/m3	0.21		ND	0.078	J	940		0.91			ND		ND
Trichlorofluoromethane	ug/m3	5000	1.4		1.2		1.6		1.5		1.5	J		ND
Undecane	ug/m3	-	1.0	J	2.4	J	0.74	J	0.59	J	39			ND
Vinyl chloride	ug/m3	0.11		ND	0.43		0.088	J		ND		ND		ND

Notes:
J - The reported value is estimated as-is is between the lab's lower detection limit and reporting limit.
ND - The analyte was not detected at the reported detection limit.
B - compound found in the blank and sample.
CI - The peak identified by the data system exhibited chromatographic interference that could not be resolved. There is reason to suspect there may be a high bias.
Highlighted values exceed DAR-1 Annual Guideline Concentrations

FIGURES



SOURCES:

1. FIGURE BASED ON PLAN TITLED "PROPOSED SOIL BORINGS/TEST PIT, MONITORING WELL AND SOIL GAS SAMPLE LOCATION SITE PLAN," BY PAULUS SOKOLOWSKI AND SARTOR ENGINEERING, PC DATED OCT 2004.
2. SURVEY OF EXISTING MONITORING WELLS CONDUCTED BY GEI ON 6-16-09.
3. 4/2016 AERIAL PHOTO ACCESSED VIA GOOGLE EARTH PRO.

LEGEND

- PDI SAMPLE
- SITE BOUNDARY

Soil Vapor Mitigation Pre-Design Investigation Summary and Sub-Slab Depressurization Design Report
Greenpoint Energy Center / Former Manufactured Gas Plant Site
Brooklyn, New York

nationalgrid

GEI Consultants

SITE PLAN WITH PDI SAMPLE LOCATIONS

Project 125180 | August 2022 | Fig. 1

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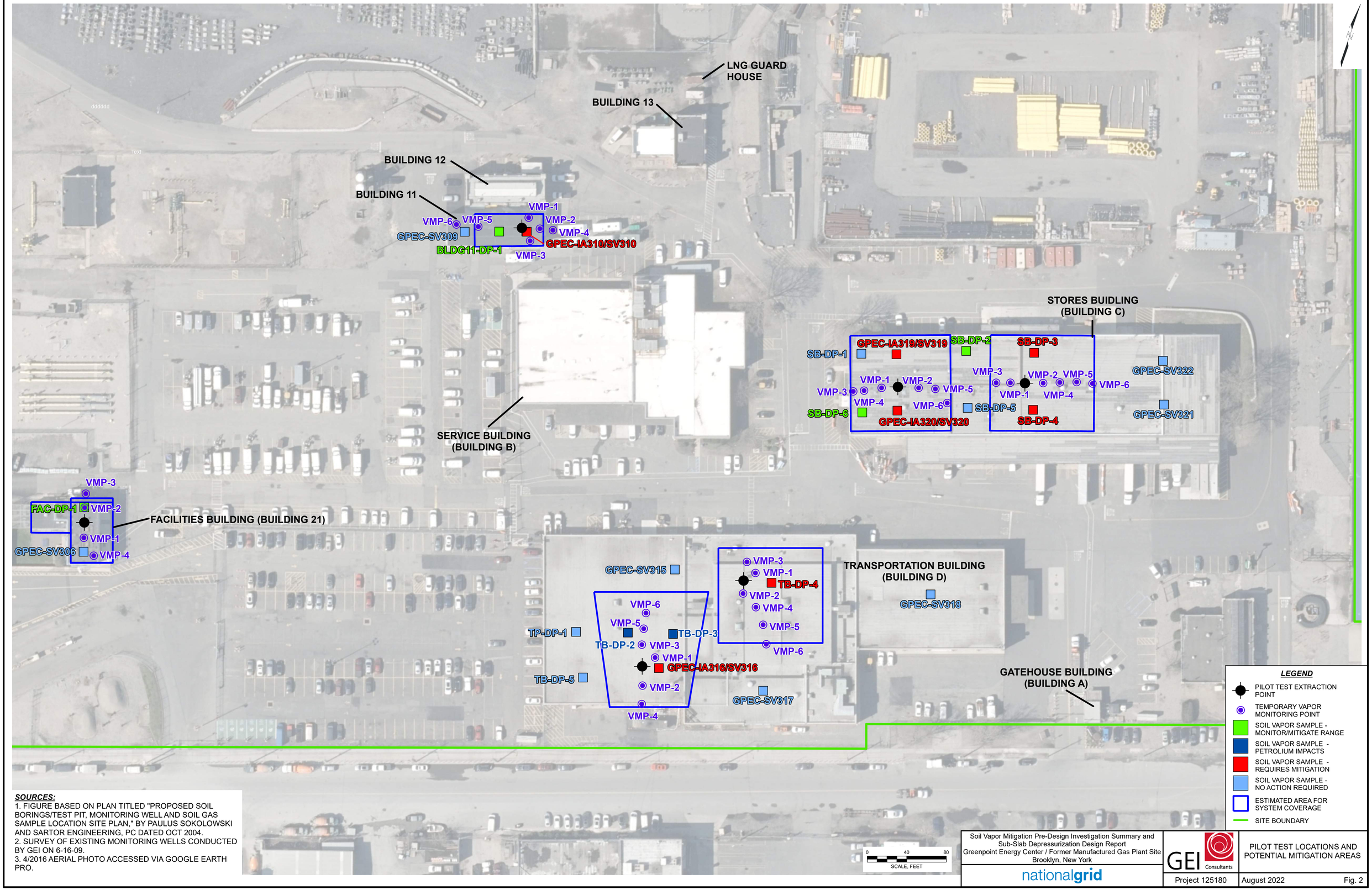

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2. SURVEY OF EXISTING MONITORING WELLS CONDUCTED BY GEI ON 6-16-09.
3. 4/2016 AERIAL PHOTO ACCESSED VIA GOOGLE EARTH PRO.

LEGEND

- PILOT TEST EXTRACTION POINT
- TEMPORARY VAPOR MONITORING POINT
- SOIL VAPOR SAMPLE - MONITOR/MITIGATE RANGE
- SOIL VAPOR SAMPLE - PETROLIUM IMPACTS
- SOIL VAPOR SAMPLE - REQUIRES MITIGATION
- SOIL VAPOR SAMPLE - NO ACTION REQUIRED
- ESTIMATED AREA FOR SYSTEM COVERAGE
- SITE BOUNDARY

Soil Vapor Mitigation Pre-Design Investigation Summary and Sub-Slab Depressurization Design Report
Greenpoint Energy Center / Former Manufactured Gas Plant Site
Brooklyn, New York

nationalgrid

GEI Consultants

PILOT TEST LOCATIONS AND POTENTIAL MITIGATION AREAS

Project 125180 | August 2022 | Fig. 2

J:\Projects\National_Grid\Greenpoint\Phase_3_RI\220509_SVI_Mitigation_PDI_Work_Plan_Fig2.mxd

ATTACHMENT 1
SSDS PDI Photo Log

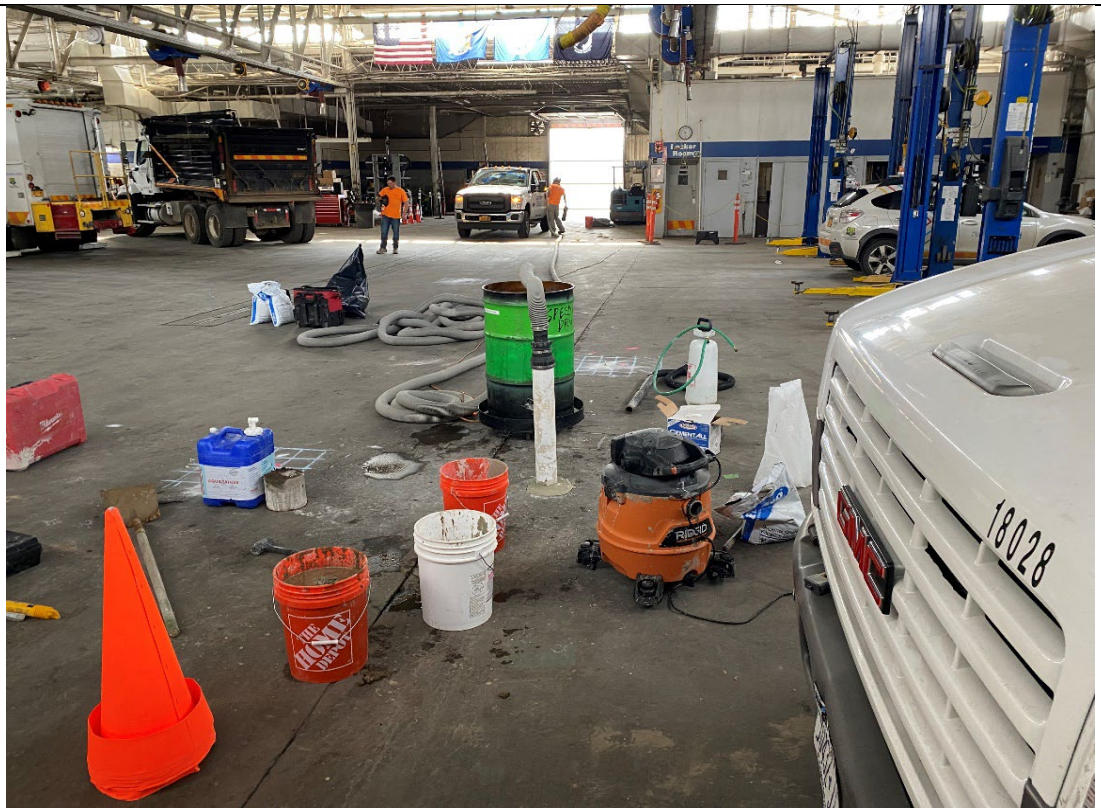
Greenpoint Pre-Design Investigation Photo Log

Photo 1. Permanent sub-slab soil vapor sampling point.	
Photo 2. Sub-slab soil vapor sample in process in Facilities Building.	

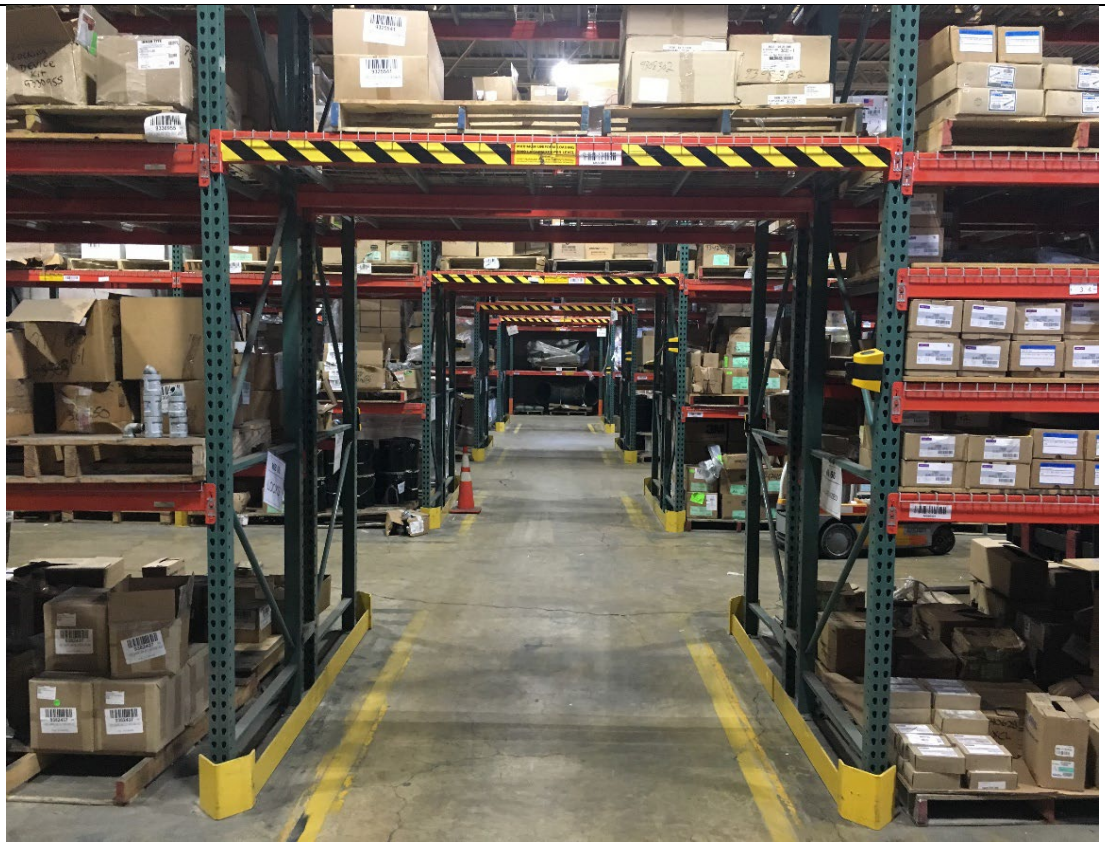
Greenpoint Pre-Design Investigation Photo Log

Photo 3. Extraction point installation in Facilities Building	
Photo 4. Installed extraction point in Facilities Building	

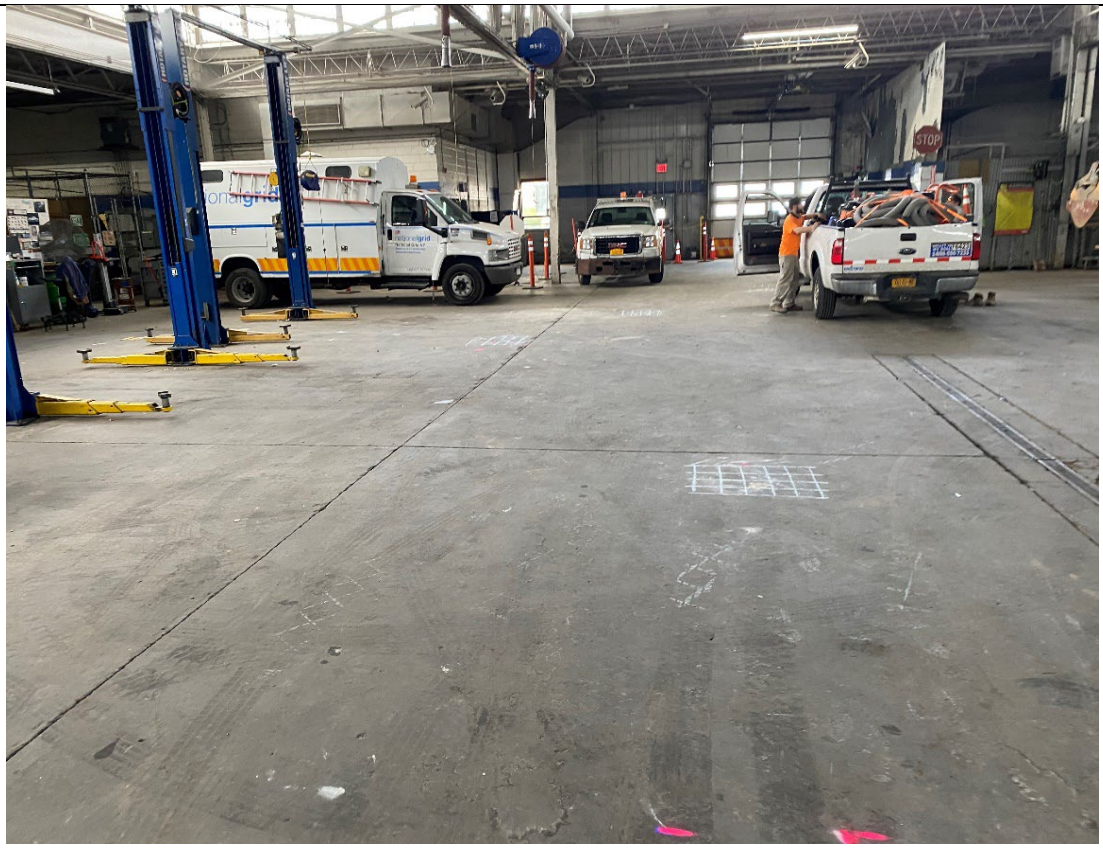
Greenpoint Pre-Design Investigation Photo Log

Photo 5. Pilot Test in process in Transportation Building	
Photo 6. Photo of portable blower and effluent sample collection	

Greenpoint Pre-Design Investigation Photo Log

Photo 7. Typical photo of storage areas in Stores Building	
Photo 8. Typical photo of central area of Stores Building	

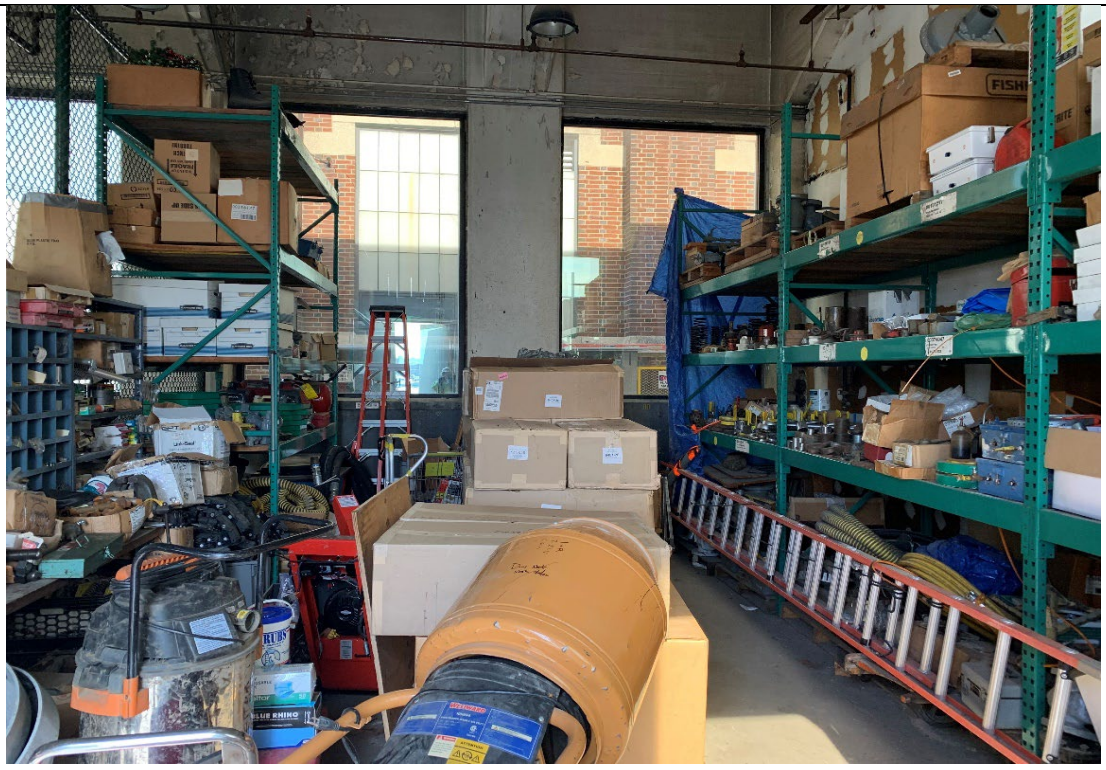
Greenpoint Pre-Design Investigation Photo Log

Photo 9. Typical photo of western area of Transportation Building	
Photo 10. Typical photo of central area of Transportation Building	

Greenpoint Pre-Design Investigation Photo Log

Photo 11. Typical photo of interior of central portion of Facilities Building	
Photo 12. Typical photo of eastern portion of Facilities Building	

Greenpoint Pre-Design Investigation Photo Log

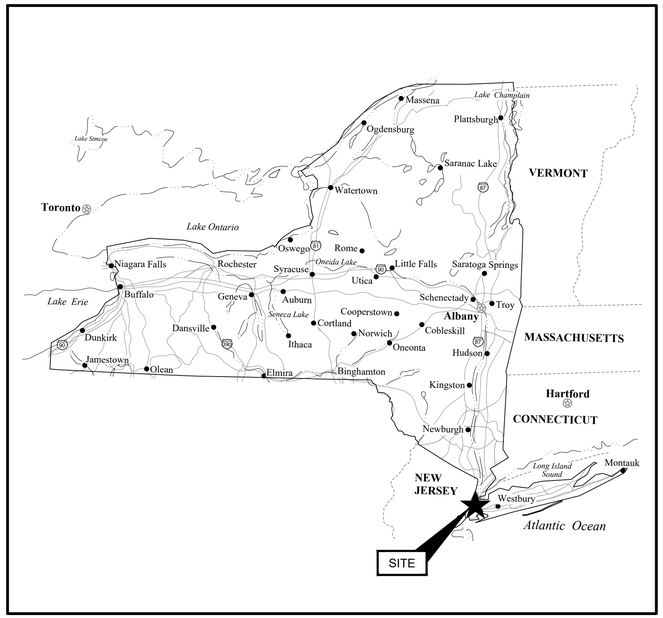
Photo 13. Typical photo of interior of eastern portion of Building 11	
Photo 14. Typical photo of interior of western portion of Building 11	

ATTACHMENT 2
Laboratory Data
(Provided Separately)

ATTACHMENT 3
Design Drawings

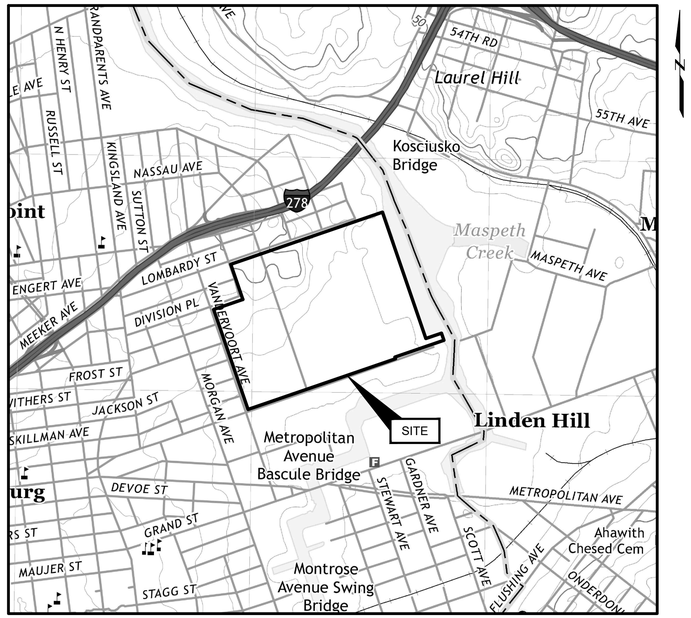
SUB-SLAB DEPRESSURIZATION SYSTEM DESIGN

GREENPOINT ENERGY CENTER
BROOKLYN, NEW YORK



SOURCE:
MAP IMAGE PREPARED BY MAGELLAN GEOGRAPHICX, SANTA BARBARA, CA 1994.

STATE MAP
APPROXIMATE SCALE: 1" = 50 MILES



SOURCE:
USGS TOPOGRAPHIC MAP, BROOKLYN, NY QUADRANGLE, 7.5-MINUTE SERIES, 2019.

SITE LOCATION MAP
SCALE: 1"=1000'

SHEET INDEX

SHEET NO.	DRAWING NO.	TITLE
1	G-01	TITLE SHEET
2	C-01	ESTIMATED MITIGATION AREAS
3	C-02	BUILDING 11
4	C-03	FACILITIES BUILDING (BUILDING 21)
5	D-01	SUB-SLAB DEPRESSURIZATION SYSTEM NOTES AND DETAILS

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ONE METROTECH CENTER
14TH FLOOR
BROOKLYN, NY 11201

nationalgrid

PREPARED BY:

GEI CONSULTANTS, INC.
455 WINDING BROOK DRIVE
SUITE 201
GLASTONBURY, CT 06033
(860)368-5300

GEI Consultants

For Review

GEI PROJECT NO. 125180

NO.	DATE	ISSUE/REVISION	APP
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DWG. NO.
G-01

SHEET NO.
1 OF 5

LEGEND:

- PILOT TEST EXTRACTION POINT
- TEMPORARY VAPOR MONITORING POINT
- SOIL VAPOR SAMPLE - MONITOR / MITIGATE RANGE
- SOIL VAPOR SAMPLE - PETROLEUM IMPACTS
- SOIL VAPOR SAMPLE - REQUIRES MITIGATION
- SOIL VAPOR SAMPLE - NO ACTION REQUIRED
- ESTIMATED AREA FOR SYSTEM COVERAGE
- SITE BOUNDARY

For Review

SOURCES:

1. FIGURE BASED ON PLAN TITLED *"PROPOSED SOIL BORINGS/TEST PIT, MONITORING WELL AND SOIL GAS SAMPLE LOCATION SITE PLAN,"* BY PAULUS SOKOLOWSKI AND SARTOR ENGINEERING, PC DATED OCT 2004.
2. SURVEY OF EXISTING MONITORING WELLS CONDUCTED BY GEI ON 6-16-09.
3. 4/2016 AERIAL PHOTO ACCESSED VIA GOOGLE EARTH PRO.

Attention:

0 1"

If this scale bar does not measure 1" then drawing is not original scale.

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Designed:	ES
Checked:	JP
Drawn:	DC/PH
Submitted By:	JP
NY P.E. No.:	095488-1
Submittal Date:	8/15/2022

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GEI Project 125180

GREENPOINT ENERGY CENTER
SUB-SLAB DEPRESSURIZATION SYSTEM
BROOKLYN, NEW YORK

DWG. NO. C-01

ESTIMATED
MITIGATION AREAS

SHEET NO. 2 OF 5

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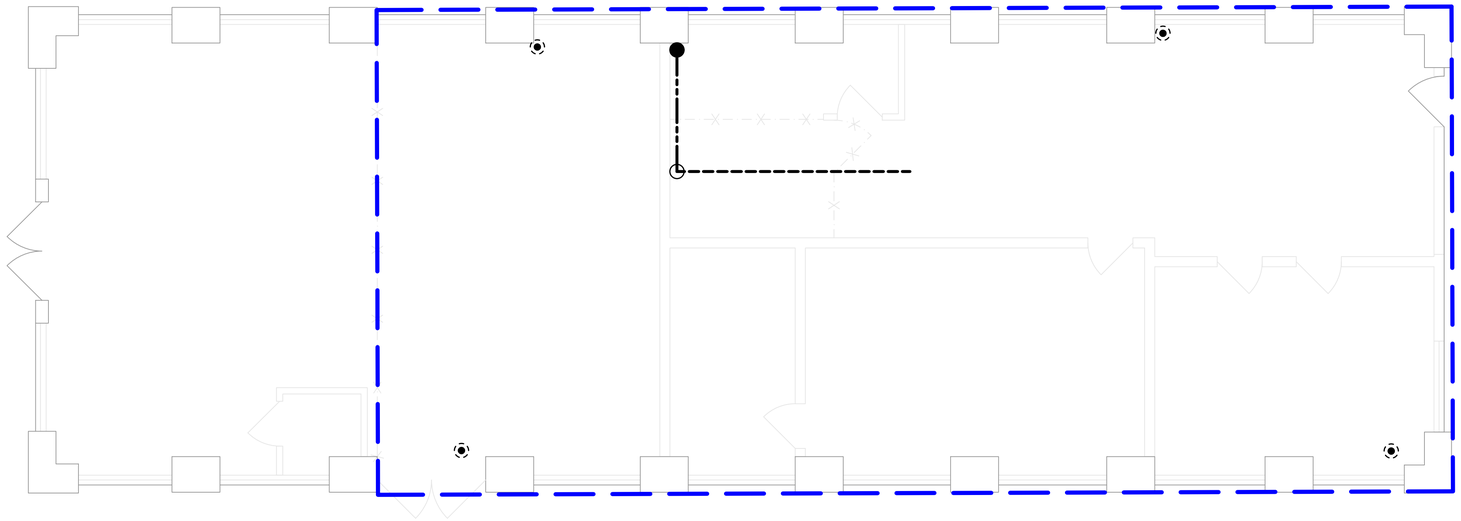


FIRST FLOOR PLAN

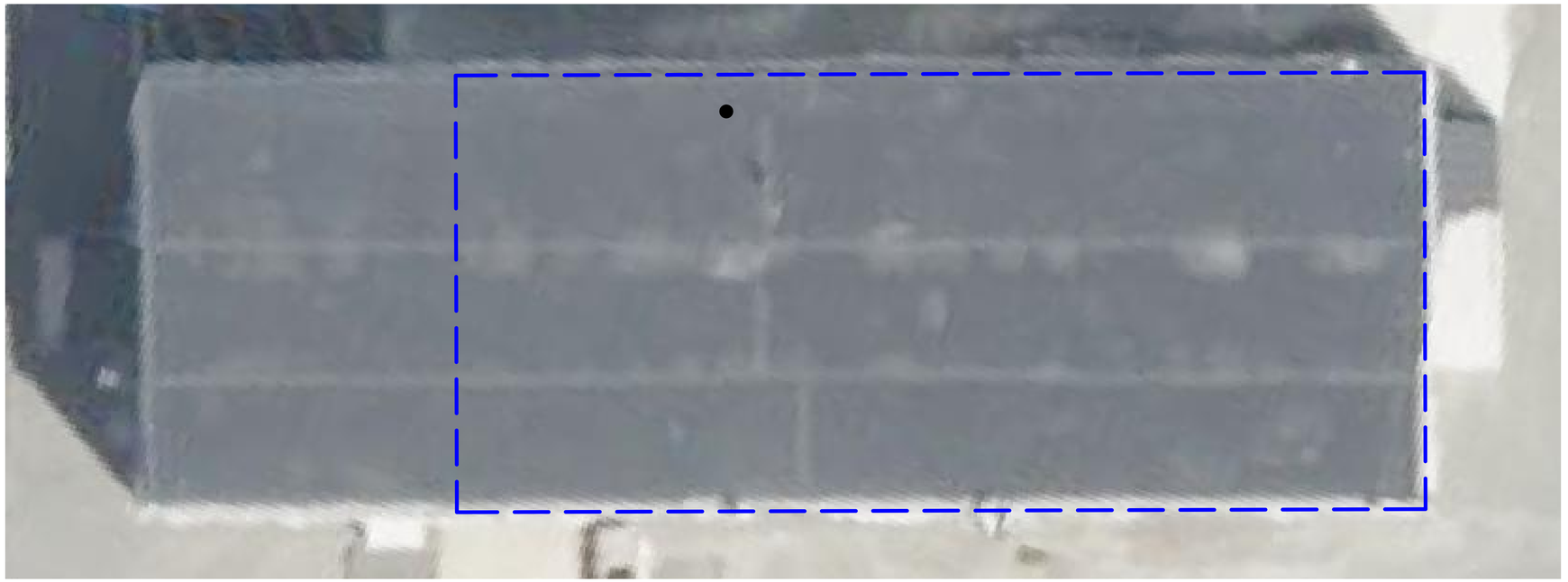
SCALE: 1" = 5'

LEGEND:

- ESTIMATED SYSTEM COVERAGE AREA
- SUBSURFACE SSDS PERFORATED PIPING - 3" SCH 40 PERFORATED PVC PIPING
- ABOVE GRADE SSDS EXHAUST DISCHARGE PIPING - 3" SCH 40 SOLID PVC PIPING
- SSDS PIPING - 3" SCH 80 PVC LATERAL STUB-UP LOCATION TO INLINE FAN
- SSDS EXHAUST STACK - 3" SCH 80, MIN. 2 FT. ABOVE ROOF
- VAPOR MONITORING POINT

NOTE:

SSDS VENITLATION FAN SHALL BE A RADONAWAY® MODEL HS2750 FAN, OR ENGINEER APPROVED EQUIVALENT.



ROOF PLAN - SYSTEM COVERAGE

SCALE: 1" = 5'

0 5 10

SCALE, FEET

For Review

SOURCES:

1. FIGURE BASED ON *FLOOR 1 FLOOR PLAN - BUILDING 11*, BY NATIONAL GRID.
2. AERIAL PHOTO ACCESSED VIA AUTODESK.

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GREENPOINT ENERGY CENTER
SUB-SLAB DEPRESSURIZATION SYSTEM
BROOKLYN, NEW YORK

BUILDING 11

DWG. NO. C-02

SHEET NO. 3 OF 5

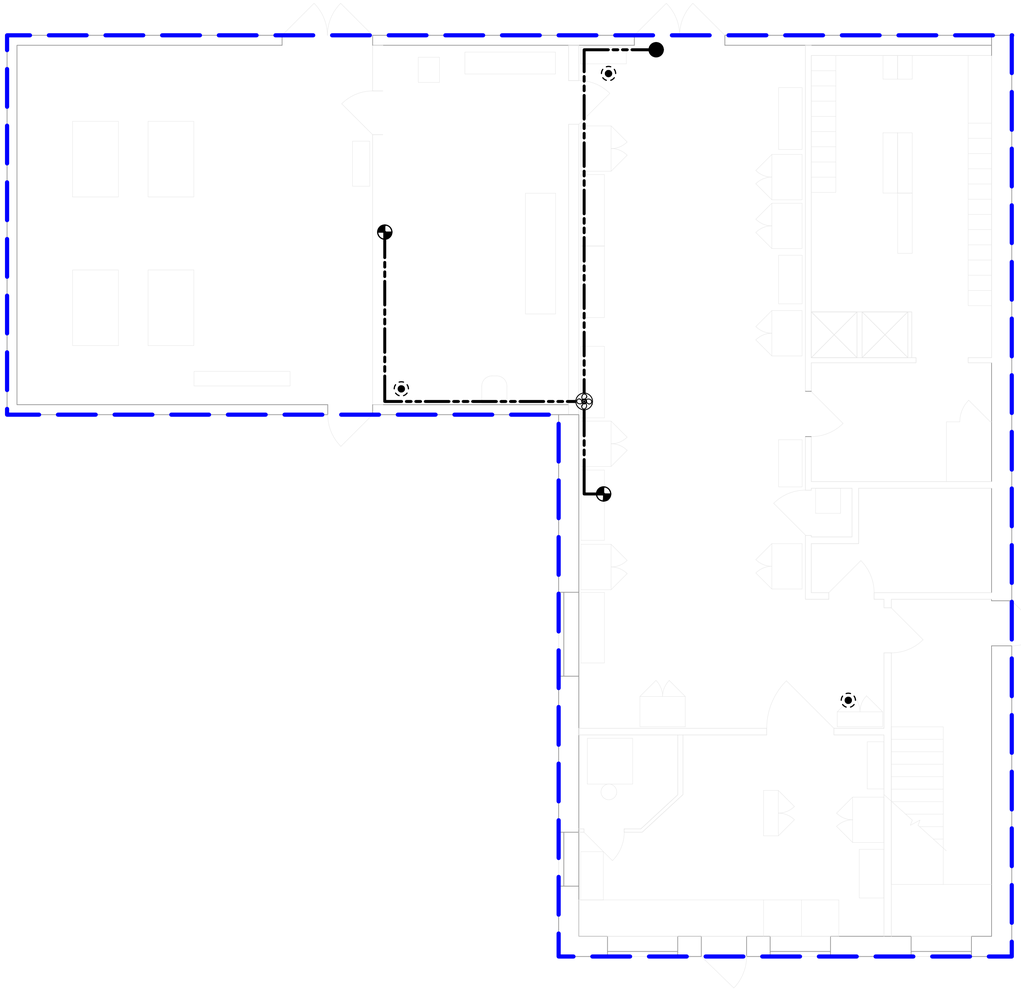
\\Blm-pzcc-1\blm-data\Tech\Projects\National Grid\Greenpoint\IRM\SSDS\00_CAD\Design\SSDS\125180_SSDS_C02

NOTE:

1. SSDS VENITLATION FAN SHALL BE A RADONAWAY® MODEL HS2750 FAN, OR ENGINEER APPROVED EQUIVALENT.
2. EACH SSDS WELL POINT WILL BE PLUMBED TO ONE INLINE VENTILATION FAN. EACH PIPING RUN WILL BE FITTED WITH A GATE VALVE, VACUUM GUAGE, AND SAMPLE PORT BETWEEN THE WELL POINT AND THE FAN. THE GAUGE AND SAMPLE PORT WILL BE INSTALLED BETWEEN THE GATE VALVE AND THE WELL.

LEGEND:

- ESTIMATED SYSTEM COVERAGE AREA
- ABOVE GRADE SSDS EXHAUST DISCHARGE PIPING - 3" SCH 40 SOLID PVC PIPING
- INLINE FAN LOCATION
- SSDS EXHAUST STACK - 3" SCH 80, MIN. 2 FT. ABOVE ROOF
- VAPOR MONITORING POINT
- SSDS WELL POINT



FIRST FLOOR PLAN

SCALE: 1" = 5'

ROOF PLAN - SYSTEM COVERAGE

SCALE: 1" = 5'

For Review

SOURCES:

1. FIGURE BASED ON *FLOOR 1 FLOOR PLAN - FACILITIES OFFICE*, BY NATIONAL GRID.
2. AERIAL PHOTO ACCESSED VIA AUTODESK.

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GEI Project 125180

GREENPOINT ENERGY CENTER
SUB-SLAB DEPRESSURIZATION SYSTEM
BROOKLYN, NEW YORK

FACILITIES BUILDING
(BUILDING 21)

DWG. NO. C-03

SHEET NO. 4 OF 5

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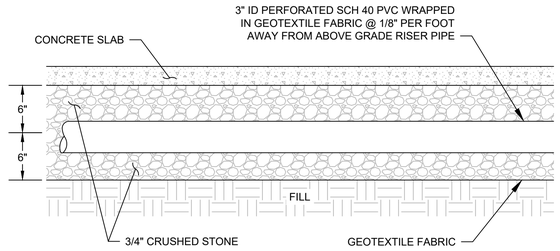
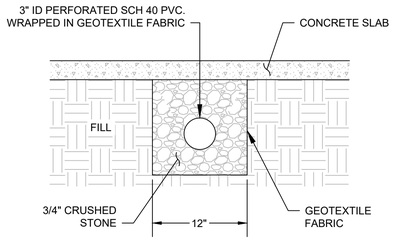
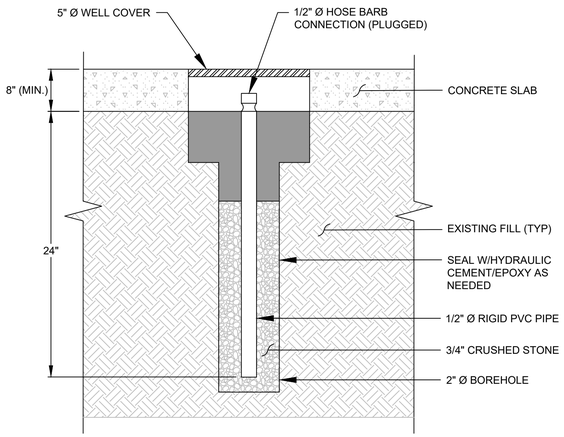


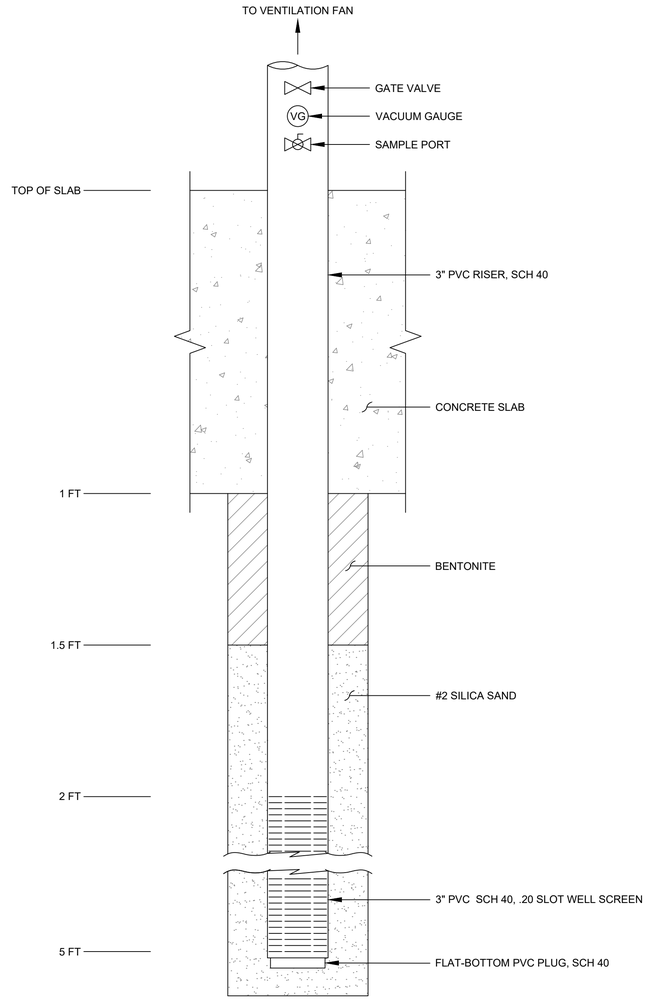
1 - DETAIL
TRENCH CROSS SECTION NOT TO SCALE



2 - DETAIL
TRENCH NOT TO SCALE



3 - DETAIL
VAPOR MONITORING POINT NOT TO SCALE



4 - DETAIL
TYPICAL SSDS WELL CONSTRUCTION DIAGRAM NOT TO SCALE

NOTES:

1. EXISTING FLOOR SLAB WILL BE SAW CUT AS NECESSARY TO ACCOMMODATE THE INSTALLATION OF THE SSDS PIPING NETWORK. RESTORE REINFORCED CONCRETE SLAB IN KIND, WITH A MINIMUM RATING OF 3,000 PSI.
2. SSDS SUBSURFACE LATERALS WILL BE CONSTRUCTED IN ACCORDANCE WITH DETAIL 1 AND 2. MONITORING POINTS WILL BE CONSTRUCTED IN ACCORDANCE WITH DETAIL 3. SSDS WELL WILL BE INSTALLED IN ACCORDANCE WITH DETAIL 4.
3. SSDS ABOVE GRADE DUCTS SHALL BE CONSTRUCTED OF 3-INCH OUTSIDE DIAMETER SCHEDULE 80 PVC PIPE. SSDS SUBSURFACE LATERAL PIPING SHALL BE CONSTRUCTED OF 3-INCH OUTSIDE DIAMETER SCHEDULE 40 PERFORATED PVC PIPE.
4. SSDS PIPING INSTALLATION SHALL COMPLY WITH CHAPTER 5, SECTION 512 OF THE NYC MECHANICAL CODE (2022).
   - (512.3) EXHAUST SYSTEM DUCTS SHALL NOT BE TRAPPED AND SHALL HAVE A MINIMUM SLOPE OF ONE-EIGHTH UNIT VERTICAL IN 12 UNITS HORIZONTAL (1-PERCENT SLOPE).
   - (512.5) SUB-SLAB SOIL EXHAUST DUCTS SHALL BE PERMANENTLY IDENTIFIED AT EACH FLOOR LEVEL BY MEANS OF A TAG, STENCIL OR OTHER APPROVED MARKING.
5. EXHAUST STACK DISCHARGE POINT WILL BE LOCATED IN ACCORDANCE WITH CHAPTER 5, SECTION 501 AND 512 OF THE NYC MECHANICAL CODE (2022). SUB-SLAB SOIL EXHAUST SYSTEM DUCTS SHALL EXTEND THROUGH THE ROOF AND TERMINATE NOT LESS THAN 6 INCHES ABOVE THE ROOF AND NOT LESS THAN 10 FEET FROM ANY OPERABLE OPENINGS OR AIR INTAKE.
6. SSDS SYSTEM DUCTS SHALL BE COMPLETED WITH A RAIN CAP THAT COMPLIES WITH SECTION 501.3.2 OF THE NYC MECHANICAL CODE (2022).
   - (501.3.2) EXHAUST OPENINGS THAT TERMINATE OUTDOORS SHALL BE PROTECTED WITH CORROSION-RESISTANT SCREENS, LOUVERS OR GRILLES. OPENINGS IN SCREENS, LOUVERS AND GRILLES SHALL BE SIZED NOT LESS THAN 1/4INCH (6 MM) AND NOT LARGER THAN 1/2 INCH (13 MM). OPENINGS SHALL BE PROTECTED AGAINST LOCAL WEATHER CONDITIONS. OUTDOOR OPENINGS LOCATED IN EXTERIOR WALLS SHALL MEET THE PROVISIONS FOR EXTERIOR WALL OPENING PROTECTIVE IN ACCORDANCE WITH THE NEW YORK CITY BUILDING CODE.
7. SSDS SYSTEM PIPING TO BE SUPPORTED ACCORDING TO LOCAL BUILDING CODES. MAXIMUM HORIZONTAL SUPPORT SPACING FOR PVC PIPE IS 4 FEET ACCORDING TO NYC PLUMBING CODE, TABLE 308.5 (2022).
8. SYSTEM WILL BE EQUIPPED WITH AN AUDIBLE ALARM NOTIFICATION SYSTEM CAPABLE OF NOTIFYING THE SYSTEM OPERATOR OF AN ALARM CONDITION.
9. SSDS VENTILATION FANS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND SUPPLIED A HARDWIRED SINGLE PHASE 120V ELECTRICAL SOURCE.
10. SSDS PIPING AND LOCATIONS MAY BE MODIFIED IN THE FIELD WITH THE APPROVAL OF THE ENGINEER TO BEST FIT THE BUILDING LAYOUT AND NATIONAL GRID'S REQUIREMENTS.

For Review

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GEI Project 125180

GREENPOINT ENERGY CENTER
SUB-SLAB DEPRESSURIZATION SYSTEM
BROOKLYN, NEW YORK

DWG. NO. D-01

SUB-SLAB DEPRESSURIZATION SYSTEM NOTES AND DETAILS

SHEET NO. 5 OF 5

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ATTACHMENT 4
Fan Specs

RadonAway®
The world's leading radon fan manufacturer

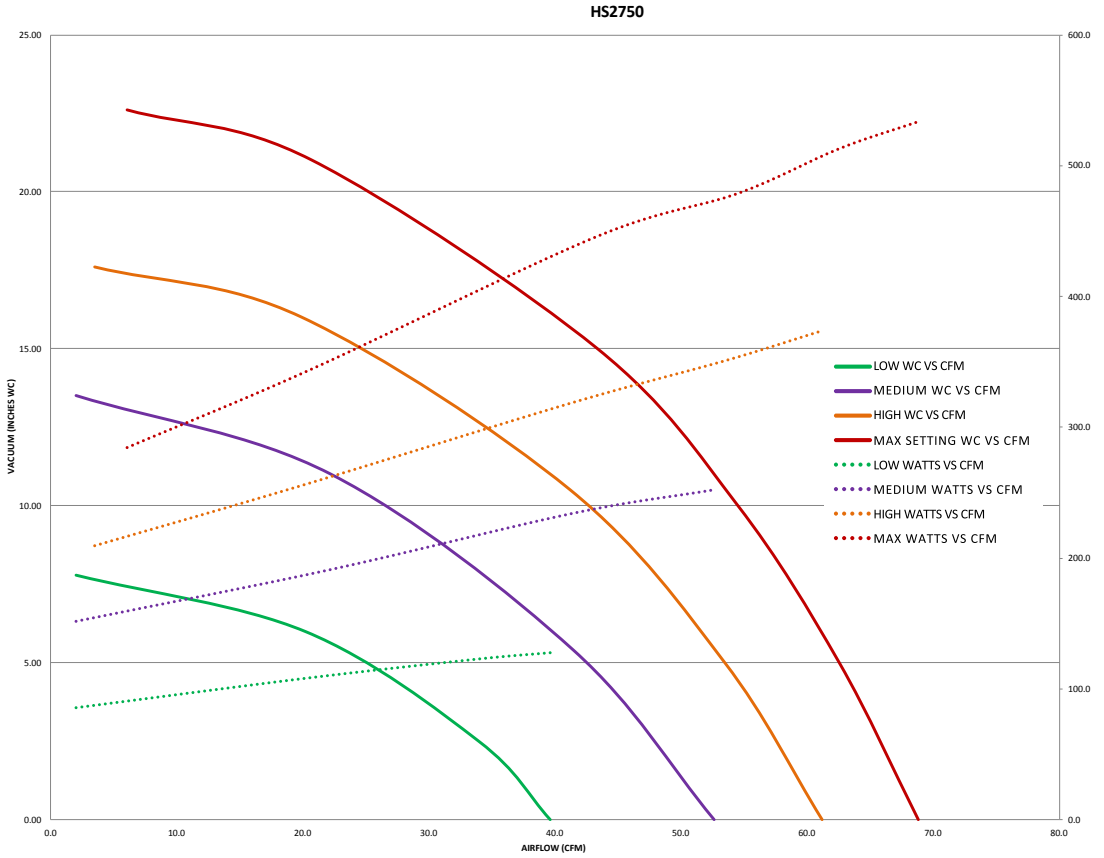
HS2750

RadonAway's new HS2750 is an ETL-listed high pressure blower that has been designed with the professional in mind. The HS2750 features multiple speed settings to meet site-specific pressures and air flows easily verified by a built in pressure gauge in the front cover of the unit. This blower unit has a new electrical box design with a wire terminal strip along with two flexible pipe couplings for quick and easy site installation.

HS2750 FEATURES

- 4 Blower Speed Settings
- Integrated Condensate Bypass
- Designed for Easy Motor Replacement
- ETL Listed
- Built-in 40" Vacuum Gauge
- Quiet Operation
- Single Stage Blower Designed for Harsh Environmental Conditions

SPEED SETTING	MAX RECOMMENDED OPERATING VACUUM	MAX OPERATING RANGE WATTS
LOW	5" WC	112-123
MEDIUM	10" WC	199-245
HIGH	15" WC	266-337
MAX	20" WC	361-463



sales@radonaway.com | radonaway.com | 800-767-3703

Rev A 0220
P/N 02084

RadonAway
The world's leading radon fan manufacturer

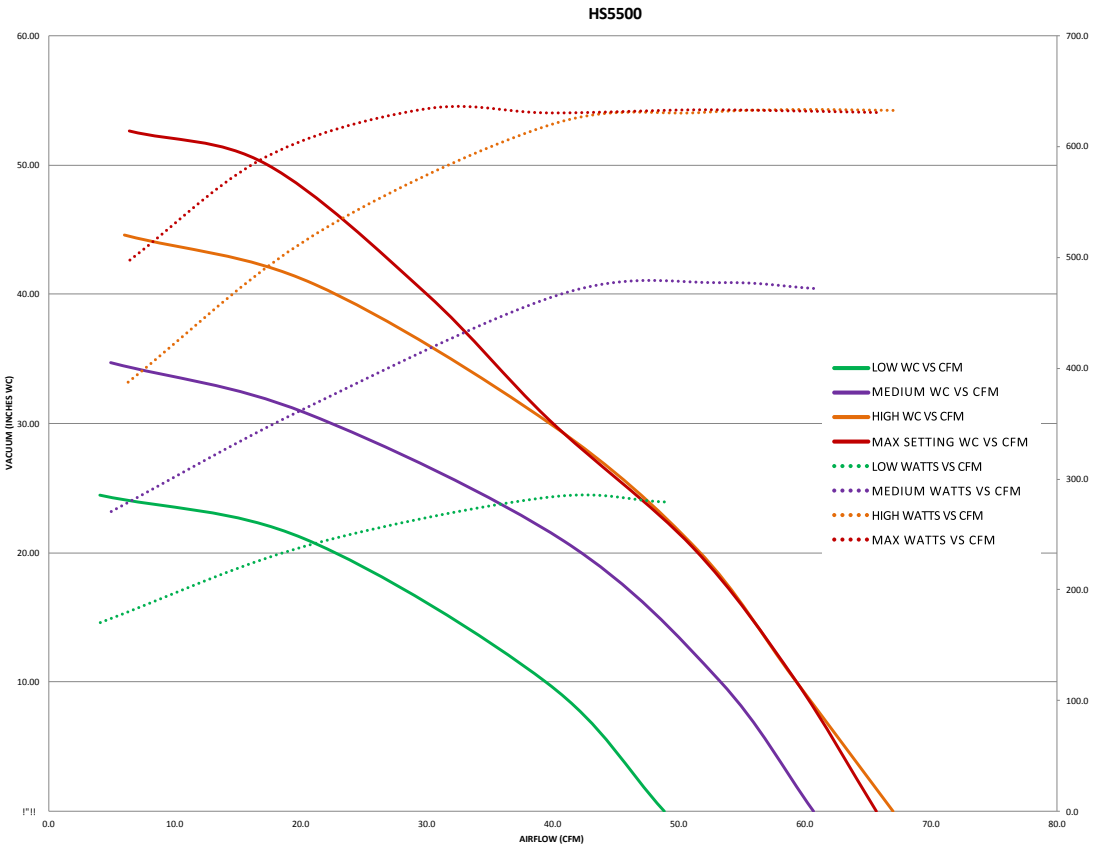
HS5500

RadonAway's new HS5500 is an ETL-listed high pressure blower that has been designed with the professional in mind. The HS5500 features multiple speed settings to meet site-specific pressures and air flows easily verified by a built in pressure gauge in the front cover of the unit. These blower units have a new electrical box design with a wire terminal strip along with two flexible pipe couplings for quick and easy site installation.

HS5500 FEATURES

- 4 Blower Speed Settings
- Integrated Condensate Bypass
- Designed for Easy Motor Replacement
- ETL Listed
- Built-in 60" Vacuum Gauge
- Quiet Operation
- 4-Stage Blower Designed for Harsh Environmental Conditions

SPEED SETTING	MAX RECOMMENDED OPERATING VACUUM	MAX OPERATING RANGE WATTS
LOW	20" WC	243-281
MEDIUM	30" WC	372-477
HIGH	40" WC	527-625
MAX	50" WC	591-632



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Rev A 0220
P/N 02085

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HS2750 and HS5500 Installation & Operating Instructions

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

1. **WARNING!** Do not use blower in hazardous environments where blower electrical system could provide ignition to combustible or flammable materials.

2. **WARNING!** Check voltage at the blower to ensure it corresponds with nameplate. See Vapor Intrusion Application Note #AN001 for important information on VI Applications. RadonAway.com/vapor-intrusion

3. **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.

4. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA) "National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician.

5. **WARNING!** In the event that the blower is immersed in water, return unit to factory for service before operating.

6. **WARNING!** Do not twist or torque blower inlet or outlet piping as leakage may result.

7. **WARNING!** Do not leave blower unit installed on system piping without electrical power for more than 48 hours. Blower failure could result from this non-operational storage.

8. **WARNING!** TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

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

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

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The HS2750 and HS5500 Blowers are intended for use by trained, certified/licensed, professional radon mitigators. The purpose of these instructions is to provide additional guidance for the most effective use of the HS2750 and HS5500 Blowers. These instructions should be considered supplemental to current industry standards and federal, state, county and local building codes and regulations. In the event of a conflict, those codes, practices and regulations take precedence over these instructions.

1.2 ENVIRONMENTALS

The HS2750 and HS5500 Blowers 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, HS2750 and HS5500 Blowers should be stored in an area where the temperature is always greater than 32°F or less than 100°F. The HS2750 and HS5500 Blowers are thermally protected such that they will shut off when the internal temperature is above 185°F / 85°C. If the HS2750 or HS5500 Blower is idle in an area where the ambient temperature exceeds this shut off, it will not restart until the internal temperature falls below 75°C.

1.3 ACOUSTICS

The HS2750 or HS5500 Blower, when installed properly, operates with little or no noticeable noise to the building occupants. Recommended system design and installation considerations to minimize noise: When installing the HS2750 or HS5500 Blower above sleeping areas, select a location for mounting at the farthest possible distance. Avoid mounting near doors, fold-down stairs or other uninsulated structures which may transmit sound. Ensure a solid mounting for the HS2750 or HS5500 Blower to avoid structure-borne vibration or noise.

The velocity of the outgoing air must also be considered in the overall system design. With small diameter piping, in some cases a “rushing” sound of the outlet air may be audible. In these instances, the use of a RadonAway Exhaust Muffler (p/n 24002) is recommended.

1.4 GROUND WATER

Under no circumstances should water be allowed to be drawn into the inlet of the HS2750 and HS5500 Blowers as this may result in damage to the unit. The HS2750 or HS5500 Blower should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the Blower with water in installations with occasional high water tables.

In the event that a temporary high water table results in water at or above slab level, water will be drawn into the riser pipes thus blocking air flow to the HS2750 or HS5500 Blower. The lack of cooling air will result in the Blower cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, power down and disconnect the HS2750 or HS5500 Blower until the water recedes allowing for return to normal operation; then reconnect and power on to turn the Blower back on.

1.5 CONDENSATION & DRAINAGE

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

The use of small diameter piping in a system increases the speed at which the air moves. The speed of the air can pull water uphill and, at sufficient velocity, it can actually move water vertically up the side walls of the pipe. This has the potential of creating a problem in the negative pressure (inlet) side piping. For HS2750 or HS5500 Blower inlet piping, the following table provides the minimum recommended pipe diameters as well as minimum pitch under several system conditions. Use this chart to size piping for a system.

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

*Typical operational flow rates:

All exhaust piping should be 2” PVC.

1.6 SYSTEM MONITOR & LABEL

A properly designed system should incorporate a “System On” indicator for affirmation of system operation. The HS2750 and HS5500 Blowers come equipped with a built-in magnehelic pressure gauge located on the front cover which serves this purpose. Other indicator products such as u-tube manometers should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the gauge with water in installations with occasional high water tables. If required, place in a conspicuous location a System Label (such as RadonAway P/N 15005-20) with instructions for contacting the installing contractor for service and also identifying the necessity for regular radon tests to be conducted.

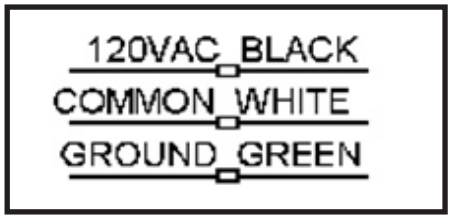
1.7 SLAB COVERAGE

The HS2750 or HS5500 Blower can provide coverage of well over 1000 sq. ft. per slab penetration. This will, of course, depend on the sub-slab aggregate in any particular installation and the diagnostic results. In general, sand and gravel are much looser aggregates than dirt and clay. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size; larger as needed) be created below the slab at each suction hole. When fine sand or dirt is present it is recommended that the pit be lined with a material such as clean gravel, size 4, 5, 56, or 6 as classified (ASTM C33).

1.8 ELECTRICAL WIRING

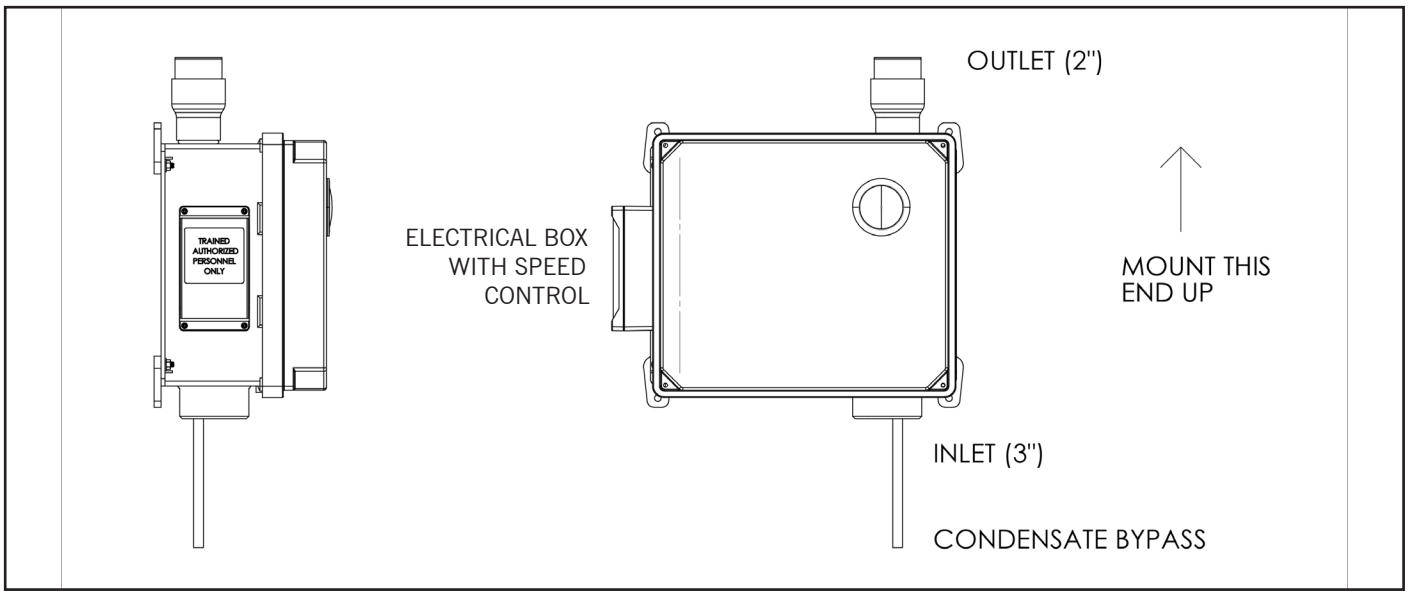
HS2750 or HSHS5500 Blower models come with an electrical switch box for hard wiring to a 120V electrical source. All wiring must be performed in accordance with the National Fire Protection Association’s (NFPA)”National Electrical Code, Standard #70”-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a UL listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly caulked to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

WIRING DIAGRAM



1.9 SPEED CONTROLS

The HS2750 and HS5500 have 4-speed (low, medium, high, maximum) built-in speed controls. They are not safe for use with solid state speed controls.



2.0 INSTALLATION

2.1 MOUNTING

Mount the HS2750 or HS5500 Blower to the wall studs, or similar structure, in the selected location with (4) 1/4" x 1 1/2" lag screws (not provided). Ensure the HS2750 or HS5500 Blower is both plumb and level.

2.2 DUCTING CONNECTIONS

Make final ducting connection to HS2750 or HS5500 Blower with flexible couplings. Ensure all connections are tight. Do not twist or torque inlet and outlet piping on HS2750 or HS5500 Blower or leaks may result.

NOTE: Do NOT solvent weld fittings to unit hubs.

2.3 VENT MUFFLER INSTALLATION

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

2.4 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

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

_____ **Ensure** the HS2750 or HS5500 Blower and all ducting is secure and vibration-free.

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

HS2750: 5" WC (low) / 10" WC (medium) / 15" WC (high) / 20" WC (maximum)
HS5500: 20" WC (low) / 30" WC (medium) / 40" WC (high) / 50" WC (maximum)

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

_____ **Verify Radon levels** by testing to applicable current industry standards and federal, state, county and local building codes and regulations.

HS2750 and HS5500 PRODUCT SPECIFICATIONS

Model	Speed Setting (Max. Op. Pressure: "WC@Sea Level)	Typical CFM vs Static Suction WC (Recommended Operating Range)								Power* Watts @ 120VAC
		2.5"	5.0"	7.5"	10.0"	12.5"	15.0"	20.0"	25.0"	
HS2750	**Low** (5")	33	24	n/a	n/a	n/a	n/a	n/a	n/a	112-123
	Medium (10")	47	42	34	25	n/a	n/a	n/a	n/a	199-245
	High (15")	n/a	n/a	47	43	33	23	n/a	n/a	266-337
	Maximum (20")	n/a	n/a	n/a	n/a	48	43	24	n/a	361-463

Shutoff Pressure ("WC @ Sea Level): Low 7.8", Med 13.5", High 17.6", Max 22.6"

**Power consumption varies with actual load conditions*

Model	Speed Setting (Max. Op. Pressure: "WC@Sea Level)	Typical CFM vs Static Suction WC (Recommended Operating Range)								Power* Watts @ 120VAC
		5.0"	10.0"	20.0"	25.0"	30.0"	35.0"	40.0"	50.0"	
HS5500	**Low** (20")	44	39	22	n/a	n/a	n/a	n/a	n/a	243-281
	Medium (30")	n/a	n/a	53	41	36	22	n/a	n/a	372-477
	High (40")	n/a	n/a	n/a	45	39	31	22	n/a	527-625
	Maximum (50")	n/a	n/a	n/a	n/a	n/a	34	29	17	591-632

Shutoff Pressure ("WC @ Sea Level): Low 24.5", Med 34.7", High 44.6", Max 52.6"

**Power consumption varies with actual load conditions*

Number Of Speeds: 4

Volts: 120

Hz: 60

AMPS (Max): 4

Inlet: 3" PVC (3.5" OD)

Outlet: 2" PVC (2.37" OD)

Mounting: Brackets for vertical mount

Weight: HS2750, 18 lbs; HS5500, 19.25 lbs

Size: 17.5" W x 9.0" D x 18.5" H

Minimum Recommended PVC Ducting (2" / 3" / 4" / 6" / 8"): 3" Inlet; 2" Outlet

Storage Temperature Range: 32°F-100°F

Thermal Cutout: 185°F / 85°C

Locked rotor protection

LISTED
Electric Fan

Intertek

Conforms to
UL STD. 507

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

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the RadonAway® HS2750 or HS5500 Blower for shipping damage within 15 days of receipt. **Notify RadonAway® of any damages immediately.** RadonAway® is not responsible for damages incurred during shipping.

Install the HS2750 or HS5500 Blower in accordance with all current industry standards and federal, state, county 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 HS2750/HS5500 Blower (the "Blower") 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 or repair any Blower which fails due to defects in materials or workmanship during the Warranty Term. This Warranty is contingent on installation of the blower 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 Blower must be returned (at Owner's cost) to the RadonAway® factory. Any Blower returned to the factory will be discarded unless the Owner provides specific instructions along with the Blower when it is returned regardless of whether or not the Blower is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

2-YEAR EXTENDED WARRANTY WITH INSTALLATION BY A FACTORY-CERTIFIED PROFESSIONAL

RadonAway® will extend the Warranty Term of the Blower to twenty-four (24) months from date of purchase or thirty (30) months from the date of manufacture, whichever is sooner, if: (1) the Blower is installed in a professionally designed and professionally installed active soil depressurization system or installed as a replacement Blower in a professionally designed and professionally installed active soil depressurization system; and (2) proof of an installer Factory Training Certificate. Upon request, 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 or 18 months from the date of manufacture, whichever is sooner. RadonAway® is not responsible for installation, removal or delivery costs associated with this Warranty.

EXCEPT AS STATED ABOVE, THE HS2750/HS5500 BLOWERS 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 BLOWER OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

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

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

Record the following information for your records:

Serial No. _____

Purchase Date: _____

ATTACHMENT 5
Air Dispersion Model

Memo

To: Jeff Parillo (GEI)

From: Caitlin Krause (GEI)

Cc: Chris Morris, George Holmes, Paul Blindauer (GEI)

Date: July 13, 2022

Re: Air Dispersion Modeling Results
National Grid – Greenpoint Remediation Site
Brooklyn, New York
GEI Project No. 125180

GEI Consultants, Inc. (GEI) completed toxic contaminants air dispersion modeling for the National Grid Greenpoint remediation site located in Brooklyn, New York, using AERMOD View, a Lakes Environmental software (EPA Version 21112). The purpose of this AERMOD dispersion modeling was to evaluate whether sub-slab depressurization systems planned for site buildings require effluent treatment. GEI followed NYSDEC's *DAR-1 Guidelines for the Evaluation and Control of Ambient Air Contaminants Under Part 212 (February 12, 2021)* and *DAR-10 Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis (September 1, 2020)*.

Source Data

The facility includes seven vertical, capped stacks and several buildings as shown in Attachment 1. GEI performed Good Engineering Practice (GEP) analysis to determine which buildings will contribute to building downwash and therefore, need to be included in the model. The analysis indicated that six buildings should be included in the model.

The pollutants that were modeled included:

- 1,1,2-Trichloroethane
- 1,1-Dichloroethane
- 1,2-Dibromoethane (EDB)
- 1,2-Dichloroethane
- 1,3-Butadiene
- 1,4-Dichlorobenzene
- 1,4-Dioxane
- 2,2,4-Trimethylpentane
- Benzene
- Benzyl Chloride
- Carbon Tetrachloride
- Chloroform
- Naphthalene
- Tetrachloroethene
- Trichloroethene
- Vinyl Chloride

The emission rates for each source are summarized in Attachment 2.

Meteorological Data

The facility does not have on-site meteorological data; therefore, GEI obtained surface and upper air meteorological data from NYSDEC Meteorology Division. Surface and upper air data was obtained from the LaGuardia Airport located in Queens County for the years 2017 through 2021.

Terrain Data

The receptor terrain data (USGS National Elevation Dataset [NED]) was resolved to 10 meters and was processed using AERMAP. NED 1/3 (USA ~10m) terrain data is available on AERMOD View and was utilized for this modeling. Additionally, an urban dispersion coefficient was used, as the facility is in an area most representative of urban land use. The stacks were modeled in a single urban group with a population of 2,000,000 based on the available 2020 census block data within a 6 km radius of the site.

Receptor Data

The National Grid facility is surrounded by security fences preventing access to the facility by the general public; therefore, receptors are located at and beyond the plant boundary. GEI followed guidance presented in DAR-10 for receptor spacing. Receptors along the plant boundary were spaced every 25 meters. Receptors were spaced 70 meters at the fence line out to a distance of 1 kilometer and spaced 100 meters from 1 kilometer to 2 kilometers.

Multi-Chemical Modeling Discussion

GEI calculated emission rate potentials of the abovementioned DAR-1 listed pollutants emitted from each source, as shown in Attachment 2. Some of these DAR-1-regulated contaminants are emitted from multiple sources; therefore, the "Multi-Chemical Run" function of AERMOD View was used to complete the dispersion modeling. To determine the AGC/SGC for each contaminant, GEI ran AERMOD View using the 1-hour and annual averaging time options.

The "Multi-Chemical Run" function was developed by Lakes Environmental for AERMOD View to address AERMOD's limitation as a single-pollutant model. The "Multi-Chemical Run" function works by creating individual batch/input files for each source, running them through AERMOD, and combining them into a single result to be viewed. The contour plot files generated by AERMOD contain the contribution from each individual pollutant for all the sources. The "Multi-Chemical Run" allows GEI to evaluate each pollutant (16 pollutants) emitted from the various sources in one project instead of running a separate project for each emitted pollutant. The "Multi-Chemical Run" input and output files are attached (.zip).

Results

The results for the pollutants listed above were compared to the corresponding DAR-1 SGC and AGC. The air dispersion modeling results show no exceedances of SGC or AGC for the modeled pollutants. Therefore, effluent treatment is not required. The results and associated DAR-1 SGC and AGC are enclosed in Attachment 3.

The AERMOD View input and output files found in Attachment 4 include the following files: plant boundary, buildings (.xlsx), sources (.xlsx), multi-chemical emission (.csv, .ADI, and .ADO), receptors (.ROU), meteorological (.PFL and .SFC), and building downwash (.bpi).

If you have any questions, please feel free to contact Caitlin Krause at 920-471-0890.

Attachments:

Attachment 1: Stack Location Plan
Attachment 2: Emission Rate Summary Table
Attachment 3: AERMOD Results
Attachment 4: AERMOD Input and Output Files (.zip)

CLK/PRB:cah
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LOMBARDY STREET

BEADEL STREET

PORTER AVENUE

DIVISION PL

VANDERVOORT AVENUE

VARICK AVENUE (CLOSED TO PUBLIC)

NEWTOWN CREEK

MASPETH AVENUE

LNG GUARD HOUSE

BUILDING 13

BUILDING 12

BUILDING 11

STACK B11

SERVICE BUILDING
(BUILDING B)

STACK BC2

STACK BC3

STORES BUILDING
(BUILDING C)

STACK BC1

STACK B21

STACK BD2

STACK BD1

TRANSPORTATION
BUILDING
(BUILDING D)

FACILITIES BUILDING
(BUILDING 21)

GATEHOUSE BUILDING
(BUILDING A)

N

0 100 200
SCALE, FEET

Greenpoint Energy Center
Sub-Slab De-Pressurization System
Brooklyn, New York

nationalgrid

GEI Consultants

STACK LOCATION PLAN

Project 125180 | July 2022 | Fig. 1

HERIOT, PAULA \\Blm-pzcc-1\blm-data\Tech\Projects\National Grid\Greenpoint\IRM\SSDS\00_CAD\Figures\SSDS\125180_SSDS_LAYOUT.dwg - 7/8/2022

National Grid - Greenpoint
Brooklyn, New York
Air Dispersion Modeling
July 2022

Emission Rates Summary Table

Pollutant	CAS No	Units	Stacks BC1 and BC2	Stack BC3	Stack BD1	Stack BD2	Stack B11	Stack B21
1,1,2-Trichloroethane	79-00-5	g/s	--	--	--	--	2.83E-07	--
1,1-Dichloroethane	75-34-3	g/s	--	--	--	7.17E-08	4.96E-06	--
1,2-Dibromoethane (EDB)	106-93-4	g/s	2.08E-09	2.83E-09	--	9.06E-09	2.60E-09	2.08E-09
1,2-Dichloroethane	107-06-2	g/s	3.02E-09	3.40E-09	--	--	1.37E-07	2.64E-09
1,3-Butadiene	106-99-0	g/s	--	--	--	--	--	3.59E-08
1,4-Dichlorobenzene	106-46-7	g/s	4.53E-09	4.72E-09	--	--	3.78E-09	3.02E-09
1,4-Dioxane	123-91-1	g/s	--	3.96E-09	1.13E-07	1.23E-08	6.84E-09	4.34E-09
2,2,4-Trimethylpentane	540-84-1	g/s	--	--	4.63E-05	--	--	--
Benzene	71-43-2	g/s	2.83E-08	2.45E-07	8.12E-07	1.42E-07	5.43E-08	5.10E-07
Benzyl chloride	100-44-7	g/s	--	2.45E-08	--	--	5.66E-09	--
Carbon tetrachloride	56-23-5	g/s	1.08E-08	9.63E-09	--	--	1.68E-08	1.09E-08
Chloroform	67-66-3	g/s	--	--	--	--	3.78E-07	--
Naphthalene	91-20-3	g/s	2.08E-06	6.23E-07	--	9.44E-08	6.37E-07	3.21E-07
Tetrachloroethene	127-18-4	g/s	9.44E-07	--	--	2.17E-07	5.90E-06	--
Trichloroethene	79-01-6	g/s	--	--	--	--	2.22E-05	1.72E-08
Vinyl chloride	75-01-4	g/s	8.12E-09	--	--	--	--	--

Notes:

1. Emission rates calculated multiplying the effluent analytical data by the gas flowrate.

National Grid - Greenpoint
Brooklyn, New York
Air Dispersion Modeling
Run Date: July 13, 2022

AERMOD Results

Pollutant	CAS No.	DAR-1		AERMOD Results	
		SGC	AGC	1-hr	Annual
1,1,2-Trichloroethane	79-00-5	--	1.4	0.00014	0.00001
1,1-Dichloroethane	75-34-3	--	0.63	0.00247	0.00011
1,2-Dibromoethane (EDB)	106-93-4	--	0.0017	0.00001	0.00000
1,2-Dichloroethane	107-06-2	--	0.038	0.00007	0.00000
1,3-Butadiene	106-99-0	--	0.033	0.00002	0.00000
1,4-Dichlorobenzene	106-46-7	--	0.091	0.00001	0.00000
1,4-Dioxane	123-91-1	3,000.0	0.20	0.00021	0.00001
2,2,4-Trimethylpentane	540-84-1	--	3,300.0	0.08162	0.00312
Benzene	71-43-2	27.0	0.13	0.00154	0.00007
Benzyl chloride	100-44-7	240	0.02	0.00002	0.00000
Carbon tetrachloride	56-23-5	1,900.0	0.17	0.00002	0.00000
Chloroform	67-66-3	150	14.7	0.00019	0.00001
Naphthalene	91-20-3	7,900.0	3.0	0.00276	0.00014
Tetrachloroethene	127-18-4	300	3.8	0.00295	0.00017
Trichloroethene	79-01-6	20	0.21	0.01107	0.00049
Vinyl chloride	75-01-4	180,000.0	0.11	0.00001	0.00000

Notes:

1. Annual and Short-term Guideline Concentration (AGC/SGC) from DAR-1 (February 12, 2021).
2. Air dispersion modeling completed using Lakes Environmental AERMOD View (EPA Version 21112).
3. The urban group population is assumed to be 2,000,000 based on 2020 census block data.
4. Meteorological data dated 2017 to 2021 from LaGuardia Airport (surface and upper air).