DT CONSULTING SERVICES, INC. & BELLUCCI ENGINEERING, PLLC

Off-Site Soil Vapor Intrusion Investigation Work Plan
77 Cornell Street
Kingston, New York

SITE NUMBER 356061

September 15, 2023(Revision II)

September 15, 2023

Mr. Michael Kilmer
New York State Department of Environmental Conservation
Division of Environmental Remediation
21 South Putt Corners Road
New Paltz, New York 12561

RE: OFF-SITE SOIL VAPOR INTRUSION WORK PLAN – REVISED II
77 Cornell Street
Kingston, Ulster County, New York
Site No.: 356061

Dear Mr. Kilmer:

DT Consulting Services, Inc. (DTCS) and Bellucci Engineering, PLLC are pleased to present this Off-Site Soil Vapor Intrusion Work Plan (SVIWP) - Revised for your review and approval. If you should have any questions or require additional information, please contact our office.

Respectfully submitted,

Daniel Bellucci, P.E.
Bellucci Engineering, PLLC

Deborah Thompson, Senior Geologist
DT Consulting Services, Inc.

CC: 77 CORNELL STREET LLC
G. BOWITCH, ESQ.

FIGURES

1.0 INTRODUCTION/BACKGROUND

The Subject Property is located at 77 Cornell Street in the City of Kingston, Ulster County, New York (heretofore referenced as the Site or Subject Property). Refer to Figures 1 & 2 for a Site Location and Site Base maps, respectively. The Site is not currently listed in the New York State Department of Environmental Conservation (NYSDEC or Department) Registry of Inactive Hazardous Waste Disposal Sites in New York State (the Registry). Prior investigation activities have been conducted on the Site and the results of those investigations were submitted to the Department. Based upon these results, the Department has designated the Site as Site Number 356061 with a Classification of "P" pursuant to ECL 27-1305.

The Subject Property contains a regular shaped lot which encompasses an area of approximately 0.88 acres along the southwest corner of the intersection of Smith Avenue and Cornell Street. The Site, also known as The Shirt Factory, is improved with 4-story building occupied by 62 tenant spaces for commercial and residential use. On-Site operations consist of artist loft/studios, professional offices/storage activities, and associated property maintenance. A partial basement is located along the southern portion of the Site structure. Areas surrounding the building include asphalt paved parking surfaces, concrete walkways and landscape spaces. Land-use surrounding the Subject Property is primarily characterized by residential and commercial development. The following table lists the abutting properties:

Location	Occupant
North	Smith Avenue & Residences
South	Cornell Street & Tremper Avenue. USPS (90 Cornell Street to the Southeast)
East	Cornell Street & USPS (90 Cornell Street)
West	Residences along Ardsley Street & Smith Avenue

Site topography is relatively flat, and at grade with the surrounding roadways. Electric and gas services is supplied by Central Hudson Gas & Electric, while potable water and sanitary services are supplied by The City of Kingston (Municipal). No groundwater supply wells were observed on the Site by representatives of this office during Site inspections and no groundwater supply wells are known to be present or used on adjoining or nearby properties. Surface water runoff enters catch basins located throughout the property which appear to discharge into the municipal storm sewer system.

2.0 PURPOSE/INTRODUCTION

DT Consulting Services, Inc./Bellucci Engineering, PLLC (DTCS/BE) has prepared this Soil Vapor Intrusion Investigation Work Plan (SVIWP) outlining the proposed investigation activities associated with the six adjoining, off-Site properties located at the following addresses[1]:

Physical Address **SBL**	**Site Use**	**Locational** **Direction**
110 Tremper Avenue 56.25-4-7	Residential	Southeast
12 Ardsley Street 56.25-4-4	Residential	East
16 Ardsley Street 56.25-4-3	Residential	East
138 Smith Avenue 48.334-6-12	Retail Liquor Store	Northeast
140 Smith Avenue 48.334-6-13	Residential	Northeast
147 Smith Avenue 56.25-4-2	Residential	Northeast

[1] If access is not granted to any of the proposed parcels as listed above, additional property access will be sought for properties with structures that are adjacent to the planned Site locations.

This Work Plan was prepared for the purpose of evaluating the potential for soil vapor intrusion in these Site-adjacent properties. Based upon Site Characterization (SC) activities performed in April 2022 under the supervision of the NYSDEC and the New York State Department of Health (NYSDOH), detections in soil vapor and/or groundwater from chlorinated solvents were encountered on-Site and along the property boundaries (see Figures 3 & 4 for additional details). To address soil vapor intrusion (SVI) on the Subject Parcel, a Sub-Slab Depressurization System (SSDS) is scheduled to be installed in July 2023. Note that the findings of the Site Characterization field study did not warrant the need for any additional remediation on the Subject facility beyond the installation of the SSDS. The final stage of the SC to satisfy the investigative requirements of the Department is to evaluate the potential for SVI impacts at adjacent Site structures. Off-Site properties which may require assessment and sampling are depicted on the Proposed SVI Sampling Map (Figure 4).

It is critical to note that the possibility of off-Site SVI impacts from locations other than the Subject Property cannot be ruled out based upon the presence of a known Hazardous Waste facility located at 85 Grand Street, Kingston, New York (historically known as Huck Manufacturing) which has been documented to be the source of wide spread chlorinated volatile organic compounds (cVOCs) SVI impacts, including in close proximity of the Subject Property. Based upon available documentation reviewed by DTCS/BE, commencing in 2006, actions have been taken to install remedial SSDSs at 17 off-Site buildings to prevent contaminated vapors from entering and affecting the indoor air quality from the source located at 85 Grand Street (see Figure 5). Note that the nearest SSDS installed from the release at Huck Manufacturing *is less than 300 feet* from the Subject Property. As the contamination from the source location (85 Grand Street) is documented to be traveling with groundwater flow towards the 77 Cornell Site and off-gassing cVOCs which require mitigation in numerous structures (see Figure 5), it is clear that there is a contaminant plume which has migrated to the vicinity of the Site and which cannot be associated with activities at the Site.

Given the above and the minimal detections of cVOCs within soil, soil vapor and groundwater within this portion of the Site, as documented during recent sampling events

(Site Characterization Report, DTCS/BE, October 6, 2022), properties located to the north and up-gradient of the Site are not proposed to be sampled at this time. In addition, the property located at 117 Tremper Avenue, southwest of the Subject Property, has been listed on the RCRA NonGen/NLR, Manifest FINDS and ECHO databases. The tenant at this facility is a former generator of ignitable wastes, spent non-halogenated solvents, methyl ethyl ketone and tetrachloroethylene (PERC).

After review and evaluation of the findings of this proposed SVI survey at the six proposed locations, DTCS/BE will confer with the NYSDEC/NYSDOH to determine if additional SVI investigative activities are warranted.

The following proposed scope of work and sampling methods are in accordance with the NYSDOH *October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH, 2006) and NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, May 3, 2010.

3.0 STRUCTURE INSPECTION AND PRODUCT INVENTORY

As per the 2006 NYSDOH Soil Vapor Intrusion guidance document, a product inventory survey documenting potential sources of volatile chemicals present within the structures is to be completed at each off-site location. The primary objective of the product inventory is to identify potential air sampling interference by characterizing the occurrence and use of chemicals and products throughout the structures. In addition to documenting the structures inventory, a photoionization detector (PID) will be utilized to screen for the presence or absence of VOCs in indoor air. All applicable field notes, field readings, photographs taken during the product inventory survey, and a copy of the completed inventory survey will be provided to the NYSDEC in a written report.

4.0 SUB-SLAB VAPOR POINT INSTALLATIONS

DTCS/BE proposes the installation of sub-slab vapor points at six off-Site structures as documented above (one per location). If a basement is present and/or accessible within

the sampling location, a sub-slab vapor point will be installed to collect a soil vapor sample immediately beneath the foundation or slab of the targeted building. A sub-slab vapor sample is collected to characterize the nature and extent of soil vapor contamination immediately beneath a building with a basement foundation and/or a slab on-grade.

Sub-slab vapor sampling results are used in conjunction with indoor air and outdoor air sampling results when evaluating the following:

- Current human exposures;
- The potential for future human exposures; and,
- Site-specific attenuation factors (i.e., the ratio of indoor air to sub-slab vapor concentrations).

During the colder months, heating systems should be operating to maintain a normal indoor air temperature (between 65 – 75°F) for at least 24 hours prior to and during the scheduled sampling time. Prior to installing temporary sub-slab vapor points, the building floor will be inspected for any penetrations (cracks, floor drains, utility perforations, sumps, etc.). Sub-slab vapor points should be installed at locations where the potential for ambient air infiltration via floor penetrations is minimal. Sub-slab samples will be collected concurrently with indoor and outdoor air sampling activities.

4.1 Installation of Sub-Slab Vapor Points

At least one sub-slab vapor sample will be collected from each representative area. If a basement or slab is present within the structure, a temporary sample vapor point will be installed. The sample point location will be determined based on the building's foundation and the potential utilities located within the area. The vapor point will be advanced using a ½-inch to ¾-inch hammer drill bit to core thru the concrete slab. The vapor point will be constructed with inert tubing (e.g., polyethylene, nylon, or Teflon), no greater than 2

inches below the bottom of the slab. The annulus surrounding the vapor point will be filled with virgin silica sand and sealed to the surface with hydrated bentonite. Alternatively, dedicated brass Vapor Pin's, fitted with silicon sleeves, may be installed in 5/8-inch cores.

4.2 Sub-Slab Vapor Point Tracer Gas Test

To verify the integrity of the temporary sample vapor point, a tracer gas will be used to test the seal. To complete this quality assurance/quality control (QA/QC) measure, helium will be used as the tracer gas to conduct a leak test. Using an enclosure (e.g., bucket, PVC well cap) over the vapor point, the atmosphere within the immediate vicinity of the area where the vapor point intersects the ground surface will be enriched with helium. One to three implant volumes (the volume of the sample probe and tube) of air will be purge from the temporary vapor point using an air sampling system and a flow module (vacuum pump). The purging flow rate will not exceed 0.2 liters per minute (L/min). The sample vapor point will be tested for helium breakthrough before the collection of the soil gas sample. Diagram 1 displays the common tracer gas methods.

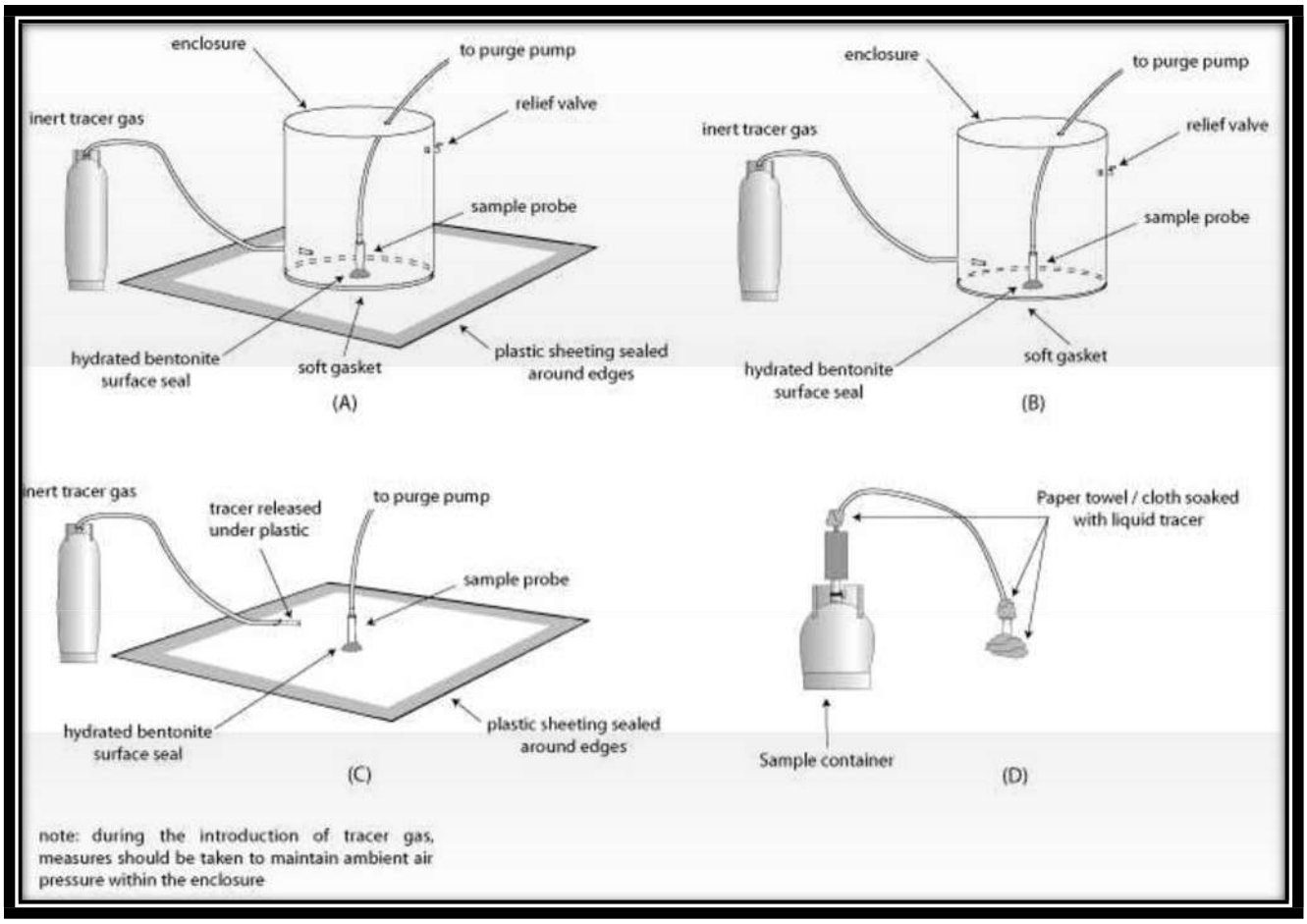


Diagram 1: Common methods for using tracer gas (NYSDOH, 2006, p. 28)

4.3 Sub-Slab Air Sampling

Following the helium tracer test and purging activities, a soil-gas sample will be collected using 6-liter Summa® canisters fitted with 24-hour flow controllers. Certified batch cleaned Summa® canisters will be provided by a NYSDOH ELAP certified laboratory, or specifically York Analytical Laboratories of Stratford, CT (York). The Summa® canisters will be analyzed for EPA Method TO-15. York will be instructed to prepare a NYSDEC Analytical Services Protocol (ASP) Category B laboratory data package for the purpose of data validation.

Additional documentation that will be gathered during sampling activities includes the barometric pressure and photographs to accompany floor plan sketches. The field sampling team will maintain a sample log sheet summarizing the following:

- Sample identification;
- Date and time of sample collection;
- Sampling depth;
- Identity of the samplers;
- Sampling methods and devices;
- Purge volumes;
- Volume of soil vapor extracted;
- If canisters are used, the vacuum before and after samples were collected;
- Apparent moisture content (dry, moist, saturated, etc.) of the sampling zone; and
- Chain of custody protocols and records used to track samples from sampling point to analysis.

4.4 Sub-Slab Vapor Point Restoration

Upon completion of the 24-hour sampling event, the temporary sample vapor points will be removed and the cored holes through the concrete will be sealed utilizing a grout and concrete mixture.

4.5 Indoor Ambient Air Sampling

Prior to collecting indoor air samples, a pre-sampling inspection will be performed to evaluate the physical layout and conditions of the building being investigated, to identify conditions that may affect or interfere with the proposed sampling, and to prepare the building for sampling.

DTCS/BE proposes that an indoor air sample will be collected from each of the six properties proposed for testing herein (provided DTCS/BE is granted access to each parcel). The indoor air sample will be collected in a time weighted 6-liter Summa® canisters fitted with a 24-hour flow controller, as discussed in Section 4.3. The samples will be obtained concurrently with the sub-slab sampling activities and will be submitted to York for analysis via EPA Method TO-15. Specific sampling locations to be utilized during this investigative task would include the following targeted locations (Refer to Diagram 2):

- From the basement (where vapor infiltration is suspected, such as near sump pumps or indoor wells, or in a central location) at a height approximately three feet above the floor to represent a height at which occupants normally are seated and/or sleep; and

- From the lowest level living space (in centrally-located, high activity use areas) at a height approximately three feet above the floor to represent a height at which occupants normally are seated and/or sleep.

4.6 Outdoor Air Sampling

One ambient outdoor air sample will be collected per day from a secure location concurrent with the sub-slab and indoor air samples as the off-Site targeted locations are within a localized area. The air sample will be collected in the breathable zone (approximately 3-5 feet above ground surface) during each day of sampling activities.

Outdoor air samples will be analyzed in a manner consistent with corresponding indoor air samples.

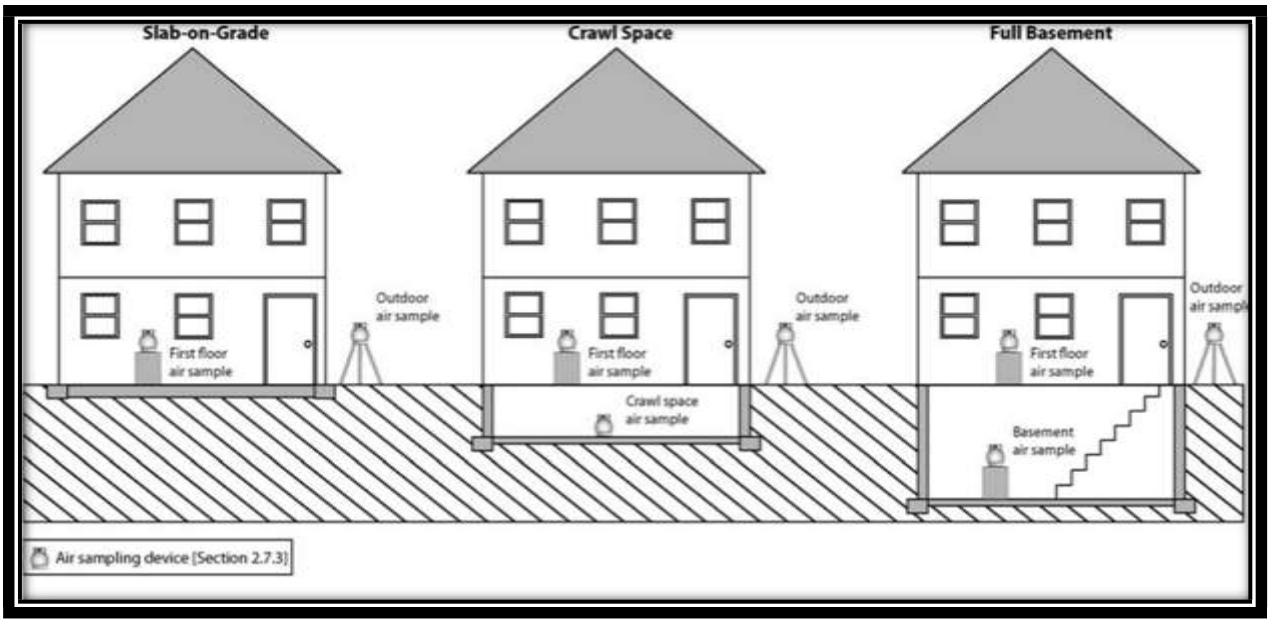


Diagram 2: Schematic of indoor and outdoor air sampling locations (NYSDOH, 2006, p. 18)

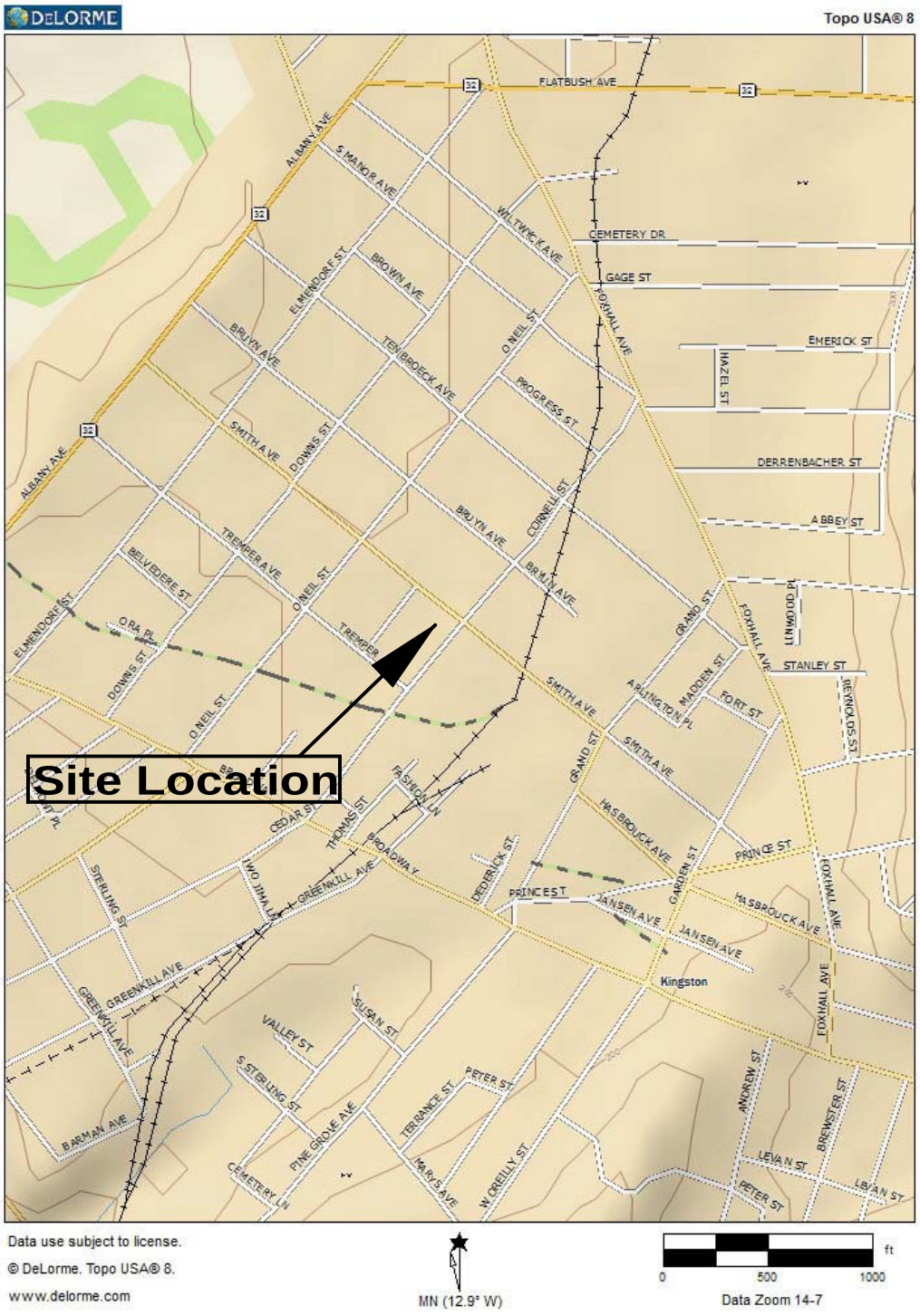
5.0 SCHEDULE

DTCS/BE is currently working on an implementation schedule for this Work Plan. The sub-slab, indoor air, and outdoor air sampling schedule will be developed when it is determined that access to each of the properties will be granted and the sampling time correlates to the published New York heating season (typically from November – April). At this time, DTCS/BE anticipates this work to begin in November of 2023. Following approval of this work plan and once access to off-Site properties is granted; the schedule will be submitted to the NYSDEC under separate cover.

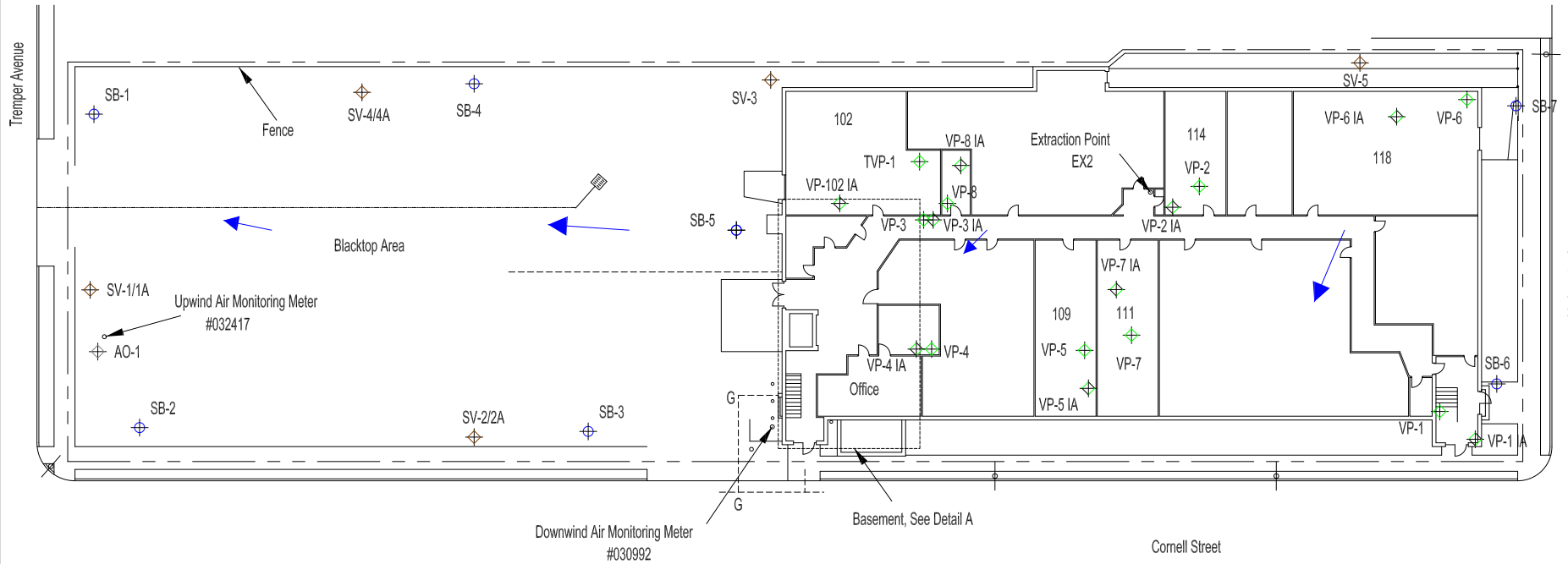
6.0 REFERENCE LIST

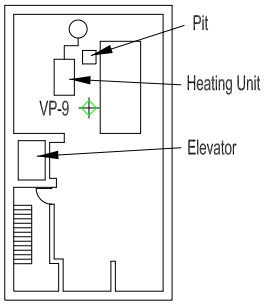
NYSDOH (2006, October). Guidance for Evaluating Soil Vapor Intrusion in the State of New York.

FIGURES



Client: Kingston Lofts LLC			**Site Location Plan**
Site: 77 Cornell Street, Kingston, New York			
Site No.: 356061	**Drawn by:** DJT	**Scale:** Graphic	**Figure No:** 1

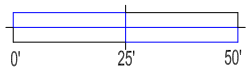




Detail A

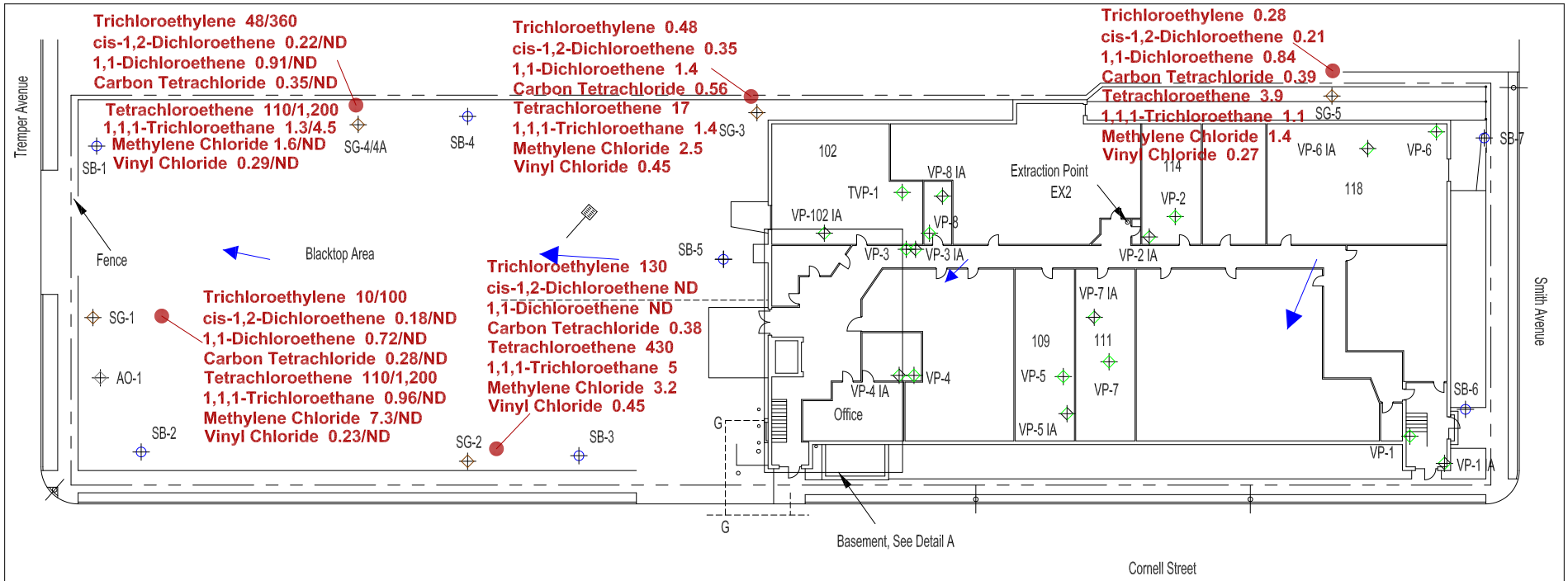
Key

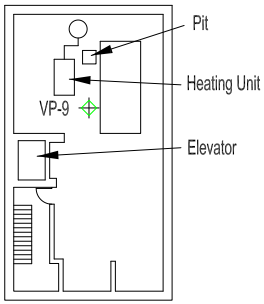
- Underground Utilities
- Approx. Property Line
- SB-XX Soil Boring
- SV-XX Soil Vapor Exterior
- VP-XX Vapor Point Interior
- VP-XXIA Vapor Point Indoor Ambient Air
- AO-XX Ambient Air Outdoor
- Utility Pole
- Storm Drain
- Direction of Groundwater Flow



DT Consulting Services, Inc.
1291 Old Post Road
Ulster Park, New York 12487
(845) 658-3484

Client: 77 Cornell Street LLC			
Location: 77 Cornell Street, Kingston, Ulster County, New York			
Title: Site (base) Map - Site Characterization Sample and Testing Map			
Scale: Graphic	Drawn By: O.T.	Site No: 356061	Fig.#: 2





Detail A

Key

- Underground Utilities
- Approx. Property Line
- SB-XX Soil Boring
- SG-XX Soil Gas Exterior
- VP-XX Vapor Point Interior
- VP-XXIA Vapor Point Indoor Ambient Air
- TVP-XX Future Test Point
- AO-XX Ambient Air Outdoor
- Utility Pole
- Storm Drain
- Direction of Groundwater Flow

Vinyl Chloride 0.23/ND

April 2022/September 2022

CVOCs Reported In Micrograms/Cubic Meter

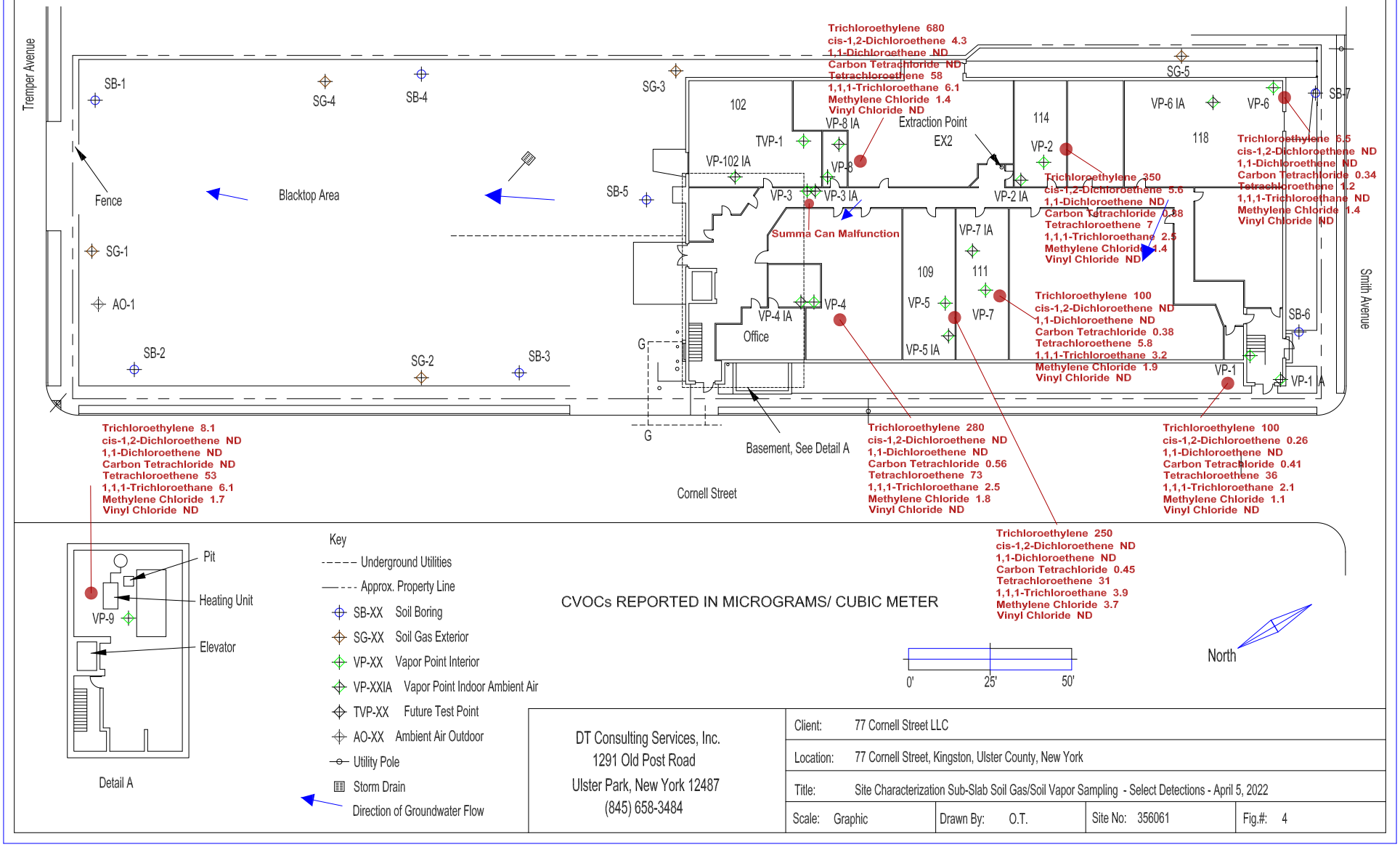
North

0' 25' 50'

DT Consulting Services, Inc.
1291 Old Post Road
Ulster Park, New York 12487
(845) 658-3484

Client:	77 Cornell Street LLC
Location:	77 Cornell Street, Kingston, Ulster County, New York
Title:	Site Characterization Soil Gas Sampling - Select Detections - April 6 & September 16, 2022

Scale:	Graphic	Drawn By:	O.T.	Site No:	356061	Fig.#:	3



DT Consulting Services, Inc.
1291 Old Post Road
Ulster Park, New York 12487
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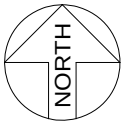
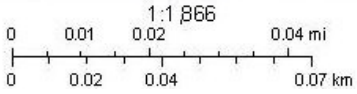
Client:	77 Cornell Street LLC
Location:	77 Cornell Street, Kingston, Ulster County, New York
Title:	Site Characterization Sub-Slab Soil Gas/Soil Vapor Sampling - Select Detections - April 5, 2022

Scale:	Drawn By:	Site No:	Fig.#:
Graphic	O.T.	356061	4



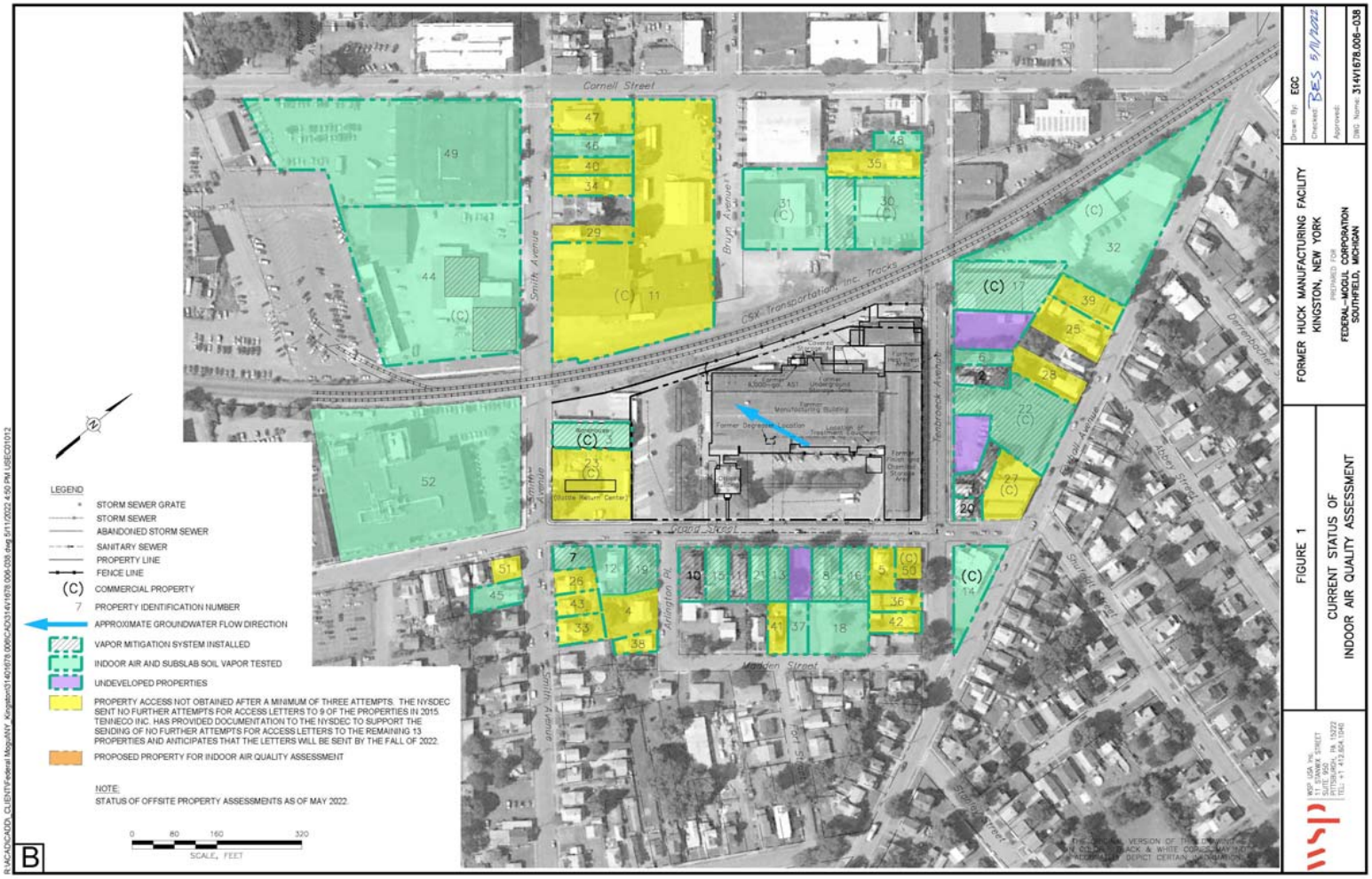
Proposed SVI Sampling Locations

1 - 110 Tremper Avenue
2 - 12 Ardsley Street
3 - 16 Ardsley Street
4 - 147 Smith Avenue
5 - 138 Smith Avenue
6 - 140 Smith Avenue



DT Consulting Services, Inc.
1291 Old Post Road
Ulster Park, New York 12487
(845) 658-3484

Client: 77 Cornell Street LLC			
Location: 77 Cornell Street, Kingston, Ulster County, New York			
Title: Area Map - Proposed SVI Sampling Locations			
Scale: Graphic	Drawn By: O.T.	Site No: 356061	Fig.#: 5



Note:
The Site (i.e., 77 Cornell Street) is off the base map provided. See figure below for comparative locations.

DT Consulting Services, Inc.
1291 Old Post Road
Ulster Park, New York 12487
(845) 658-3484

Client:	77 Cornell Street LLC			
Location:	77 Cornell Street, Kingston, Ulster County, New York			
Title:	Huck Manufacturing cVOC Impacts - Updated May 2022			
Scale: Graphic		Drawn By: O.T.	Site No: 356061	Fig.#: 6