New York State Department of Environmental Conservation

Soil Vapor Intrusion Investigation Work Plan

Site #C314126A
19, 21 & 23 Academy Street (Off-Site)
Poughkeepsie, New York

February 13, 2020

Soil Vapor Intrusion Investigation Work Plan

Site #C314126A
19, 21 & 23 Academy Street (Off-Site)
Poughkeepsie, NY

Prepared for:
Mr. Michael Kilmer
New York State Department of Environmental Conservation
Region 3 - Division of Environmental Remediation
21 South Putt Corners Road
New Paltz, NY 12561

Prepared by:
Groundwater & Environmental Services, Inc.
63 East Main St, Unit 3
Pawling, NY 12564
TEL: 866-839-5195
www.gesonline.com

GES Project:
1102727

Date:
February 13, 2020

Sara Kosari
2020.02.13
14:26:50 -05'00'

Sara Kosari
Associate Geologist

Christina Andreotto
2020.02.13 17:49:22
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Christina Andreotto, P.G.
Project Manager

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1 Introduction

Groundwater & Environmental Services, Inc. (GES), on behalf of the New York State Department of Environmental Conservation (NYSDEC), has prepared this *Soil Vapor Intrusion Investigation Work Plan* outlining the proposed investigation activities associated with the three (3) properties located at 19, 21, and 23 Academy Street in Poughkeepsie, New York (the "Site"). This Work Plan was prepared for the purpose of evaluating the potential for soil vapor intrusion in the surrounding properties within the vicinity of the Site. Based on a previous *Phase II Environmental Site Assessment* (ESA), detections of soil vapor from chlorinated solvents were found at the properties located adjacent to the Site. In November 2019, work performed by the Department of Homes and Community Renewal indicated lower, but actionable levels of chlorinated solvents in the soil vapor. A Site Location Map and a Site Map indicating pertinent Site features are provided as **Figures 1** and **2**, respectively. Off-site properties associated with the site, and which may require assessment and sampling, are depicted on the Expanded Site Map (**Figure 3**). The following proposed scope of work and sampling methods are in accordance with the New York State Department of Health (NYSDOH) *October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH, 2006).

2 Structure Sampling and Product Inventory

2.1 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.

GES proposes conducting an inventory survey at all associated off-site properties that require a soil vapor intrusion investigation (up to eleven total properties). In addition to documenting the structures inventory, a photoionization detector (PID) will be utilized to screen for the presence or absence of odors.

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.

2.2 Sub-Slab Vapor Point Installations

GES proposes the installation of sub-slab vapor points at up to eleven (11) off-site structures. If a basement is present and/or accessible within the structures, a sub-slab vapor point will be installed to collect a soil vapor sample immediately beneath the foundation or slab of both the residential and commercial buildings.

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.

2.2.1 Installation of Sub-Slab Vapor Points

The number of sub-slab vapor points that should be collected in a building will be determined based on the size of the structures. Larger structures will have two (2) vapor points installed. At least one (1) sub-slab vapor sample should 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 remaining space around the tubing will be sealed to the surface with a non-volatile organic compound (VOC) containing product (e.g. permagum grout, melted beeswax, putty).

2.2.2 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 a GILIAN personal air sampling system and a flow module (vacuum pump). The purging flow rate should 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.

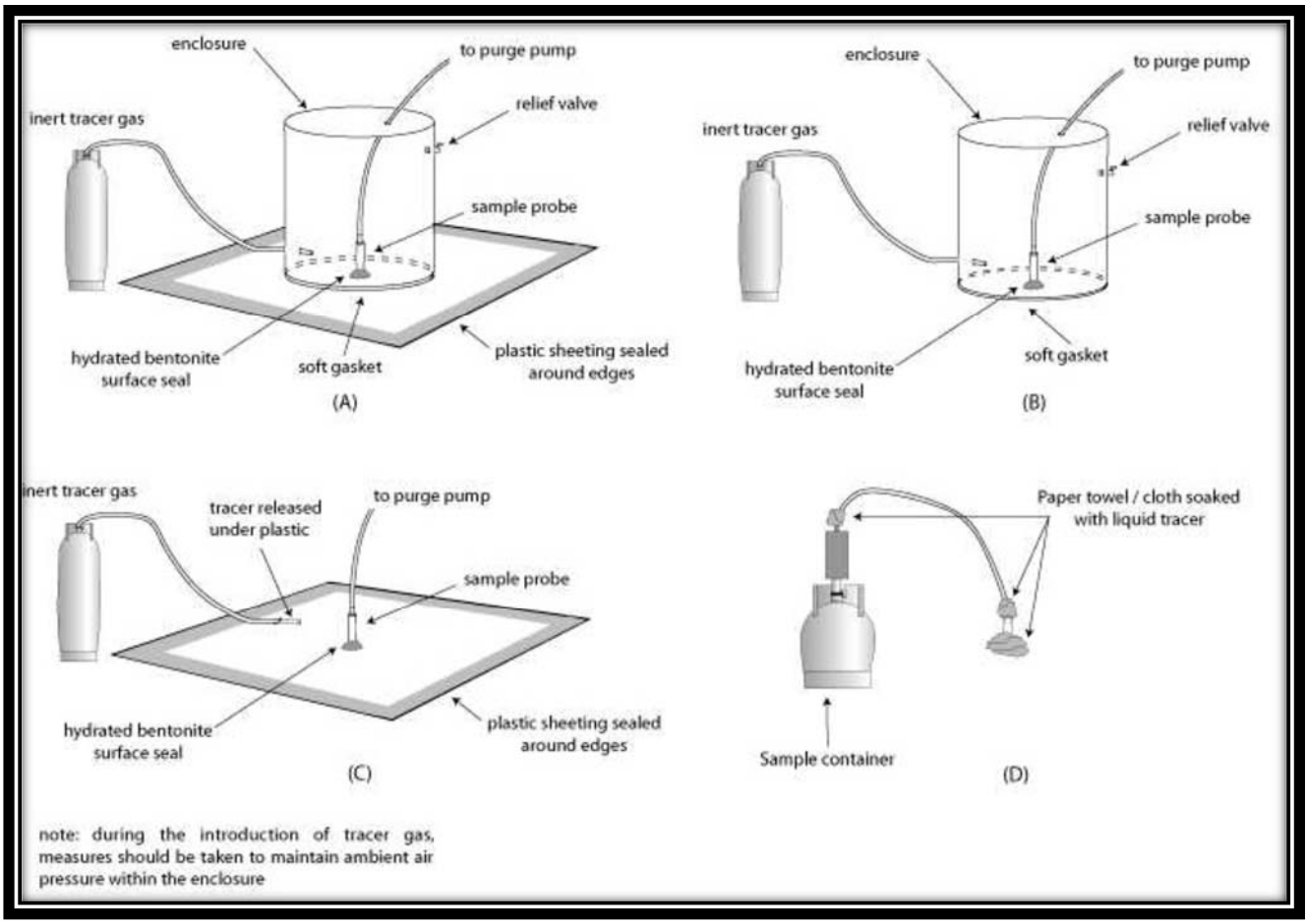


Diagram 1: Common methods for using tracer gas (NYSDOH, 2006, p. 28)

2.2.3 Sub-Slab Air Sampling

Following the helium tracer test and purging activities, a soil-gas sample will be collected using a time weighted 6-liter Summa® canisters fitted with a 24-hour flow controller. Certified cleaned Summa® canisters will be provided by a NYSDEC certified laboratory, TestAmerica Laboratories of Buffalo, New York (TestAmerica). The Summa® canisters will be analyzed for EPA Method TO-15. TestAmerica 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

2.2.4 Sub-Slab Vapor Point Restoration

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

2.3 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.

GES proposes that an indoor air sample will be collected from each property identified by the NYSDEC, provided that GES is granted access to each property. The indoor air sample will be collected in a time weighted 6-liter Summa® canisters fitted with a 24-hour flow controller that does not exceed 0.2 L/min. The samples will be obtained concurrently with the sub-slab sampling activities and will be submitted to TestAmerica for TO-15.

Depending on the type of structures, an indoor air sample will be collected from the following locations (Refer to Diagram 2):

- From the crawl space area;
- 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;
- 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; and,
- In a commercial setting, from multiple tenant spaces at a height approximately three feet above the floor to represent a height at which occupants normally are seated.

A QA/QC sample in the form of a field duplicate sample will be collected at select locations. GES proposes a total of one (1) duplicate sample per day to be collected. The locations of the duplicate samples will be determined during field activities.

2.4 Outdoor Air Sampling

Up to two (2) ambient outdoor air samples will be collected per day from a secure location concurrent with the sub-slab and indoor air samples. If several buildings are being sampled within a localized area, a single representative outdoor air sample will be collected. An 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.

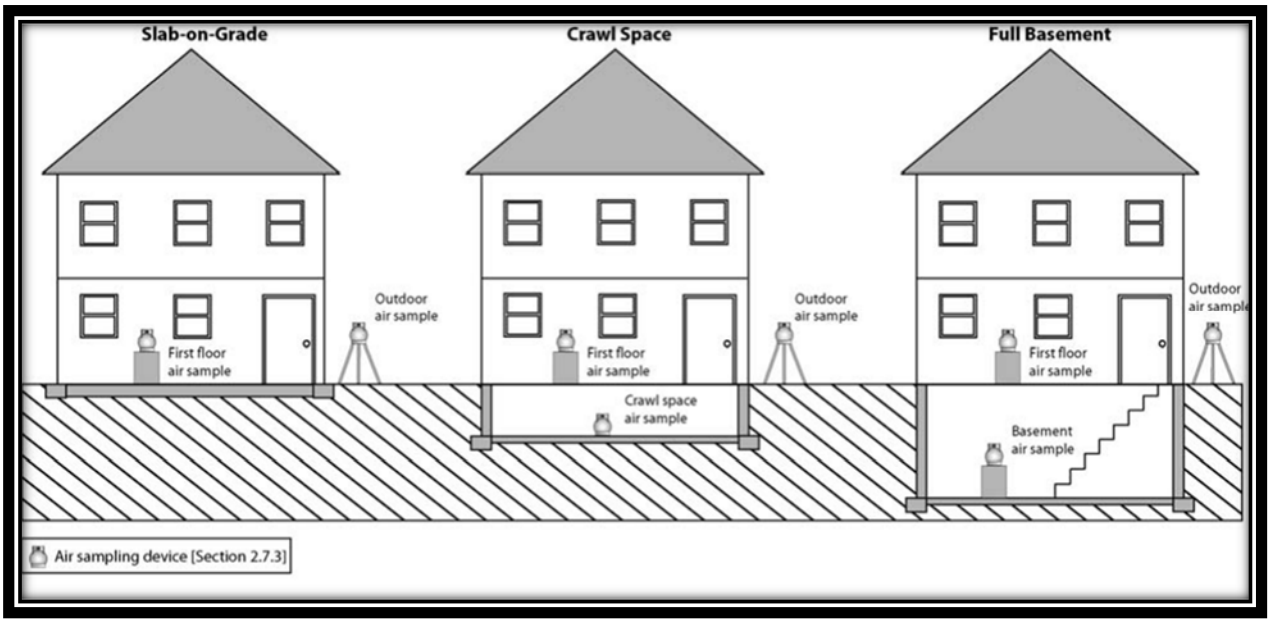


Diagram 2: Schematic of indoor and outdoor air sampling locations (NYSDOH, 2006, p. 18)

3 Schedule

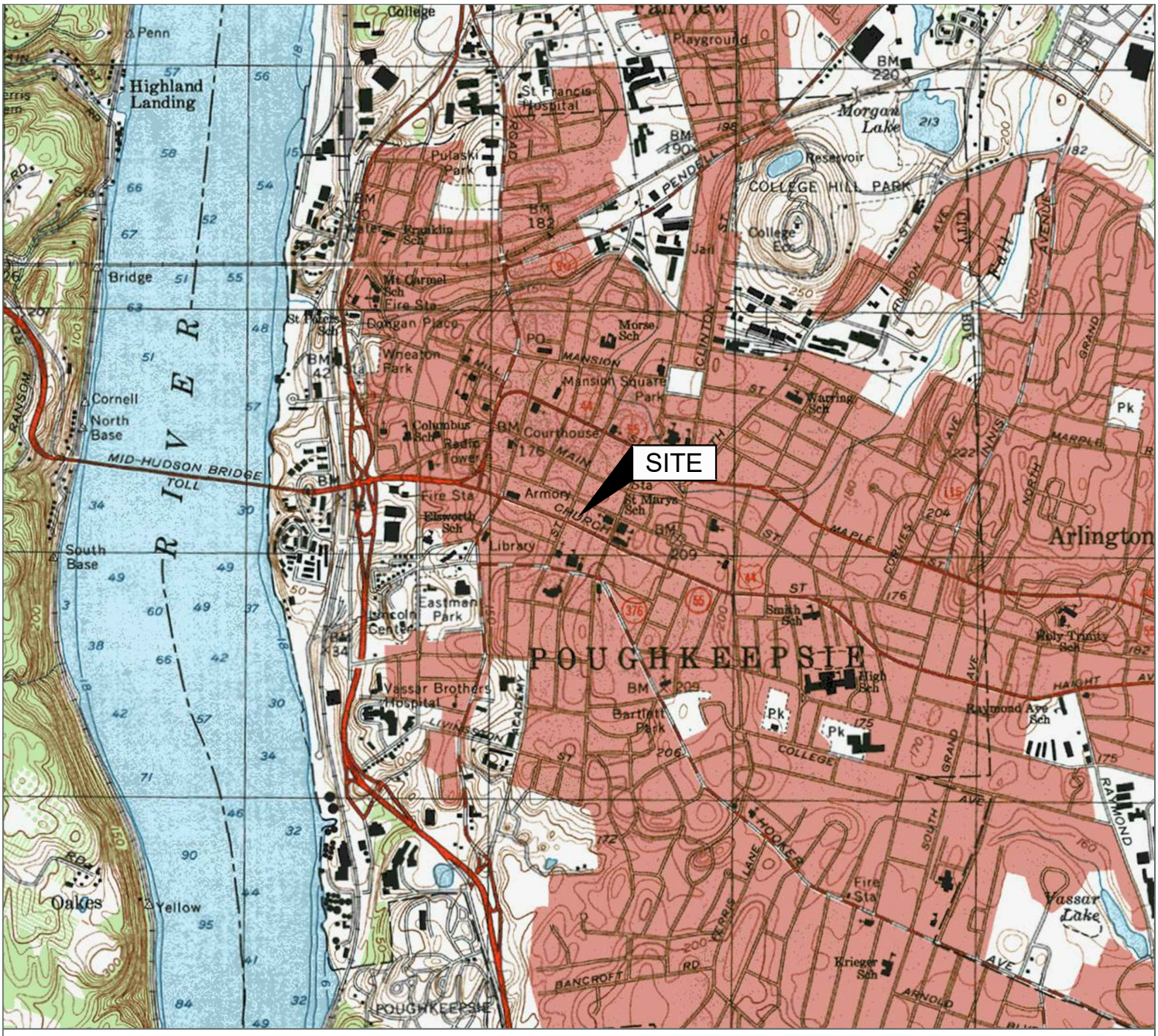
GES is currently working on an implementation schedule for this Work Plan. The sub-slab, indoor air, and outdoor air sampling schedule will be developed when it is determined that access to each of the properties will be granted. At this time, GES anticipates this work to begin in February-March of 2020.

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. GES looks forward to working with the NYSDEC and the NYSDOH on the review and execution of this *Soil Vapor Intrusion Investigation Work Plan*. If you have any questions or concerns, please contact Christina Andreotto of GES at (866) 839-5195 ext. 3862.

4 Reference list

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

Figures



Source:
USGS 7.5 Minute Series
Topographic Quadrangle, 1995
Poughkeepsie, New York
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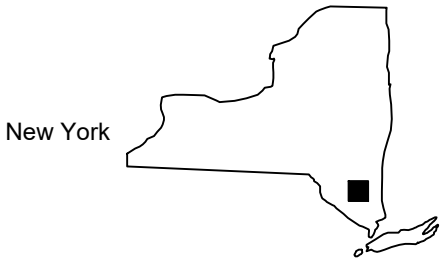

Quadrangle Location

Site Location Map

NYSDEC
19, 21 and 23 Academy Street
Poughkeepsie, New York
#C314126A

Drawn
W.G.S.
Approved
C.A.

Date
1/31/20
Figure
1

Scale In Feet
0 2000

Groundwater & Environmental Services, Inc.

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LEGEND

SITE BOUNDARY

Site Map

NYSDEC
19, 21 and 23 Academy Street
Poughkeepsie, New York
#C314126A

Drawn
W.G.S.
Approved
C.A.

Date
1/31/20
Figure
2

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Scale In Feet
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GES
Groundwater & Environmental Services, Inc.

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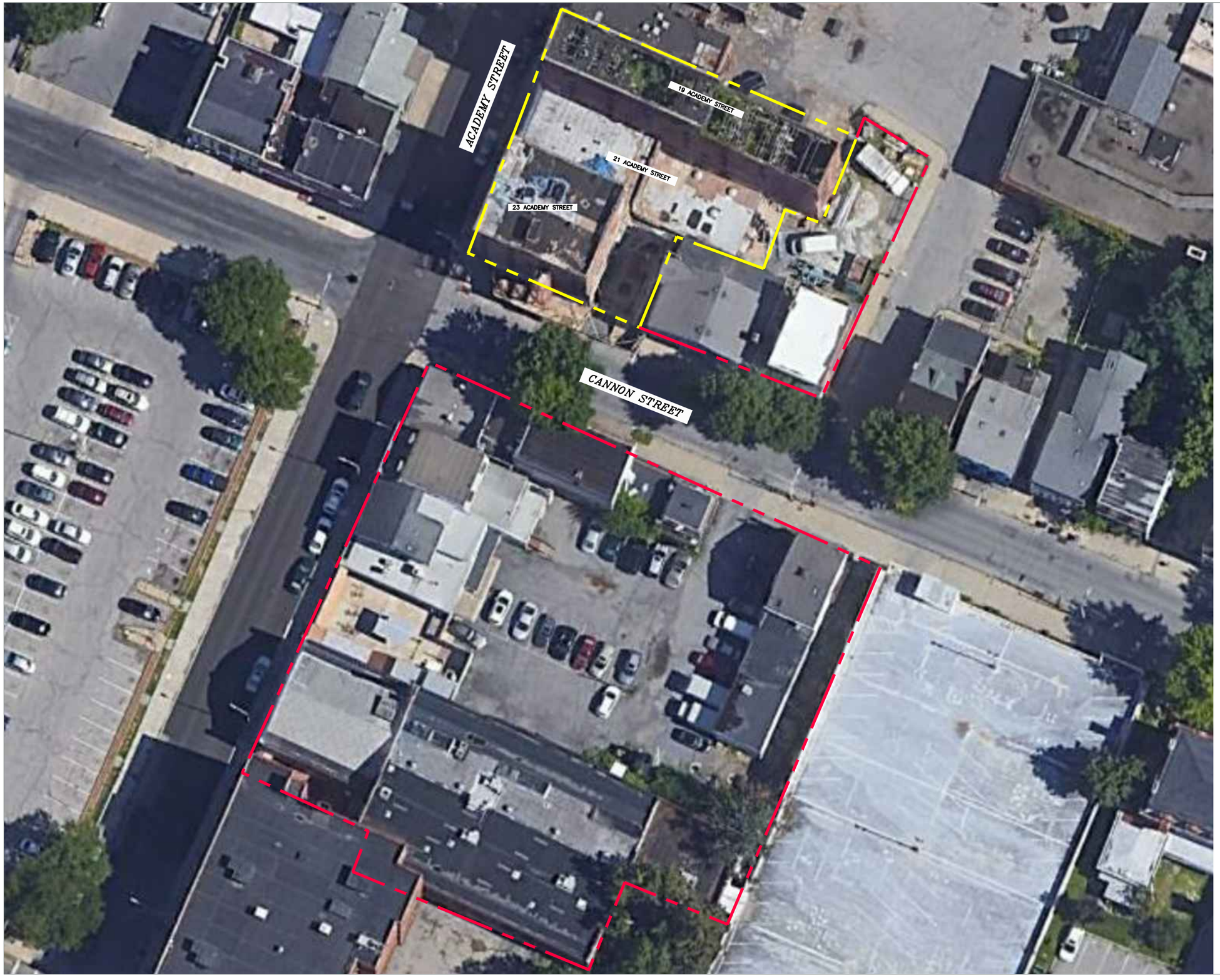

LEGEND

SITE BOUNDARY

OFF–SITE PROPERTIES

Expanded Site Map

NYSDEC
19, 21 and 23 Academy Street
Poughkeepsie, New York
#C314126A

Drawn
W.G.S.
Designed
C.A.
Approved
C.A.

Date
2/13/20
Figure
3

Scale In Feet
0 30

Groundwater & Environmental Services, Inc.

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