LANGAN

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June 13, 2025

Attn: Aaron Fischer, P.E.
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233

**Re: Pre-Design Investigation Work Plan**
**459 Smith Street (Former Citizens MGP Site – Parcel III)**
**Brooklyn, NY**
**BCP Site No. C224012B**
**Langan Project No. 170420201**

Dear Mr. Fischer,

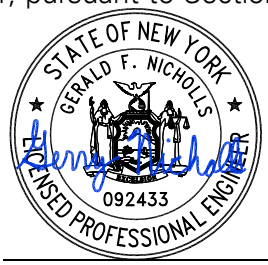
This Pre-Design Investigation Work Plan (PDI WP) was prepared by Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan) on behalf of HR DC Smith Street Owner, LP (the Volunteer) for Parcel III of the Former Citizens Manufactured Gas Plant (MGP) Site (the "site") to further characterize the nature and extent of contamination in support of the forthcoming remediation under the New York State Brownfield Cleanup Program (NYS BCP). The Volunteer will implement this work plan pursuant to the October 30, 2019 Brownfield Cleanup Agreement (BCA) and August 19, 2021 BCA Addendum with the New York State Department of Environmental Conservation (NYSDEC) under NYS BCP Site No. C224012B.

This PDI WP describes the proposed scope of work for the collection of soil, groundwater, and soil vapor samples from the site to supplement the existing dataset provided in the October 2005 Final Remedial Investigation Report (RIR), prepared by GEI Consultants, Inc. and in subsequent environmental investigation reports prepared for the site. This work plan is specifically intended to further characterize the horizontal and vertical extents of contamination related to historic fill and chlorinated solvents at the site (i.e., non-MGP-related contamination) to inform the future remedy.

## CERTIFICATION

I, Gerald F. Nicholls, certify that I am currently a New York State (NYS) registered professional engineer and that this Pre-Design Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and Green Remediation (DER-31).

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.




| Gerald Nicholls | 6/13/2025 | |
|---|---|---|
| NYS Professional Engineer #092433 | Date | Signature |

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

## SITE BACKGROUND AND ENVIRONMENTAL HISTORY

### Site Location and Description

The site is located at 459 Smith Street in the Gowanus neighborhood of Brooklyn, New York. The site occupies a total area of 165,840 square feet (about 3.81 acres) and is identified as Block 471, Lot 200 on the Kings County Tax Map.

The site is bounded by the Citizens MGP BCP site (BCP Site No. C224012) to the north, the Gowanus Canal, a United States Environmental Protection Agency (US EPA) superfund site, to the east, Huntington Street to the south, and Smith Street and an elevated segment of the Metropolitan Transportation Authority – New York City Transit (MTA-NYCT) subway to the west. The New York City Department of Environmental Protection (NYCDEP) Bond-Lorraine Street sewer transects the site from the southwestern to northeastern corners of the site and a New York City Department of Transportation (NYCDOT) mapped street (Nelson Street) transects the site from Smith Street to the northern-adjoining property.

The site is vacant and was formerly used by National Grid as a staging area to support their remediation of the site and adjoining properties, including the Gowanus Canal, and is surrounded by wooden and chain-link perimeter fencing. A site location map and site plan are provided as Figure 1.

### Site History

The site was occupied by a fertilizer plant from as early as 1886 until some point between 1904 and 1915 when the former Citizens MGP Site on the northern-adjoining property expanded south to include the site. On-site MGP operations continued to expand between 1915 and 1948 and included construction of a tar separator, tar handling facilities, oil storage tanks, and a 1-million-gallon oil tank. The former MGP buildings and structures were demolished in the early 1960s. Circa 1971, the site was redeveloped with manufacturing buildings occupied by Antarenni Industries, Inc., and Vitamaster Industries Inc. until circa 2009 when the warehouse was demolished.

### Summary of Prior Remediation Activities

National Grid is currently enrolled as a Participant in the NYS BCP for the cleanup of Parcels I, II, and III of the former Citizens MGP site. The nature and extent of contamination at the former Citizens MGP site was described in the 2005 Final RIR, prepared by GEI, which identified the presence of coal tar in subsurface soils surrounding former tar handling structures at the site. Additional contaminant delineation was completed during the remedial design investigation phase and National Grid implemented the NYSDEC-approved 100% Remedial Design between July 2019 and April 2022. Implementation of the 100% Remedial Design generally included:

- Selective demolition of former building foundations, underground facilities, and former tar-contaminated MGP structures;
- Selective demolition of the existing bulkhead wall along the Gowanus Canal to facilitate construction of the new bulkhead barrier wall;
- Temporary treatment and discharge of groundwater into the Gowanus Canal under a discharge permit during dewatering operations for installation of the bulkhead barrier wall and to support remedial excavations;
- Installation of a new steel bulkhead barrier wall along the Gowanus Canal, which included sealed-seam interlocking sheet piles secured to an upland sheet pile anchor wall;
- Installation of a temporary fabric structure equipped with air handling units to enclose the targeted excavation area for the removal of MGP-impacted soil/fill and former tar-contaminated MGP structures;
- Excavation and off-site disposal of soil/fill from the following areas:
    - The central-eastern part of the site to a maximum depth of about 5 feet below grade surface (bgs) to facilitate installation of the temporary fabric structure;
    - The central-eastern part of the site to a maximum depth of about 20.5 feet bgs for removal of MGP-impacted soil/fill associated with source material and former tar-contaminated MGP structures;
    - Along the eastern boundary of the site to a maximum depth of about 11 feet bgs to facilitate installation of the new bulkhead barrier wall; and
- Backfill of excavation areas for restoration of the original site grade using imported soil/fill or excavated material suitable for reuse.

Remediation activities completed by National Grid are detailed in the October 31, 2023 draft Construction Completion Report.

**Supplemental Environmental Investigations**

Following National Grid's implementation of the 100% Remedial Design, Langan implemented a Supplemental Remedial Design Investigation (SRDI) to supplement the existing dataset by investigating and characterizing the nature and extent of emerging contaminants (PFAS and 1,4-dioxane), evaluating surficial soil quality and soil vapor within proposed building footprints, and generating sufficient analytical data to inform the development of ECs and ICs required by the selected site remedy.

Additional supplemental groundwater sampling was performed at the direction of the NYSDEC based on concentrations of chlorinated volatile organic compounds (CVOCs) detected in soil

vapor during the 2021 SRDI. The objective of the supplemental groundwater sampling was to further investigate the nature and extent of CVOC contamination on-site. CVOCs were detected in groundwater in two of 16 accessible wells; however, the detected concentrations of CVOCs were below the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA Water (collectively referred to as the NYSDEC SGVs).

Following completion of the above-described supplemental investigations, Langan prepared the May 30, 2025 Draft Remedial Action Work Plan (RAWP) to address remaining contamination at the site. As part of the review and approval process for the draft RAWP, the NYSDEC required the implementation of a pre-design investigation to further characterize the nature and extent of on-site non-MGP-related contamination, which is described herein.

## PRE-DESIGN INVESTIGATION SCOPE OF WORK

The objective of this PDI WP is to collect supplemental soil, groundwater, and soil vapor samples to further characterize the horizontal and vertical extents of non-MGP-related contamination at the site (i.e., contamination related to historic fill and chlorinated solvents). The proposed scope of work for the PDI includes:

*Pre-Screening for Chlorinated Solvents*

- Implementation of a pre-screening exercise to inform soil boring, monitoring well, and soil vapor locations for the delineation of CVOCs impacts and to confirm the absence of an on-site CVOC source with the potential to migrate off-site.

*Soil Investigation*

- Advancement of 20 soil borings from surface grade to the bottom of the historic fill layer, which is anticipated to extend to depths between about 12 and 20 feet bgs
- Collection of at least two soil samples from each soil boring location (plus quality assurance/quality control [QA/QC] samples) for laboratory analysis
- Advancement of additional soil borings and collection of soil samples (at locations to be determined by the pre-screening exercise) to further investigate and delineate the extent of CVOC contamination at the site

*Groundwater Investigation*

- Installation and development of three groundwater monitoring wells and collection of groundwater samples for laboratory analysis from the following locations:
    - One monitoring well at the location of former soil boring/soil vapor point EB-01/SV-01
    - One monitoring well adjacent to former soil boring CGSB-77B
    - One monitoring well adjacent to existing monitoring well CGMW-15
- Collection of groundwater samples from 12 existing monitoring wells screened at the shallow interval (between about elevation [el] 16 to el -24 feet[1]) for laboratory analysis

*Soil Vapor Investigation*

- Installation of soil vapor points and collection of soil vapor samples at locations to be determined by the pre-screening exercise

[1] Referenced to the North American Vertical Datum of 1988 (NAVD88)

Modifications to this scope of work will likely be required based on the results of the pre-screening exercise and in the event that unexpected contamination is observed that would require additional delineation. Proposed modifications to the scope of work will be coordinated with the NYSDEC during PDI WP implementation.

**Pre-Screening for CVOC Investigation**

A pre-screening investigation will be implemented to inform future soil boring, monitoring well, and soil vapor locations for the investigation of CVOC-related contamination at the site. The pre-screening exercise will be implemented in the northwestern part of the site, around former soil boring/soil vapor point EB-01/SV-01 (the sample location exhibiting the highest concentration of tetrachloroethene [PCE] in soil vapor during the 2021 SRDI).

The pre-screening exercise will utilize proprietary passive vapor sampling technology supplied by Amplified Geochemical Imaging LLC (AGI) to provide a qualitative summary map depicting the potential presence of CVOCs in soil vapor. The technology includes passive vapor sampling probes constructed of proprietary sorbents that are encased in a semipermeable membrane to allow for the passage of organic vapors. For seven days, the sorbent media will be exposed to soil vapor to allow to adsorption of CVOCs prior to retrieval and analysis. Documentation describing the proposed passive vapor sampling technology is provided in Attachment 2.

Twenty-one passive vapor sampling probes (PSV-01 through PSV-21) will be installed in the northwestern part of the site and spaced about 50 feet apart at the approximate locations shown on Figure 2. The passive vapor sampling points will be installed to about 5 feet bgs or 2 feet above the groundwater table (whichever is shallower) and will remain in the subsurface for seven days prior to retrieval and submission to AGI's analytical facility via overnight shipping. Following analysis of the passive vapor sampling probes, AGI will provide a qualitative map (i.e., a heat map) to summarize the extent of CVOCs detected in soil vapor. The results of the pre-screening investigation will inform the future soil boring, monitoring well, and soil vapor locations (discussed in the following sections) to delineate the horizontal extent of CVOCs and to confirm the absence of an on-site CVOC source with the potential to migrate off-site.

**Soil Investigation**

Drilling and Logging

An environmental drilling subcontractor will advance 20 soil borings (SSB-01 through SSB-20) to about 20 feet bgs to further delineate the horizontal and vertical extents of historic fill at the site. Soil borings will be advanced to the bottom of the historic fill layer (previously encountered at depths between about 12 and 20 feet bgs) using a direct-push or sonic drill rig. A plan showing the proposed boring locations is included as Figure 2.

If MGP-related contamination (i.e., GCM/NAPL) is not observed in the bottom 10 feet of the soil boring and the minimum depth of advancement is achieved (i.e., the bottom of the historic fill layer), no further advancement of the soil boring will be required. If MGP-related contamination is encountered, the soil boring will be advanced until vertical delineation of GCM/NAPL has been achieved (i.e., a minimum of 10 feet of material without evidence of GCM/NAPL). If there is less than 50% recovery, delineation will not be determined based on that interval and an additional interval will be advanced to achieve vertical delineation. Historical soil borings from previous investigations may be used to determine vertical delineation (in consultation with the NYSDEC on a case-by-case basis) if the soil boring is located within 20 feet of the impacted soil boring.

Langan field staff will document the work, screen the soil samples for environmental impacts, and collect environmental samples for laboratory analysis. Soil will be screened continuously to the boring termination depth with a PID equipped with a 10.6 electron volt (eV) bulb and for visual and olfactory evidence of environmental impacts (e.g., staining and odor). Soil descriptions will be recorded in a field log. If any soil boring interval has less than 50% recovery, an additional soil boring will be advanced adjacent to the initial location to re-log the interval.

Non-disposable, down-hole drilling equipment and sampling apparatus will be decontaminated between boring locations using Alconox (or similar) and water where grossly-impacted material is identified. Following sampling, each soil boring that is not converted into a groundwater monitoring well will be backfilled using non-impacted soil cuttings and/or clean sand to the initial surface grade.

The location and elevation of soil borings will be surveyed by a New York State (NYS)-licensed land surveyor. Vertical control will be established by surveying performed relative to NAVD88. Elevations of the existing surface grade will be surveyed to the nearest 0.01 foot at the location of each soil boring. Soil Sampling and Analysis

Langan's 2021 Supplemental Remedial Design Investigation (SRDI) included 15 soil samples collected from 0 to 2 feet bgs that were analyzed for the full Part 375-list of contaminants to evaluate surficial/shallow soil quality. As such, the surficial interval will not be resampled and soil samples will be collected from the following intervals:

- One sample will be collected from each soil boring at varying depths between 2 feet bgs and the bottom of the historic fill layer (between about 12 and 20 feet bgs) to sufficiently characterize contamination associated with historic fill at the site. Soil samples will be biased toward observed impacts (based on the presence of staining, odor, and/or PID readings above background), if encountered.
- One sample will be collected from the groundwater interface, which was previously encountered between about el 0 and el 9 feet NAVD88 (between about 8 and 16 feet bgs).

The soil samples will be collected into laboratory-supplied containers and will be sealed, labeled, and placed in a cooler containing ice (to attempt to maintain a temperature of approximately 4 degrees Celsius) for delivery to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified analytical laboratory. Soil samples will be analyzed for NYSDEC Part 375/target compound list (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides, herbicides, NYSDEC Part 375/target analyte list (TAL) metals, hexavalent and trivalent chromium, and total cyanide. QA/QC procedures are described in the QAPP provided as Appendix G of the Remedial Action Work Plan (RAWP).

If distinct zones of grossly-contaminated material are identified in the soil boring, two additional samples will be collected – one in the impacted interval and one in the interval below the observed impacts for analysis of Part 375/TCL VOCs and SVOCs.

CVOC Investigation

Additional soil borings will be advanced at locations indicative of elevated CVOC concentrations in soil vapor based on the results of the pre-screening exercise. Delineation soil borings will be advanced to the groundwater table (between about 8 and 16 feet bgs) and soil samples will be collected from the 0- to 4-foot; 4- to 8-foot; 8- to 12-foot; and 12- to 16-foot intervals (for a total of up to four soil samples per delineation soil boring). Recovered soil will be screened using a PID and soil samples collected from within each 4-foot interval will be biased toward the interval exhibiting the highest PID reading. If PID readings above background conditions are encountered at the deepest interval, the soil boring will be advanced deeper and additional soil samples will be collected (one soil sample for each 4-foot-interval) until vertical delineation has been achieved. If PID readings above background conditions are not recorded during soil screening, soil samples will be collected from the shallowest interval within the 4-foot increment.

The scope of the CVOC delineation in the northwestern part of the site will be refined after completion of pre-screening exercise and in coordination with the NYSDEC prior to implementation.

**Groundwater Investigation**

Monitoring Well Installation

Three groundwater monitoring wells will be installed at the following locations:

- One monitoring well (SMW-01) at the location of former soil boring/soil vapor point EB-01/SV-01 (the sample location exhibiting the highest concentration of PCE in soil vapor during the 2021 SRDI)
- One monitoring well (SMW-02) at the location of former soil boring CGSB-77B

- One monitoring well (SMW-03) adjacent to existing monitoring well CGMW-15

Soil from each borehole will be logged continuously from surface grade to the boring termination depth prior to monitoring well installation. If GCM/NAPL is encountered during monitoring well installation, soil samples will be collected as described in the "Soil Sampling and Analysis" section of this work plan.

The proposed monitoring wells will be constructed using 2-inch-diameter polyvinyl chloride (PVC) riser pipe with 10-foot-long, 0.01-inch slotted screens, or 10-foot-long, 2-inch-diameter pre-pack wells with an outer layer of stainless-steel screen and silica sand over 0.01-inch slotted screens. If acceptable turbidity levels cannot be achieved during low-flow purging of pre-pack wells, standard 2-inch-diameter monitoring wells will be installed in accordance with NYSDEC guidance. The proposed monitoring wells will be installed such that the well screens straddle the observed groundwater table. The well annulus around the slotted screen in each well will be a minimum of 2 inches (minimum 6-inch-diameter boreholes) and will be backfilled with clean sand to about 2 feet above the top of the screen. A minimum 1-foot-thick bentonite seal will be installed above the sand in each well, and the borehole annuli will be backfilled with non-impacted soil cuttings and/or clean sand.

Following installation, the monitoring wells will be developed using a surge block across the well screens to agitate and remove fine particles in 2- to 3-foot increments for approximately 2 minutes per increment. After surging, the wells will be purged via pumping and turbidity will be monitored until the water becomes clear (having turbidity under 50 Nephelometric Turbidity Units [NTU]). The wells will then be allowed to sit for a minimum of one week before sampling.

The location and elevation of newly installed groundwater monitoring wells (top of casing elevations) will be surveyed by a NYS-licensed land surveyor. Vertical control will be established by surveying points relative to NAVD88. Elevations of the top of monitoring well casings will be surveyed to the nearest 0.01 foot.

Additional monitoring wells may be installed to further investigate CVOC contamination in groundwater based on the results of the pre-screening exercise. If required, additional monitoring well locations will be coordinated with the NYSDEC prior to installation.

<u>Groundwater Sampling and Analysis</u>

One groundwater sample will be collected from each of the existing monitoring wells constructed with a well screen above el -23 feet NAVD88 (the required supplemental treatment depth, as described in the March 2023 Joint Letter issued by the NYSDEC and US EPA):

- CGMW-34S
- CGMW-35
- CGMW-36
- CGMW-37
- CGMW-38
- CGMW-39
- CGMW-42I
- CGMW-58

- CGMW-59
- 459-MW05
- 459-MW14
- 459-MW15

Groundwater samples will not be collected from shallow monitoring wells CGMW-40D and 459-MW02 due to obstructions encountered in the well casing during supplemental groundwater sampling performed by Langan in February 2024. Additionally, a groundwater sample will not be collected from existing monitoring well CGMW-15, as the screened interval is only about 3 inches long. An additional groundwater sample will be collected from newly installed monitoring well SMW-03, which will be installed adjacent to CGMW-15 as described in the previous section.

Prior to sampling, the monitoring wells will be gauged for static water levels and each well will be purged. Physical and chemical parameters (e.g., temperature, dissolved oxygen, oxygen reduction potential, pH, turbidity) will be allowed to stabilize to the ranges specified in the US EPA Low Stress Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, dated July 30, 1996 and Revised September 19, 2017. Samples will be collected with a submersible monsoon pump or equivalent and dedicated polyethylene tubing. The pump will be decontaminated with Alconox® and water between each sample location. Development and purge water will be containerized for off-site disposal.

One groundwater sample will be collected from each existing monitoring well and the newly installed monitoring wells, for a total of 15 groundwater samples, plus additional QA/QC sampling. Groundwater samples will not be collected from monitoring wells containing non-aqueous phase liquid (NAPL). The samples will be collected in laboratory-supplied containers and will be sealed, labeled, and placed in a cooler containing ice (to attempt to maintain a temperature of approximately 4 degrees Celsius) for delivery to a NYSDOH ELAP-certified analytical laboratory. Groundwater samples collected from existing monitoring wells will be analyzed for Part 375/TCL VOCs, SVOCs, PCBs, pesticides, herbicides, Part 375/TAL metals (filtered and unfiltered), hexavalent and trivalent chromium, and total cyanide. Existing monitoring wells that were not sampled during the SRDI and all newly installed wells will also be sampled for per- and polyfluoroalkyl substances (PFAS) and 1,4-Dioxane. Groundwater samples collected for further investigation of CVOCs will be analyzed for TCL VOCs.

**Soil Vapor Investigation**

Soil Vapor Point Installation

Soil vapor points will be installed at locations indicative of elevated CVOC concentrations in soil vapor based on the results of the pre-screening exercise in the northwestern part of the site. A supplemental investigation plan showing the proposed sample locations will be provided to the NYSDEC and the NYSDOH for review and approval prior to soil vapor point installation. As a QA/QC measure, additional soil vapor points will be installed at locations coinciding with the pre-

screening locations at a frequency of one soil vapor point per 5 passive vapor sampling probes to verify the results of the pre-screening exercise (for a total of 5 verification points).

Soil vapor samples will be collected from each soil vapor point to confirm the presence of CVOCs through laboratory analysis by a NYSDOH ELAP-certified analytical laboratory. Soil vapor points will be installed in accordance with the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (October 2006 and subsequent updates) and at locations to be coordinated with the NYSDEC.

The vapor collection points will consist of inert sample tubing attached to a 1.875-inch polyethylene implant, which will be installed to about 2 feet above the observed groundwater table. The annulus (i.e., the sampling zone) around the installed implants and/or tubing will be filled with a clean, coarse sand pack followed by a hydrated bentonite seal to surface grade.

Soil Vapor Sampling and Analysis

Soil vapor samples will be collected in general accordance with the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (October 2006 and subsequent updates). Prior to sample collection, approximately three vapor probe volumes (i.e., the volume of the sample implant and tubing) will be purged from each sample point at a rate of less than 0.2 liters per minute using a RAE Systems MultiRAE® meter (or approved equivalent). Purged soil vapor will be monitored for VOCs during this process.

A helium tracer gas will be used in accordance with NYSDOH protocols to serve as a QA/QC technique to document the integrity of each soil vapor point seal before and after sampling. The tracer gas will be introduced into a container surrounding the vapor point and seal. Helium will be measured from the sampling tube and inside the container. If the sample tubing contains more than 10% of the tracer gas concentration that was introduced into the container, then the seal is considered compromised and should be enhanced or reconstructed to reduce outside air infiltration. After integrity of each seal is confirmed, soil vapor samples will be collected into laboratory-supplied, batch-certified 2.7- or 6-liter Summa® canisters with flow controllers calibrated for a 2-hour sampling period. Soil vapor samples will be analyzed for VOCs by US EPA Method TO-15.

A log sheet for each soil vapor sample will be completed to record sample identification, date and time of sample collection, sampling depth, name of the field engineer responsible for sampling, sampling methods and equipment, vapor purge volumes, volume of vapor extracted, flow rate, and vacuum of canisters before and after sample collection.

**Data Management and Validation**

Laboratory analyses of soil, groundwater, vapor, and air samples will be conducted by a NYSDOH ELAP-approved laboratory in accordance with USEPA SW-846 methods and NYSDEC Analytical

Services Protocol (ASP) Category B deliverable format. Environmental data will be reported electronically using the database software application EQuIS as part of NYSDEC's Environmental Information Management System (EIMS).

QA/QC procedures required by the NYSDEC ASP and SW-846 methods, including initial and continuing instrument calibrations, standard compound spikes, surrogate compound spikes, and analysis of other samples (blanks, laboratory control samples, and matrix spikes/matrix spike duplicates), will be followed. The laboratory will provide sample bottles, which will be pre-cleaned and preserved in accordance with the SW-846 methods. Where there are differences in the SW-846 and NYSDEC ASP requirements, the NYSDEC ASP shall take precedence.

Data validation will be performed in accordance with the USEPA validation guidelines for organic and inorganic data review. Validation will include the following:

- Verification of QC sample results
- Verification of the identification of sample results (both positive hits and non-detects)
- Recalculation of 10% of all investigative sample results
- Preparation of Data Usability Summary Reports (DUSRs)

The DUSRs will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and COC procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method. A detailed assessment of each sample delivery group (SDG) will follow. Additional details on the DUSRs are provided in the QAPP, which is included as Appendix G of the RAWP.

**Management of Investigation-Derived Waste**

Recovered soil cuttings will not be returned to boreholes and each borehole will be filled with hydrated bentonite chips or clean sand from the boring termination depth to surface grade. Investigation-derived waste (IDW), including soil cuttings, purged groundwater, and decontamination fluids, will be containerized in properly-labeled and sealed United Nations/Department of Transportation (UN/DOT)-approved 55-gallon drums and staged for future waste characterization and off-site disposal at a facility permitted to accept the waste. The drums will be staged in a secure area on-site, pending receipt of laboratory data and off-site disposal to an appropriate facility. The site will be secured during and after investigation to prevent public's access to the site.

**Community Air Monitoring Plan**

Air monitoring will be implemented during ground-intrusive investigation activities in accordance with the site-specific CAMP included as Attachment 1, including the Special Requirements for Work within 20 feet of Potentially Exposed Individuals or Structures. At a minimum, the CAMP

will include one upwind and one downwind CAMP station around each distinct area of intrusive work. If two drilling activities are ongoing, CAMP monitoring will be expanded to accommodate the area.

## REPORTING

### Daily Field Reports

Daily field reports will be submitted to NYSDEC and NYSDOH Project by the end of the day following the reporting period and will include:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the site (if any);
- References to a site map to document daily remedial activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP findings, including corrective actions for instances where action levels were exceeded;
- An explanation of notable site conditions;
- A description of anticipated site activities; and
- The NYSDEC-assigned project number will appear on all reports.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the PDI WP or other sensitive or time critical information; however, such conditions must also be included in the daily reports. Emergency conditions and changes to the PDI WP will be addressed directly to NYSDEC Project Manager via personal communication.

Daily reports will include a description of daily activities keyed to a site map that identifies work areas. These reports will include a summary of air monitoring results, odor and dust problems and corrective actions, and complaints received from the public (if any).

### Remedial Design Document

The results of the pre-design investigation will be documented in a remedial design document, which will describe the completed scope of work and will present a summary of the analytical results. The report will include:

- A summary of the site history and previous investigations
- A description of site conditions
- Sampling methodology and field observations
- An evaluation of the results and findings
- Conclusions for refinement of the remedial elements described in the RAWP (if any)

The report will include soil boring, well construction, and soil vapor point installation logs, sampling logs, tabulated analytical results, figures, and laboratory data packages. The tabulated analytical results will include sample location, media sampled, sample depth, field/laboratory identification numbers, analytical results compared to the applicable Standards, Criteria, and Guidance (SCGs) pertaining to the site and contaminants of concern. The report will include scaled figures showing the locations of soil borings, monitoring wells, and soil vapor points with sample concentrations above SCGs for each media.

## SCHEDULE

Mobilization for the PDI will commence following approval of this work plan, pending driller and contractor availability and scheduling. Implementation of the PDI WP will begin with the pre-screening exercise in the northwestern corner of the site and with mobilization for drilling and sampling outside of the pre-screening area. Drilling and sampling is anticipated to take about 3 weeks to complete. The NYSDEC will be notified a minimum of seven days prior to implementation of this work plan to allow for a NYSDEC representative to be present during sample collection.

## CLOSING

We respectfully request approval of this Pre-Design Investigation Work Plan. Please contact us with any questions or comments.

Sincerely,
**Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.**

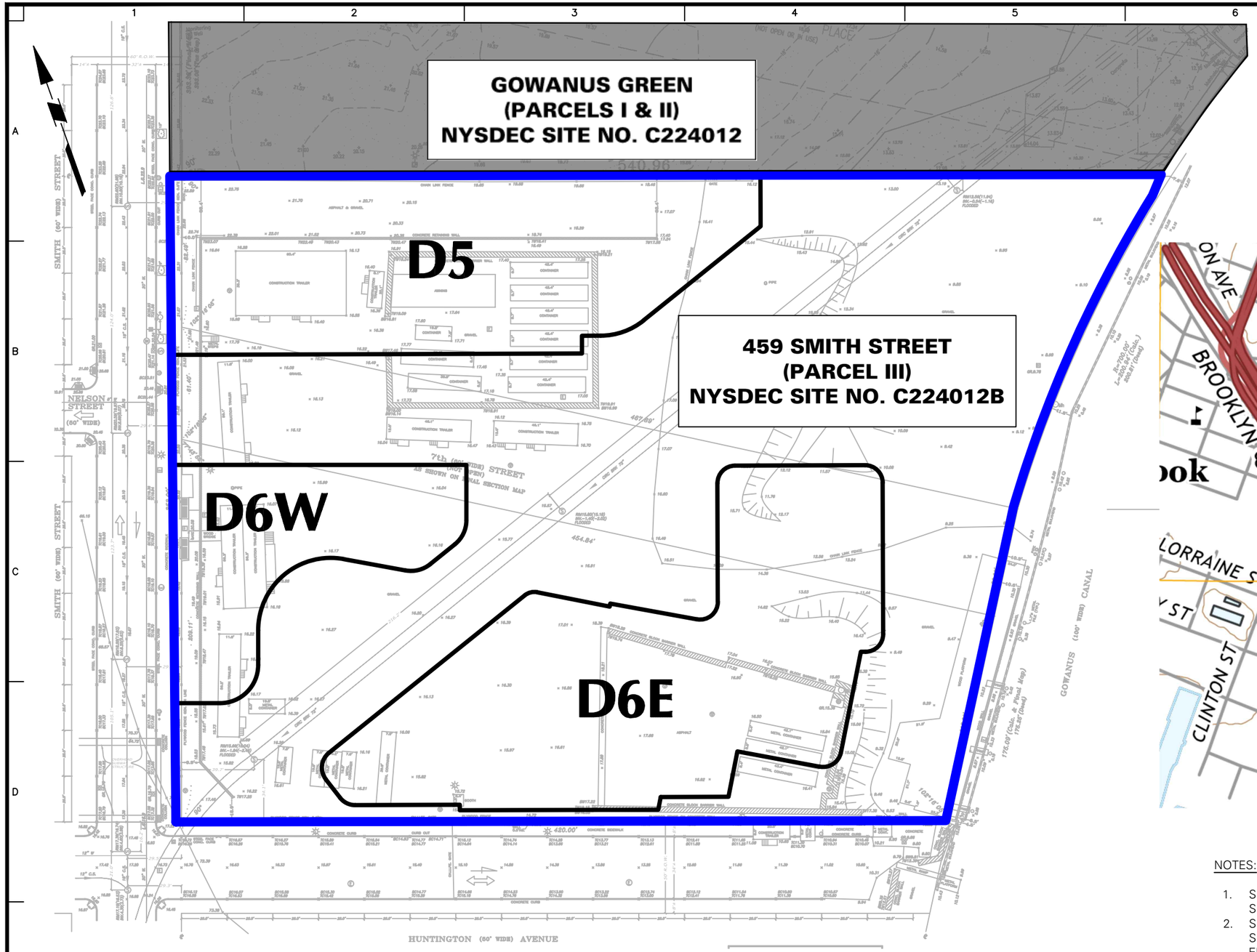
Gerald Nicholls, PE, CHMM
Associate Principal

Enclosure(s):
Figure 1 Site Location Map and Site Plan
Figure 2 Proposed Sample Location Plan

Attachment 1 Community Air Monitoring Plan
Attachment 2 Passive Soil Vapor Sampling Documentation

cc: H. Dudek, L. Gorton, S. Deyette – NYSDEC
Y. Schwimmer, M. Loeb – HR DC Smith Street Owner, LP
P. Van Rossem, A. Prophete – National Grid
M. Benoit, T. Young – Arcadis
D. Yudelson – Sive, Paget & Riesel
P. McMahon, M. Au, S. Simpson – Langan

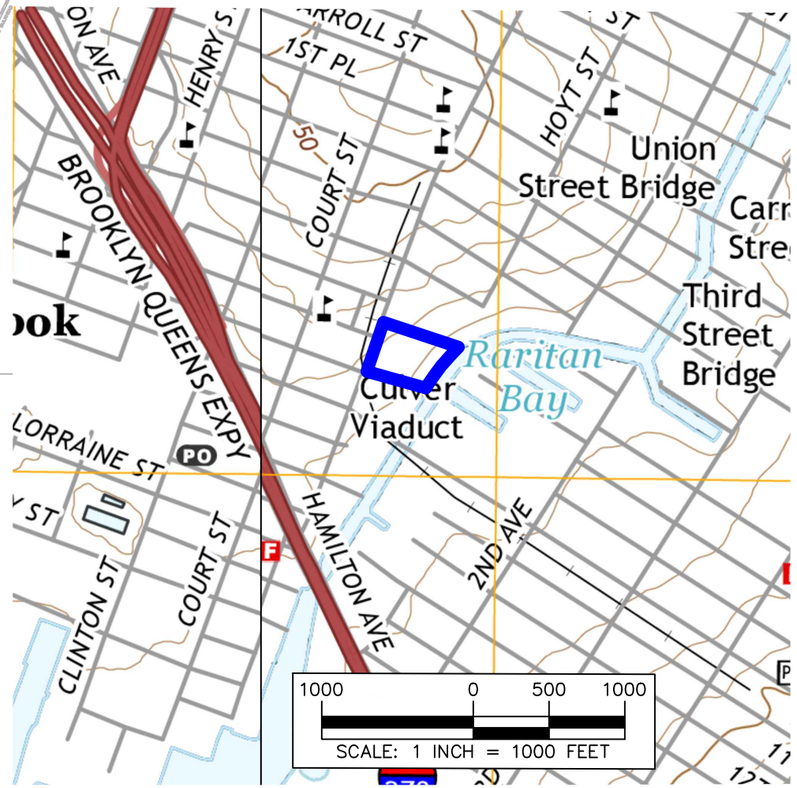
# FIGURES




LEGEND:

APPROXIMATE 459 SMITH STREET SITE BOUNDARY

PROPOSED BUILDING FOOTPRINTS




NOTES:

1. SITE LOCATION BASE MAP IS REFERENCED FROM THE UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5 MINUTE SERIES BROOKLYN, N.Y. QUADRANGLE MAP, DATED 2016.
2. SITE PLAN BASE MAP REFERENCED FROM DRAWING ENTITLED "ARCHITECTURAL SURVEY" PREPARED BY LEONARD J. STRANDBERG AND ASSOCIATES, CONSULTING ENGINEERS AND LAND SURVEYORS, P.C., LAST UPDATED DECEMBER 13, 2021
3. ALL ELEVATIONS SHOWN HEREIN REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

60 0 30 60

SCALE: 1 INCH = 60 FEET

LANGAN
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
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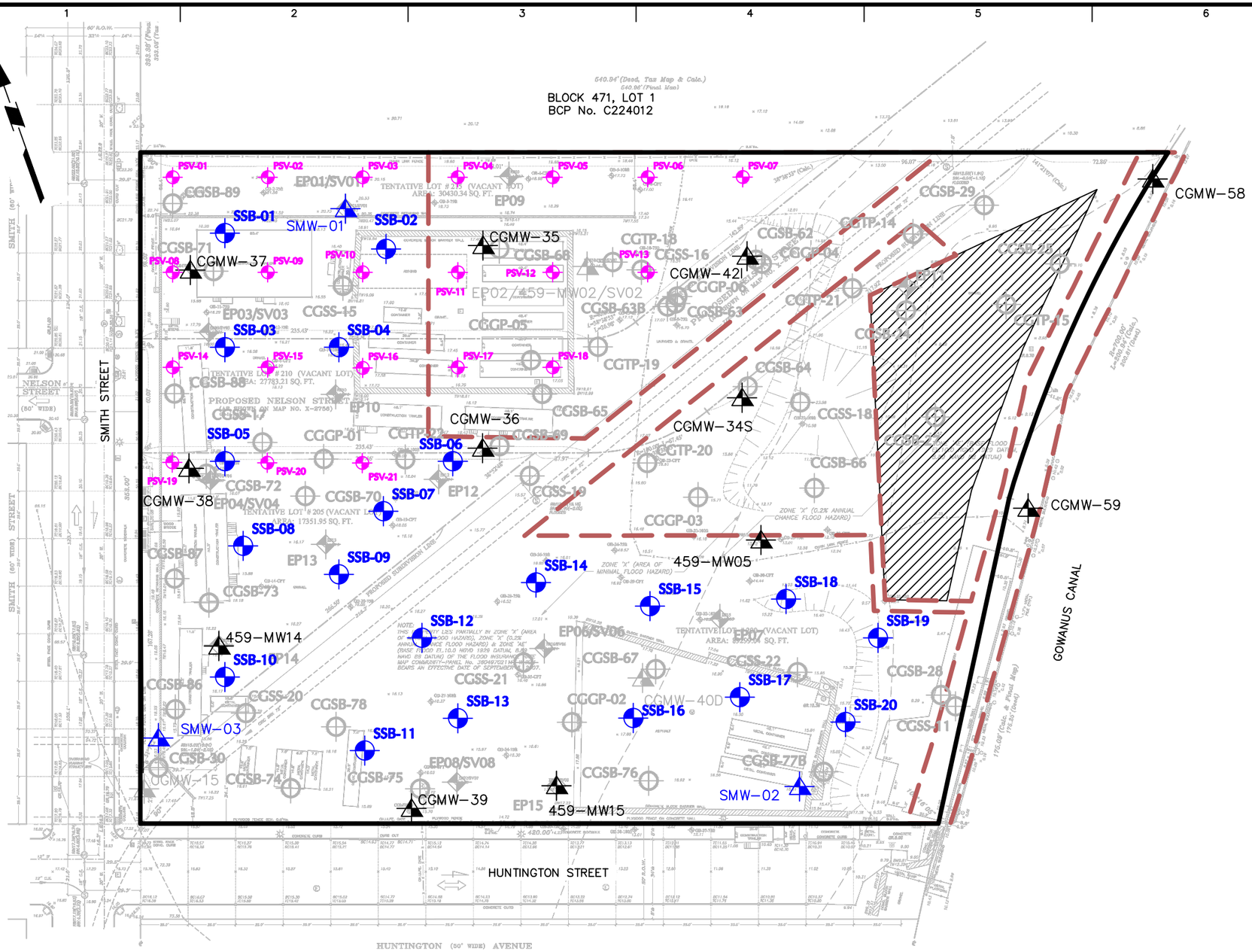
| Project | Figure Title | Project No. | Figure |
|---|---|---|---|
| 459 SMITH STREET<br>NYSDEC BCP NO. C224012B<br>BLOCK NO. 471, LOT NO. 200<br>KINGS NEW YORK | SITE LOCATION MAP AND SITE PLAN | 170420201 | 1 |
| | | Date 8/8/2024 | |
| | | Drawn By SS | |
| | | Checked By MA | |



Filename: \\langan.com\data\NYC\data2\170420201\Cadd Data - 170420201\SheetFiles\Environmental\Treatability Study - Parcels I, II and III\Figure 1 - Site Plan.dwg Date: 10/7/2024 Time: 14:20 User: ssimpson Style Table: Langan.stb Layout: 459 Smith TSWP




LEGEND:

- APPROXIMATE PROPERTY LINE
- APPROXIMATE EXTENTS OF SUPPLEMENTAL REMEDIATION AREA
- PREVIOUS EXCAVATION AREA TO ABOUT EL -10 FEET
- APPROXIMATE REMEDIAL DESIGN INVESTIGATION SOIL SAMPLE LOCATION (LANGAN 2022)
- APPROXIMATE REMEDIAL DESIGN INVESTIGATION SOIL SAMPLE LOCATION (GEI)
- PROPOSED SOIL BORING LOCATION FOR HISTORIC FILL DELINEATION
- PROPOSED PASSIVE VAPOR SAMPLING PROBE FOR PRE-SCREENING EXERCISE
- APPROXIMATE LOCATION OF EXISTING MONITORING WELL (NO SAMPLES PROPOSED)
- APPROXIMATE LOCATION OF EXISTING MONITORING WELL (SHALLOW INTERVALS ONLY)
- PROPOSED MONITORING WELL LOCATION

NOTES:

1. BASE MAP REFERENCED FROM DRAWING ENTITLED "ARCHITECTURAL SURVEY" PREPARED BY LEONARD J. STRANDBERG AND ASSOCIATES, CONSULTING ENGINEERS AND LAND SURVEYORS, P.C., LAST UPDATED DECEMBER 13, 2021.
2. ALL ELEVATIONS SHOWN HEREIN REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. CVOC = CHLORINATED VOLATILE ORGANIC COMPOUND
4. EL = ELEVATION

**WARNING:** IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, LAND SURVEYOR OR GEOLOGIST, TO ALTER THIS ITEM IN ANY WAY.

60 0 30 60
SCALE: 1 INCH = 60 FEET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Project
**459 SMITH STREET**
NYSDEC BCP No. C224012B
BLOCK No. 471, LOT No. 200
KINGS NEW YORK

Figure Title
**PROPOSED SAMPLE LOCATION PLAN**

| | |
|---|---|
| Project No. | 170420201 |
| Date | 4/23/2025 |
| Drawn By | MA |
| Checked By | PM |

Figure No. **2**



Filename: \\langan.com\data\NYC\data2\170420201\Cadd Data - 170420201\SheetFiles\Environmental\Pre-Design Investigation\170420201-BL101-0103.dwg Date: 6/9/2025 Time: 16:29 User: mau Style Table: Langan.stb Layout: Proposed Sample Location Plan

# ATTACHMENT 1

# COMMUNITY AIR MONITORING PLAN

# COMMUNITY AIR MONITORING PLAN

# for

# 459 SMITH STREET
# BROOKLYN, NEW YORK
# NYSDEC BCP SITE NO. C224012B

***Prepared For:***

**HR DC Smith Street Owner, LP**
**52 Sutton Place**
**Lawrence, NY 11559**

***Prepared By:***

**Langan Engineering, Environmental, Surveying,**
**Landscape Architecture and Geology, D.P.C.**
**368 Ninth Avenue, 8th Floor**
**New York, New York 10001**

**May 2025**
**Langan Project No. 170420201**

LANGAN

## 1.0 Introduction

This site-specific community air monitoring plan (CAMP) was prepared in general compliance with the New York State Department of Health (NYSDOH) Generic CAMP and is intended to mitigate potential exposures of sensitive receptors to nuisance odors and dust resulting from ground-intrusive work. This CAMP is intended for use during implementation of the Pre-Design Investigation Work Plan (PDI WP), which includes, but is not limited to, soil boring advancement, monitoring well installation, soil vapor point installation, and soil, groundwater, and soil vapor sampling.

## 2.0 Community Air Monitoring

Monitoring for particulates and odors will be conducted during ground-intrusive work by a Langan field representative under the supervision of the remedial engineer (RE). The CAMP will include real-time monitoring for volatile organic compounds (VOCs) and particulates at the downwind perimeter of each designated work area when ground-intrusive work is in progress. Continuous monitoring will be required for all ground-intrusive work. Ground-intrusive work includes, but is not limited to, soil boring advancement and excavation. The work zone is defined as the general area in which machinery is operating in support of the investigation. At a minimum, the CAMP will include two perimeter CAMP stations (one upwind and one downwind) and one handheld photoionization detector (PID) within the work zone at each distinct area of intrusive work. Perimeter CAMP stations will be set to an inlet height between 3 and 5 feet above ground surface. CAMP stations will monitor for VOCs with a PID; and dust emissions with equipment using real-time monitoring capable of measuring PM-10 (e.g., DustTrak or equivalent). The site perimeter will also be visually monitored for fugitive dust emissions.

The day-to-day location of CAMP stations will be fluid and dynamic based on wind direction and work zone location and will take into account the location of sensitive receptors and/or ground-level air intakes (if any). In accordance with the CAMP, downwind CAMP monitoring data will be compared to upwind CAMP monitoring data, to provide a real-time comparison to ambient conditions. CAMP data will be provided with the daily field reports.

An on-site supply of odor/vapor suppressing foam (Atmos® [formerly Rusmar] AC-645, Atmos® Seal 900, or RE-approved equivalent) will be maintained for active mitigation within any areas where nuisance odors are identified during the investigation.

*CAMP Action Levels*

For VOC monitoring, the following actions will be taken based on VOC levels measured:

- If total VOC levels exceed 5 parts per million (ppm) above background for the 15-minute average at the perimeter, work activities will be temporarily halted and monitoring continued. If levels

readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.

- If total VOC levels at the downwind perimeter of the hot zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps work activities will resume provided that the total organic vapor level 200 feet downwind of the hot zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less – but in no case less than 20 feet, is below 5 ppm above background for the 15-minute average.

- If the downwind total VOC level persist above 25 ppm at the perimeter of the site, activities will be shut down.

For dust monitoring with field instrumentation, the following actions will be taken based on instrumentation measurements:

- If the downwind particulate level is 100 micrograms per cubic meter (µg/m$^3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression must be employed. Work may continue with dust suppression techniques provided that downwind particulate matter less than 10 microns (PM10) levels do not exceed 150 µg/m$^3$ above the background level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM10 levels are greater than 150 µg/m$^3$ above the background level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM10 concentration to within 150 µg/m$^3$ of the upwind level and in preventing visible dust migration.

## 3.0 Odor, Vapor, and Dust Suppression Techniques

Work practices to minimize odors and vapors include covering drums and open boreholes, plugging monitoring wells, and minimizing the handling of contaminated material. Offending odor and organic vapor controls may include the application of foam suppressants or tarps over the odor or VOC source areas. Foam suppressants may include biodegradable foams applied over the source material for short-term control of the odor and VOCs.

## 4.0 Monitoring of Nearby Occupied Structures

This section applies where structures within about 20 feet of the ground-intrusive work may be occupied

during the planned investigation. Where this condition exists, the following will be considered for incorporation into the CAMP:

- One of the CAMP monitoring stations will be placed between the work area and nearest outside wall of the occupied structure. If site conditions warrant, a third station may be used to accomplish this task.
    - If 15-minute-average total VOC concentrations exceed 1 ppm above background near the outside wall or next to intake vents of the occupied structure, periodic VOC monitoring will be performed within the occupied structure.
    - If 15-minute-average total PM10 concentrations exceed 150 µg/$m^3$ above background near the outside wall or next to intake vents of the occupied structure, work activities will be temporarily suspended until suppression techniques are implemented and concentrations return to background.
- Where nuisances have developed during investigation work and cannot be corrected using the techniques described in Section 3.0, use of additional engineering controls may be considered, such as vapor/dust barriers or ventilation devices.
- Consideration should be given to scheduling or sequencing ground-intrusive activities during periods when potentially exposed populations may not be occupying the structure.

## 5.0 Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations opposite the walls of occupied structures or next to intake vents

exceed 150 µg/m³, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 µg/m³ or less at the monitoring point.

- Depending upon the nature of contamination and investigation activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary.

## 6.0 Special Requirements for Indoor Work with Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under "Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures" except that in this instance "nearby/occupied structures" would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g., weekends or evenings) when building occupancy is at a minimum.

## 7.0 Reporting

A summary of CAMP findings, including triggered action levels, will be provided daily to the New York State Department of Environmental Conservation (NYSDEC) and NYSDOH project managers as part of daily reporting. In addition to a summary of CAMP findings, daily reports will include:

- The NYSDEC assigned project number
- An update of progress made during the reporting day including a photograph log
- Locations of work
- References to an alpha-numeric map for site activities
- A summary of complaints (if any) with relevant details (names, phone numbers)
- A summary of CAMP findings, including exceedances, wind direction, work areas, location of CAMP monitoring stations and other relevant site information (exceedances of the 15-minute time weighted average will be reported to the NYSDEC as soon as they are calculated)
- An explanation of notable site conditions

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of

emergencies (accident, spill), requests for changes to the PDI WP, or other sensitive or time critical information; however, such conditions must also be included in the daily reports. Emergency conditions and changes to the PDI WP will be addressed directly to NYSDEC Project Manager via personal communication.

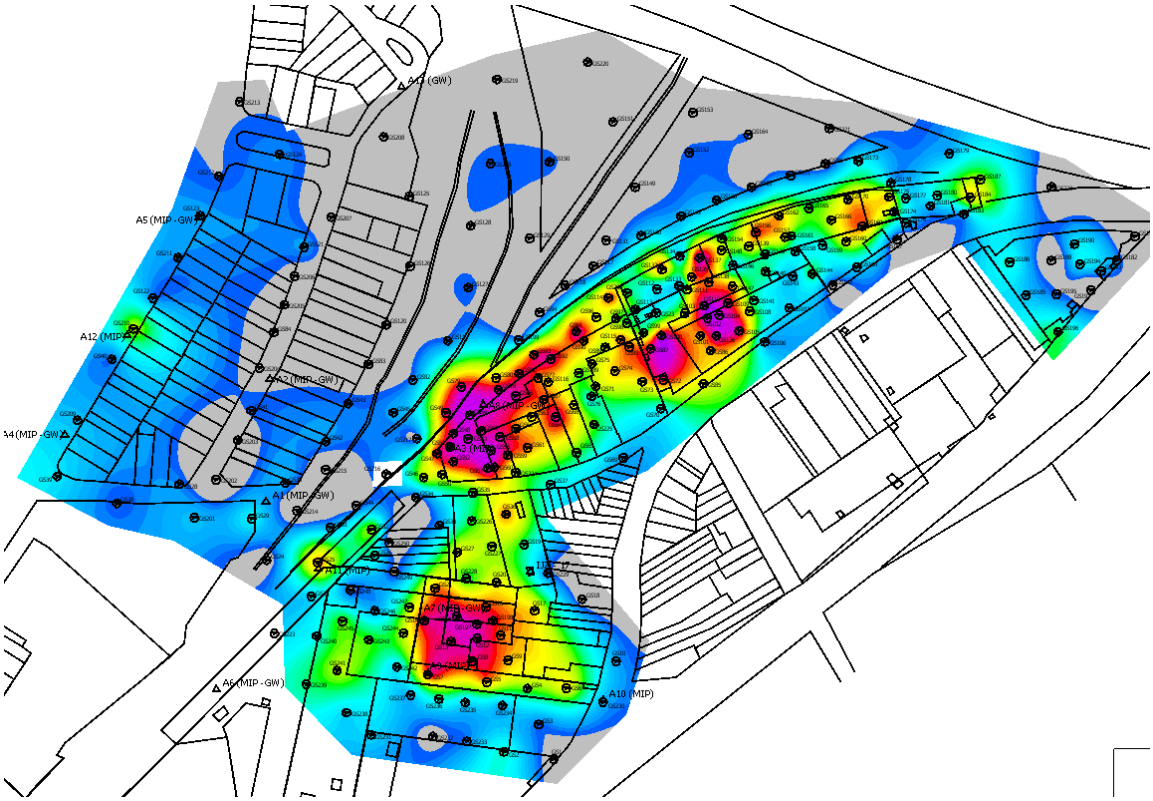
# ATTACHMENT 2

# PASSIVE SOIL VAPOR SAMPLING DOCUMENTATION

# Amplified Geochemical Imaging, LLC.

# Environmental Services

## High Resolution Site Characterization (HRSC)
## Vapor Intrusion Investigations
## Long-Term & Remedial Monitoring
## Groundwater & Sediment Porewater Sampling



# AGI Environmental Services "snapshot"


## *AGI Environmental Service Options*

### Screening

- Type 1 Sampler
- AGI Screening method*
- Results as mass (µg)
- Applicable compounds

### Concentration

- Type 8 Sampler
- AGI Screening method*
- Results as mass (µg) and concentrations (µg/m$^3$; µg/L)
- Applicable compounds

**Note: Target compounds associated with each Service Option are provided on page 4.**

*US EPA 8260 modified for external standard calibration

## *AGI Universal Passive Sampler Capabilities*

### Type 1

- No measured uptake rates
- Volatility range $C_2$ to $C_{20}$
- Vinyl chloride, 11DCE are reported

### Type 8

- Measured uptake rates
- Volatility range $C_4$ to $C_{20}$
- Vinyl chloride, 11DCE **cannot** be reported

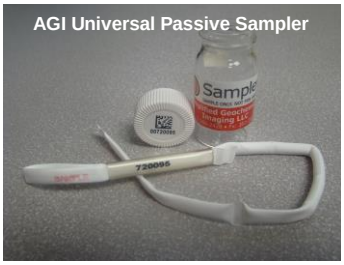
1) Select the AGI Environmental Service Option and number of samplers to meet your project objectives.
2) AGI samplers are shipped to you for deployment and retrieval.
3) AGI samplers are returned to AGI's laboratory in Newark, Delaware, USA for analysis.
4) An AGI Laboratory Report is issued.
5) For soil gas surveys of 10 or more AGI field samplers, contour maps are prepared, and an AGI Mapping Report is issued.

- The service cost includes the AGI Universal Passive Samplers, sampler analysis, reports with data tables and contour maps (as needed), and shipping to you (some restrictions apply).
- A quotation can be prepared by completing the interactive questionnaire located on page 9.
- Additional detailed service information is contained in the following pages.

## AGI Analytical Method

1) **AGI Screening Method**[1]
   a. Thermal desorption GC/MS (Modified method 8260)
   b. External standard calibration
   c. Second source calibration checks/ reference standards
   d. Method blanks, BFB tune checks

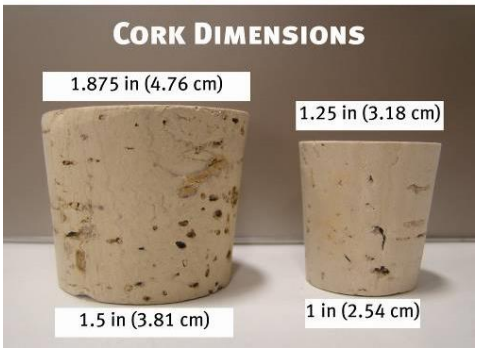
[1]Type 8 sampler is required for concentration reporting. Mass data only for compounds not having measured or estimated sampling rates




**All Service Options Include:**

- Survey design, pre- and post-survey consultation (as needed)
- AGI Universal Passive Samplers, trip blanks, outbound shipping (some restrictions apply)
- Chain of Custody and Installation/Retrieval e-Log
- Analysis, electronic data deliverable (EDD)[2], Laboratory Report[2]
- Soil gas contour maps[2] (up to five) and a Mapping Report[2] for projects having at least 10 AGI field samplers[3]
- Data, reports, and maps provided electronically via secure ftp site
- Corks (small, default, see photo at right) – as applicable
- String, insertion rod, weights (for groundwater sampling) - as applicable

[2]Standard EDD format; CSV for data tables, PDF for contour maps and reports.
Other formats may be available upon request and may incur additional cost.
[3]For projects with <10 samplers, a fee is charged to provide contour maps and Mapping Report.


**Turn around time (TAT):**

- TAT is a function of the number of samplers and the current laboratory capacity. Normal TAT is approximately 10-12 working days (≤ 50 samplers). TAT increases by two days for every additional 50 samplers.

**Not included:**

- Sampler field installation and retrieval costs
- Return shipping costs
- Taxes, duties, or VAT

**Terms:**

- Project-specific pricing quotation valid for 90 days
- Paid in full 30 days from invoice date
- Credit approval required
- Soil gas surveys may be subject to a minimum order fee

| CAS No. | Screening Option<br>Units: micrograms, µg | Concentration Option<br>Units: µg; µg/m³ or µg/L | |
|---|---|---|---|
| 75-01-4 | Vinyl chloride** | | |
| 1634-04-4 | Methyl tert-Butyl Ether | Methyl tert-Butyl Ether | |
| | BTEX (summed) | BTEX (summed) | |
| 71-43-2 | Benzene | Benzene | |
| 108-88-3 | Toluene | Toluene | |
| 100-41-4 | Ethylbenzene | Ethylbenzene | |
| 108-38-3/106-42-3 | m,p-xylene | m,p-xylene | |
| 95-47-6 | o-xylene | o-xylene | |
| 111-65-9 | Octane | Octane* | |
| 1120-21-4 | Undecane | Undecane* | |
| 629-50-5 | Tridecane | Tridecane* | |
| 629-62-9 | Pentadecane | Pentadecane* | |
| 108-67-6 | 1,3,5-Trimethylbenzene | 1,3,5-Trimethylbenzene | |
| 95-63-6 | 1,2,4-Trimethylbenzene | 1,2,4-Trimethylbenzene | |
| 91-20-3 | Naphthalene | Naphthalene | |
| 91-57-6 | 2-Methylnaphthalene | 2-Methylnaphthalene | |
| 86-73-7 | Fluorene | Fluorene* | |
| 83-32-9 | Acenaphthene | Acenaphthene* | |
| 208-96-8 | Acenaphthylene | Acenaphthylene* | |
| 156-60-5 | trans-1,2-Dichloroethene | trans-1,2-Dichloroethene | |
| 156-59-2 | cis-1,2-Dichloroethene | cis-1,2-Dichloroethene | |
| 79-01-6 | Trichloroethene | Trichloroethene | |
| 127-18-4 | Tetrachloroethene | Tetrachloroethene | |
| 75-35-4 | 1,1-Dichloroethene** | | |
| 75-35-3 | 1,1-Dichloroethane | 1,1-Dichloroethane | |
| 107-06-2 | 1,2-Dichloroethane | 1,2-Dichloroethane | |
| 79-00-5 | 1,1,2-Trichloroethane | 1,1,2-Trichloroethane | |
| 71-55-6 | 1,1,1-Trichloroethane | 1,1,1-Trichloroethane | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 1,1,2,2-Tetrachloroethane | |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 1,1,1,2-Tetrachloroethane* | |
| 67-66-3 | Chloroform | Chloroform | |
| 56-23-5 | Carbon tetrachloride | Carbon tetrachloride | |
| 108-90-7 | Chlorobenzene | Chlorobenzene | |
| 95-50-1 | 1,2-Dichlorobenzene | 1,2-Dichlorobenzene | |
| 541-73-1 | 1,3-Dichlorobenzene | 1,3-Dichlorobenzene | |
| 106-46-7 | 1,4-Dichlorobenzene | 1,4-Dichlorobenzene | |
| | TPH†<br>GRPH††*optional*<br>DRPH†*optional* | TPH*†<br>GRPH*††*optional*<br>DRPH*†*optional* | |

* Concentrations based on estimated sampling rates

** Not reportable for water sampling

† Uses undecane response for quantification

†† Uses octane response for quantification

**Note:** Vinyl chloride response is determined using a single point calibration. All other compound responses are determined using a minimum of five calibration levels, except as noted.

### Additional Analyte Groups

- Compounds below are not included on AGI's standard scope of accreditation
- Can be added to any of the three service options
- Additional fee per AGI Universal Sampler per group
- Single point calibration, mass (µg) data

| Explosive Breakdown | PCBs | Chemical Agent Breakdown | Pesticides |
|---|---|---|---|
| Nitrobenzene | Monochlorobiphenyl | 1,4-Dithiane | alpha BHC |
| 2-Nitrotoluene | Dichlorobiphenyl | 1,4-Oxathiane | beta BHC |
| 3-Nitrotoluene | Trichlorobiphenyl | Thiodiglycol | gamma BHC |
| 4-Nitrotoluene | Tetrachlorobiphenyl | Benzothiazole | delta BHC |
| 1,3-Dinitrobenzene | Pentachlorobiphenyl | Dimethyldisulfide | Heptachlor |
| 2,6-Dinitrotoluene | | 2-Chloroacetophenone | Aldrin |
| 2,4-Dinitrotoluene | **PAHs** | 4-Chloroacetophenone | Heptachlor Epoxide |
| 1,3,5-Trinitrobenzene | Phenanthrene | p-Chlorophenylmethylsulfide | Endosulfan I |
| 2,4,6-Trinitrotoluene | Anthracene | p-Chlorophenylmethylsulfone | 4,4'-DDE |
| | Fluoranthene | p-Chlorophenylmethylsulfoxide | Dieldrin |
| | Pyrene | Diisopropylmethylphosphonate (DIMP) | Endrin |
| | | Dimethylmethylphosphonate (DMMP) | 4,4'-DDD |
| | | | Endosulfan II |
| | | | Endrin Aldehyde |
| | | | 4,4'-DDT |
| | | | Endosulfan Sulfate |
| | | | Endrin Ketone |
| | | | Methoxychlor |

**Additional non-standard target compounds for which detection and reporting capabilities have been confirmed.**

***Additional charges apply; mass (µg) data***

| | | | |
|---|---|---|---|
| 1,2,3-Trichlorobenzene | 3-Methylphenol | Dichlorofluoromethane (F-21) | Tetrachlorodifluoroethane (F-112) |
| 1,2,3-Trichloropropane | 4,4-Dichlorobenzophenone | Dichlorotetrafluoroethane (F-114) | Trichlorofluoromethane (F-11) |
| 1,2,4-Trichlorobenzene | 4-Aminobiphenyl | Dicyclopentadiene | Trichlorotrifluoroethane (F-113) |
| 1,2-Dibromo-3-Chloropropane | 4-Chloroaniline | Freon 123 | |
| 1,2-Dibromoethane (EDB) | 4-Isopropytoluene | Freon 123A | |
| 1,2-Dichloropropane | 4-Methyphenol | Hexachlorobutadiene | |
| 1,4-Dioxane | Acetone | Hexane | |
| 2,2,4-Trimethylpentane | Aniline | 2-Hexanone | |
| 2,2-Dichloropropane | Bromodichloromethane | Methyl Ethyl Ketone | |
| 2,3,4,5-Tetrachlorophenol | Bromoform | Methyl Isobutyl Ketone | |
| 2,3,4,6-Tetrachlorophenol | Carbon Tetrafluoride (F-14) | Methylene Chloride | |
| 2,3,5,6-Tetrachorophenol | Chlorodifluoromethane (F-22) | Nitrobenzene | |
| 2,4-Dichlorobenzophenone | Chlorotrifluoromethane (F-13) | o-Toluidine | |
| 2,4-Dimethylphenol | Dibromochloromethane | Phenol | |
| 2-Chlorotoluene | Dichlorodifluoromethane (F-12) | Styrene | |

**AdditionalServices (fees may apply)**

- Single compound reporting (e.g., PCE only)
- Reporting a subset of the listed target compounds
- QA deliverables

  BFB tune reports, calibration data, individual quantitation reports (samples and QC) with mass spectral comparisons to reference spectra (samples and blanks)
- Expedited analytical results
  - ≤ 50 AGI Universal Samplers, five working day TAT, starting from the day after sampler receipt
    - For example: Samplers are received on a Tuesday, the Laboratory Report will be issued no later than the following Tuesday.
    - For weeks that do not include US holidays or closure due to inclement weather
- Supplemental services – billed at an hourly rate, two hour minimum
- **Non-standard target compounds (fees apply)**
  - Can be added to any of the three service options, mass (µg) data only
  - Up to five compounds by single point calibration (Dependent on availability of standards and method applicability)
  - Up to ten compounds, library search, estimated masses >0.1µg

**Other Information**

- AGI Universal Passive Samplers returned unused cannot be placed back into inventory. A per-sampler fee is assessed for samplers not returned, returned unused, lost or damaged.
- Please use samplers within three months of sampler receipt.
- To ensure accuracy and applicability of sample results, please do not retain samplers or transfer them to other projects without discussion with, and approval by AGI.

## TECHNOLOGY REFERENCES

ASTM, *Standard Practice for Passive Soil Gas Sampling in the Vadose Zone for Source Identification, Spatial Variability Assessment, Monitoring, and Vapor Intrusion Evaluations*, ASTM D 7758-11.

ASTM, *Standard Guide for Deriving Equations for Calculating VOC and SVOC Concentrations in Soil Gas, Air, Water, and Porewater from the Mass Accumulated on Adsorbent-based Passive Samplers*, ASTM WK40037, in press.

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**ADDITIONAL AMPLIFIED GEOCHEMICAL IMAGING, LLC'S REFERENCES**
**(available on request)**

- Case Studies
- Concentration Method Summary for AGI Samplers
- Descriptions of Service
- General Guidelines for Survey Design and Sample Spacing - Soil Gas and Subslab Soil Gas Sampling
- How to Install AGI Universal Samplers for Soil Gas Sampling (includes sub-slab sampling)

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Fax: +1-303-986-2898

To help us ensure its accuracy of the quote, please take a moment and provide information for the following.

***Complete the form and email to:***
***orders@agisurveys.net***

**Contact Information (your name, company, phone, email)**
Click here to enter text.

**Date quote is needed:** Click here to enter a date.
**Anticipated field sampling start date:** Click here to enter a date.

**Address for sampler shipment (street address, city, state, zip code, country):**
Click here to enter text.

**Address for invoicing (street address, city, state, zip code, country):**
Click here to enter text.

**Project objective:** *Indicate if the AGI Environmental Survey in support of site assessment, source identification, vapor intrusion, plume delineation, groundwater sampling, etc.*
Click here to enter text.

**Project reference:** *Name of site or project for referencing ☐on project related correspondence and reporting.*

Click here to enter text.

**Project city, state, country:**

Click here to enter text.

**Service option *(check only one)*:** ☐ Screening (relative mass reporting)
☐ Concentration (relative mass and concentration reporting)

**Additional compound lists** ☐ Addt'l PAHs ☐ PCBs ☐ Pesticides
☐ Explosive Breakdown ☐ Chemical Agent Breakdown

Other Non-standard compounds (pending lab approval - relative mass value reporting only):

Click here to enter text.

**Media *(check one only)***: ☐Air ☐Soil Gas ☐Ground water ☐Sediment porewater ☐Other
*Complete a second form for additional matrices*

Click here to enter text. **Enter AGI Universal Sampler count(1) for field deployment**

**For soil gas surveys:**

Click here to enter text. **Enter Cork** count:** Small, 1.0 inch (2.54cm)* (common for hard surfaces)

Click here to enter text. **Enter Cork** count:** Large, 1.5 inch (3.81cm)* (common for uncovered surfaces)

Click here to enter text. **Enter number of insertion rods needed (one per field crew)**

***Optional - dependent on QAPP requirements***

Click here to enter text. **Enter Laboratory duplicate count(2) *(analysis of second set of adsorbents)***

1 - AGI adds an appropriate number of samplers as trip blanks at no additional cost
2 – Client specifies which samplers will have the duplicate adsorbent analyzed, to be noted on the Installation and Retrieval e-Log
* - Diameter of narrow end of tapered cork
** - We are striving to reduce waste by sending only the cork sizes and counts required. If the cork size is unknown presently, we will ask at the time the order is placed, or ship small corks (default choice).