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**Bayer MaterialScience LLC**

# Vapor Intrusion Investigation Work Plan

125 New South Road
Hicksville, New York
USEPA ID No. NYD002920312

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ARCADIS

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## 1. Introduction

This work plan describes proposed vapor intrusion (VI) investigation activities to be performed at the Simone Development (Simone) building complex located at 1 Enterprise Place, Hicksville, New York east of Bayer MaterialScience LLC (Bayer) site located at 125 New South Road, Hicksville, New York ("the Site"). This work plan has been prepared pursuant to the following:

- A February 23, 2010 letter from the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) (the "Agencies") commenting on the Phase IV Soil Vapor Investigation (SVI) performed at the Site.

- A July 30, 2010 conference call with the Agencies to discuss offsite SVI activities and separation of the offsite SVI from onsite Resource Conservation and Recovery Act (RCRA) closure activities.

- A September 28, 2010 site meeting with the Agencies in which the Agencies requested indoor air and sub-slab soil vapor sampling at the Simone building complex.

This work plan was originally submitted to the NYSDEC in "draft" format on January 14, 2011. The work plan has been revised to address comments contained in e-mail correspondence from the NYSDEC dated January 19, 2011 and comments discussed with the Agencies during follow-up conference calls on January 25, 2011 and March 8, 2011.

The VI investigation will be performed to: (1) evaluate the potential presence, concentration, and distribution of volatile organic compounds (VOCs) in soil vapor below the Simone building complex (hereafter, "sub-slab soil vapor"); and (2) evaluate the potential for VOCs in sub-slab soil vapor to enter the complex.

The organization of this work plan is presented below, followed by a summary of relevant background information and the VI investigation objectives.

### 1.1 Plan Organization

This work plan has been organized into the following sections:

| Section | Purpose |
|---|---|
| Section 1 – Introduction | Presents background information relevant to the proposed VI investigation. |
| Section 2 – Proposed VI Investigation Activities | Presents a detailed description of proposed VI investigation activities. |
| Section 3 – Reporting | Presents a description of the report to be prepared following completion of the VI investigation field activities. |
| Section 4 – Schedule | Presents the anticipated schedule for implementing proposed VI investigation activities. |

### 1.2 Background Information

This section presents relevant background information about the Site and the Simone building complex (subject of the VI Investigation) used to develop this work plan.

An action item proposed in response to findings of the Phase I SVI was to perform a walk-through of the Simone building complex to observe operations at the building and determine if sub-slab soil vapor and indoor air sampling was needed. On June 4, 2008, Bayer and ARCADIS were accompanied by the Agencies for a walk-through of the Simone building complex. Businesses that occupied space at the complex included Allied Building Products (Allied), Publishers Circulation Fulfillment (PCF) Newspaper Delivery, Empire Bakery Equipment, Coral Graphics, Big Bear Cycles, New Business Solutions (NBS), and Williams Specialized, Inc. The walk-through did not include a full building reconnaissance or product inventory (both of which will be performed as part of this VI investigation described in this work plan). The walk-through was an opportunity for Bayer, ARCADIS, and the Agencies to observe the general construction of the building, products used that potentially contain VOCs, heating systems for the building, overhead door locations, types of businesses occupying the building, general locations of floor drains, the roof drainage system, and general stormwater management. During the walk-through, businesses observed to have potential sources of VOCs were the following:

| Business Name | Business Description | Potential VOC Source |
|---|---|---|
| Allied | Building materials distributor | Outside/Inside Chemical Storage/Product Inventory, Vehicle Maintenance |
| Empire Bakery Equipment | Bakery equipment and systems for baking and food service industries | Parts washing machine located in in-house workshop |
| Big Boar Cycles | Motorcycle retail, building, customizing, maintenance, and restoring | General motorcycle maintenance, parts washing, chemical storage |

Prior to the September 28, 2010 site meeting, ARCADIS took an inventory of businesses occupying the Simone building complex by recording information from business signs at the entrance to the complex. The signs indicated that seven businesses were then occupying space at the complex. Based on the signs, most of the businesses at the complex appeared to be the same as those observed during the 2008 walk-through, except Big Bear Cycles and Williams Specialized, Inc. did not appear to occupy space anymore. Two new businesses that appear to occupy space at the complex include DWG Distribution and Mash City Business Systems. Additional businesses may occupy the property, but did not have a visible sign and/or could have moved in since the site meetings. Current businesses at Simone building complex will be verified during the proposed building reconnaissance described in this work plan.

A description of the Simone building complex and property history is presented below. A summary of relevant previous investigations at the Bayer property is also presented below.

### 1.2.1 Simone Building Complex History and Description

Based on information provided on the Nassau County Department of Assessment (NCDA) website, the Simone building complex was constructed in 1967 for use as a storage facility by Grumman Aerospace Corporation (now known as Northrop Grumman). Additional building history, including previous owners since 1967, the year Simone acquired the property, history of tenants, tenants' activities, current tenant hours of operation, number of occupants, and days/week the businesses are occupied, will be determined as part of the building reconnaissance and interview with the building owner and others knowledgeable in building operations and maintenance (described in Section 2 below).

Based on observations made during the June 4, 2008 walk-through and information on the NCDA website, the Simone building complex is described as follows:

- Rectangular in shape with a footprint of approximately 150,741 square feet (sf).
- Oriented north to south on an approximately 7.6-acre lot.
- A one-story structure with concrete slab-on-grade construction.
- Bordered by the Bayer site on the west, a complex owned by Northrop Grumman Corporation to the east, and commercial/industrial properties to the north and south.

The location of Simone building complex in relation to the Site is shown on Figure 1.

#### 1.2.2 Summary of Previous Onsite VOC Soil Sampling

Soil samples collected from approximately 175 locations at the Bayer site have been analyzed for VOCs since the start of the RCRA Facility Investigation (RFI) in February 2004. Details of the VOC soil sampling programs are included in the following documents, which have been approved by the NYSDEC:

- *RCRA Facility Investigation Report* prepared by BBL (now known as ARCADIS) (BBL, June 2004).
- Phase II RFI Report contained in a letter from BBL to the NYSDEC dated January 5, 2005.
- *Interim Corrective Measure Certification Report* (BBL, November 2005).
- Phase VI Pre-Design Soil Sampling Plan contained in a letter from ARCADIS to the NYSDEC dated March 5, 2007 and follow-up e-mail correspondence from ARCADIS BBL to the NYSDEC dated April 9, 2007.

A total of 19 individual VOC constituents have been detected in the soil samples collected as part of the 2004 RFI, the 2005 ICM, and the 2005-2007 Phase I through Phase VI pre-design soil sampling activities. However, outside the Plant 1 area, no VOCs other than acetone (a common laboratory artifact) were detected in soils at concentrations exceeding the soil guidance values presented in the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) titled “Determination of Soil Cleanup Objectives and Cleanup Levels,” HWR-94-4046, dated January 24, 1994 (TAGM 4046). Nine VOCs were identified in the Plant 1 area soils at concentrations exceeding the TAGM 4046 soil guidance values. These VOCs include acetone, 2-

butanone, methylene chloride, 4-methyl-2-pentanone, tetrachloroethene (PCE), trans-1,2- dichloroethylene (DCE), trichloroethene (TCE), vinyl chloride, and xylenes. Of these constituents, only one (PCE) was detected at concentrations exceeding the commercial use soil cleanup objectives (SCOs) presented in Title 6 of the Official Compilation of Codes, Rules, and Regulations of the State of New York (6 NYCRR) Part 375-6.8(b).

Additional pre-excavation verification samples were collected from the Plant 1 area prior to the 2009 Interim Corrective Measure (ICM) to verify the excavation limits for VOC-impacted soil in the area. As summarized in a May 7, 2009 letter from ARCADIS to the NYSDEC, no VOCs were detected in these samples at concentrations exceeding the commercial use SCOs presented in 6 NYCRR Part 375-6.8(b). The VOC-impacted soil in and around the Plant 1 area was removed as part of the 2009 ICM.

#### 1.2.3 Summary of Previous Onsite Soil Vapor Investigations

VOC soil vapor sampling activities were previously performed at the Site as part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Remedial Investigation (RI) in 1989. Since the CERCLA RI, four additional soil vapor investigations (SVIs) have been performed at the Site from September 2007 to August 2009. The soil vapor sampling locations for the SVIs are shown on Figure 1. The sampling activities and results for the CERCLA RI and SVIs are briefly summarized below.

##### 1.2.3.1 CERCLA Soil Vapor Sampling

Soil vapor samples were collected during the CERCLA RI at 55 locations that provided coverage across the Site, except for areas covered by pavement or buildings at the time. Soil vapor field screening was performed using a photoionization detector (PID) and confirmatory soil vapor analysis for site-related VOCs, including TCE, PCE, trans-1,2- DCE, and vinyl chloride monomer, was performed using portable gas chromatography. Based on the analytical results, PCE was the only VOC identified in the soil vapor samples. PCE was detected at only two soil vapor sampling locations – one location southeast of Plant 1 and one location northwest of Plant 2. However, the detection limits were higher than those that could be achieved using current analytical methods, and improvements to soil vapor sampling methodologies were made since 1989.

Details of the previous soil vapor sampling are presented in the Remedial Investigation Report (Leggette, Brashears & Graham, Inc., revised August 1992). Sections of the

report related to the previous soil vapor sampling, including applicable tables and a figure, were provided to the NYSDEC in July 11, 2006 e-mail correspondence from BBL. The soil gas summary was subsequently reviewed by the NYSDOH, and comments sent to Bayer in a January 22, 2007 letter from the NYSDEC.

#### 1.2.3.2 Phase I SVI

An initial SVI was performed at the Site in September 2007 to provide an updated assessment of soil vapor concentrations. Work performed and results obtained for the SVI were provided in a December 20, 2007 letter report from ARCADIS to the NYSDEC (the "Phase I SVI Report"). Soil vapor samples were collected from 18 locations (locations SG-1 through SG-18, as shown on Figure 1) as part of the SVI and were analyzed for a full suite of VOCs. Soil vapor sampling locations were selected to provide coverage across the Site, including in areas where building construction may occur during site redevelopment, within/near footprints of the former plant buildings, near areas where TCE was identified in the 1989 soil vapor assessment, and in various paved areas.

The NYSDEC has not established standards, criteria, or guidance values for VOCs in soil vapor. Therefore, soil vapor data were compared to indoor air guideline values presented in the NYSDOH document titled "Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York", dated October 2006 (hereafter, "the NYSDOH VI Guidance"). Several VOCs were identified in soil vapor at concentrations exceeding these "screening criteria". Two or more VOCs were identified at concentrations exceeding indoor air guideline values at each soil vapor sampling location. Constituents that were detected at the highest concentrations included PCE, TCE, cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride. PCE and/or TCE were detected at concentrations greater than indoor air guideline values at 12 of the 18 sampling locations. The highest concentrations of VOCs detected in soil vapor were at locations within the footprints of the former onsite buildings and along the eastern property boundary.

Based on the identification of VOCs in soil vapor along the eastern property boundary as part of the Phase I SVI, a walk-through of the Simone building complex was performed on June 4, 2008 to observe operations at the building and determine if sub-slab soil vapor and indoor air sampling was needed. As indicated in Subsection 1.2, Bayer and ARCADIS were accompanied by the Agencies for the walk-through, which was intended to provide a general indication of the building layout, uses, and potential VOC sources. As previously mentioned, a detailed building reconnaissance and product

inventory were not conducted. However, potential sources of VOCs were identified in certain sections of the building during the walk-through, as identified in Subsection 1.2.

#### 1.2.3.3 Phase II SVI

Based on the results of the Phase I SVI, the NYSDEC and NYSDOH requested additional soil vapor sampling in certain areas of the Site, including adjacent to Plant 1 and along the eastern and western property boundaries. Additional soil vapor sampling was conducted under a Phase II SVI in June 2008 that consisted of the following (refer to Figure 1 for the sampling locations cited below):

- Collecting one additional soil vapor sample (at location SG-19) to further assess the presence and extent of vinyl chloride adjacent to the Plant 1 footprint.

- Collecting two additional soil vapor samples along the eastern and western property boundaries (at locations SG-20 and SG-21) to further assess the presence and extent of PCE, TCE, and cis-1, 2-DCE.

The Phase II SVI was performed in accordance with letters from ARCADIS to the NYSDEC dated February 28, 2008 and April 2, 2008, which respond to comments on the Phase I SVI Report. VOCs were also identified in soil vapor samples collected during the Phase II SVI, which led to a Phase III SVI in February 2009.

#### 1.2.3.4 Phase III SVI

The Phase III SVI was performed in February 2009 in accordance with letters from ARCADIS to the NYSDEC dated November 18, 2008 and January 19, 2009. The Phase III SVI involved the collection of soil vapor samples at six additional sampling locations (locations SG-22, SG-23, SG-24, SG-25, SG-26, and SG-27, as shown on Figure 1) to further evaluate VOCs in soil vapor that were identified at soil vapor sampling locations SG-20 and SG-21 as part of the Phase II SVI. The results of the Phase III soil vapor sampling are summarized in February 25, 2008 e-mail correspondence from ARCADIS to the NYSDEC and NYSDOH. Based on review of the Phase III SVI analytical results, the NYSDEC and NYSDOH concurred that the low VOC concentrations identified by the Phase III SVI sampling indicated that sampling offsite in the area of New South Road was not necessary.

1.2.3.5 Phase IV SVI

In a January 19, 2009 letter from ARCADIS to the NYSDEC, Bayer proposed to perform confirmatory (Phase IV) soil vapor sampling at various locations across the Site following implementation of the 2009 ICM. The work plan for the Phase IV soil vapor sampling was provided to the NYSDEC in a July 2, 2009 letter from ARCADIS, modified by July 10, 2010 e-mail correspondence from ARCADIS to the NYSDEC, and approved by the NYSDEC on July 15, 2009. The Phase IV soil vapor sampling activities were performed in August 2009 following completion of the 2009 ICM activities. The Phase IV SVI consisted of collection of soil vapor samples from 10 "revisited" sampling locations (locations SG-1, SG-3, SG-4, SG-5, SG-6, SG-8, SG-9, SG-11, SG-13, and SG-15) and two new sampling locations (locations SG-14A and SG-28), as shown on Figure 1.

The Phase IV laboratory results were provided to the NYSDEC and NYSDOH in September 28, 2009 e-mail correspondence from Bayer. Additional copies of the results were sent to the NYSDOH on October 6, 2009. The findings of the Phase IV SVI were discussed during a February 18, 2010 telephone conference call attended by the NYSDEC, NYSDOH, Bayer, and ARCADIS.

VOCs were identified in each Phase IV soil vapor sample. For the most part, the VOC concentrations identified in the Phase IV soil vapor samples were generally the same or somewhat higher than the concentrations identified in the soil vapor samples from the previous investigations. However, VOC concentrations identified at soil vapor sampling locations SG-8 (within the Plant 3 footprint), SG-9 (immediately west of the rainwater runoff sumps identified as AOCs 28 and 29), and SG-14A (along the eastern property boundary) were lower than the concentrations from previous investigations.

1.2.3.6 Background Information Search

In accordance with the January 15, 2009 letter from ARCADIS to the NYSDEC, Bayer obtained and reviewed background information for seven commercial/industrial properties south of the Site to identify the potential generation, use, handling, storage, offsite transportation, disposal, spills, etc., of VOCs (or materials containing VOCs) at these properties and to assess the need for an offsite SVI or VI investigation. Background information was collected on the following seven properties: (1) American Compressed Gases; (2) Capitol Warehouse Corporation; (3) Number One Textiles; (4) Westye Group East; (5) Dynamic Graphics; (6) Matt-Conn Services Corp (Matt-Conn); and (7) Long Island Railroad (LIRR).

A summary of information obtained from the background information search is presented in an October 1, 2010 letter from ARCADIS to the NYSDEC. As indicated in the letter, operations (past and/or present) conducted at three of the properties south of the Site (Capitol Warehouse Corp., Number One Textiles, and Matt-Conn) clearly involved use/handling, generation, storage, or release(s) of materials containing VOCs. The use/handling, generation, storage, or release is evident based on waste manifest information. In addition, operations/events at four of the other properties (American Compressed Gases, Westye Group, Dynamic Graphics, and LIRR) are indicative of potential past or present VOC use. Based on the information found, Bayer eliminated buildings south of the Site from consideration for soil vapor, indoor air, and sub-slab soil vapor sampling. The need for sampling at these locations is being further assessed by the Agencies, and a final decision is pending.

### 1.3 VI Investigation Objectives

Based on the concentrations of VOCs identified in pre- and post-ICM soil vapors collected near Bayer's eastern property boundary, the VI investigation activities proposed in this work plan will be implemented to evaluate: (1) the potential presence, concentration, and distribution of VOCs in sub-slab soil vapor at the adjacent Simone building complex (if any); and (2) the potential for vapor intrusion into the complex.

## 2. Proposed Vapor Intrusion Investigation Activities

The proposed VI investigation activities consist of the following:

- A building reconnaissance and product inventory at the Simone building complex.
- Sub-slab and indoor air sampling at the Simone building complex.

Bayer is actively pursuing an access agreement with Simone needed for the proposed investigation on Simone property. The investigation is contingent upon receipt of approval from Simone.

A discussion of the proposed building reconnaissance and product inventory activities is presented below, followed by a discussion of the proposed sub-slab and indoor air sampling activities.

### 2.1 Building Reconnaissance and Product Inventory

ARCADIS will conduct a building reconnaissance and product inventory accompanied by personnel from Simone (and the NYSDEC/NYSDOH and Bayer, if available). The reconnaissance and product inventory will focus on all of the businesses currently occupying the Simone building complex.

Prior to or following the reconnaissance, ARCADIS will meet with Simone and the building manager (or others knowledgeable in building operations and maintenance) to complete the questionnaire portion of the NYSDOH Indoor Air Quality Questionnaire and Building Inventory form (Appendix B to the NYSDOH VI Guidance), which is included as Appendix A to this work plan. During this meeting, ARCADIS will also ask Simone and the building manager for additional information on the history of the building use and occupants, including a listing of historical tenants, the tenants' activities, and parts of the building occupied by the tenants.

The building reconnaissance will be performed to: (1) observe the building layout and construction (including the presence/locations of basements, sumps, pits, vaults, dry wells, catch basins, and/or drainage pipes); (2) identify locations where VOCs (if present in subsurface soil) could potentially enter the building; and (3) select sub-slab soil vapor and indoor air sampling locations. Prior to performing this task, ARCADIS will request the following from Simone: (1) construction drawings showing the building layout, including the subdivision of the building for the various tenant leases; and (2) drawings showing the building foundation and drainage construction. As part of this task,

ARCADIS will collect information related to the depth of basements, foundation walls, doorways, equipment, and other factors that influence pressure, ventilation, and air movement in the building, where applicable. ARCADIS will document observed floor penetrations, cracks, or other preferential pathways that could potentially serve as a route for vapors to enter the building. A PID capable of measuring VOCs at the parts per billion (ppb) level (i.e., a ppbRAE) will be used to evaluate the presence of VOCs migrating through these potential pathways.

The product inventory will be performed to document products containing VOCs (or potentially containing VOCs) that are used, handled, or stored in the building. As part of this activity, ARCADIS will document recent renovations or maintenance within the building (fresh paint, new carpet, and new furniture) and the use, storage, or handling of products containing VOCs such as cleaners, degreasers, and solvents (with a focus on products containing TCE, PCE, and cis-1,2-DCE). The ppbRAE will be used to evaluate the presence of these VOCs originating from potential sources inside the buildings.

Photographs of the building interior and products (in each business within the complex) will be taken during the reconnaissance and product inventory activities. Results of the reconnaissance and product inventory will be documented on the NYSDOH Indoor Air Quality Questionnaire and Building Inventory form.

As a final step of the building reconnaissance and product inventory, ARCADIS will review mapping (if available) showing locations, depths, construction materials, and bedding for underground utilities located in the vicinity of the building. The map information will support an evaluation of potential soil vapor migration pathways. The sampling locations identified in this work plan will be adjusted, as needed, based on the findings of the building reconnaissance and locations of underground utilities (to avoid direct contact with the utilities and evaluate the utilities as a potential migration pathway). The NYSDEC and NYSDOH will be invited to participate in a field mark-out of sampling locations, which will be performed after the above-described reconnaissance and product inventory activities are completed.

### 2.2 Indoor Air and Sub-Slab Soil Vapor Sampling

Sub-slab vapor and indoor air sampling will be performed following completion of the building reconnaissance and product inventory activities. As part of the proposed VI Investigation, samples will be collected concurrently from up to 8 paired sub-slab soil vapor sampling and indoor air sampling locations. Four of the sampling locations have been selected to: (1) be adjacent to previous soil vapor sampling locations along the

eastern portion of Bayer's property where VOCs have been identified in soil vapor at elevated concentrations; and (2) provide aerial coverage within the footprint of the Simone building complex. Up to four additional sampling locations will be selected based on the findings of the building reconnaissance and product inventory. As indicated in Subsection 2.1 above, the four pre-determined sampling locations identified in this work plan will be adjusted, as needed, based on the findings of the building reconnaissance and locations of underground utilities. Tie-distance measurements (from fixed reference points in the building and shown on mapping to be requested from Simone) will be obtained to document the final sampling locations.

Samples will be designated by the prefix "SSV-" (for sub-slab soil vapor) or "IA-" (for indoor air) followed by a unique number for that location. The proposed sampling locations are identified in the table below.

| Sample ID | Proposed Location |
|---|---|
| SSV-1/IA-1 | Adjacent to previous soil vapor sampling location SG-16 on Bayer property |
| SSV-2/IA-2 | Adjacent to previous soil vapor sampling location SG-15 on Bayer property |
| SSV-3/IA-3 | Adjacent to previous soil vapor sampling locations SG-14 and SG-14A on Bayer property |
| SSV-4/IA-4 | Adjacent to previous soil vapor sampling locations SG-20, SG-27, and SG-28 on Bayer property |
| SSV-5/IA-5 | To be determined |
| SSV-6/IA-6 | To be determined |
| SSV-7/IA-7 | To be determined |
| SSV-8/IA-8 | To be determined |

Work activities to be performed in connection with the sub-slab vapor and indoor air sampling include installing and purging temporary sub-slab vapor sampling points, completing tracer gas tests, and collecting samples for laboratory analysis. These work activities will be coordinated with the property owner (Simone) and the tenants of each affected business to minimize interference with their business operations. Details of these work activities are presented below.

#### 2.2.1 Temporary Sub-Slab Soil Vapor Probe Installation

ARCADIS will install a temporary sub-slab soil vapor sample collection point at each proposed sampling location inside the building. Each point will be installed by coring through the floor slab using a hammer drill equipped with a ½-inch diameter pulverizing

bit, and then inserting a section of ¼-inch inside diameter laboratory- or food-grade Teflon®-lined or fluoropolymer tubing into the corehole. If necessary, the drill bit will be advanced 2 to 3 inches into the sub-slab material to create an open cavity. The annular space between the tubing and the corehole will be sealed with melted beeswax or hydrated bentonite. At each location, coring is anticipated to take up to 1 hour to complete following setup (assuming that the concrete is not thicker than 6- to 8-inches and steel re-bar reinforcement is not encountered). This work may be conducted during morning or evening, and outside normal business hours, if needed, to accommodate the tenants.

### 2.2.2 Sub-Slab Soil Vapor Purging Activities

After each sub-slab vapor sample collection point is installed, purging will be performed to remove atmospheric air from the sample point and attached tubing. The purging will be performed using a gas-tight syringe at a flow rate of less than 200 milliliters per minute (mL/min). Purging will continue until approximately 1 to 3 times the volume of air inside the tubing has been removed. The purge air collected in the syringe will be discharged outdoors or to Tedlar® bags for later discharge outdoors. Tracer gas testing will be performed during purging at each sampling location (as discussed in Subsection 2.4) to evaluate the integrity of the seals around the sub-slab vapor sampling points. At each location, the purging and tracer gas testing is anticipated to take up to 1 hour to complete (on top of the 1 hour anticipated for coring and probe installation).

If sampling will not be performed immediately following purging, the exposed end of the sample tubing will be sealed with melted beeswax or via crimping to prevent entry of indoor air into the tubing or release of sub-slab vapor into indoor air. The actual start of sampling will depend on schedule arrangements made with Simone and the tenants. It is anticipated that sampling will start later in the day or the next day so that samples within a particular business (and/or adjacent businesses) can be collected concurrently over the proposed sampling period).

### 2.2.3 Indoor Air and Sub-Slab Sample Collection Activities

Indoor air and sub-slab soil vapor sampling will be performed in accordance with Section 2.7 of the NYSDOH VI Guidance. Each indoor air and sub-slab soil vapor sample will be collected in a separate, pre-cleaned SUMMA® canister. Batch-certified-clean canisters will be provided by the laboratory with an initial vacuum of at least 28 inches of mercury (in. of Hg).

Flow regulators will be pre-set to draw indoor air and sub-slab soil vapor at a pre-determined rate (approximately 12.5 mL/min or 4 mL/min) to provide uniform sample collection over an approximate 8 hour or 24 hour sampling period. An 8 hour sampling period coinciding with normal business hours (e.g., with sample canister deployment in morning and retrieval in late afternoon) is preferred. This would provide data to directly correlate with the period when the building is occupied and heating/ventilation systems are operating. Canister vacuum could be routinely monitored over this timeframe. A 24 hour sampling period is an option, but this does not afford the same ability to monitor canister vacuum. In accordance with the NYSDEC Division of Environmental Remediation (DER) February 2008 document titled "NYSDEC Modifications to EPA Region 9 TO-15 QA/QC", the valve on the canister will be closed when the canister vacuum reaches approximately 5 in. of Hg, leaving a vacuum in the canister as a means for the laboratory to verify the canister does not leak while in transit.

Given the distribution of proposed sampling locations (which are anticipated to be within 4 or more separate businesses), timeframes for probe installation, purging and sampling, it is anticipated that implementation of the full scope of work for sampling activities described herein may take up to 1 week to complete for all of the businesses.

### 2.3 Ambient Air Sampling

An upwind, ambient (outdoor) air sample will be collected on the day of sub-slab soil vapor/indoor air sampling in accordance with the NYSDOH VI Guidance. Consistent with the sub-slab and indoor air sampling approach, the proposed ambient air sampling will also involve use of a pre-cleaned 6-Liter SUMMA® canister with an attached flow regulator. The regulator for the ambient air sample will also be adjusted by the laboratory to provide uniform sample collection over an approximate 8-hour or 24-hour sampling period. The location of the ambient air sample will be determined by field personnel the day of sampling based on wind direction.

### 2.4 Quality Assurance/Quality Control

Key quality assurance/quality control (QA/QC) measures to be implemented in connection with the sub-slab vapor and indoor air sampling include obtaining multiple canister vacuum readings, using a tracer gas, and collecting and analyzing duplicate samples, as discussed below.

Four sets of SUMMA® canister vacuum readings will be obtained in connection with sampling and analysis: (1) following canister cleaning for shipping to the field; (2) prior to

sampling, with all the connections and leak checks completed; (3) at the end of sampling; and (4) prior to analysis in the laboratory. Vacuum readings (1) and (2) are expected to be within 5 in. of Hg, as are vacuum readings (3) and (4). Additional canisters will be available in the field for use in the event that vacuum reading (2) is less than reading (1) by >5 in. of Hg. If vacuum readings (3) and (4) are outside of 5 in. of Hg, the vacuum differences will be taken into consideration during the results evaluation, and the results will be qualified, as needed.

Tracer gas testing will be performed during purging at each sampling location (locations SSV-1 through SSV-8) to evaluate the integrity of the seals around the soil vapor sampling points. The tracer gas (helium) will provide a means to: (1) evaluate whether the sub-slab vapor samples could be diluted by surface air; and (2) determine if improvements to the seals might be needed prior to sampling. The tracer gas testing will be performed as illustrated in Figure 2.4(b) of the NYSDOH VI Guidance. The helium levels in the purge gas and inside the enclosure installed around the sampling point will be measured using a gas detector prior to and after purging. Improvements to the seals will be made, if needed, based on the results of real-time monitoring for helium.

Field duplicates will be collected in support of the VI Investigation at a frequency of one duplicate per 10 samples, with at least one duplicate per sample delivery group. Based on the total number of sub-slab vapor, indoor air, and ambient air samples to be collected as part of the VI investigation (8 sub-slab vapor samples, 8 indoor air samples, and 1 ambient air sample), two field duplicate samples will be collected and submitted for laboratory analysis for QA/QC purposes.

Equipment blanks and trip blanks will not be used for the proposed investigation for the following reasons:

- The tubing to be used for the sub-slab soil vapor sampling will be manufactured from laboratory- or food-grade quality inert material (i.e., Teflon® or fluoropolymer) that does not adsorb or off-gas VOCs. All vapor probe materials (e.g., sampling point, tubing, valves, and fittings) will be new, and the vapor probe will be purged prior to sampling so that any air that enters during handling/installation will be evacuated prior to sample collection. In the remote chance that the tubing were to be a source of VOCs in the soil vapor samples, this could be identified by comparing results from one location to the next [for similar levels of a particular constituent(s)].

- SUMMA® canister vacuum readings obtained prior to shipment and following laboratory receipt will be compared. If the vacuum readings prior to and following shipment are consistent, this will support that gases did not enter or escape from the canisters while in transit (i.e., there was no cross-contamination of VOCs or introduction of VOCs during shipping and handling).

### 2.5 Laboratory Analysis

The sub-slab vapor samples will be submitted to TestAmerica (TA) located in Burlington, Vermont for laboratory analysis for VOCs in accordance with United States Environmental Protection Agency (USEPA) Compendium Method TO-15. The indoor air and ambient air samples will be submitted to TA for analysis for VOCs in accordance with USEPA Compendium Low-Level Method TO-15. The VOC analyte list and associated detection limits are presented in Table 1. TestAmerica is certified in the State of New York to perform air sample analyses. Laboratory analysis will be performed on a standard turn-around for reporting of analytical results (i.e., approximately three weeks following sample collection). The deliverable package provided by the laboratory will include the following items:

- Chain of custody forms.
- Instrument run logs with time and date information.
- A case narrative describing any QC problems (i.e. initial calibration, continuing calibration, system blank contamination) encountered by the lab, or conversely, a statement saying that there were no QC problems. The case narrative shall include a written statement with regard to sample holding times from collection to analysis (30 days for SUMMA® canisters).
- Contract Laboratory Procedure (CLP) Form I sheets for each sample analyzed plus total/extracted ion chromatograms.
- CLP Form II, system monitoring compound (surrogate) recoveries.
- CLP Form IV, system, field and trip blanks, where applicable.
- CLP Form V, GC/MS instrument performance check for bromofluorobenzene.

- CLP Form VI, GC/MS initial calibration form.
- CLP Form VII, internal standard area and retention time summaries.
- Starting and ending vacuum/pressure readings of each sample canister. If the laboratory pressurizes the canisters during the sample analysis, it will apply the appropriate dilution factor. The information used by the laboratory to calculate the dilution factor will be presented in the laboratory analytical data report.

Matrix spike/matrix spike duplicate (MS/MSD) recoveries and relative percent differences (RPDs) are not included under USEPA Method TO-15. Results for laboratory control/laboratory control spike (LC/LCS) samples will instead be provided in accordance with the analytical method.

## 3. Reporting

Preliminary laboratory analytical results and a figure showing sampling locations will be provided to the NYSDEC, NYSDOH, and Simone within 48 hours following receipt of the data from the laboratory (before data are validated). A summary report will also be prepared following receipt of the analytical results. The report will include:

- A summary of work activities performed and analytical results obtained for the VI investigation.
- An identification of potential VOC sources observed during the building reconnaissance/product inventory and VI investigation.
- An evaluation of the sub-slab soil vapor and indoor air results, including comparisons to the decision matrices and indoor air guideline values presented in the NYSDOH VI Guidance. The indoor air guideline values are presented in Table 1.
- Data tables presenting validated laboratory analytical results.
- Figures showing the approximate ambient air, sub-slab vapor, and indoor air sampling locations and corresponding laboratory analytical results.
- Photographs of the Simone building complex and sampling in progress.
- Completed NYSDOH Indoor Air Quality Questionnaire and Building Inventory form with photographs of products, a table listing products identified during the building inventory and material safety data sheets (MSDSs) for the products.
- Sub-slab soil vapor and indoor/ambient air field sampling logs.
- A copy of the data validation report. Validation of the sub-slab soil vapor and indoor air analytical results will be performed in accordance with procedures in the USEPA National Functional Guidelines dated October 1999.
- A CD containing the full laboratory analytical data reports.
- Recommendations for follow-up sampling or no further action related to sub-slab soil vapor and indoor air, as appropriate.

## 4. Schedule

ARCADIS is prepared to implement the proposed sub-slab soil vapor and indoor air sampling activities shortly following NYSDEC/NYSDOH approval of this work plan and execution of an access agreement by Bayer and Simone. The proposed field activities will take approximately one week to complete. Preliminary laboratory analytical results for the sub-slab soil vapor and indoor air sampling activities will be available approximately three weeks following sampling. As indicated above, preliminary laboratory analytical results and a figure showing sampling locations will be provided to the NYSDEC, NYSDOH, and Simone within 48 hours following receipt of the data from the laboratory (before data are validated). Data validation is anticipated to be completed within approximately one month following receipt of the final laboratory analytical results. The summary letter report will be submitted to the NYSDEC, NYSDOH, and Simone within one month after the laboratory analytical results are validated.

**Table**

**TABLE 1**
**PROPOSED ANALYTE LIST AND REPORTING LIMITS**

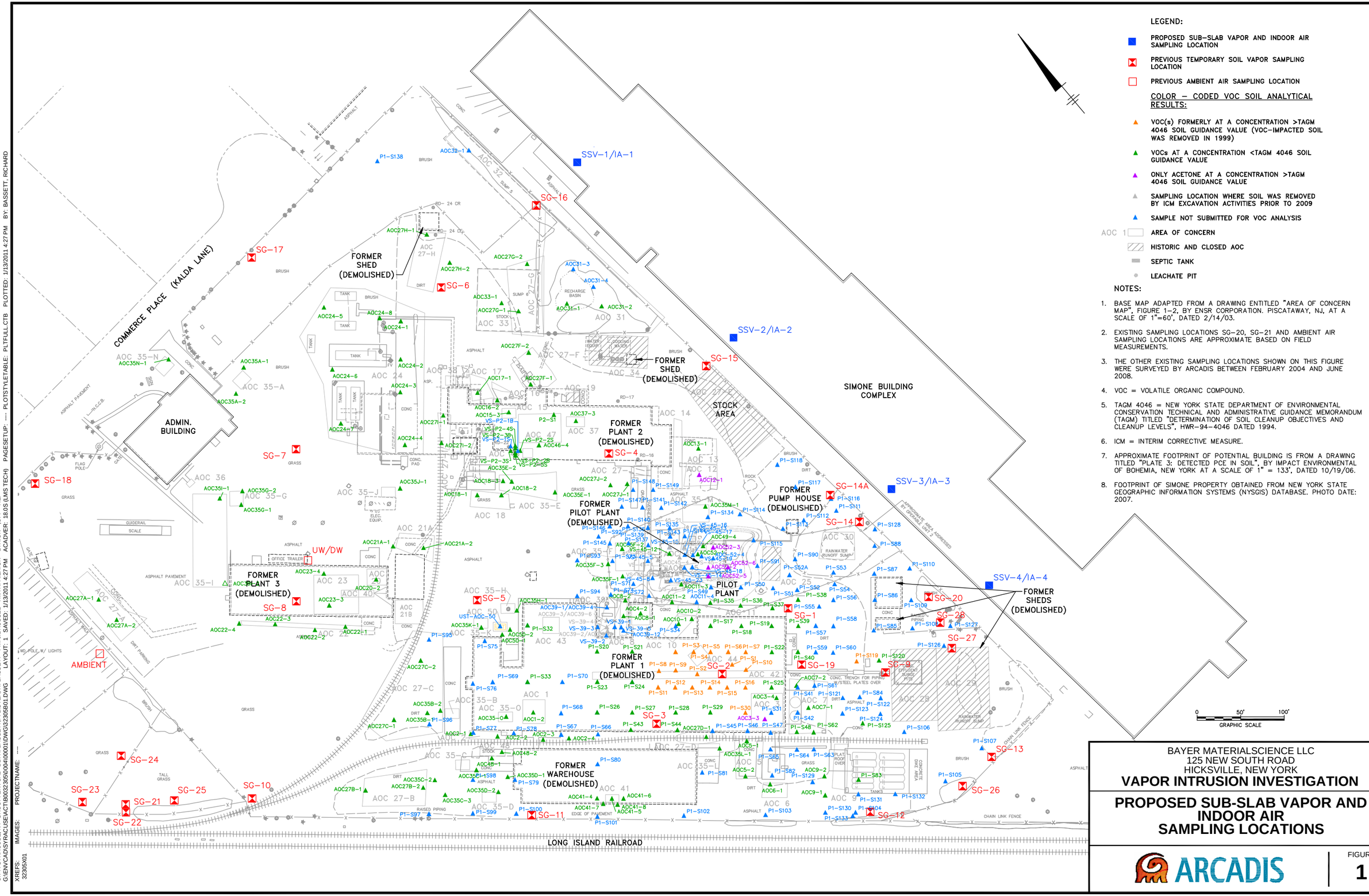
**SOIL VAPOR INVESTIGATION WORK PLAN**
**BAYER MATERIALSCIENCE LLC**
**125 NEW SOUTH ROAD**
**HICKSVILLE, NEW YORK**

| Compound | CAS Number | Reporting Limit | | | | NYSDOH Indoor Air Guideline Value ($\mu g/m^3$) | USEPA 90th Percentile Background Levels ($\mu g/m^3$) | |
|---|---|---|---|---|---|---|---|---|
| | | Soil Vapor/Sub-slab Soil Vapor | | Indoor Air/Ambient Air | | | | |
| | | (ppb v/v) | (µg/m3) | (ppb v/v) | (µg/m3) | | Indoor Air | Outdoor Air |
| Benzene | 71-43-2 | 0.2 | 0.64 | 0.04 | 0.13 | - - | 9.4 | 6.6 |
| Bromodichloromethane | 75-27-4 | 0.2 | 1.3 | 0.04 | 0.27 | - - | - - | - - |
| Bromoethene | 593-60-2 | 0.2 | 0.87 | 0.08 | 0.35 | - - | - - | - - |
| Bromoform | 75-25-2 | 0.2 | 2.1 | 0.04 | 0.41 | - - | - - | - - |
| Bromomethane (Methyl bromide) | 74-83-9 | 0.2 | 0.78 | 0.08 | 0.31 | - - | < 1.7 | < 1.6 |
| 1,3-Butadiene | 106-99-0 | 0.5 | 1.1 | 0.08 | 0.18 | - - | < 3.0 | < 3.4 |
| Carbon tetrachloride | 56-23-5 | 0.2 | 1.3 | 0.04 | 0.25 | - - | < 1.3 | 0.7 |
| Chloroethane | 75-00-3 | 0.5 | 1.3 | 0.08 | 0.21 | - - | < 1.1 | < 1.2 |
| Chloroform | 67-66-3 | 0.2 | 1.0 | 0.04 | 0.20 | - - | 1.1 | 0.6 |
| 3-Chloropropene (allyl chloride) | 107-05-1 | 0.5 | 1.6 | 0.08 | 0.25 | - - | - - | - - |
| Cyclohexane | 110-82-7 | 0.2 | 0.69 | 0.04 | 0.14 | - - | - - | - - |
| Dibromochloromethane | 124-48-1 | 0.2 | 2.0 | 0.04 | 0.40 | - - | - - | - - |
| 1,2-Dibromoethane | 106-93-4 | 0.2 | 1.5 | 0.04 | 0.31 | - - | < 1.5 | < 1.6 |
| Dichlorodifluoromethane (Freon 12) | 75-71-8 | 0.5 | 2.5 | 0.04 | 0.20 | - - | 16.5 | 8.1 |
| 1,1-Dichloroethane | 75-34-3 | 0.2 | 0.81 | 0.04 | 0.16 | - - | < 0.7 | < 0.6 |
| 1,2-Dichloroethane | 107-06-2 | 0.2 | 0.81 | 0.08 | 0.32 | - - | < 0.9 | < 0.8 |
| 1,1-Dichloroethene | 75-35-4 | 0.2 | 0.79 | 0.04 | 0.16 | - - | < 1.4 | < 1.4 |
| 1,2-Dichloroethene (cis) | 156-59-2 | 0.2 | 0.79 | 0.04 | 0.16 | - - | < 1.9 | < 1.8 |
| 1,2-Dichloroethene (trans) | 156-60-5 | 0.2 | 0.79 | 0.04 | 0.16 | - - | - - | - - |
| 1,2-Dichloropropane | 78-87-5 | 0.2 | 0.92 | 0.08 | 0.37 | - - | < 1.6 | < 1.6 |
| cis-1,3-Dichloropropene | 10061-01-5 | 0.2 | 0.91 | 0.04 | 0.18 | - - | < 2.3 | < 2.2 |
| trans-1,3-Dichloropropene | 10061-02-6 | 0.2 | 0.91 | 0.04 | 0.18 | - - | < 1.3 | < 1.4 |
| 1,2-Dichlorotetrafluoroethane (Freon 114) | 76-14-2 | 0.2 | 1.4 | 0.04 | 0.28 | - - | - - | - - |
| Ethylbenzene | 100-41-4 | 0.2 | 0.87 | 0.04 | 0.17 | - - | 5.7 | 3.5 |
| 4-Ethyltoluene (p-Ethyltoluene) | 622-96-8 | 0.2 | 1.0 | 0.04 | 0.20 | - - | 3.6 | 3 |
| n-Heptane | 142-82-5 | 0.2 | 0.83 | 0.04 | 0.17 | - - | - - | - - |
| n-Hexane | 110-54-3 | 0.5 | 1.8 | 0.08 | 0.28 | - - | 10.2 | 6.4 |
| Methylene chloride | 75-09-2 | 0.5 | 1.7 | 0.8 | 2.78 | 60 | 10 | 6.1 |
| MTBE (Methyl tert-butyl ether) | 1634-04-4 | 0.5 | 1.8 | 0.04 | 0.14 | - - | 11.5 | 6.2 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 0.2 | 1.4 | 0.04 | 0.27 | - - | - - | - - |
| Tetrachloroethene (PCE) | 127-18-4 | 0.2 | 1.4 | 0.04 | 0.27 | 100 | 15.9 | 6.5 |
| Toluene | 108-88-3 | 0.2 | 0.75 | 0.04 | 0.15 | - - | 43 | 33.7 |
| 1,1,1-Trichloroethane | 71-55-6 | 0.2 | 1.1 | 0.04 | 0.22 | - - | 20.6 | 2.6 |
| 1,1,2-Trichloroethane | 79-00-5 | 0.2 | 1.1 | 0.04 | 0.22 | - - | < 1.5 | < 1.6 |
| Trichloroethene (TCE) | 79-01-6 | 0.2 | 1.1 | 0.04 | 0.21 | 5 | 4.2 | 1.3 |
| Trichlorofluoromethane (Freon 11) | 75-69-4 | 0.2 | 1.1 | 0.04 | 0.22 | - - | 18.1 | 4.3 |
| 1,3,5-Trimethylbenzene | 108-67-8 | 0.2 | 1.0 | 0.08 | 0.39 | - - | 3.7 | 2.7 |
| 2,2,4-Trimethylpentane | 540-84-1 | 0.2 | 0.9 | 0.04 | 0.19 | - - | - - | - - |
| Vinyl chloride | 75-01-4 | 0.2 | 0.51 | 0.08 | 0.20 | - - | < 1.9 | < 1.8 |
| Xylenes (m&p) | 1330-20-7 | 0.5 | 2.2 | 0.08 | 0.35 | - - | 22.2 | 12.8 |
| Xylenes (o) | 95-47-6 | 0.2 | 0.87 | 0.04 | 0.17 | - - | 7.9 | 4.6 |

**Notes:**

1. Analyses to be performed by TestAmerica Laboratories of Burlington, Vermont using United States Environmental Protection Agency (USEPA) Method TO-15 (soil vapor and sub-slab soil vapor samples) and USEPA Low-Level Method TO-15 (indoor air and ambient air samples) for volatile organic compounds (VOCs).
2. CAS = Chemical Abstract Service.
3. ppb (v/v) = parts per billion volumetric basis.
4. $\mu g/m^3$ = micrograms per cubic meter.
5. -- = Not available.
6. New York State Department of Health (NYSDOH) Indoor Air Guideline Values are from Table 3.1 of the "Guidance for Evaluating Soil Vapor in the State of New York" (NYSDOH, October 2006).
7. USEPA Indoor Air Background Levels and USEPA Outdoor Air Background Levels are the 90th percentile of background air values observed by the USEPA in a study of public and commercial office buildings, per USEPA database information referenced in Section 3.2.4 of the "Guidance for Evaulating Soil Vapor Intrusion in the State of New York" (NYSDOH, October 2006).
8. Shading designates VOCs detected in soil samples previously collected at the site as part of the 2004 RCRA Facility Investigation, the 2005 Interim Corrective Measure, and the 2006 Phase I through Phase III pre-design soil sampling activities.

**Figure**




LEGEND:

- PROPOSED SUB-SLAB VAPOR AND INDOOR AIR SAMPLING LOCATION
- PREVIOUS TEMPORARY SOIL VAPOR SAMPLING LOCATION
- PREVIOUS AMBIENT AIR SAMPLING LOCATION

COLOR – CODED VOC SOIL ANALYTICAL RESULTS:

- VOC(s) FORMERLY AT A CONCENTRATION >TAGM 4046 SOIL GUIDANCE VALUE (VOC-IMPACTED SOIL WAS REMOVED IN 1999)
- VOCs AT A CONCENTRATION <TAGM 4046 SOIL GUIDANCE VALUE
- ONLY ACETONE AT A CONCENTRATION >TAGM 4046 SOIL GUIDANCE VALUE
- SAMPLING LOCATION WHERE SOIL WAS REMOVED BY ICM EXCAVATION ACTIVITIES PRIOR TO 2009
- SAMPLE NOT SUBMITTED FOR VOC ANALYSIS
- AOC 1 — AREA OF CONCERN
- HISTORIC AND CLOSED AOC
- SEPTIC TANK
- LEACHATE PIT

NOTES:

1. BASE MAP ADAPTED FROM A DRAWING ENTITLED "AREA OF CONCERN MAP", FIGURE 1-2, BY ENSR CORPORATION. PISCATAWAY, NJ, AT A SCALE OF 1"=60', DATED 2/14/03.
2. EXISTING SAMPLING LOCATIONS SG-20, SG-21 AND AMBIENT AIR SAMPLING LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.
3. THE OTHER EXISTING SAMPLING LOCATIONS SHOWN ON THIS FIGURE WERE SURVEYED BY ARCADIS BETWEEN FEBRUARY 2004 AND JUNE 2008.
4. VOC = VOLATILE ORGANIC COMPOUND.
5. TAGM 4046 = NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM (TAGM) TITLED "DETERMINATION OF SOIL CLEANUP OBJECTIVES AND CLEANUP LEVELS", HWR-94-4046 DATED 1994.
6. ICM = INTERIM CORRECTIVE MEASURE.
7. APPROXIMATE FOOTPRINT OF POTENTIAL BUILDING IS FROM A DRAWING TITLED "PLATE 3: DETECTED PCE IN SOIL", BY IMPACT ENVIRONMENTAL OF BOHEMIA, NEW YORK AT A SCALE OF 1" = 133', DATED 10/19/06.
8. FOOTPRINT OF SIMONE PROPERTY OBTAINED FROM NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS (NYSGIS) DATABASE. PHOTO DATE: 2007.

BAYER MATERIALSCIENCE LLC
125 NEW SOUTH ROAD
HICKSVILLE, NEW YORK

# VAPOR INTRUSION INVESTIGATION

## PROPOSED SUB-SLAB VAPOR AND INDOOR AIR SAMPLING LOCATIONS

ARCADIS

FIGURE 1

CITY: SYRACUSE, NY GROUP: ENVCAD DB: R. BASSETT, P. LISTER, R. BASSETT PM: J.BRUSSEL TM/TR: A.ENIGK LYR:ON=*;OFF=*REF* PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/13/2011 4:27 PM BY: BASSETT, RICHARD
G:\ENVCAD\SYRACUSE\ACTIB\32305\00040\00001\DWG\32305B01.DWG LAYOUT: 1 SAVED: 1/13/2011 4:27 PM ACADVER: 18.0S (LMS TECH)
PROJECTNAME: ----
IMAGES:
XREFS:
32305X01

ARCADIS

## Appendix A

New York State Department of Health
Indoor Air Quality Questionnaire and
Building Inventory Form

**NEW YORK STATE DEPARTMENT OF HEALTH**
**INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY**
**CENTER FOR ENVIRONMENTAL HEALTH**

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

**1. OCCUPANT:**

**Interviewed: Y / N**

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

**2. OWNER OR LANDLORD:** (Check if same as occupant ___ )

**Interviewed: Y / N**

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

**3. BUILDING CHARACTERISTICS**

**Type of Building:** (Circle appropriate response)

| | | |
|---|---|---|
| Residential | School | Commercial/Multi-use |
| Industrial | Church | Other: _____ |

**If the property is residential, type?** (Circle appropriate response)

| | | |
|---|---|---|
| Ranch | 2-Family | 3-Family |
| Raised Ranch | Split Level | Colonial |
| Cape Cod | Contemporary | Mobile Home |
| Duplex | Apartment House | Townhouses/Condos |
| Modular | Log Home | Other:_____ |

**If multiple units, how many?** _____

**If the property is commercial, type?**

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

**Other characteristics:**

Number of floors_____ Building age_____

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

## 4. AIRFLOW

**Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:**

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

**5. BASEMENT AND CONSTRUCTION CHARACTERISTICS** (Circle all that apply)

| | | | | |
|---|---|---|---|---|
| **a. Above grade construction:** | wood frame | concrete | stone | brick |
| **b. Basement type:** | full | crawlspace | slab | other _____ |
| **c. Basement floor:** | concrete | dirt | stone | other _____ |
| **d. Basement floor:** | uncovered | covered | covered with _____ | |
| **e. Concrete floor:** | unsealed | sealed | sealed with _____ | |
| **f. Foundation walls:** | poured | block | stone | other _____ |
| **g. Foundation walls:** | unsealed | sealed | sealed with _____ | |
| **h. The basement is:** | wet | damp | dry | moldy |
| **i. The basement is:** | finished | unfinished | partially finished | |
| **j. Sump present?** | Y / N | | | |
| **k. Water in sump?** | Y / N / not applicable | | | |

**Basement/Lowest level depth below grade:** _____(feet)

**Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)**

_____

_____

**6. HEATING, VENTING and AIR CONDITIONING** (Circle all that apply)

**Type of heating system(s) used in this building: (circle all that apply – note primary)**

| | | | |
|---|---|---|---|
| Hot air circulation | Heat pump | Hot water baseboard | |
| Space Heaters | Stream radiation | Radiant floor | |
| Electric baseboard | Wood stove | Outdoor wood boiler | Other _____ |

**The primary type of fuel used is**:

| | | |
|---|---|---|
| Natural Gas | Fuel Oil | Kerosene |
| Electric | Propane | Solar |
| Wood | Coal | |

**Domestic hot water tank fueled by:** _____

| | | | | |
|---|---|---|---|---|
| **Boiler/furnace located in:** | Basement | Outdoors | Main Floor | Other_____ |
| **Air conditioning:** | Central Air | Window units | Open Windows | None |

**Are there air distribution ducts present?** Y / N

**Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.**

_____

_____

_____

_____

## 7. OCCUPANCY

**Is basement/lowest level occupied?** Full-time Occasionally Seldom Almost Never

| **Level** | **General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)** |
|---|---|
| Basement | _____ |
| 1st Floor | _____ |
| 2nd Floor | _____ |
| 3rd Floor | _____ |
| 4th Floor | _____ |

## 8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

**a. Is there an attached garage?** Y / N

**b. Does the garage have a separate heating unit?** Y / N / NA

**c. Are petroleum-powered machines or vehicles stored in the garage** (e.g., lawnmower, atv, car) Y / N / NA Please specify_____

**d. Has the building ever had a fire?** Y / N When?_____

**e. Is a kerosene or unvented gas space heater present?** Y / N Where? _____

**f. Is there a workshop or hobby/craft area?** Y / N Where & Type? _____

**g. Is there smoking in the building?** Y / N How frequently? _____

**h. Have cleaning products been used recently?** Y / N When & Type? _____

**i. Have cosmetic products been used recently?** Y / N When & Type? _____

**j. Has painting/staining been done in the last 6 months?** Y / N Where & When? _____

**k. Is there new carpet, drapes or other textiles?** Y / N Where & When? _____

**l. Have air fresheners been used recently?** Y / N When & Type? _____

**m. Is there a kitchen exhaust fan?** Y / N If yes, where vented?_____

**n. Is there a bathroom exhaust fan?** Y / N If yes, where vented?_____

**o. Is there a clothes dryer?** Y / N If yes, is it vented outside? Y / N

**p. Has there been a pesticide application?** Y / N When & Type?_____

**Are there odors in the building?** Y / N
If yes, please describe: _____

**Do any of the building occupants use solvents at work?** Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

**Do any of the building occupants regularly use or work at a dry-cleaning service?** (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

**Is there a radon mitigation system for the building/structure?** Y / N Date of Installation: _____
**Is the system active or passive?** Active/Passive

**9. WATER AND SEWAGE**

| | | | | | |
|---|---|---|---|---|---|
| **Water Supply:** | Public Water | Drilled Well | Driven Well | Dug Well | Other: _____ |
| **Sewage Disposal:** | Public Sewer | Septic Tank | Leach Field | Dry Well | Other: _____ |

**10. RELOCATION INFORMATION (for oil spill residential emergency)**

**a. Provide reasons why relocation is recommended:** _____

**b. Residents choose to:** remain in home relocate to friends/family relocate to hotel/motel

**c. Responsibility for costs associated with reimbursement explained?** Y / N

**d. Relocation package provided and explained to residents?** Y / N

**11. FLOOR PLANS**

**Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.**

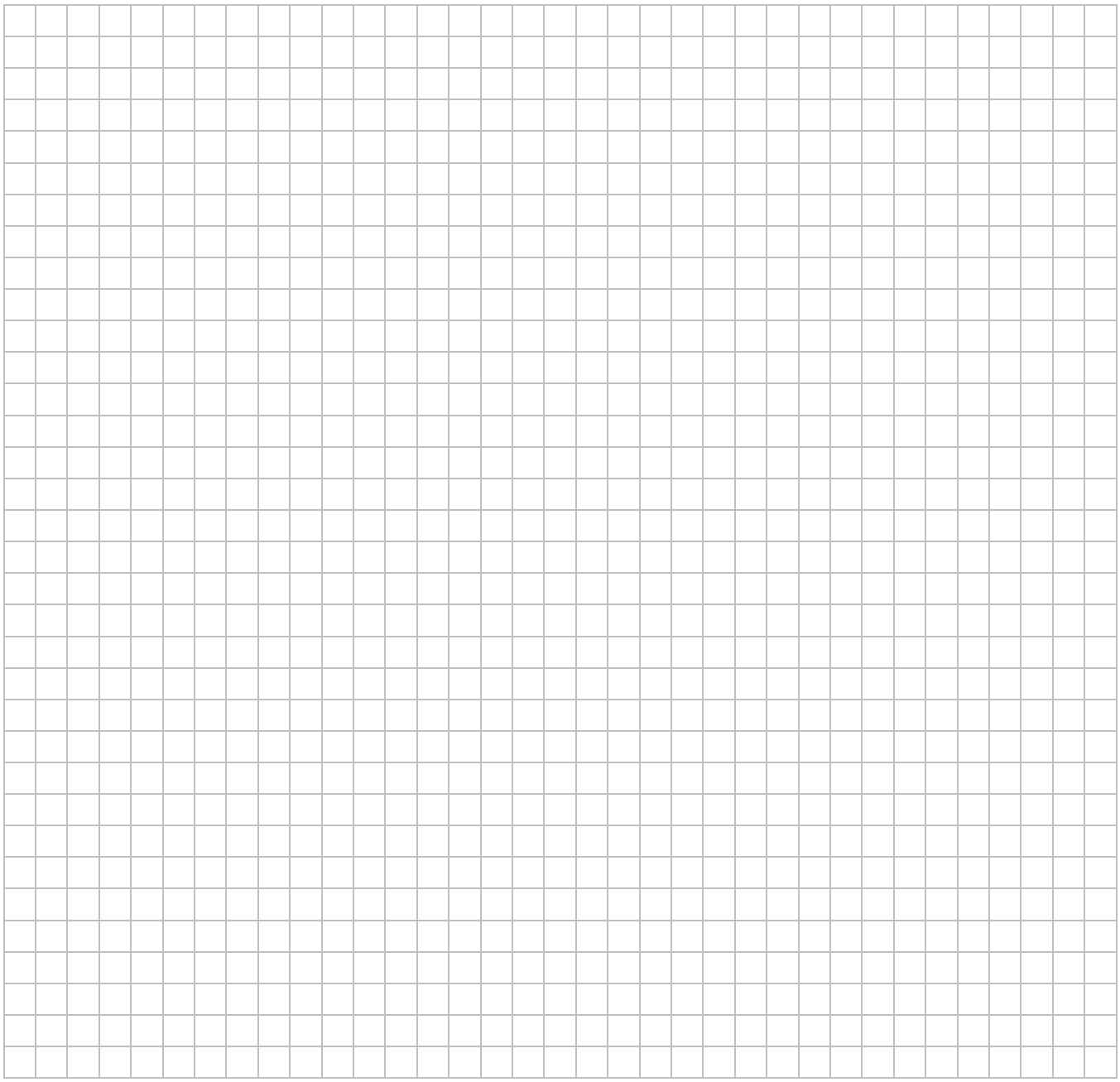
**Basement:**

**First Floor:**

**12. OUTDOOR PLOT**

**Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.**

**Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.**



**13. PRODUCT INVENTORY FORM**

**Make & Model of field instrument used: _____**

**List specific products found in the residence that have the potential to affect indoor air quality.**

| Location | Product Description | Size (units) | Condition* | Chemical Ingredients | Field Instrument Reading (units) | Photo** Y / N |
|---|---|---|---|---|---|---|
| | | | | | | |
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* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.