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Transmitted Via Federal Express

March 29, 2006

Mr. Girish Desai, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation
State University of New York at Stony Brook
Building 40
Stony Brook, NY 11790-2356

Re: Former Unisys Corporation
Great Neck, New York
NYSDEC Site No. 130045
Proposed Soil Vapor Intrusion Evaluation

Dear Mr. Desai:

This letter is submitted on behalf of Lockheed Martin Corporation (LMC) and presents a work plan for sampling indoor air and ambient air at the former Unisys Facility located in Great Neck, New York (the "Site"). The sampling activities described herein will determine if volatile organic compounds (VOCs) of interest are present in indoor air and evaluate the potential for soil vapor intrusion at the facility, currently owned by i.Park Lake Success, Inc.

Relevant background information is presented below, followed by a discussion of the proposed sampling activities and anticipated schedule.

Background

Between 1941 and 1998, activities at the site involved the design and manufacturing of a wide range of defense-related products. Manufacturing operations ceased in 1998, and a professional office park currently occupies the Site.

Soil vapor investigation activities began at the site in 1989. Soil vapor investigation activities implemented prior to 1996 are summarized in the *Phase I Remedial Investigation Report* prepared by H2M Associates, Inc. (December 1996) [the "Phase I RI Report"]. As indicated in the Phase I RI Report, initial soil vapor sampling focused on the southeast corner of the former Manufacturing Building (which was in operation at that time), an area consistent with the locations of five former dry wells, the potential source of VOC impacts. In September 1989, a total of 43 soil vapor samples were collected from 18 locations near the southeast corner of the former Manufacturing Building. Laboratory analytical results indicated the presence of tetrachloroethene (PCE) and trichloroethene (TCE) in the samples at concentrations ranging from 0.08 to 780 parts per billion by volume (ppbv). In February 1995, the southeast corner of the former Manufacturing Building was revisited as part of the RI, and an additional 29 soil vapor samples were collected. PCE, TCE and 1,2-dichlorethene (cis-1,2-DCE) were detected at several sampling locations. VOCs were detected at 14 of the 29 sampling locations, and total VOC concentrations ranged from 1 microgram per liter (µg/L) to 3,300 µg/L.

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In 1997, LMC retained TetraTech, Inc. ["TetraTech"] to plan and implement a soil vapor survey to assess the entire site and evaluate areas where solvents could potentially have been discharged during previous site operations. Soil vapor investigation activities implemented by TetraTech in 1997 are summarized in the *Soil Gas Survey Report* (September 1997). As indicated in the *Soil Gas Survey Report*, shallow soil vapor samples (i.e., 6 feet below ground surface [bgs]) were collected on a 100-foot grid from 255 locations outside the footprints of the former Manufacturing Building and outlying buildings. Soil vapor samples were also collected from 15 feet bgs at three of these locations. In addition, shallow soil vapor samples (i.e., 6 feet bgs) were collected at 9 locations within the footprint of the former Manufacturing Building. Nine VOCs were detected in the soil vapor samples, including chloroform, cis-1,2-DCE, ethylbenzene, methylene chloride, trichlorofluoromethane (TCFM), 1,1,2-trichloroethane (1,1,2-TCA), TCE, PCE, and m,p-xylene. TCE and PCE were detected with the greatest frequency, and the highest concentrations were found near the southeast corner of the former Manufacturing Building, the location of the five former dry wells. The remaining VOCs were detected in a limited number of samples collected at isolated locations. PCE and TCE were generally detected at concentrations 2- to 5-times greater than the concentrations of other VOCs. Laboratory analytical results for PCE and TCE are shown on Figures 4-2 and 4-3 of the *Soil Gas Survey Report*, respectively, which are included in Attachment A. The PCE and TCE soil vapor sampling results are also summarized in the table below.

Constituent/ Sampling Location	Number of Samples Where Constituent was Detected	Concentration Range (µg/L)	Location of Highest Concentration
PCE			
Inside Building Footprint	6 of 9	1.38 – 13.43	MBSG8
Outside Building Footprint	22 of 255	1.22 – 83.93	EPLSG26
TCE			
Inside Building Footprint	7 of 9	1.68 – 38.23	MBSG5
Outside Building Footprint	13 of 255	1.04 – 29.8	BLDGSG35

The detection of PCE and TCE during the 1997 soil vapor survey was consistent with the findings of previous soil vapor investigation activities suggesting that the VOC impacts are generally limited to the area near the southeast corner of the former Manufacturing Building.

In 1994, a soil vapor extraction (SVE) system was installed to address the VOC impacts identified near the southeast corner of the former Manufacturing Building. Details of the SVE system are presented in the *Soil Vapor Extraction System Evaluation* (TetraTech, March 1999). During 1999, in accordance with a Record of Decision (ROD) issued by the New York State Department of Environmental Conservation (NYSDEC), LMC upgraded the SVE system. Upgrades to the SVE system included the installation of three shallow vapor extraction points screened immediately above a low permeability layer (identified at depths between 28 and 48 feet bgs) and the installation of a perched water dewatering system. The purpose of the system upgrade was to remediate VOCs from shallow soils immediately above the low permeability unit. In addition, the SVE system upgrade served as an engineering control to preclude the migration of soil vapors in this area. ARCADIS G&M, Inc. (ARCADIS) was retained to plan and oversee construction of the SVE system upgrades.

In December 2001, the SVE system mechanical components were relocated as part of site redevelopment. During this timeframe, the NYSDEC requested that pre-relocation and post-relocation system operating data be collected. This included the collection of induced vacuum measurements at several locations in the vicinity of the southeast corner of the former Manufacturing Building. One of the primary goals for collection of this data was to demonstrate that the SVE system upgrades installed in 1999 were controlling the migration of soil vapors. A detailed discussion of site conditions following the SVE system upgrade/relocation and induced vacuum measurement collection is presented in the *System Operation, Maintenance, and Monitoring (OM&M) Report November 2001 – December 2002* prepared by ARCADIS. As summarized in the OM&M Report,

VOC-impacted soil near the southeast corner of the former Manufacturing Building is limited to an area outside of the building footprint, and the upgraded/relocated SVE system has generated negative pressure over the entire estimated impact area.

Based on the depth to groundwater in the vicinity of the Site (greater than 90 feet), it is unlikely that groundwater is the source of VOCs detected in shallow soil vapor at the Site. Soil and perched groundwater immediately above and within the low permeability layer are believed to be the source of VOCs in shallow soil vapor at the Site. The SVE system wells are screened a short distance above this low permeability layer and the SVE system is controlling the migration of vapors from the immediate vicinity of this layer.

Proposed Approach

To evaluate the potential for soil vapor migration into the facility located at the Site, four indoor air samples will be collected from four locations within the former Manufacturing Building (locations IA-1 through IA-4), and an indoor air sample will be collected from one location in the former Foundry Building (location IA-5), as shown on Figure 1. The sampling locations were selected to focus on potential migration pathways and VOC source areas (i.e., to provide data to evaluate potential "worst-case scenarios"), based on: (1) the results of previous investigation activities; and (2) Activity and Use Limitation (AUL) Areas identified during Resource Conservation and Recovery Act (RCRA) closure, as discussed in the *RCRA Closure Work Plan* (ARCADIS, February 2001) and the *RCRA Closure Report* (ARCADIS, March 2005). AUL areas where VOCs were suspected or detected have been selected for indoor air evaluation; areas designated as AULs for other reasons (e.g., metals impacts) have not been selected for indoor air evaluation. The rationale for each proposed sampling location is briefly summarized below.

- *Locations IA-1*: One indoor air sample will be collected in the vicinity of AUL Area 17 (the former Reclamation Room), based on elevated VOC concentrations identified in samples of residual material that was removed from a soil-bottom sump previously located in this area. For Quality Assurance/Quality Control (QA/QC) purposes, a blind duplicate sample will also be collected at the southeast sample location.

- *Location IA-2*: One indoor air sample will be collected in the vicinity of previous soil vapor sampling locations, based on elevated VOC concentrations identified in soil vapor samples collected by TetraTech in 1997 (as previously discussed in the background section of this work plan).

- *Location IA-3*: One indoor air sample will be collected in an area with no suspected VOC impacts, based on concerns raised by the current tenant.

- *Location IA-4*: One indoor air sample will be collected in the vicinity of AUL Area 11 (the former Photo Process Lab), based on potential VOC impacts beneath the slab in this area.

- *Location IA-5*: One indoor air sample will be collected in the vicinity of AUL Area 31 (the former Foundry Building Basement Sump) based on potential VOC impacts beneath the slab in this area.

In addition to the proposed indoor air sampling, one ambient air sample will be collected near the eastern side of the former Manufacturing Building (location AA-1) and one ambient air sample will be collected near the south side of the former Foundry Building (location AA-2), as shown on Figure 1. Ambient air sampling results will be taken into consideration in the evaluation of the potential vapor intrusion exposure pathway.

Prior to implementing sampling activities, a pre-sampling field reconnaissance will be performed with representatives from BBL, LMC, and other potentially interested parties (i.e., i.Park, NYSDEC, and New York State Department of Health [NYSDOH] representatives). BBL's representatives will mark the proposed sampling locations during the pre-sampling reconnaissance. Proposed sampling locations will be adjusted, as necessary, based on conditions observed during the pre-sampling reconnaissance. BBL representatives will also conduct the following:

- a VOC inventory of the proposed sampling areas to identify potential use of target VOCs that could result in the presence of background VOCs in indoor air;
- an integrity survey of the proposed sampling areas to evaluate the potential for VOC originating beneath the building slab (if any) to enter the building through cracks or other openings; and
- a preliminary air handling system evaluation to provide a qualitative understanding of the air handling system in the building to adequately ventilate indoor air.

The pre-sampling field reconnaissance visit will also include completing a NYSDOH Indoor Air Quality Questionnaire and Building Inventory (Appendix B of the NYSDOH *Draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York*), which is included as Attachment B to this letter.

Sample collection will be conducted the day following completion of the pre-sampling field reconnaissance and in a manner and time period to minimize disruptions to the tenants. Indoor air and ambient air sampling will be conducted concurrently.

Samples will be collected in accordance with BBL's standard operating procedures (SOPs). The SOPs for indoor air sample collection and ambient air sample collection are included as Attachments C and D to this letter, respectively. Samples will be analyzed in accordance with USEPA Compendium Method TO-15, titled "*Determination of VOCs In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS)*". As detailed in the SOPs, each sample will be collected using a 6-liter SUMMA® canister with an attached pre-set flow regulator. The laboratory will provide certified-clean canisters with an initial vacuum of approximately 26 inches of mercury (in. of Hg) for sample collection. Flow regulators for indoor and ambient air sampling will be pre-set by the laboratory to provide uniform sample collection over an approximate 8-hour sampling period. The valve on the SUMMA® canister will be closed when approximately 2 in. of Hg vacuum remains in the canister, leaving a vacuum in the canister as a means for the laboratory to verify the canister does not leak while in transit.

Samples will be submitted to Severn Trent Laboratories, Inc. (STL) located in Burlington, Vermont for laboratory analysis for chlorinated-VOCs identified during previous soil vapor sampling (i.e., chloroform, cis-1,2-DCE, methylene chloride, TCFM, 1,1,2-TCA, TCE, and PCE) in accordance with USEPA Compendium Method TO-15. STL – Burlington's detection limits for these constituents are listed in Table 1. STL is certified in the State of New York to perform air sample analyses. Laboratory analysis will be performed on a standard turnaround for reporting of analytical results (i.e., three to four weeks following sample collection).

Reporting

Following receipt of the laboratory analytical results, a summary letter report will be prepared for submittal to the NYSDEC/NYSDOH. The letter report will include:

- A summary of work activities performed and analytical results obtained for the indoor air and ambient air sampling;

- A conceptual site model, which uses the site-specific information collected (e.g., VOC inventory, integrity survey, preliminary air handling system evaluation, analytical data) in conjunction with the historical soil vapor information, to characterize the potential for vapor intrusion;
- Data tables presenting validated laboratory analytical results;
- Figures showing the sampling locations and corresponding laboratory analytical results; and
- Copies of the laboratory analytical data validation reports.

Schedule

Following NYSDEC approval, BBL will coordinate access with i.Park and current tenants of the office park (as necessary). The pre-sampling field reconnaissance activities will be implemented once appropriate access agreements are in place. Pre-sampling field reconnaissance is expected to take approximately one to two days to complete. Sampling would start after the pre-sampling field reconnaissance, and is expected to take approximately one to two days to complete. As indicated above, laboratory analytical results will be available approximately three to four weeks after sampling is completed. The summary letter report will be submitted to the NYSDEC within two months following receipt of analytical results.

We await your approval and are prepared to begin implementation of the proposed activities as discussed above. Please do not hesitate to contact me (tel: 516-328-0464 ext. 16, e-mail: SMORRIS@BBL-inc.com) or Ms. Susan B. Welt (tel: 315-446-2570 ext. 19506, e-mail: swelt@bbl-inc.com) if you have any questions or require additional information.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Scott A. Morris, P.E.
Senior Project Manager

CSA/csc
Enclosures
U:\CSC06\17362196Ltr.doc

cc: Ms. Tina Armstrong, Ph.D., Lockheed Martin Corporation
Ms. Deanna Ripstein, New York State Department of Health
Mr. Lowell McBurney, P.E., Blasland, Bouck & Lee, Inc.
Ms. Susan Welt, Blasland, Bouck & Lee, Inc.
Mr. Nicholas Valkenburg, ARCADIS

TABLE 1
TO-15 DETECTION LIMITS: STL - BURLINGTON

PROPOSED VAPOR INTRUSION EVALUATION
LOCKHEED MARTIN CORPORATION - FORMER UNISYS FACILITY
GREAT NECK, NEW YORK

Compound	CAS Number	Molecular Weigth	Reporting Limit (ppbv)	Reporting Limit ($\mu g/m^3$)
Chloroform	67-66-3	119.39	0.20	0.98
1,2-Dichloroethene (cis)	156-59-2	96.95	0.20	0.79
Methylene chloride	75-09-2	84.94	0.50	1.7
Tetrachloroethene (PCE)	127-18-4	165.85	0.20	1.4
1,1,2-Trichloroethane	79-00-5	133.42	0.20	1.1
Trichloroethene (TCE)	79-01-6	131.4	0.20	1.07
Trichlorofluoromethane (Freon 11)	75-69-4	137.38	0.20	1.1

Notes:
ppbv = parts per billion by volume.
$\mu g/m^3$ = micrograms per cubic meter

2. Butanone
Toluene
Xylenes

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Tetrachloroethene (PCE)	127-18-4	165.85	0.20	1.4
1,1,2-Trichloroethane	79-00-5	133.42	0.20	1.1
Trichloroethene (TCE)	79-01-6	131.4	0.20	1.07
Trichlorofluoromethane (Freon 11)	75-69-4	137.38	0.20	1.1

Notes:
ppbv = parts per billion by volume.
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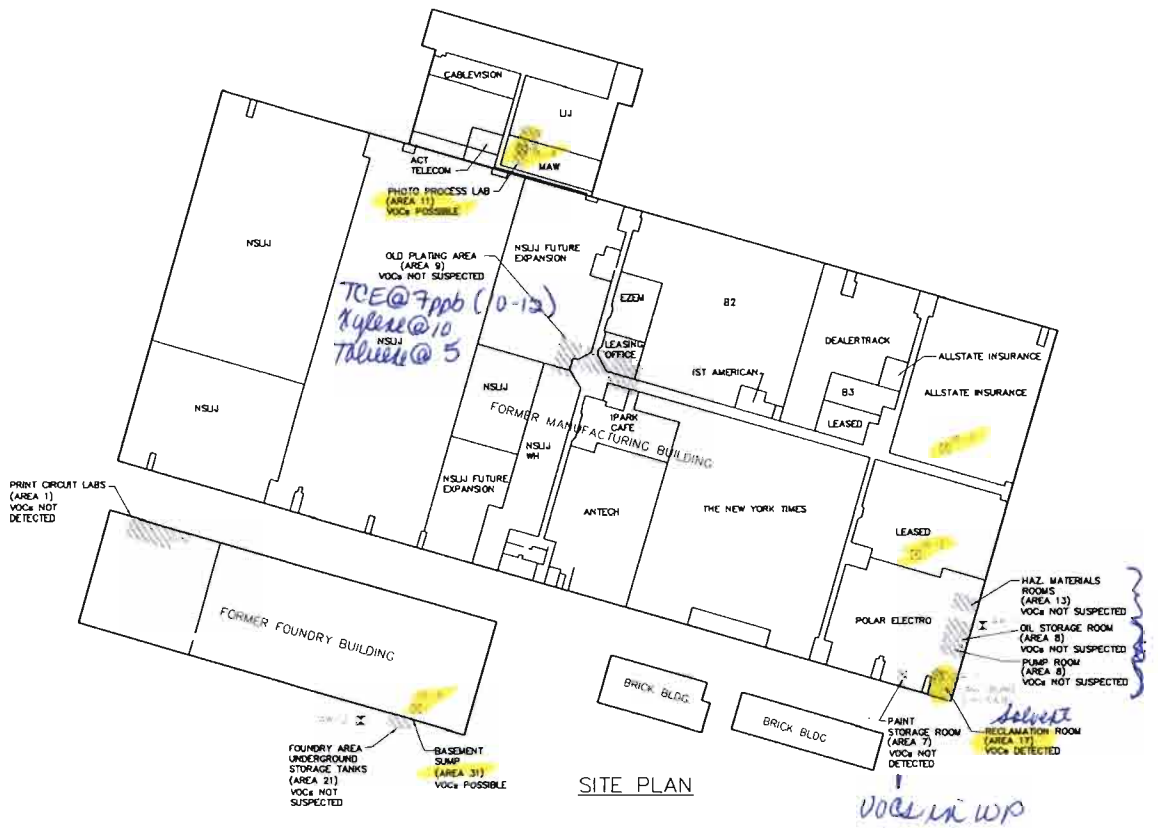


SITE PLAN

LEGEND:

PROPOSED INDOOR AIR SAMPLE

PROPOSED AMBIENT AIR SAMPLE

ACTIVITY USE LIMITATION AREA

NOTES:

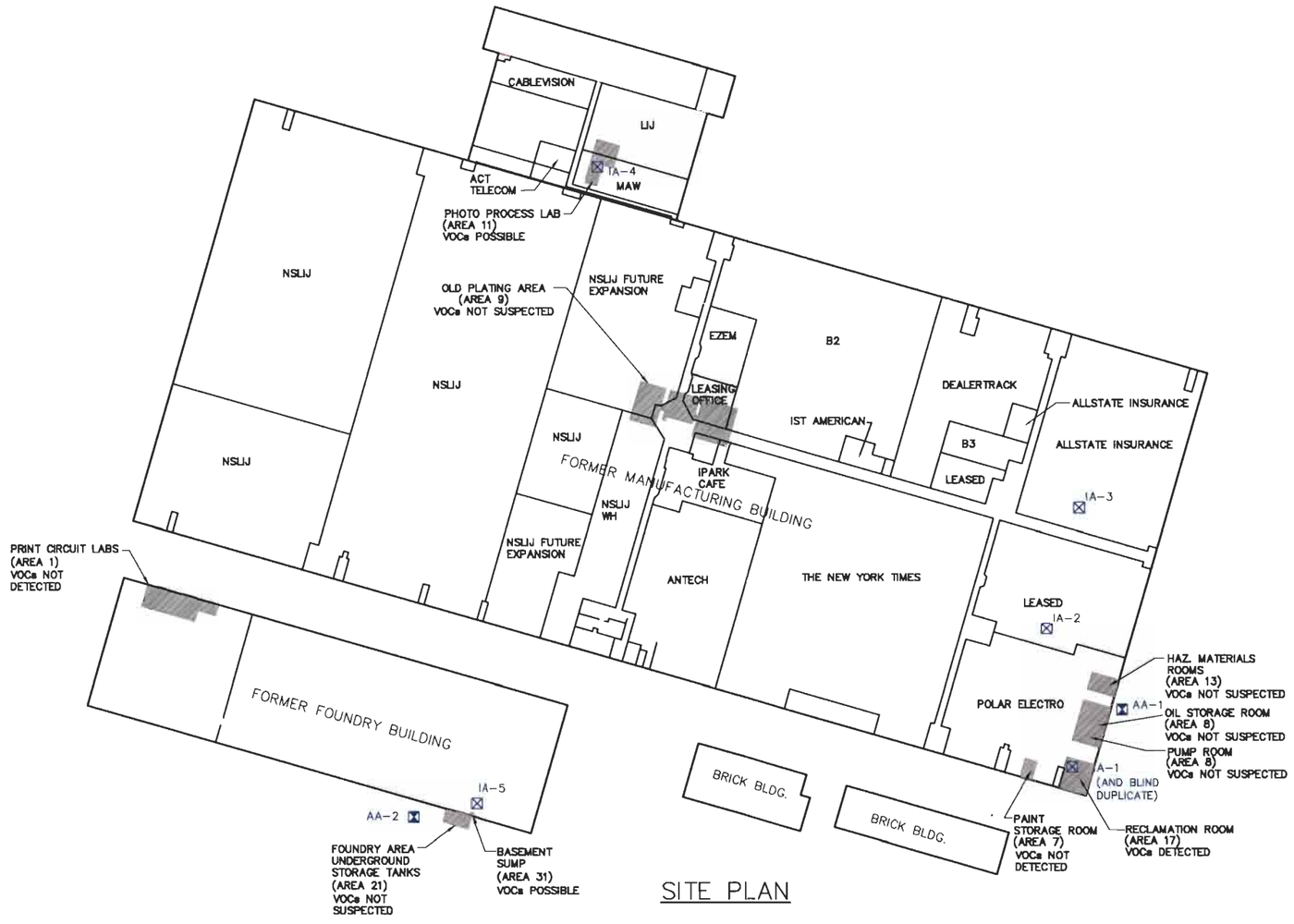
1. MAPPING IS BASED ON A DRAWING ENTITLED "LOCATION MAP OF AUL'S", DRAWING NUMBER 4 BY ARCADIS G&M, INC., DATED NOVEMBER 2, 2001.
2. LOCATION OF ACTIVITIES USE LIMITATION (AUL) AREAS IS ADAPTED FROM A DRAWING ENTITLED "ACTIVITIES USE LIMITATION AREAS", BY-SEAR BROWN, DATED MAY 15, 2001.
3. LAYOUT OF TENANT SPACES WITHIN THE BUILDINGS IS ADAPTED FROM A DRAWING ENTITLED "I.PARK LAKE SUCCESS, NSUJ BLOCK PLAN" BY THE PHILLIPS GROUP, DATED APRIL 7, 2005.

FORMER UNISYS FACILITY
GREAT NECK, NEW YORK

PROPOSED SAMPLING LOCATIONS

BBL BLASLAND BOUCK & LEE, INC. engineers, scientists, economists

FIGURE 1



SITE PLAN

LEGEND:

IA-3 — PROPOSED INDOOR AIR SAMPLE

AA-2 — PROPOSED AMBIENT AIR SAMPLE

ACTIVITY USE LIMITATION AREA

NOTES:

1. MAPPING IS BASED ON A DRAWING ENTITLED "LOCATION MAP OF AUL'S", DRAWING NUMBER 4 BY ARCADIS G&M, INC., DATED NOVEMBER 2, 2001.
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0 100' 200'
GRAPHIC SCALE

FORMER UNISYS FACILITY
GREAT NECK, NEW YORK

PROPOSED SAMPLING LOCATIONS

BBL BLASLAND, BOUCK & LEE, INC. engineers, scientists, economists

FIGURE 1

X: (XREF)
L: (LAYER)
P: PAGESET/PLT-DL
3/27/06 SYR-DIV85-RCB
38031006/38031B01.DWG

Attachment A

Soil Gas Survey Report (TetraTech, September 1997) – Figures 4-2 and 4-3

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FIGURE 4-2
TETRACHLOROETHENE (PCE)
ISOCONCENTRATION MAP

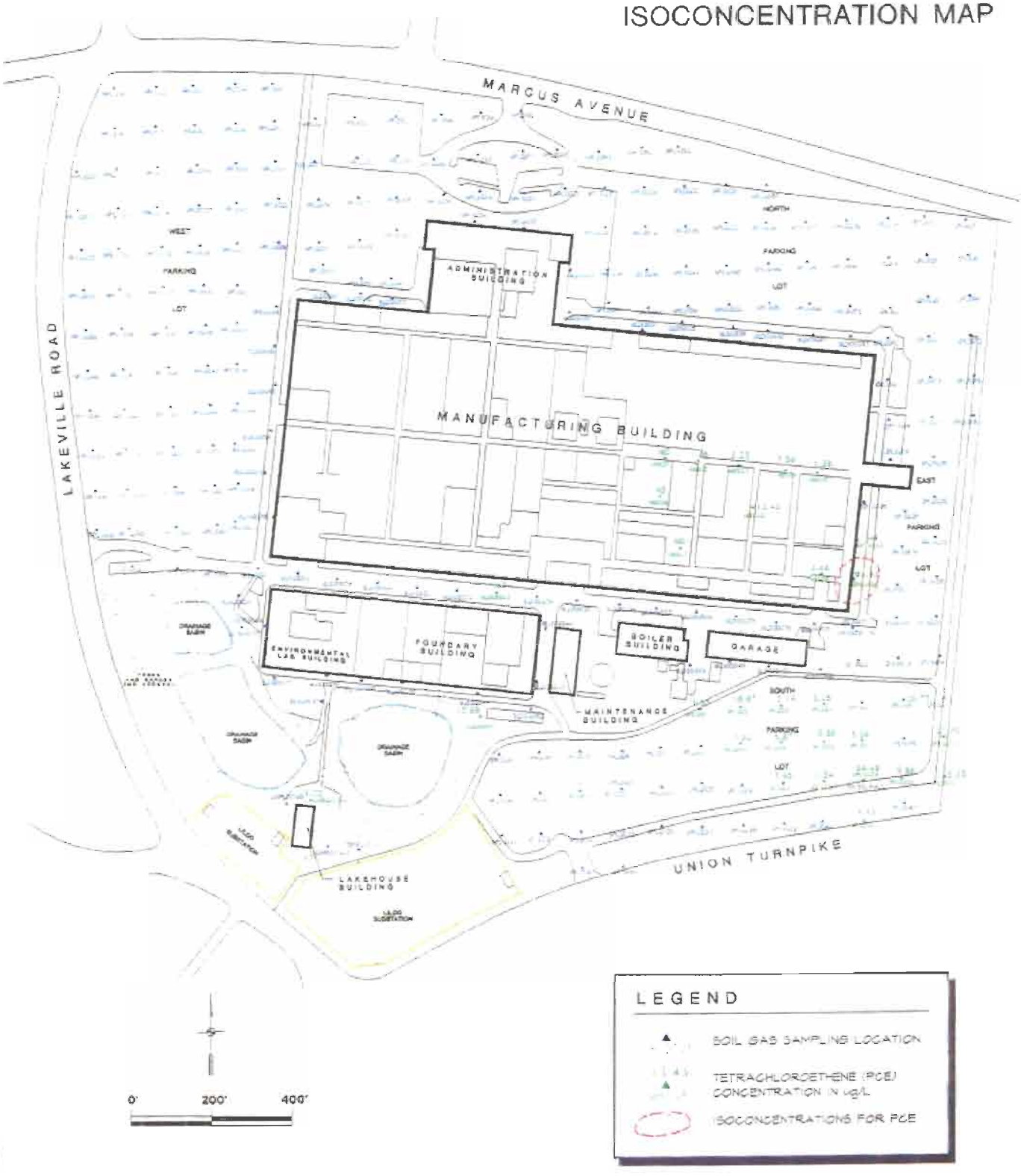
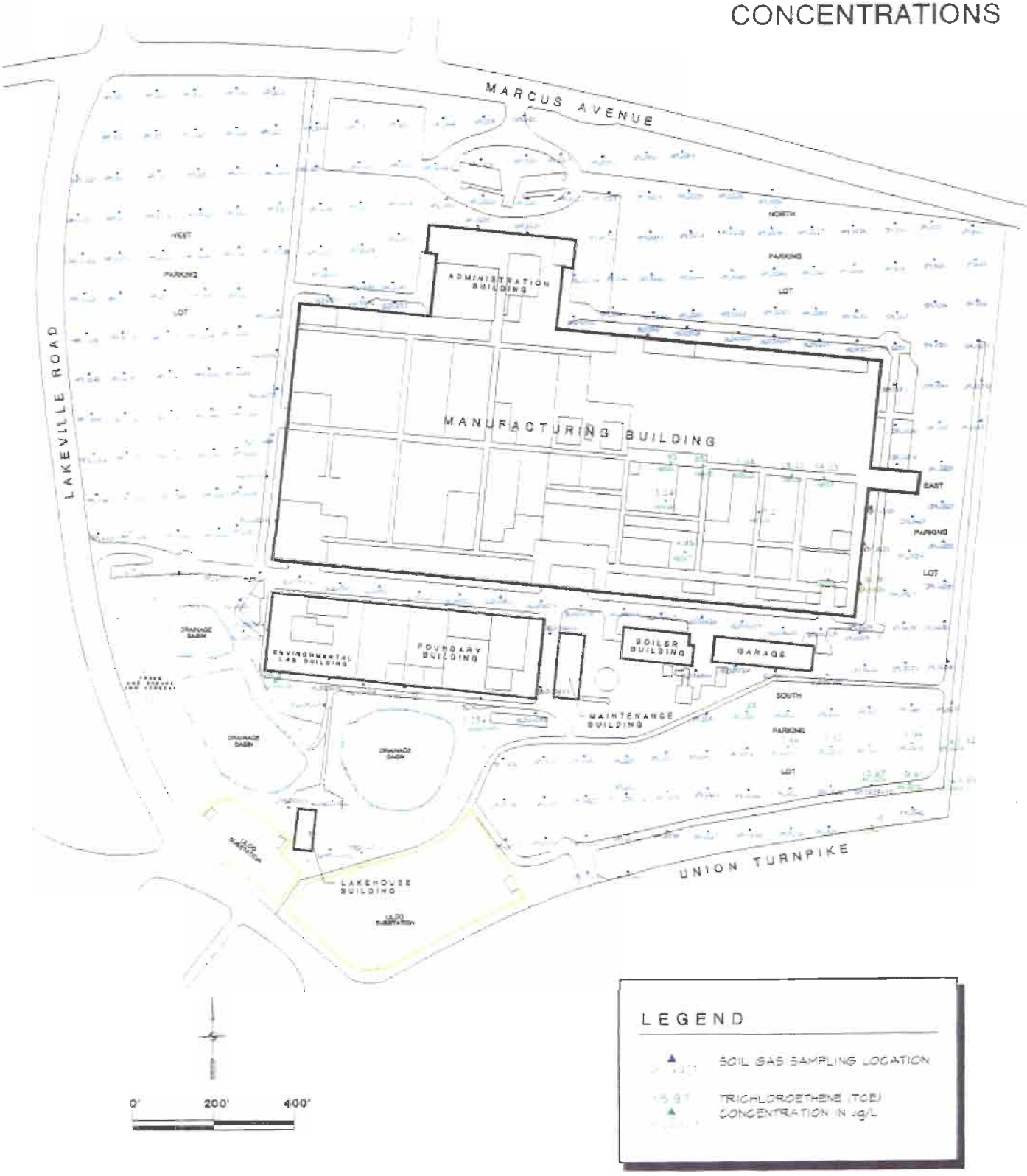


FIGURE 4-3
TRICHLOROETHENE (TCE) CONCENTRATIONS



Attachment B

Building Survey and Product Inventory Form

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Attachment B – Building Survey and Product Inventory Form

Directions: This form must be completed for each residence or area 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 / NA			

Basement/lowest level depth below grade: _____(feet)

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

_____

_____

Are the basement walls or floor sealed with waterproof paint or epoxy coatings? Y / N

6. HEATING, VENTILATING, 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 bas	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

General Use of Each Floor (e.g., family room, 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?_____

q. **Are there odors in the building?** Y / N

If yes, please describe: _____

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

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

Are there any Outside Contaminant Sources? (circle appropriate responses)

Contaminated site with 1000-foot radius? Y / N Specify _____

Other stationary sources nearby (e.g., gas stations, emission stacks, etc.): _____

_____

Heavy vehicle traffic nearby (or other mobile sources): _____

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

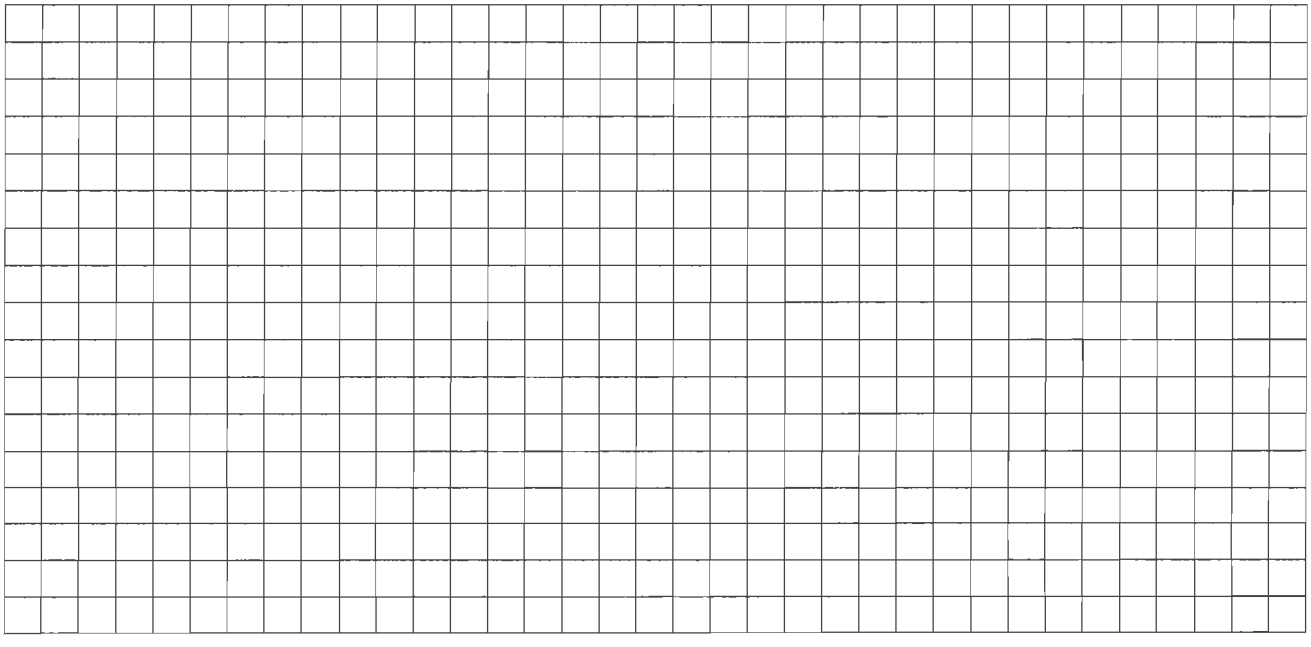
c. **Responsibility for costs associated with reimbursement explained?** Y / N

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

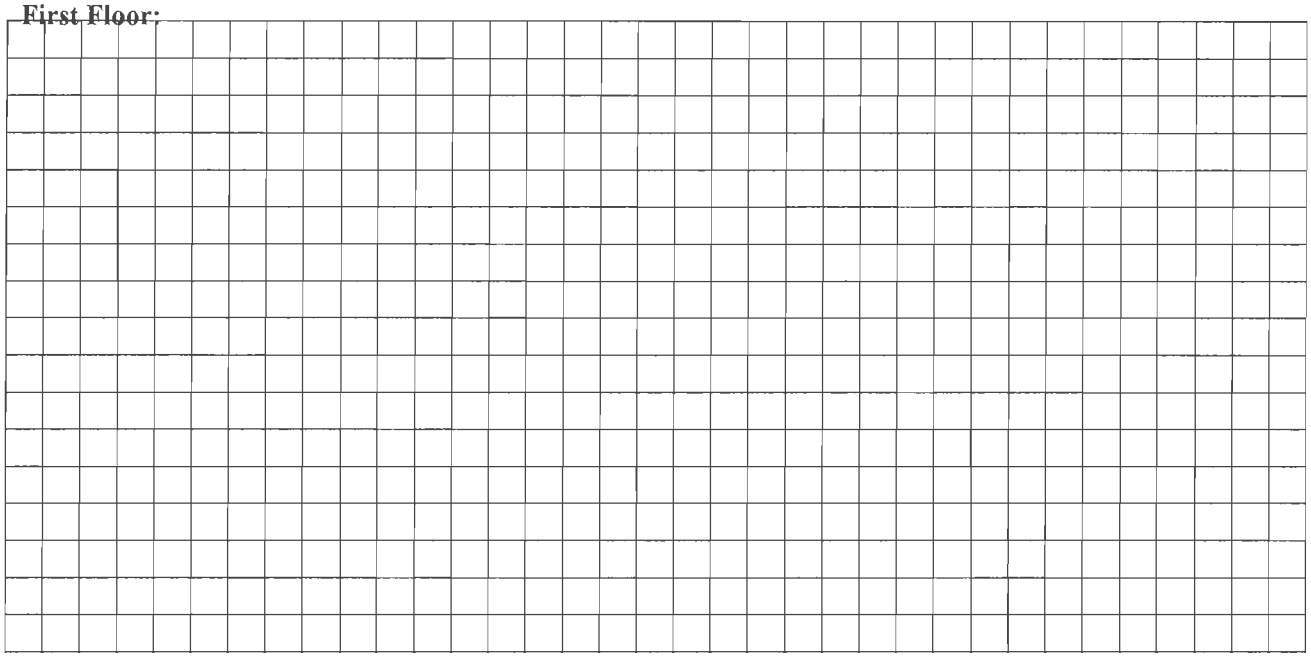
11. FLOOR PLANS

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:



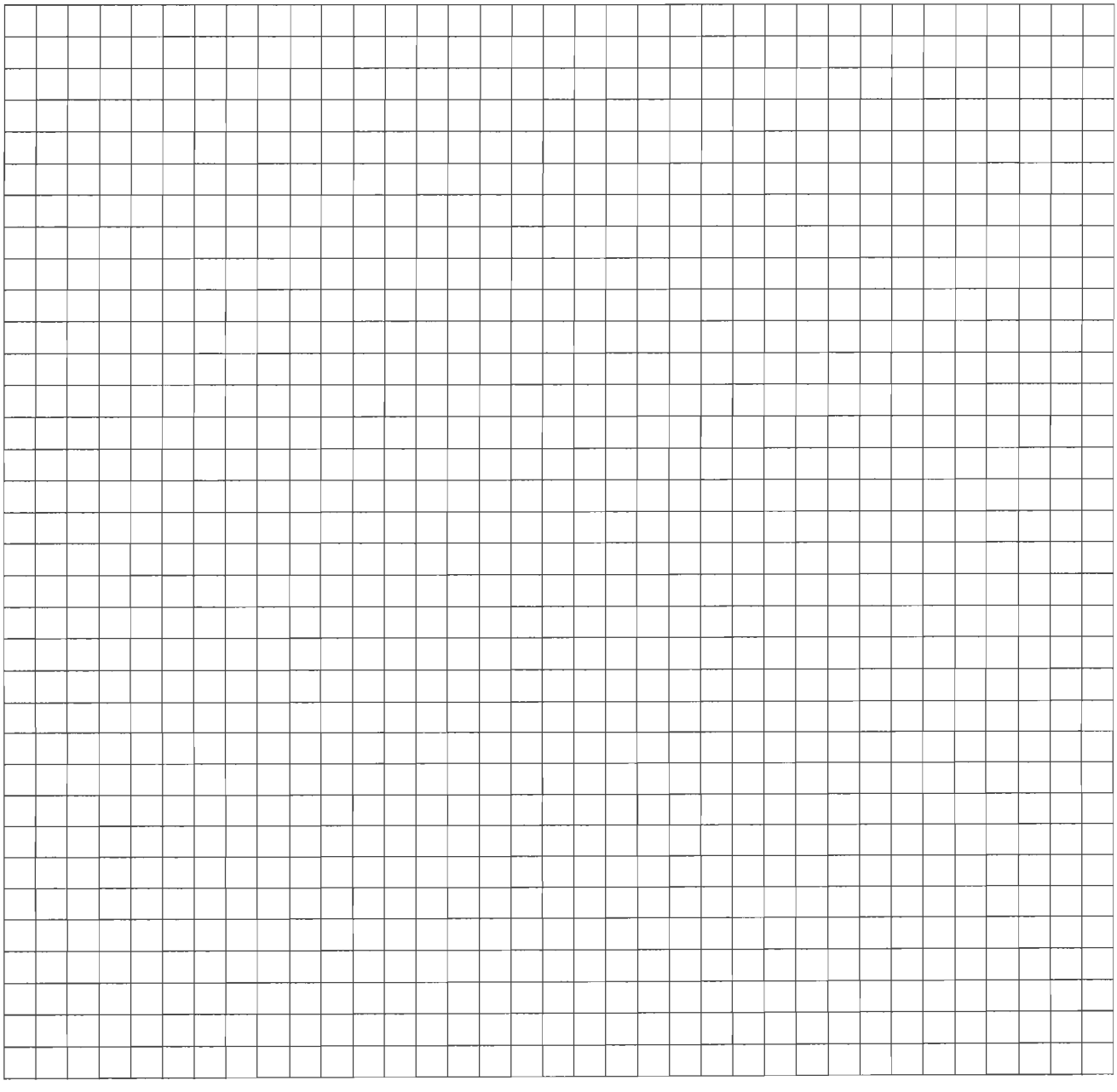
First Floor:



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 and Model of field instrument used: _____

List specific products found in the residence or area that have the potential to affect indoor air quality (e.g., gasoline or kerosene storage cans, glues, paints, cleaning solvents/products, polishes/waxes, new furniture/ carpet, nail polish/hairspray/cologne).

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y/N

14. SAMPLING INFORMATION

Sample Technician: _____ Phone number: ( ) _____ - _____

Sample Source: Indoor Air / Sub-Slab / Near Slab Soil Gas / Exterior Soil Gas

Sampler Type: Tedlar Bag / Sorbent / Stainless Steel Canister / Other (specify): _____

Analytical Method: TO-15 / TO-17 / Other: _____ Cert. Laboratory: _____

Sample Locations (floor, room):

Field ID # _____ - _____ Field ID # _____ - _____

Field ID # _____ - _____ Field ID # _____ - _____

If distributed to occupants prior to sampling event, were the state-specific "Instructions for Occupants" followed? *Yes / No*

If not, describe modifications: _____

15. METEOROLOGICAL CONDITIONS

Was there significant precipitation within 12 hours prior to (or during) the sampling event? *Yes / No*

Describe the general weather conditions: _____

_____

16. GENERAL OBSERVATIONS

Provide any information that may be pertinent to the sampling event and may assist in the data interpretation process.

_____

_____

_____

_____

Attachment C

BBL SOP: Indoor Air Sampling and Analysis

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Attachment C – Indoor Air Sampling and Analysis

I. Scope and Application

This standard operating procedure (SOP) describes the procedures to collect indoor air samples for the analysis of volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Method TO-15 (TO-15). The TO-15 method uses a 6-liter SUMMA® passivated stainless steel canister. An evacuated SUMMA® canister (<28 inches of mercury [Hg]) will provide a recoverable whole-gas sample of approximately 5.5 liters when allowed to fill to a vacuum of 2 inches of Hg. The whole-air sample is then analyzed for VOCs using a quadrupole or ion-trap gas chromatograph/mass spectrometer (GS/MS) system to provide compound detection limits of 0.5 parts per billion volume (ppbv).

The following sections list the necessary equipment and provide detailed instructions for placing the sampling device and collecting indoor air samples for VOC analysis.

II. Personnel Qualifications

BBL field sampling personnel will have current health and safety training, including 40-hour HAZWOPER training, site supervisor training, site-specific training, first aid, and cardiopulmonary resuscitation (CPR), as needed. BBL field sampling personnel will be well versed in the relevant SOPs and possess the required skills and experience necessary to successfully complete the desired field work. BBL personnel responsible for leading indoor air sample collection activities must have previous indoor air sampling experience.

III. Equipment List

The equipment required for indoor air sample collection is presented below:

- Photoionization detector (PID) with VOC detection limit capabilities in the ppb range;
- 6-liter, stainless steel SUMMA® canisters (order at least one extra, if feasible);
- Flow controllers with in-line particulate filters and vacuum gauges (flow controllers are pre-calibrated by the laboratory to a specified sample duration [e.g., 8-hour, 24-hour]). Confirm with lab that flow controller comes with in-line particulate filter and pressure gauge (order an extra set for each extra SUMMA® canister, if feasible);
- Stainless steel "T" fitting (for connection to SUMMA® canisters and Teflon® tubing to collect split [i.e., duplicate] samples);
- Appropriate-sized open-end wrench (typically 9/16-inch);
- Chain-of-custody (COC) form;
- Sampling summary form;
- Building survey and product inventory form (Attachment B);
- Field notebook;
- Camera;
- Lock and chain; and
- Ladder or similar to hold canister above the ground surface (optional).

IV. Cautions

Care must be taken to minimize the potential for introducing interferences during the sampling event. As such, care must be taken to keep the canister away from heavy pedestrian traffic areas (e.g., main entranceways, walkways). If the canister is not to be overseen for the entire sample duration, precautions should be taken to maintain the security of the sample (e.g., do not place in areas regularly accessed by the public, fasten the sampling device to a secure object using lock and chain, label the canister to indicate it is part of a scientific project, place the canister in secure housing that does not disrupt the integrity/validity of the sampling event). Sampling personnel should not handle hazardous substances (such as gasoline), permanent marking pens, wear/apply fragrances, or smoke cigarettes before and/or during the sampling event.

Care should also be taken to ensure that the flow controller is pre-calibrated to the proper sample collection time (confirm with laboratory). Sample integrity is maintained if the sampling event is shorter than the target duration, but sample integrity can be compromised if the event is extended to the point that the canister reaches atmospheric pressure.

V. Health and Safety Considerations

Field sampling equipment must be carefully handled to minimize the potential for injury and the spread of hazardous substances.

VI. Procedures

Initial Building Survey

1. Complete the appropriate building survey form and product inventory form (e.g., state-specific form or BBL form, Attachment B) at least 48 hours in advance of sample collection.

2. Survey the area for the apparent presence of items or materials that may potentially produce or emit constituents of concern and interfere with analytical laboratory analysis of the collected sample. Record relevant information on survey form and document with photographs.

3. Using the PID, screen indoor air in the location intended for sampling and the vicinity of potential VOC sources to preliminarily assess for the potential gross presence of VOCs.

4. Record date, time, location, and PID readings in the field notebook.

5. Items or materials that contain constituents of concern and/or exhibit elevated PID readings shall be considered probable sources of VOCs. Request approval of the owner or occupant to have these items removed at least 48 hours prior to sampling.

6. Set a time with the owner or occupant to return for placement of SUMMA® canisters.

Preparation of SUMMA®-Type Canister and Collection of Sample

1. Record the following information in the field notebook (contact the local airport or other suitable information source [e.g., weatherunderground.com] to obtain the following information):

   - Ambient temperature;
   - Barometric pressure; and
   - Relative humidity.

2. Choose the sample location in accordance with the sampling plan. If a breathing zone sample is required, place the canister on a ladder, tripod, or other similar stand to locate the canister orifice 3 to 5 feet above ground or floor surface. If the canister will not be overseen for the entire sampling period, secure the canister as appropriate (e.g., lock and chain). Canister may be affixed to wall/ceiling support with nylon rope or placed on a stable surface. In general, areas near windows, doors, air supply vents, and/or other potential sources of "drafts" shall be avoided.

3. Record SUMMA® canister serial number and flow controller number in the field notebook and COC. Assign sample identification on canister ID tag, and record in the field book, on the sampling summary form, and the COC.

4. Remove the brass dust cap from the SUMMA® canister. Attach the flow controller with in-line particulate filter and vacuum gauge (leave swage-lock cap on the vacuum gauge during this procedure) to the SUMMA® canister with the appropriate-sized wrench. Tighten with fingers first, then gently with the wrench.

5. Open the SUMMA® canister valve to initiate sample collection. Record the date and local time (24-hour basis) of valve opening in the field notebook, sampling summary form, and COC. Collection of duplicate/split samples will include attaching a stainless steel "T" to split the indoor air stream to two SUMMA® canisters, one for the original investigative sample and one for the duplicate/split sample.

6. Record the initial vacuum pressure in the SUMMA® canister in the field notebook and COC. If the initial vacuum pressure does not register less than -28 inches of Hg, then the SUMMA® canister is not appropriate for use and another canister should be used.

7. Take a photograph of the SUMMA® canister and surrounding area.

Termination of Sample Collection

1. Arrive at the SUMMA® canister location at least 10 to 15 minutes prior to the end of the sampling interval (e.g., 8-hour).

2. Stop collecting the sample when the canister vacuum reaches approximately 2 inches of Hg (leaving some vacuum in the canister provides a way to verify if the canister leaks before it reaches the laboratory) or when the desired sample time has elapsed.

3. Record the final vacuum pressure. Stop collecting the sample by closing the SUMMA® canister valve. Record the date, local time (24-hour basis) of valve closing in the field notebook, sampling summary form, and COC.

4. Remove the particulate filter and flow controller from the SUMMA® canister, re-install brass plug on canister fitting, and tighten with wrench.

5. Package the canister and flow controller in the shipping container supplied by the laboratory for return shipment to the laboratory. The SUMMA® canister does not require preservation with ice or refrigeration during shipment.

6. Complete the appropriate forms and sample labels as directed by the laboratory (e.g., affix card with string).

7. Complete COC and place requisite copies in shipping container. Close shipping container and affix custody seal to container closure. Ship to laboratory (via overnight carrier [e.g., Federal Express]) for analysis.

VII. Waste Management

No specific waste management procedures are required.

VIII. Data Recording and Management

PID measurements taken during the initial building survey will be recorded in the field notebook, with notations of project name, sample date, sample time, and sample location (e.g., description and GPS coordinates if available). A building survey form and product inventory form (Attachment B) will also be completed for each building within the facility being sampled during each sampling event.

Measurements will be recorded in the field notebook at the time of measurement, with notations of project name, sample date, sample start and finish times, sample location (e.g., description and GPS coordinates if available), canister serial number, flow controller number, initial vacuum reading, and final vacuum reading. Field notebooks and COC records will be transmitted to the Project Manager.

IX. Quality Assurance

Indoor air sample analysis will be performed using USEPA Method TO-15. This method uses a quadrupole or ion-trap GC/MS with a capillary column to provide optimum detection limits. The GC/MS system requires a 1-liter gas sample (which can easily be recovered from a 6-liter canister) to provide a 0.5 ppbv detection limit. The 6-liter canister also provides several additional 1-liter samples in case subsequent re-analyses or dilutions are required. This system also offers the advantage of the GC/MS detector, which confirms the identity of detected compounds by evaluating their mass spectra in either the SCAN or SIM mode.

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Indoor/Ambient Air Sample Collection Log

Sample ID:

Client:		**Outdoor/Indoor:**	
Project:		**Sample Intake Height**	
Location:		**Miscellaneous Equipment:**	
Project #:		**Time on/off:**	
Samplers:		**Subcontractor:**	

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F or C)	Relative Humidity (%)	Air Speed (ft/min)	Pressure Differential (inches of H20)	PID (ppm or ppb)

SUMMA Canister Information

Size (circle one): 1 L 6 L

Canister ID:
Flow
Controler ID: _____

General Observations/Notes:

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure and relative humidity via suitable information source (e.g., weatherunderground.com).

Attachment D

BBL SOP: Ambient Air Sampling and Analysis

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Attachment D – Ambient Air Sampling and Analysis

I. Scope and Application

This standard operating procedure (SOP) describes the procedures to collect ambient air samples for the analysis of volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Method TO-15 (TO-15). The TO-15 method uses a 6-liter SUMMA® passivated stainless steel canister. An evacuated SUMMA® canister (<28 inches of mercury [Hg]) will provide a recoverable whole-gas sample of approximately 5.5 liters when allowed to fill to a vacuum of 2 inches of Hg. The whole-air sample is then analyzed for VOCs using a quadrupole or ion-trap gas chromatograph/mass spectrometer (GS/MS) system to provide compound detection limits of 0.5 parts per billion volume (ppbv).

The following sections list the necessary equipment and provide detailed instructions for placing the sampling device and collecting ambient air samples for VOC analysis.

II. Personnel Qualifications

BBL field sampling personnel will have current health and safety training, including 40-hour HAZWOPER training, site supervisor training, site-specific training, first aid, and cardiopulmonary resuscitation (CPR), as needed. BBL field sampling personnel will be well versed in the relevant SOPs and possess the required skills and experience necessary to successfully complete the desired field work. BBL personnel responsible for leading ambient air sample collection activities must have previous ambient air sampling experience.

III. Equipment List

The equipment required for ambient air sample collection is presented below:

- 6-liter, stainless steel SUMMA® canisters (order at least one extra, if feasible);
- Flow controllers with in-line particulate filters and vacuum gauges (flow controllers are pre-calibrated by the laboratory to a specified sample duration [e.g., 8-hour]). Confirm with lab that flow controller comes with in-line particulate filter and pressure gauge (order an extra set for each extra SUMMA® canister, if feasible);
- Appropriate-sized open-end wrench (typically 9/16-inch);
- Chain-of-custody (COC) form;
- Field notebook;
- Sampling summary form;
- Camera;
- Lock and chain; and
- Ladder or similar to hold canister above the ground surface (optional).

IV. Cautions

Care must be taken to minimize the potential for introducing interferences during the sampling event. As such, care must be taken to keep the canister away from public roadways to prevent collection of automobile source pollutants (unless this is the objective of the study). Care must also be taken to keep the canister away from heavy pedestrian traffic areas (e.g., main entranceways, walkways). If the canister is not to be overseen for the entire sample duration, precautions should be taken to maintain the security of the sample (e.g., do not place in areas regularly accessed by the public, fasten the sampling device to a secure object using lock and chain, label the canister to indicate it is part of a scientific project, place the canister in secure housing that does not disrupt the integrity/validity of the sampling event). Sampling personnel should not handle hazardous substances (such as gasoline), permanent marking pens, wear/apply fragrances, or smoke cigarettes before and/or during the sampling event.

Care should also be taken to ensure that the flow controller is pre-calibrated to the proper sample collection time (confirm with laboratory). Sample integrity is maintained if the sampling event is shorter than the target duration, but sample integrity can be compromised if the event is extended to the point that the canister reaches atmospheric pressure.

V. Health and Safety Considerations

Field sampling equipment must be carefully handled to minimize the potential for injury and the spread of hazardous substances.

VI. Procedures

Preparation of SUMMA®-Type Canister and Collection of Sample

1. Record the following information in the field notebook (contact the local airport or other suitable information source [e.g., weatherunderground.com] to obtain the following information):

    - ambient temperature;
    - barometric pressure; and
    - relative humidity.

2. Choose the sample location in accordance with the sampling plan. If a breathing zone sample is required, place the canister on a ladder, tripod, or other similar stand to locate the canister orifice 3 to 5 feet above ground. If the canister will not be overseen for the entire sampling period, secure the canister as appropriate (e.g., lock and chain).

3. Record SUMMA® canister serial number and flow controller number in the field notebook and COC. Assign sample identification on canister ID tag and record in the field notebook, sampling summary form, and COC.

4. Remove the brass dust cap from the SUMMA® canister. Attach the flow controller with in-line particulate filter and vacuum gauge (leave swage-lock cap on the vacuum gauge during this procedure) to the SUMMA® canister with the appropriate wrench. Tighten with fingers first, then gently with the wrench.

5. Open the SUMMA® canister valve to initiate sample collection. Record the date and local time (24-hour basis) of valve opening in the field notebook, sampling summary form, and COC.

6. Record the initial vacuum pressure in the SUMMA® canister in the field notebook and COC. If the initial vacuum pressure does not register less than -28 inches of Hg, then the SUMMA® canister is not appropriate for use and another canister should be used.

7. Take a photograph of the SUMMA® canister and surrounding area.

Termination of Sample Collection

1. Arrive at the SUMMA® canister location at least 10 to 15 minutes prior to the end of the sampling interval (e.g., 8-hour).

2. Stop collecting the sample when the canister vacuum reaches approximately 2 inches of Hg (leaving some vacuum in the canister provides a way to verify if the canister leaks before it reaches the laboratory) or when the desired sample time has elapsed.

3. Record the final vacuum pressure. Stop collecting the sample by closing the SUMMA® canister valve. Record the date and local time (24-hour basis) of valve closing in the field notebook, sampling summary form, and COC.

4. Remove the particulate filter and flow controller from the SUMMA® canister, re-install brass plug on canister fitting, and tighten with wrench.

5. Package the canister and flow controller in the shipping container supplied by the laboratory for return shipment to the laboratory. The SUMMA® canister does not require preservation with ice or refrigeration during shipment.

6. Complete the appropriate forms and sample labels as directed by the laboratory (e.g., affix card with string).

7. Complete COC and place requisite copies in shipping container. Close shipping container and affix custody seal to container closure. Ship to laboratory (via overnight carrier [e.g., Federal Express]) for analysis.

VII. Waste Management

No specific waste management procedures are required.

VIII. Data Recording and Management

Measurements will be recorded in the field notebook at the time of measurement, with notations of project name, sample date, sample start and finish times, sample location (e.g., GPS coordinates if available), canister serial number, flow controller number, initial vacuum reading, and final vacuum reading. Field sampling summary forms and COC records will be transmitted to the Project Manager.

IX. Quality Assurance

Ambient air sample analysis will be performed using USEPA Method TO-15. This method uses a quadrupole or ion-trap GC/MS with a capillary column to provide optimum detection limits. The GC/MS system requires a 1-liter gas sample (which can easily be recovered from a 6-liter canister) to provide a 0.5 ppbv detection limit. The 6-liter canister also provides several additional 1-liter samples in case subsequent re-analyses or dilutions are required. This system also offers the advantage of the GC/MS detector, which confirms the identity of detected compounds by evaluating their mass spectra in either the SCAN or SIM mode.

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Indoor/Ambient Air Sample Collection Log

Sample ID:

Client:		**Outdoor/Indoor:**	
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Project #:		**Time on/off:**	
Samplers:		**Subcontractor:**	

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F or C)	Relative Humidity (%)	Air Speed (ft/min)	Pressure Differential (inches of H20)	PID (ppm or ppb)

SUMMA Canister Information

Size (circle one): 1 L 6 L

Canister ID:
Flow
Controler ID: _____

General Observations/Notes:

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure and relative humidity via suitable information source (e.g., weatherunderground.com).

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