8976 Wellington Road
Manassas, VA 20109

April 23, 2019

Jessica LaClair
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau E, 12th Floor
625 Broadway
Albany, New York 12233-7014

Re: Building 335 Data Summary Report
Former IBM East Fishkill Facility
Hopewell Junction, New York
NYSDEC Site No. 314054

Dear Ms. LaClair:

The enclosed document presents the findings of a vapor intrusion assessment conducted at Building 335, located at the former IBM East Fishkill Facility in Hopewell Junction, New York. Building 335 is currently owned by iPark East Fishkill LLC.

If you have any questions, please contact me at (703) 257-2583.

Sincerely yours,
International Business Machines Corporation

Dean W. Chartrand
Program Manager
Corporate Environmental Affairs

Enclosure

Cc:	Julia Kenney	NYSDOH	(w/enclosure via e-mail)
	Mike Buckley	iPark	(w/enclosure via e-mail)
	Carl Monheit	iPark	(w/enclosure via e-mail)
	Gary Marone	Global Foundries	(w/enclosure via e-mail)
	David Shea	Sanborn Head	(w/enclosure via e-mail)

SANBORN HEAD ENGINEERING

Building Trust. Engineering Success.

B335 DATA SUMMARY REPORT

Former IBM East Fishkill Facility
Hopewell Junction, New York

Corporate Environmental Affairs

Prepared for IBM Corporation
File No. 2999.06
April 2019

SANBORN HEAD ENGINEERING
Building Trust. Engineering Success.

20 Foundry Street
Concord, NH 03301

Dean Chartrand
IBM Corporate Environmental Affairs
8976 Wellington Road
Manassas, VA 20109

April 19, 2019
File No. 2999.06

Re: Building 335 Data Summary Report
Former IBM East Fishkill Facility
Hopewell Junction, New York
EPA ID No. NYD000707901, NYSDEC Site No. 314054

Dear Mr. Chartrand:

The enclosed report presents the findings of a vapor intrusion assessment conducted between November 2018 and February 2019 at Building 335 of the former IBM East Fishkill facility. Please contact us if you have any questions.

Very truly yours,
SANBORN, HEAD ENGINEERING, P.C.

David Shea, P.E.
President

JHS/DS: ds

Encl. B335 Data Summary Report

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SANBORN HEAD ENGINEERING
Building Trust. Engineering Success.

B335 DATA SUMMARY REPORT

Former IBM East Fishkill Facility
Hopewell Junction, New York

Prepared for
IBM Corporation

Corporate Environmental Affairs

Prepared by
Sanborn, Head Engineering, P.C.

File 2999.06
April 2019

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1.0 INTRODUCTION

This report presents the scope of work and results of a vapor intrusion (VI) assessment for Building 335 (B335) at the former IBM East Fishkill Facility in Hopewell Junction, New York (the site). B335 formerly housed IBM's tetrachloroethene (PCE) recycling plant for the facility. B335 has been owned by iPark East Fishkill LLC (also referred to as National Resources [NR]) since September 2017 and is reportedly unoccupied. A site location plan is provided as Figure 1, and the location of B335 is shown on the facility plan provided as Figure 2.

In summer of 2018, iPark expressed its intent to market B335 for lease. Therefore, IBM elected to proceed with an investigation of PCE presence in indoor air and subslab vapor. The work described herein was conducted on behalf of IBM by Sanborn, Head Engineering, PC (SHPC). The services performed and this report are subject to the standard limitations for this type of work, as described in Appendix A.

2.0 BACKGROUND INFORMATION

IBM owned the East Fishkill facility property until 2015, at which time the property was transferred to Global Foundries. Global Foundries subsequently subdivided the property into 8 lots and sold 6 lots to iPark in September 2017. The lot lines as of the date of this report are shown on Figure 2. B335 is located on Lot 7, which is owned by iPark East Fishkill LLC.

B335 formerly housed the facility's PCE recycling operations, and the building and its contents were decommissioned by IBM circa 2002. The scope of decommissioning is uncertain, but it included removal of all interior process equipment (further described in Section 2.2), pipes and ducts, and roof-top equipment. The building is currently a vacant empty shell and a portion of the Building is being used by iPark for storage of various materials and equipment. Photographs of the building exterior and interior are provided in the photograph log in Appendix B. The building is located within the Area C (or B330) Area of Concern (AOC) as identified in the site's Part 373 Hazardous Waste Management Permit.

B335 is a single-story building that was constructed in three phases, which are shown on Figure 3 as Original B335, Expansion 1, and Expansion 2. The original building is at the northeastern end and is built into the hillside that slopes up to B330C to the north and B338 to the east. It is uncertain in what year the original building was constructed. Expansion 1 was added onto the northwest side of the original building circa 1979-1980[1]. The original building and Expansion 1 were constructed of concrete walls and a concrete ceiling. Expansion 2 was constructed in 1982-1983[2] and was added onto the west side of the building for additional capacity. Expansion 2 was constructed of a combination of concrete and corrugated steel walls and a steel roof deck.

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[1] Drawing titled, "Support Building #335 Addition", Sheet A-4012, prepared by IBM Data Systems Division Facilities Engineering, dated 10/5/79.

[2] Drawing titled, "Perchlor Storage Tanks, As-Built Drawings", Sheet M-2011, prepared by IBM Data Systems Division Facilities Engineering, dated 7/1/83.

Air louvers are situated on the upper portion of the northwest and southeast exterior walls to allow fresh air to enter the building. In addition, several electric coil unit heaters are located near the ceiling, several of which can be activated with switches. No other heating, ventilation, and air conditioning (HVAC) is present in the building.

2.1 Hydrogeology

Based on information provided in the most recent site Annual Corrective Action Status Report[3], overburden groundwater (also referred to as soil groundwater) is present at a depth of approximately 15 feet below ground surface (bgs) near the building. Based on logs for borings advanced near the building, the building is underlain by approximately 40 feet of glacial till, which is underlain by dolomite.

PCE was detected at a concentration of 2.5 micrograms per liter (µg/L), or parts per billion (ppb), in a sample of groundwater collected in 2017 from the nearest overburden monitoring well located just to the south of B335 (well #756). PCE was detected at a concentration of 2,700 ppb in a sample of bedrock groundwater collected in 2017 from a monitoring well located just to the west of B335 (well #607).

2.2 Former Building Processes

Five PCE aboveground storage tanks (ASTs) were located within B335 after both expansions were complete: two 10,000-gallon clean PCE ASTs; one 10,000-gallon spent PCE AST, and two 5,000-gallon PCE ASTs. Based on information provided by a former site worker, spent PCE was piped to a series of stills where PCE was boiled off and re-condensed to remove the impurities. The condensed liquid went through a water separator, and the effluent PCE went to the clean PCE tanks. Exhaust from the stills was treated through activated carbon units, with waste condensate from the exhaust collected in a pit near the carbon beds. The waste condensate was then pumped back through the still system. Sludge from the still bottoms was reportedly shoveled out and trucked away for disposal. Refer to Figure 3 for the approximate location of the tanks and equipment.

2.3 Potential PCE Sources and Transport Mechanisms to Indoor Air

Potential sources for PCE presence in soil, groundwater, and soil vapor resulting from B335 operations include interior subsurface pits, interior subsurface PCE drain lines associated with the stills, and spillage of PCE inside the building. Anecdotal information suggests that at least one PCE spill occurred onto the floor due to overflowing of the stills in the northern portion of the building.

PCE was detected at a concentration of 560 µg/m^3 in a grab sample of indoor air collected using a SUMMA® canister from the center of the building in November 2018. The sources and mechanisms by which PCE reaches indoor air is important because of the implications for selecting an effective mitigation approach. The three primary sources and transport mechanisms for PCE presence in indoor air include: off-gassing (volatilization) of PCE

[3] Groundwater Sciences Corporation and IBM, "2017 Annual Corrective Action Status Report, Former IBM East Fishkill Facility, Town of East Fishkill, Dutchess County, New York, NYSDEC Site No. 314054, EPA ID No. NYD000707901", dated May 30, 2018.

sorbed in concrete building materials, VI of PCE-containing soil vapor by diffusion through the concrete floors and walls, and VI of PCE-containing soil vapor by pressure gradient-driven advective flow through the building envelope. Exhibit 2-1 provides a conceptual schematic of these three transport mechanisms in a building with historical interior spills to the concrete floor, and a release from a subgrade pipe.

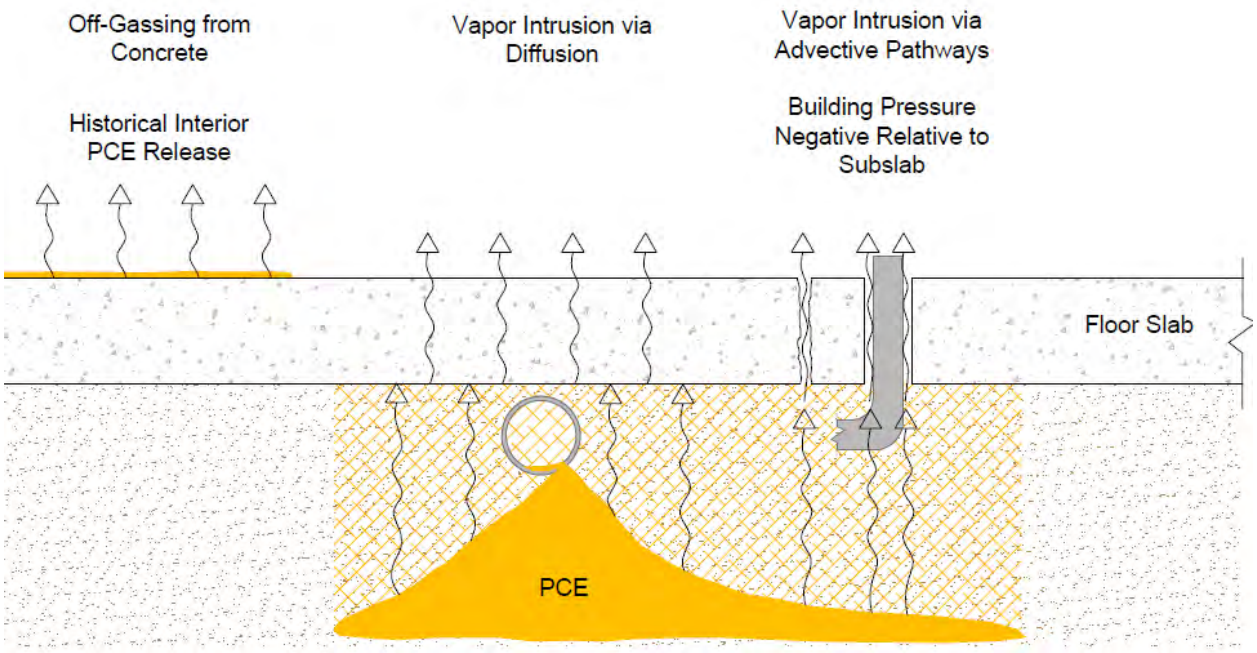


Exhibit 2-1: Conceptual Schematic of Transport Mechanisms of PCE to Indoor Air

Off-gassing and VI by diffusion are driven by a concentration gradient, meaning that contamination moves from an area of high to low concentrations. VI by advection is driven by pressure gradients, meaning that contamination moves from an area of higher to lower pressure.

In addition to the previously-discussed sources, PCE in indoor air may sorb into the concrete floor, walls, and ceiling over time, and then eventually back-diffuse (off-gas) into the building.

3.0 VAPOR INTRUSION ASSESSMENT

A VI assessment was completed in B335 with the following objectives:

- To evaluate the impacts to indoor air (IA) and subslab vapor (SSV) related to the building's former use as the facility's PCE recycling plant;
- To evaluate the transport mechanisms of PCE to indoor air (i.e., off-gassing, VI by diffusion, VI by advection);
- To assess the suitability of the building for occupancy under current conditions; and
- To assess the feasibility of mitigating impacts to indoor air.

Exhibit 3-1 summarizes the testing methods employed and corresponding project objectives for the VI assessment. A description and the results of each testing method are provided in the following sections. Exploration locations are shown on Figure 4.

Exhibit 3-1: Testing Methods and Project Objectives

Testing Method	Assess IA	Assess SSV	Transport Mechanism			Suitability for Occupancy	Feasibility of Mitigation
			Off-Gassing	VI - Diffusion	VI - Advection		
Indoor Air Grab Sample	√					√	
Passive Diffusion Sampling	√		√	√			√
Building Pressure Testing and Indoor Air Screening	√	√	√	√	√	√	√
Subslab Vapor Sampling		√		√	√	√	
Flux Testing	√		√	√			√

3.1 Indoor Air Grab Sample - Scope of Work and Results

One indoor air grab sample (IAB335-Grab) was collected on November 7, 2018 to obtain a discrete snapshot of site-related VOCs in the building air. The sample was collected over a period of approximately 1 minute into a 6-L SUMMA canister and submitted to Eurofins Air Toxics, Inc. (EATI) of Folsom, California for analysis of the site-specific analyte list by USEPA Method TO-15 in select ion monitoring (SIM)/full scan mode.

At the time of sampling, the building had been generally closed-up for some time, and the air louvers were partially closed, resulting in limited air exchange. TCE and PCE were detected in the sample at concentrations of 1.8 and 560 µg/m^3, respectively. A summary of results, including other compounds, is provided in Table 1. The laboratory analytical report is included in Appendix C.1.

3.2 Passive Diffusion Sampling

Passive diffusion samples were collected in November 2018 to assess the potential for off-gassing and VI by diffusion from the concrete floor slab. Photographs of the passive samplers are included in Appendix B.

3.2.1 Scope of Work

Passive samples were obtained using Assay Technology's 566 Organic Vapor Monitor, which contains a charcoal insert for sample collection over time. The passive diffusion samplers were placed at 11 locations on the concrete floor as shown on Figure 4, with the sorbent facing down toward the concrete. The samplers were placed uniformly in the building to provide general building coverage.

The samplers were deployed on November 26, 2018 for a period of approximately 43 hours (~1.8 days). Passive samplers were submitted to SGS Galson of East Syracuse, NY (SGS) for analysis of TCE and PCE using modified NIOSH Method 1022.

3.2.2 Results

The passive diffusion sample results for PCE are presented on Figure 5, and the lab reports are included in Appendix C.2. TCE was not detected above the reporting limit at any of the sample locations.

PCE was detected in each of the samples at concentrations ranging from 300 to 620 µg/m^3. PCE isopleths are shown on Figure 5. The highest concentrations of PCE (600 µg/m^3 and greater) were detected on the north and northeast side of the building near the former still area and the approximate vicinity of at least one former PCE spill to the floor. Concentrations decreased to the south and west in the area where less PCE handling occurred.

The passive sampler results suggest:

- Off-gassing and VI by diffusion are likely contributing to PCE concentrations in indoor air; and
- The highest concentration of PCE sorbed to the concrete floor slab and/or beneath the floor slab is in the northeast area of the building near the former stills and PCE spill to the floor.

3.3 Building Pressure Testing and Indoor Air Screening

Building pressure testing and indoor air screening was completed between December 5 and 7, 2018. The purpose of the testing was to identify the transport mechanisms by which PCE is entering indoor air (i.e., off-gassing, VI by diffusion, VI by advection). Photographs of the general set-up for pressure testing are included in Appendix B.

3.3.1 Scope of Work

Indoor air screening was conducted with the building at varying pressures relative to the building exterior to assess transport mechanisms of PCE to indoor air. With the building at a positive pressure relative to the subslab, VI by advective pathways is theoretically cut off. Increases in PCE in indoor air when the building is under a positive pressure can be attributed to off-gassing of PCE from the concrete floors or walls, or by diffusion of PCE through the floor slab. Conversely, with the building under negative pressure relative to the subslab, VI by advective pathways is theoretically enhanced. An increase in PCE in indoor air when the building is under negative pressure would indicate VI is occurring by the advective pathway.

A gas chromatograph with an electron capture detector (GC-ECD) was set up in B335 to sample and analyze indoor air for PCE and TCE at six locations (IA335-001 through IA335-006 on Figure 4) for the duration of the testing. The GC-ECD collected and analyzed an indoor air sample every 10 minutes, rotating through the 6 locations on a continuous basis, resulting in approximately one reading per hour at each location. Two GC-ECD split

samples were collected using SUMMA® canisters and submitted for laboratory analysis for quality assurance/quality control (QA/QC) purposes.

Three differential pressure (DP) transducers were set up in the doorways to measure and record the pressure differential between the interior and exterior of the building. Measurements were collected for the duration of the testing.

Up to three 36-inch-diameter air circulating floor fans were placed in exterior doorways to either transfer air into or out of the building depending on the desired test conditions. The fans were equipped with two speeds for a flow rate of up to 7,800 cubic feet per minute (CFM) each. Air exchange rates (AER) were calculated as described in Exhibit 3-2.

The general procedure for pressure testing was as follows:

- The building was flushed with outside air to reduce the initial indoor air PCE concentrations as much as possible before starting the test. Exterior doorways were opened, and the fans were placed in the doorways on a high setting, which resulted in an AER of 12 to 13 per hour.
- Louvers on the exterior walls were then covered with plastic sheeting to decrease air leakage during pressure testing.
- Floor fans were set up in the doorways with plastic sheeting around them to decrease leakage of outside air.
- Floor fans were oriented to transfer outside air into the building to test the building under positive pressure.
- Floor fans were oriented to exhaust air out of the building to test the building under negative pressure.

The number of fans and doorways in which they were installed was adjusted to reach the desired differential pressure of at least 5 Pa. Exhibit 3-2 presents a summary of tests and associated AER and differential pressure.

Exhibit 3-2: Summary of Test Conditions

Date	Test Condition	Air Exchanges Per Hour *	Representative DP (Pascals)**
12/5/2018	Building Flush #1	12	0.52
12/5/2018	Positive Pressure Test #1	3.3	18
12/6/2018	Negative Pressure Test #1	3.8	-25
12/6/2018	Negative Pressure Test #2	2.0	-8.9
12/6/2018	Negative Pressure Test #3	3.1	-16
12/6/2018	Building Flush #2	13	5.2
12/6/2018	Positive Pressure Test #2	4.4	24
12/7/2018	Negative Pressure Test #4	1.9	-5.5

*Air exchanges per hour were calculated using the following formula:

AER = (60/[V/Q])

V = Building volume in cubic feet (ft^3)

Q = Air Flow Rate in cubic feet per minute (cfm)

** Positive DP values indicate that the building interior is at a higher pressure than the building exterior (i.e., pressurized). Negative DP values indicate that the building interior is at a lower pressure than the building exterior (i.e., under vacuum). 1 Pa = 0.004 inches of water column

3.3.2 Results

Time series charts showing DP measurements and PCE concentrations (measured using the GC-ECD) are provided in Appendix D. The AER and DPs for each of the testing periods are also shown on the charts. A summary of stabilized, representative PCE indoor air concentrations during the testing periods is provided in Table 2.

3.3.2.1 Differential Pressure

DP measurements confirmed that the building was either negative or positive relative to the building exterior during the associated tests. These results demonstrate that the fans were capable of controlling building pressures as intended during the testing. Note that the DPs were measured between the building interior and exterior, but were assumed to also reflect the relative changes in DP between the building interior and the subslab.

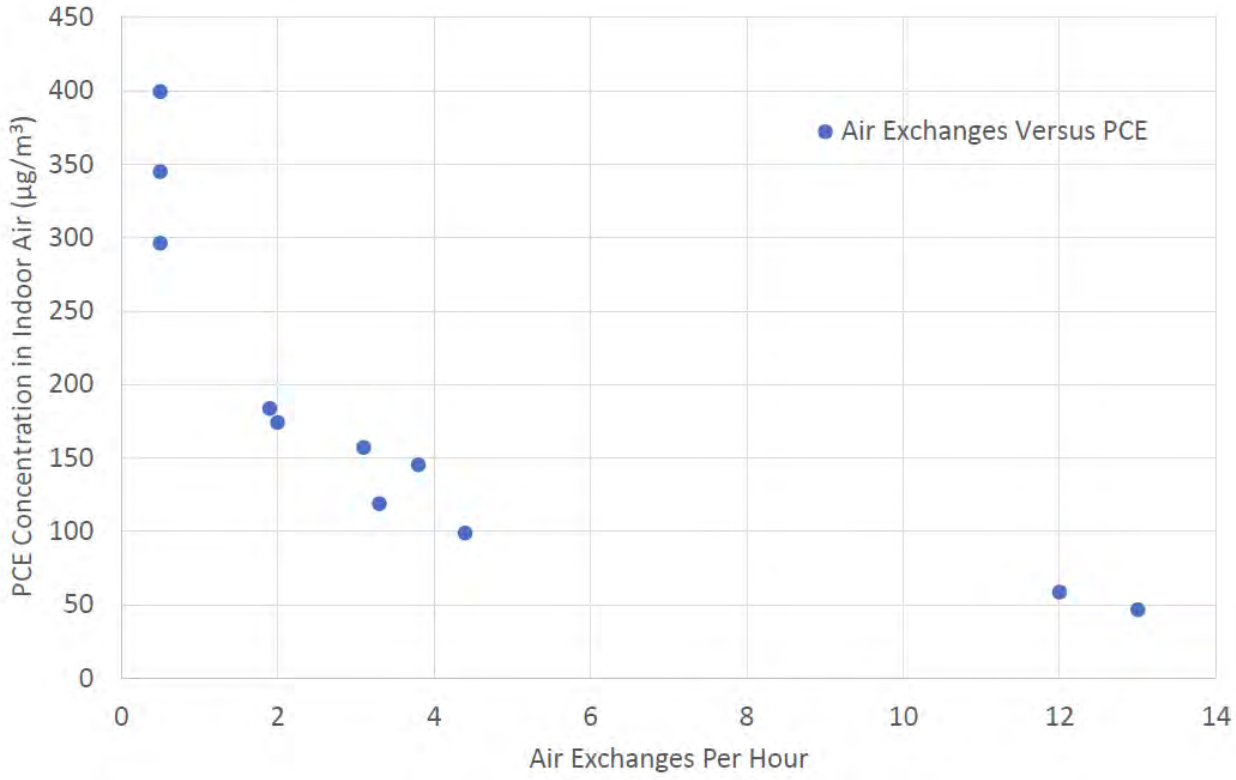
During Positive Pressure (PP) testing, DPs ranged from approximately 15 to 25 Pascals, and during Negative Pressure (NP) testing, DPs ranged from approximately -5 to -25 Pascals. In general, a DP of 5-10 Pascals is presumed to be adequate to either suppress or enhance VI.

In addition, changes in AER generally directly correlated with changes in DP measurements during PP and NP tests. For example, the higher AER for PP Test #2 resulted in the building being more positive (higher DP) than during PP Test #1 when the AER was lower.

3.3.2.2 Air Exchange Rate

As shown in Exhibit 3-3, lower AERs generally resulted in higher PCE concentrations, while higher AERs generally resulted in lower PCE concentrations.

Exhibit 3-3: AER Versus PCE Concentrations in Indoor Air



3.3.2.3 Key Findings

The following discussion is based on the data presented in Table 2. During the building flush-out periods, PCE concentrations decreased to between 28 and 99 µg/m^3 (average = 53 µg/m^3) at AERs between 12 and 13 per hour. These elevated concentrations even during significant ventilation suggest that relatively high air exchanges are not adequate to lower PCE concentrations to acceptable levels due to the combined effects of off-gassing, VI by diffusion, and VI by advection.

During PP testing, PCE concentrations increased from between 28 and 45 µg/m^3 to between 88 and 126 µg/m^3 (average = 109 µg/m^3). Under positive building conditions, VI by advective pathways should be cut off in theory. Therefore, the observed PCE increases confirm that off-gassing and/or VI by diffusion are contributing to PCE presence in indoor air.

During NP testing, VI by advective pathways should in theory be enhanced due to the increased pressure gradient from the subslab into the building. PCE stabilized at a higher concentration during NP testing (average = 165 µg/m^3) than during PP testing (average = 109 µg/m^3), confirming that VI by the advective pathway is also contributing to PCE concentrations in indoor air. The results also showed that PCE concentrations were dependent on AER in addition to DP; PCE concentrations were found to decrease under higher AERs (and when the building was more negative). This is likely the result of dilution

from fresh air being drawn through the leaky metal walls of the building, not just intrusion of soil vapor.

A comparison of split SUMMA canisters with GC-ECD screening samples is provided in Appendix E, and the analytical laboratory report for the split SUMMA samples is provided in Appendix C.3.

3.4 Subslab Vapor Monitoring Port Installation and Sampling

Subslab vapor (SSV) monitoring ports SSV335-001 through SSV335-012 were installed on January 29, 2019. The SSV port locations are shown on Figure 4 and were intended to provide generally broad coverage of the building footprint.

3.4.1 Scope of Work

The SSV ports consist of ¼-inch stainless steel tubing equipped with threaded connectors that penetrate the building slab. A schematic of an SSV port is shown in Exhibit 3-4 below.

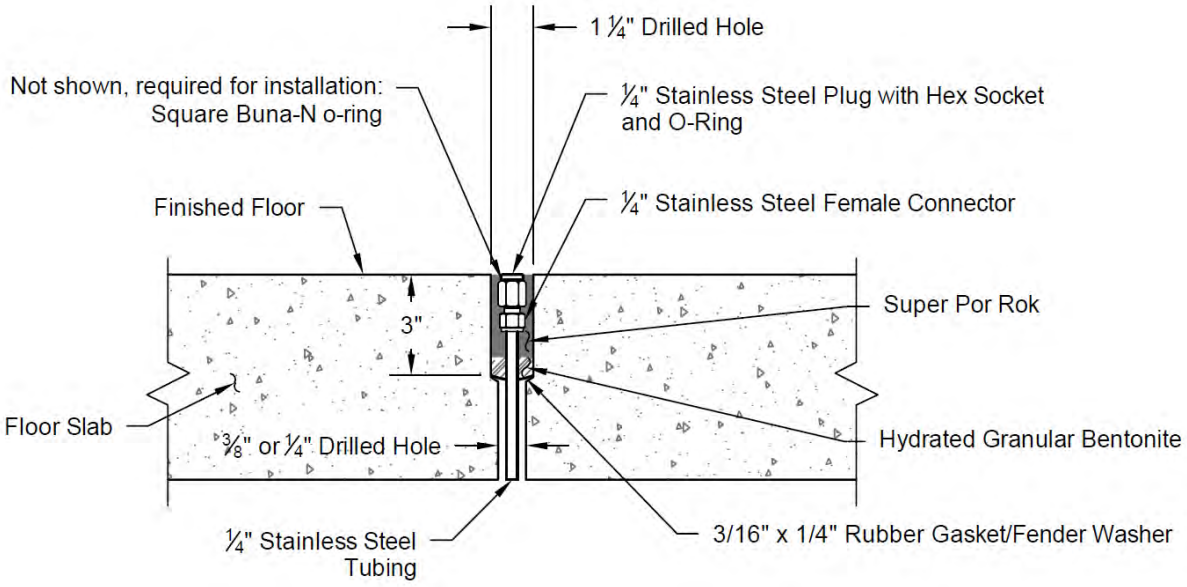


Exhibit 3-4: Subslab Vapor Port

Helium integrity testing was performed on two of the SSV ports on January 30, 2019 following installation to confirm air tight seals around the slab penetration.

The SSV ports were sampled on January 30, 2019 over a period of approximately 1 hour using 1-L SUMMA® canisters. The samples were submitted to EATI for analysis of the site-specific analyte list using USEPA Method TO-15 in full scan mode.

3.4.2 Results

A summary of subslab vapor results is included in Table 3. Laboratory analytical reports are provided in Appendix C.4. Field forms that document the subslab vapor sample collection and integrity testing results are including in Appendix F.

PCE was detected in each of the subslab vapor samples ranging in concentration from 13,000 to 25,000,000 µg/m^3. The PCE results are shown on Figure 6 along with isopleths showing the inferred distribution of PCE in subslab vapor. The highest concentration of PCE was detected in the area of the former stills, where subgrade PCE drain pipes have been identified on historical drawings. Concentrations were also elevated in the area of the former PCE ASTs. In general, PCE concentrations were higher in the northeastern half of the building where most of the PCE handling occurred.

At the location of the highest passive sample result (PD335-05/SSV335-005), the subslab vapor concentration was two orders of magnitude lower than the highest subslab vapor concentration. This inconsistency suggests that off-gassing from the concrete floor, rather than VI by diffusion, may be the primary contributor to the passive sample results in that area. Anecdotal information suggests that this area was impacted by at least one PCE surface spill in the past.

The subslab vapor sample results suggest:

- PCE was likely released to the subsurface in the northwest corner of the building near the former stills via subsurface pipes or pits;
- Subsurface releases may have occurred near the former PCE tanks;
- VI is likely occurring by advection and diffusion through the floor slab (given the elevated PCE concentrations in subslab vapor); and
- Interior PCE spills likely impacted the western portion of the building near SSV335-005.

3.5 Mass Flux Testing

Mass flux testing was conducted using fabricated flux chambers on January 29 and 30, 2019 to further assess the transport mechanisms contributing to PCE in indoor air. The main goal was to assess the flux of PCE into the building from off-gassing and VI by diffusion.

3.5.1 Scope of Work

A photograph of a flux chamber and its main components is provided in Exhibit 3-5.

Exhibit 3-5: Flux Chamber

The chambers were constructed using a 3.4-L plastic container with a gasket secured to the open side of the container to create a seal when placed on the floor. Two ports were drilled into the sides of the chamber to purge and sample the air within the chamber. A weight was placed on top of the chamber to allow the gasket to maintain contact with the concrete floor during the test.

The chambers were placed at the locations designated FT335-001 through FT335-006 on Figure 4. The flux tests were co-located with the passive diffusion sampler locations to compare the results. FT335-001 and FT335-002 were placed on the northwest and northeast concrete walls, respectively, at a height of approximately 5 feet above the floor slab (center of chamber). FT335-003 through FT335-006 were placed on the floor slab. In each case, the chambers were placed over areas where there were no visible cracks or other pathways for VI by advection. Photographs of the flux chambers are included in Appendix B.

With both sample ports open, 4 to 5 chamber volumes of ultra-high purity nitrogen were injected through one port to purge any initial VOC presence from the chamber. Both sample ports were then closed, and the chamber was allowed to sit for a period of between 40 and 60 minutes. At the end of the test, a grab sample of the chamber air was collected through one of the sample ports using a 1-L SUMMA® canister. The samples were submitted to EATI for analysis of the site-specific analyte list by USEPA Method TO-15.

3.5.2 Results

A summary of the analytical results for the flux chamber samples are provided in Table 4, and the analytical laboratory report is provided in Appendix C.4. Mass flux of PCE from the walls and floor was calculated at each location using the following equation.

Mass Flux = M/SA/T

where:
M = Mass of PCE in the chamber (µg)*
SA = Surface area enclosed by the chamber (m^2)
T = Duration of test (days)
*PCE mass was calculated by multiplying the volume of the chamber by the PCE concentration.

Calculated mass flux values are provided in Exhibit 3-6.

Exhibit 3-6: Calculated Mass Flux Values

Flux Test Location	Calculated PCE Mass Flux (µg/m²/day)
FT335-001 (NW wall)	290
FT335-002 (NE wall)	440
FT335-003 (floor)	980
FT335-004 (floor)	7,600
FT335-005 (floor)	56,000
FT335-006 (floor)	6,400

The highest mass flux value was calculated at FT335-005, which is co-located with the passive sample with the highest PCE concentration and located in the area where at least one historical PCE spill occurred. Like the passive sample, this location is outside of the area exhibiting the highest subslab vapor concentrations, indicating that the elevated mass flux is likely predominantly due to off-gassing from the slab rather than VI by diffusion or advection.

The wall samples exhibited the lowest mass flux values, indicating limited off-gassing or diffusive VI from the walls (in the case of the east wall built into the hillside).

Theoretical indoor air concentrations assuming steady-state, well-mixed conditions were calculated based on the mass flux values and assumed air exchange rates using the following equation:

$IA = MFlux/(AER*H)$

where:
IA = Calculated PCE concentration in indoor air (µg/m³)
MFlux = Mass flux (µg/m²/day)
AER = Air exchange rate (1/day)
H = Mixing height of the building (m)

The results represent PCE concentrations from off-gassing and VI by diffusion and provide an estimate of the relative contribution from those pathways, and not VI by advection.

Based on typical AER in buildings with modern HVAC systems (48 to 96 outside air exchanges per day), potential PCE concentrations in indoor air from off-gassing and VI by diffusion were calculated to range from 37 to 74 µg/m³.

4.0 CONCLUSIONS AND IMPLICATIONS FOR MITIGATION

A VI investigation was completed in B335 between November 2018 and February 2019 to assess impacts to subslab vapor and indoor air as a result of its former use as the facility's

PCE recycling plant. These investigations included indoor air grab sampling, passive diffusion sampling, building pressure testing and indoor air screening, subslab vapor sampling, and mass flux testing. The building is currently vacant and used for storage.

PCE was detected at a concentration of 560 µg/m^3 in an indoor air grab sample collected from the building in November 2018, indicating that the building is not suitable for occupancy under current conditions as compared to NYSDOH's guidance value of 30 ug/m^3.[4]

The results of the VI investigation indicated that three transport mechanisms are likely contributing to the PCE presence in indoor air: off-gassing of PCE from the slab, VI through the slab by diffusion, and VI through floor cracks and other advective pathways.

Based on these results, a multi-faceted mitigation approach would likely be needed to adequately lower PCE concentrations in indoor air. Potential mitigation techniques include floor sealants to address off-gassing and diffusion, a subslab depressurization system (SSDS) to address advective VI, active HVAC to increase AER and building pressure, and/or a vented floor constructed over the existing slab. It is difficult to predict if these measures would be sufficient to lower PCE indoor air concentrations to levels suitable for routine occupancy. Based on our experience with VI mitigation and the results of this study, we believe it would be challenging to reduce PCE indoor air concentrations to acceptable levels in this building using the above measures.

Given the building's historical use as the PCE recycling plant and the very high PCE concentrations in subslab vapor, IBM is considering conducting a RCRA Facility Investigation (RFI) to evaluate the potential source of PCE, including assessment of the magnitude and extent of subsurface contamination and the feasibility of remediation, if appropriate.

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[4] Tetrachloroethene (PERC) in Indoor and Outdoor Air, September 2013 Fact Sheet, New York State Department of Health, Bureau of Toxic Substance Assessment.

TABLES

Table 1
Summary of Grab Indoor Air Analytical Results
Building 335
Former IBM East Fishkill Facility
Hopewell Junction, New York

Analyte	Sample Name	IAB335-Grab
	Collection Date	11/7/2018
Acetone	µg/m3	13
Benzene	µg/m3	<2.5
Carbon tetrachloride	µg/m3	<0.98
CFC113 (Ethane, 1,1,2-trichloro-1,2,2-trifluoro-)	µg/m3	<5.9
Chlorobenzene (Monochlorobenzene)	µg/m3	<3.6
Dichlorobenzene (1,2-)	µg/m3	<4.6
Dichlorobenzene (1,3-)	µg/m3	<4.6
Dichlorobenzene (1,4-)	µg/m3	<4.6
Dichlorodifluoromethane (CFC12)	µg/m3	<19
Dichloroethene (1,1-)	µg/m3	<0.31
Dichloroethene (cis-1,2-)	µg/m3	1.4
Ethylbenzene	µg/m3	<3.4
Methylene Chloride (Dichloromethane)	µg/m3	<5.4
Tetrachloroethene (PCE)	µg/m3	560
Toluene	µg/m3	3.6
Trichlorobenzene (1,2,4-)	µg/m3	<29
Trichloroethane (1,1,1-)	µg/m3	<4.2
Trichloroethene (TCE)	µg/m3	1.8
Trichlorofluoromethane (CFC11)	µg/m3	<4.4
Vinyl chloride	µg/m3	<0.20
Xylene (m,p-)	µg/m3	5.4
Xylene (o-)	µg/m3	<3.4

Notes:

1. The results represent a grab sample collected by Sanborn Head Engineering P.C. on the date indicated in a 6L SUMMA canister. The sample was analyzed by Eurofins Air Toxics of Folsom, California for the project-specific list of volatile organic compounds (VOCs) by United States Protection Agency (USEPA) Method TO-15 using a combination of full scan and selective ion monitoring (SIM) mode.

2. Results are presented in micrograms per cubic meter ($\mu g/m^3$).

3. Results are displayed with two significant figures.

4. "<" indicates the analyte is non-detect at or above the indicated sample specific practical quantification limit (PQL).

Table 2
Summary of PCE Screening Results During Building Pressure Testing
Building 335
Former IBM East Fishkill Facility
Hopewell Junction, New York

Test Period	Air Exchange Rate per Hour	Stabilized PCE Concentration (µg/m^3)					
		IA335-001	IA335-002	IA335-003	IA335-004	IA335-005	IA335-006
Baseline (Pre-Testing Conditions)	NM	405	399	406	400	400	386
Building Flush #1	12	62	62	6	45	46	78
Positive Pressure Test #1	3.3	126	119	118	109	122	119
Resting Overnight #1	NM	349	343	338	345	349	345
Negative Pressure Test #1	3.8	159	158	112	148	152	143
Negative Pressure Test #2	2.0	186	183	159	170	173	174
Negative Pressure Test #3	3.1	172	168	138	143	153	169
Building Flush #2	1.3	29	32	2	28	45	99
Positive Pressure Test #2	4.4	100	101	9	88	98	107
Resting Overnight #2	NM	301	300	292	304	296	284
Negative Pressure Test #4	1.9	186	180	164	177	194	201

Notes
1. Indoor air samples were collected and analyzed by Sanborn Head using a portable gas chromatograph with electron capture detector (GC-ECD).
2. IA335-003 was located near a floor fan for the building flushes and Positive Pressure Test #2. Therefore, the concentrations are not representative of typical indoor air concentrations during those tests because of the intense mixing in front of the fan.

Table 3
Summary of Subslab Vapor Analytical Results
Building 335
Former IBM East Fishkill Facility
Hopewell Junction, New York

Analyte	Sample Name	SSV335-001	SSV335-002	SSV335-003	SSV335-004	SSV335-005	SSV335-006	SSV335-007	SSV335-008	SSV335-009	SSV335-010	SSV335-011	SSV335-011 Dup	SSV335-012
	Collection Date	1/30/2019	1/30/2019	1/30/2019	1/30/2019	1/30/2019	1/30/2019	1/30/2019	1/30/2019	1/30/2019	1/30/2019	1/30/2019	1/30/2019	1/30/2019
Acetone	ug/m3	<150	<830	<5,900	<23,000	<12,000	<220	<120,000	<200,000	<29,000	<1,200	<57,000	<49,000	<73,000
Benzene	ug/m3	<20	<280	<2,000	<7,800	<4,000	<29	<39,000	<68,000	<9,700	<390	<19,000	<16,000	<24,000
Carbon tetrachloride	ug/m3	<39	<550	<3,900	<15,000	<7,900	<58	<77,000	<130,000	<19,000	<770	<38,000	<32,000	<48,000
CFC113 (Ethane, 1,1,2-trichloro-1,2,2-trifluoro-)	ug/m3	<47	<670	<4,800	<19,000	<9,600	<70	<94,000	<160,000	<23,000	<940	<46,000	<39,000	<59,000
Chlorobenzene (Monochlorobenzene)	ug/m3	<28	<400	<2,900	<11,000	<5,800	<42	<57,000	<98,000	<14,000	<570	<28,000	<24,000	<35,000
Dichlorobenzene (1,2-)	ug/m3	<37	<520	<3,800	<15,000	<7,500	<55	<74,000	<130,000	<18,000	<740	<36,000	<31,000	<46,000
Dichlorobenzene (1,3-)	ug/m3	<37	<520	<3,800	<15,000	<7,500	<55	<74,000	<130,000	<18,000	<740	<36,000	<31,000	<46,000
Dichlorobenzene (1,4-)	ug/m3	<37	<520	<3,800	<15,000	<7,500	<55	<74,000	<130,000	<18,000	<740	<36,000	<31,000	<46,000
Dichlorodifluoromethane (CFC12)	ug/m3	<30	<430	<3,100	<12,000	<6,200	<45	<61,000	<100,000	<15,000	<610	<30,000	<25,000	<38,000
Dichloroethene (1,1-)	ug/m3	<24	<340	<2,500	<9,700	<5,000	<36	<49,000	<85,000	<12,000	<490	<24,000	<20,000	<30,000
Dichloroethene (cis-1,2-)	ug/m3	<24	<340	<2,500	<9,700	<5,000	150	110,000	<85,000	<12,000	<490	<24,000	<20,000	<30,000
Ethylbenzene	ug/m3	<27	<380	<2,700	<10,000	<5,400	<40	<53,000	<93,000	<13,000	<530	<26,000	<22,000	<33,000
Methylene Chloride (Dichloromethane)	ug/m3	<210	<1,200	<8,700	<34,000	<17,000	<320	<170,000	<300,000	<42,000	<1,700	<84,000	<71,000	<110,000
Tetrachloroethene (PCE)	ug/m3	13,000	100,000	580,000	660,000	370,000	14,000	15,000,000	25,000,000	2,500,000	88,000	3,800,000	3,000,000	7,700,000
Toluene	ug/m3	<23	<330	<2,400	<9,200	<4,700	<34	<46,000	<81,000	<11,000	<460	<23,000	<19,000	<29,000
Trichlorobenzene (1,2,4-)	ug/m3	<180	<2,600	<18,000	<72,000	<37,000	<270	<360,000	<640,000	<90,000	<3,600	<180,000	<150,000	<230,000
Trichloroethane (1,1,1-)	ug/m3	<34	<470	<3,400	<13,000	<6,800	<50	<67,000	<120,000	<16,000	<670	<33,000	<28,000	<42,000
Trichloroethene (TCE)	ug/m3	160	1,700	<3,400	<13,000	<6,700	350	70,000	<120,000	<16,000	<660	<32,000	<28,000	<41,000
Trichlorofluoromethane (CFC11)	ug/m3	<34	<490	<3,500	<14,000	<7,000	<51	<69,000	<120,000	<17,000	<690	<34,000	<29,000	<43,000
Vinyl chloride	ug/m3	<16	<220	<1,600	<6,200	<3,200	<23	<31,000	<55,000	<7,800	<310	<15,000	<13,000	<20,000
Xylene (m,p-)	ug/m3	<27	<380	<2,700	<10,000	<5,400	<40	<53,000	<93,000	<13,000	<530	<26,000	<22,000	<33,000
Xylene (o-)	ug/m3	<27	<380	<2,700	<10,000	<5,400	<40	<53,000	<93,000	<13,000	<530	<26,000	<22,000	<33,000

Notes:

1. Subslab vapor samples were collected by Sanborn Head Engineering P.C. in 1L SUMMA® canisters over a period of approximately 1 hour. The samples were analyzed by Eurofins Air Toxics of Folsom, California for the project-specific list of volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method TO-15 in full scan mode.

2. Results are presented in micrograms per cubic meter ($\mu g/m^3$).

3. Results are displayed with two significant figures.

4. "<" indicates the analyte is non-detect at or above the indicated sample specific practical quantification limit (PQL).

Table 4
Summary of Flux Chamber Analytical Results
Building 335
Former IBM East Fishkill Facility
Hopewell Junction, New York

Analyte	Sample Name	FT335-001-60G	FT335-002-40G	FT335-003-40G	FT335-004-40G	FT335-005-40G	FT335-006-40G
	Collection Date	1/29/2019	1/29/2019	1/29/2019	1/29/2019	1/30/2019	1/30/2019
Acetone	ug/m3	33	<30	<25	<30	<120	<28
Benzene	ug/m3	<4.3	<4.0	<3.4	<4.0	<16	<3.8
Carbon tetrachloride	ug/m3	<8.4	<7.8	<6.6	<7.9	<31	<7.6
CFC113 (Ethane, 1,1,2-trichloro-1,2,2-trifluoro-)	ug/m3	<10	<9.5	<8.0	<9.6	<38	<9.2
Chlorobenzene (Monochlorobenzene)	ug/m3	<6.2	<5.7	<4.8	<5.8	<23	<5.5
Dichlorobenzene (1,2-)	ug/m3	<8.0	<7.5	<6.3	<7.5	<30	<7.2
Dichlorobenzene (1,3-)	ug/m3	<8.0	<7.5	<6.3	<7.5	<30	<7.2
Dichlorobenzene (1,4-)	ug/m3	<8.0	<7.5	<6.3	<7.5	<30	<7.2
Dichlorodifluoromethane (CFC12)	ug/m3	<6.6	<6.2	<5.2	<6.2	<24	<5.9
Dichloroethene (1,1-)	ug/m3	<5.3	<4.9	<4.2	<5.0	<19	<4.8
Dichloroethene (cis-1,2-)	ug/m3	<5.3	<4.9	<4.2	7.9	<19	<4.8
Ethylbenzene	ug/m3	<5.8	<5.4	13	13	<21	<5.2
Methylene Chloride (Dichloromethane)	ug/m3	<46	<43	<36	<43	<170	<42
Tetrachloroethene (PCE)	ug/m3	180	180	400	3,100	23,000	2,600
Toluene	ug/m3	<5.0	<4.7	5.6	5.2	<18	<4.5
Trichlorobenzene (1,2,4-)	ug/m3	<40	<37	<31	<37	<140	<36
Trichloroethane (1,1,1-)	ug/m3	<7.3	<6.8	<5.7	<6.8	<27	<6.5
Trichloroethene (TCE)	ug/m3	<7.2	<6.7	<5.6	11	34	37
Trichlorofluoromethane (CFC11)	ug/m3	<7.5	<7.0	<5.9	<7.0	<28	<6.7
Vinyl chloride	ug/m3	<3.4	<3.2	<2.7	<3.2	<12	<3.1
Xylene (m,p-)	ug/m3	<5.8	<5.4	70	66	38	20
Xylene (o-)	ug/m3	<5.8	<5.4	21	22	<21	8.4

Notes:

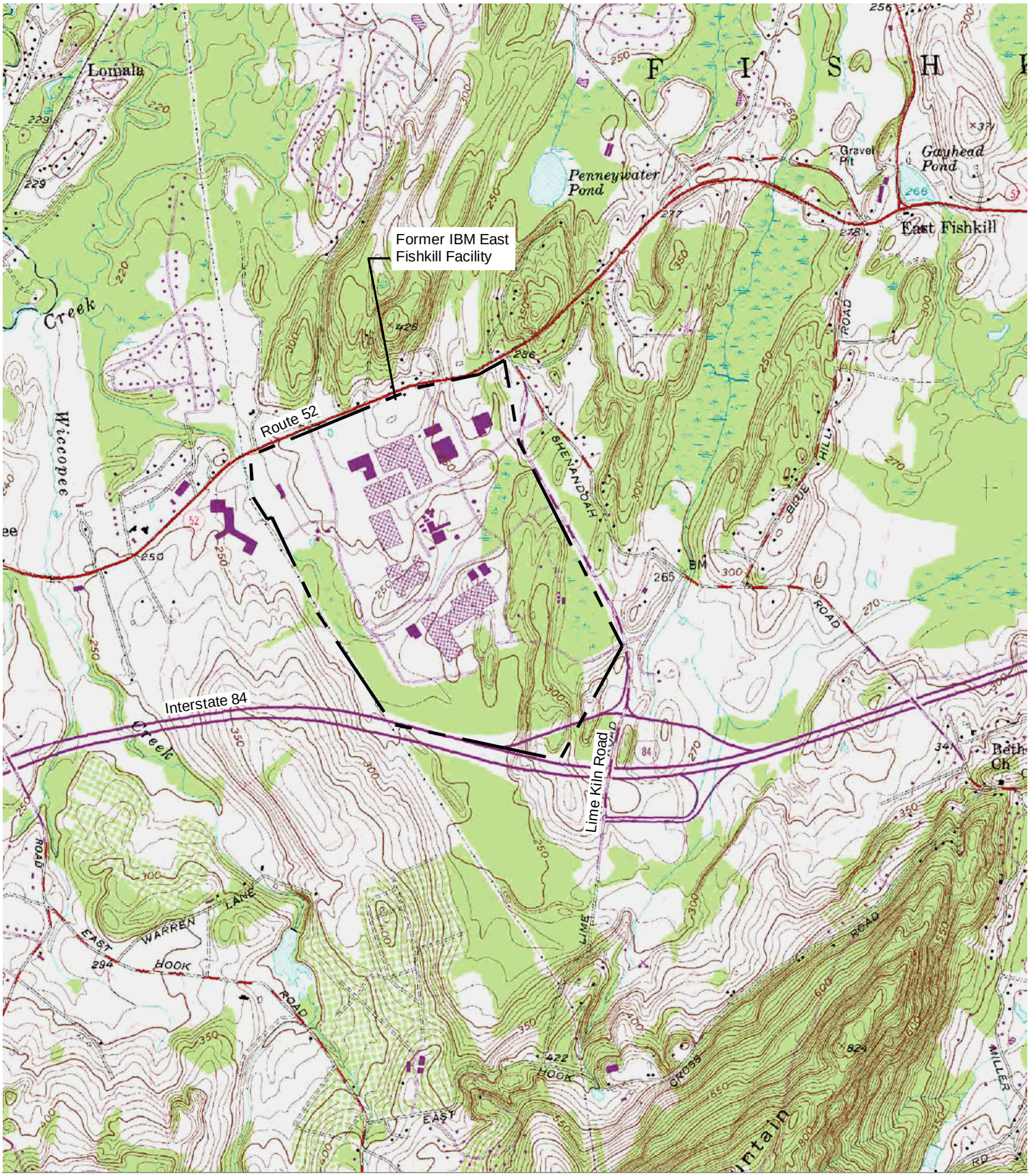
1. Flux chamber samples were grab samples collected by Sanborn Head Engineering P.C. on the dates indicated in 1L SUMMA® canisters. The samples were analyzed by Eurofins Air Toxics of Folsom, California for the project-specific list of volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method TO-15 in full scan mode.

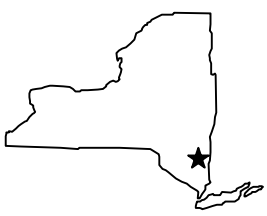
2. Results are presented in micrograms per cubic meter ($\mu g/m^3$).

3. Results are displayed with two significant figures.

4. "<" indicates the analyte is non-detect at or above the indicated sample specific practical quantification limit (PQL).

FIGURES





Notes:
Base map taken from 7.5 minute USGS Quadrangle Maps: Hopewell Junction, New York, Dated 1957, Photorevised in 1981.

Drawn By: E. Wright
Designed By: J. Sanborn
Reviewed By: D. Shea
Project No: 2999.06
Date: April 2019

1,000' 0 2,000' Feet

SANBORN HEAD ENGINEERING

Figure 1

Site Location Plan

B335 Data Summary Report

Former IBM East Fishkill Facility
Hopewell Junction, New York

Figure 2

B335 Location Plan

B335 Data Summary Report

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By: E. Wright
Designed By: J. Sanborn
Reviewed By: D. Shea
Project No: 2999.06
Date: April 2019

Figure Narrative

This figure shows the buildings at the former IBM East Fishkill facility. Building B335 is highlighted.

Legend

— - - — Property Line

Unlabeled features include wastewater treatment tanks, pump houses, trailers, and other structures and features not intended for human occupancy

B320B Indicates building number

Indicates the location of B335

GlobalFoundries
Lot 1 GlobalFoundries U.S 2 LLC
Lot 5 GlobalFoundries U.S 2 LLC

i.Park
Lot 2 i.Park East Fishkill I LLC
Lot 3 i.Park East Fishkill I LLC
Lot 4 i.Park East Fishkill LLC
Lot 6 i.Park East Fishkill LLC
Lot 7 i.Park East Fishkill LLC
Lot 8 i.Park East Fishkill LLC

- Subdivision (GlobalFoundries U.S. 2 LLC)
- Subdivision (i.Park East Fishkill LLC)
- Subdivision (i.Park East Fishkill I LLC)

N
W E
S

200' 100' 0 200' 400' Feet

SANBORN HEAD ENGINEERING

File:P:\2900s\2999.00\Graphics Files\CAD\B335\B335_LocationPlan.dwg Plot Date: 3-8-19

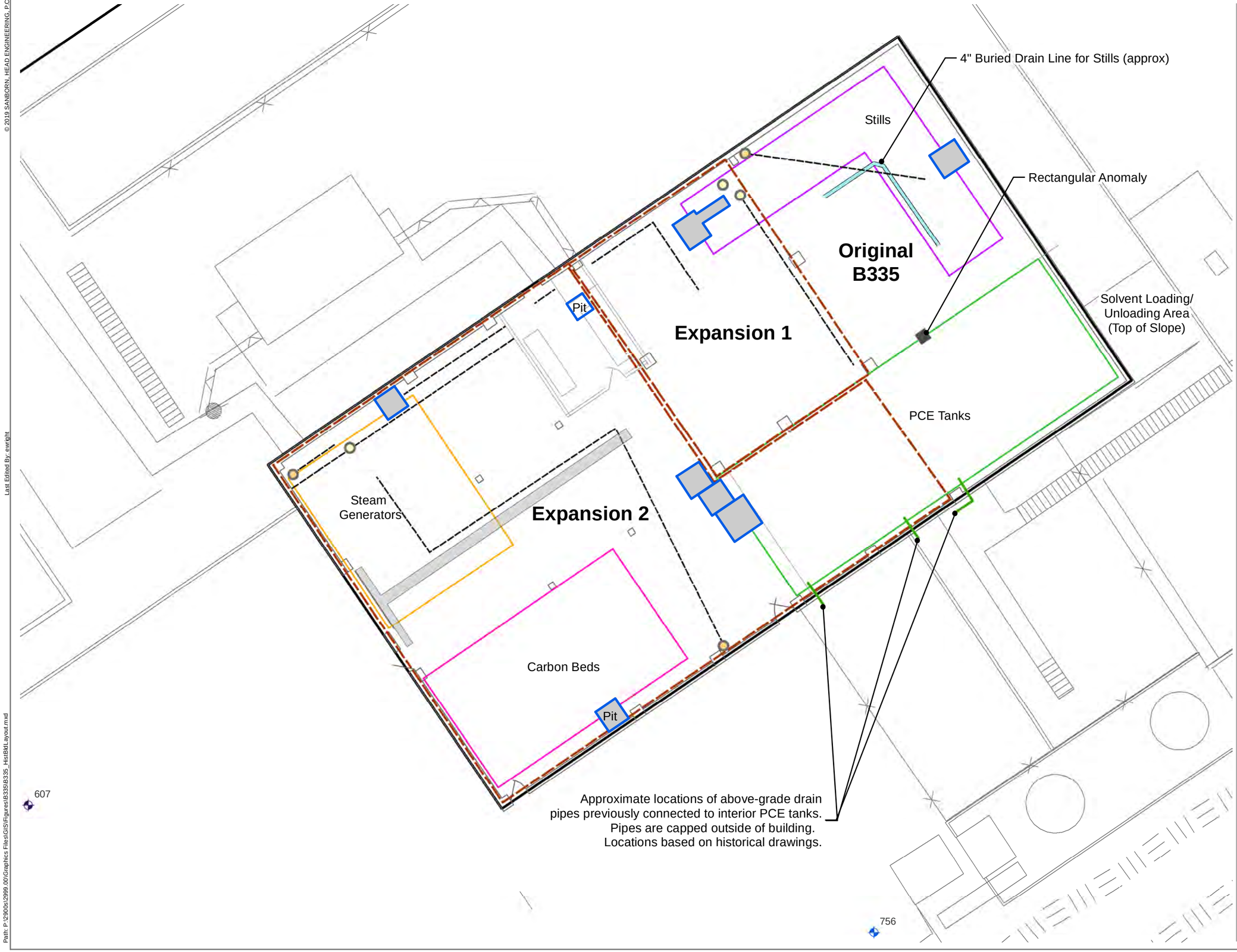


Figure 3

Historical Building Layout Plan

B335 Data Summary Report

Former IBM East Fishkill Facility

Hopewell Junction, New York

Drawn By:	E. Wright / H. Pothier
Designed By:	J. Sanborn
Reviewed By:	D. Shea
Project No:	2999.06
Date:	April 2019

Figure Narrative

This figure shows the approximate layout of key features of the former B335 PCE recycling plant. The locations are based on the following historical drawings: "B335 Perchlor Expansion 1&2 Schematic (F-23)" (date unknown), "Plumbing Floor Plan" dated 11-17-1980 prepared by IBM Facilities Engineering, and As-Built Drawing "Perchlor Storage Tanks" dated 7/1/1985 prepared by IBM Facilities Engineering. The plans were provided to Sanborn Head by Groundwater Sciences Corporation on July 10, 2018. The locations of dashed pipes, capped pipes, drains, and filled pits and trenches are based on field observations made by Sanborn Head staff and on a ground penetrating radar survey completed by Underground Surveying of Brookfield, Connecticut on January 19, 2019.

Legend

- Capped Pipe N.T.S.
- Drain from Roof N.T.S.
- Filled Pit
- Filled Trench
- Unknown Pipes Identified by Utility Locator
- Bedrock Monitoring Well
- Soil Monitoring Well

N W E S

7.5 3.75 0 7.5 15 Feet

SANBORN HEAD ENGINEERING

Last Edited By: ewright

Path: P:\2900s\2999.00\Graphics Files\GIS\Figures\B335\B335_Master.mxd

Figure 4

Exploration Location Plan

B335 Data Summary Report

Former IBM East Fishkill Facility

Hopewell Junction, New York

Drawn By:	H. Pothier / E. Wright
Designed By:	J. Sanborn
Reviewed By:	D. Shea
Project No:	2999.06
Date:	April 2019

Figure Narrative

This figure shows exploration locations for field work completed in B335 in November and December 2018 and January 2019.

Legend

- Passive Diffusion Sample Location
- GC-ECD Indoor Air Screening Location
- Indoor Air Grab Sample
- Subslab Vapor Port Location
- Flux Test Location
- 5 — Door I.D.
- Node 2 — Differential Pressure Node I.D.

7.5 3.75 0 7.5 15 Feet

SANBORN HEAD ENGINEERING

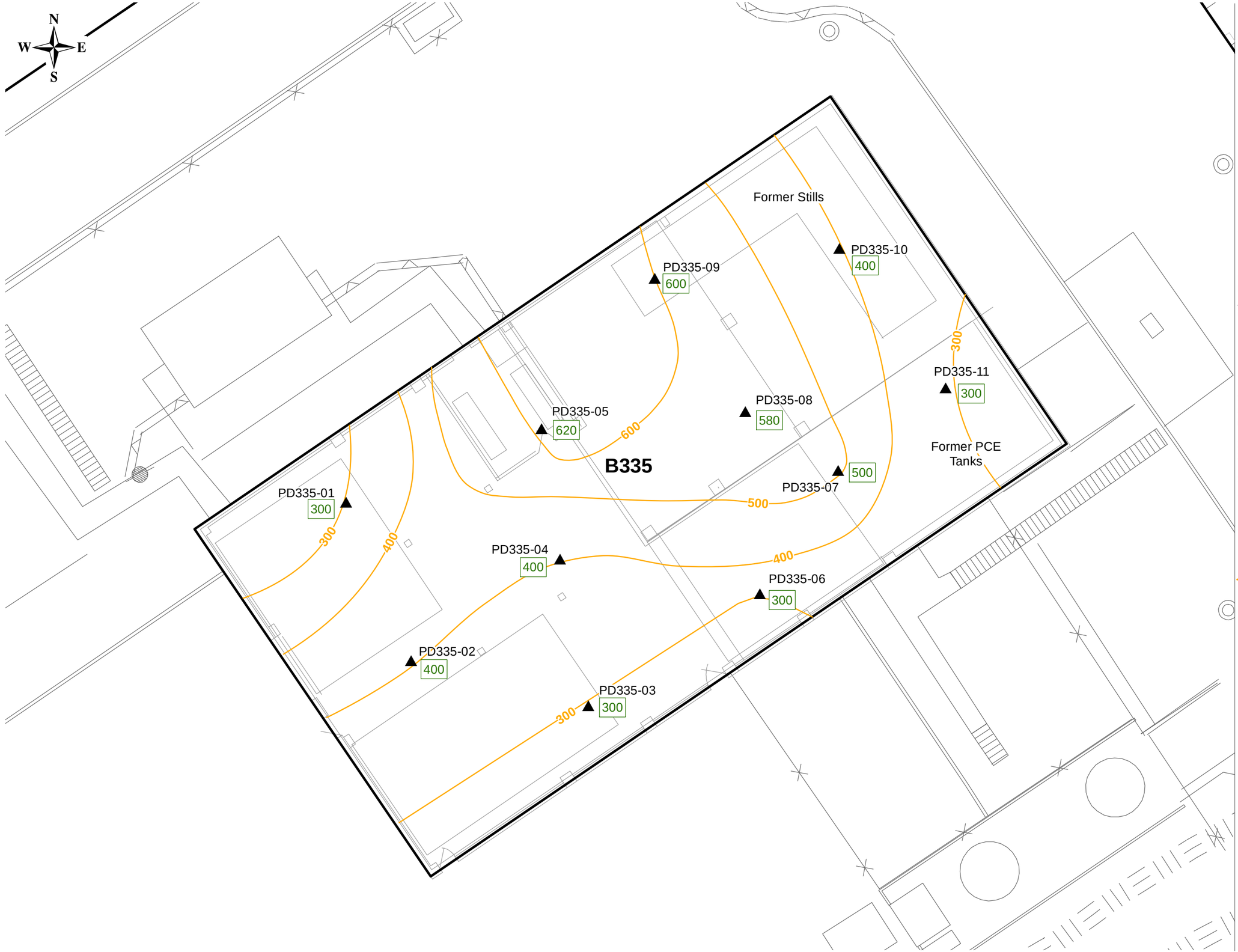


Figure 5

B335 Passive Sampler Results

B335 Data Summary Report

Former IBM East Fishkill Facility

Hopewell Junction, New York

Drawn By:	H. Pothier / E. Wright
Designed By:	J. Sanborn
Reviewed By:	D. Shea
Project No:	2999.06
Date:	April 2019

Figure Narrative

This figure shows the results of indoor air sampling conducted using passive diffusion samplers in B335. The results represent PCE concentrations just above the floor slab, and may be indicative of off-gassing from the floor slab.

Notes

1. Samples PD335-01 through PD335-11 were collected on the concrete floor slab with the sorbent facing down.

2. Samplers were deployed on November 26, 2018 and retrieved on November 28, 2018.

3. Results shown are for PCE in units of µg/m^3.

Legend

- ▲ Passive Diffusion Sample Location
- 300 — PCE Isopleth in µg/m^3. Results represent PCE concentrations just above the floor slab.
- 300 — PCE concentration in µg/m^3 for samples collected using passive sampler

7.5 3.75 0 7.5 15 Feet

SANBORN HEAD ENGINEERING

Figure 6

Concentration Isopleths for Tetrachloroethene in Subslab Vapor

B335 Data Summary Report

Former IBM East Fishkill Facility

Hopewell Junction, New York

Drawn By:	H. Pothier / E. Wright
Designed By:	J. Sanborn
Reviewed By:	D. Shea
Project No:	2999.06
Date:	April 2019

Figure Narrative

This figure presents the tetrachlorethene (PCE) concentrations detected in subslab vapor in B335. Samples were collected on January 30, 2019 by Sanborn, Head Engineering PC using 1-L SUMMA canisters with 1-hour flow controllers.

The colored shading represents inferred PCE concentrations below the slab based on the results of the samples collected at the monitoring ports. Other interpretations are possible.

Legend

Subslab Vapor Port Location

13,000 PCE Concentration in µg/m³

PCE Concentration in Subslab Vapor (µg/m³)

- <50,000
- 50,000 - 500,000
- 500,000 - 5,000,000
- >5,000,000

7.5 3.75 0 7.5 15 Feet

SANBORN HEAD ENGINEERING

APPENDICES

APPENDIX A

LIMITATIONS

APPENDIX A
SHPC LIMITATIONS

1. The findings and conclusions described in this report are based in part on the data obtained from a finite number of samples from widely spaced locations. The figures are intended to depict inferred conditions during a given period of time, consistent with available information. The actual conditions will vary from that shown, both spatially and temporally. Other interpretations are possible. The nature and extent of variations between sampling locations may not become evident until further investigation is initiated. If variations or other latent conditions then appear evident, it may be necessary to re-evaluate the conclusions of this report.

2. The conclusions contained in this report are based in part upon various types of chemical data as well as historical and hydrogeologic information developed by previous investigators. While SHPC has reviewed that data available to us at the time the report was prepared and information as stated in this report, any of SHPC's interpretations and conclusions that have relied on that information will be contingent on its validity. SHPC has not performed an independent assessment of the reliability of the data; should additional chemical data, historical information, or hydrogeologic information become available in the future, such information should be reviewed by SHPC and the interpretations and conclusions presented herein may be modified accordingly.

3. Additional compounds not searched for during the current study may be present in vapor and indoor air at the site. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their distribution within the vapor and indoor air may occur due to the passage of time, seasonal water table fluctuations, recharge events, and other factors.

4. This report has been prepared for the exclusive use of the IBM Corporation for specific application to the former IBM East Fishkill facility in accordance with generally accepted hydrogeologic and engineering practices. No warranty, expressed or implied, is made. The contents of this report should not be relied on by any other party without the express written consent of SHPC.

5. In preparing this report, SHPC has endeavored to conform to generally accepted practices of other consultants undertaking similar studies at the same time and in the same geographical area. SHPC has attempted to observe a degree of care and skill generally exercised by the technical community under similar circumstances and conditions.

APPENDIX B

PHOTOGRAPH LOG

APPENDIX B
B335 SUMMARY REPORT
PHOTO LOG

Photo 1: View of Building 335 looking north

Photo 2: View of Building 335 and air louvers, looking east

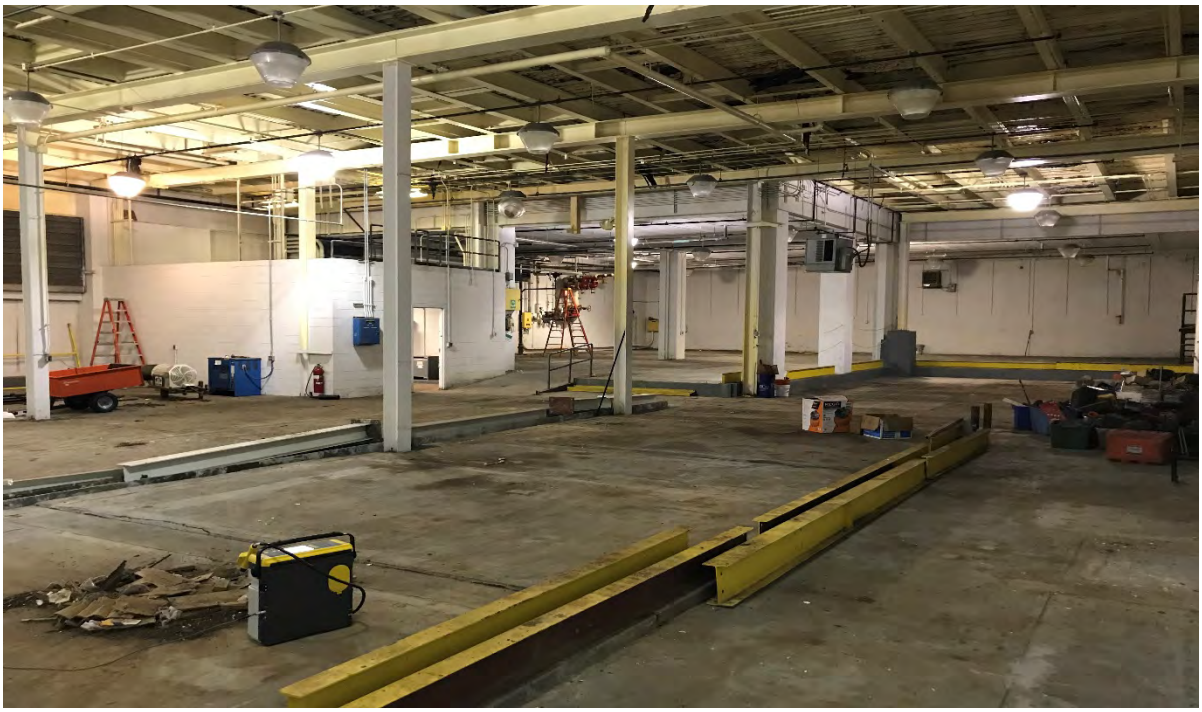


Photo 3: B335 Interior, looking north

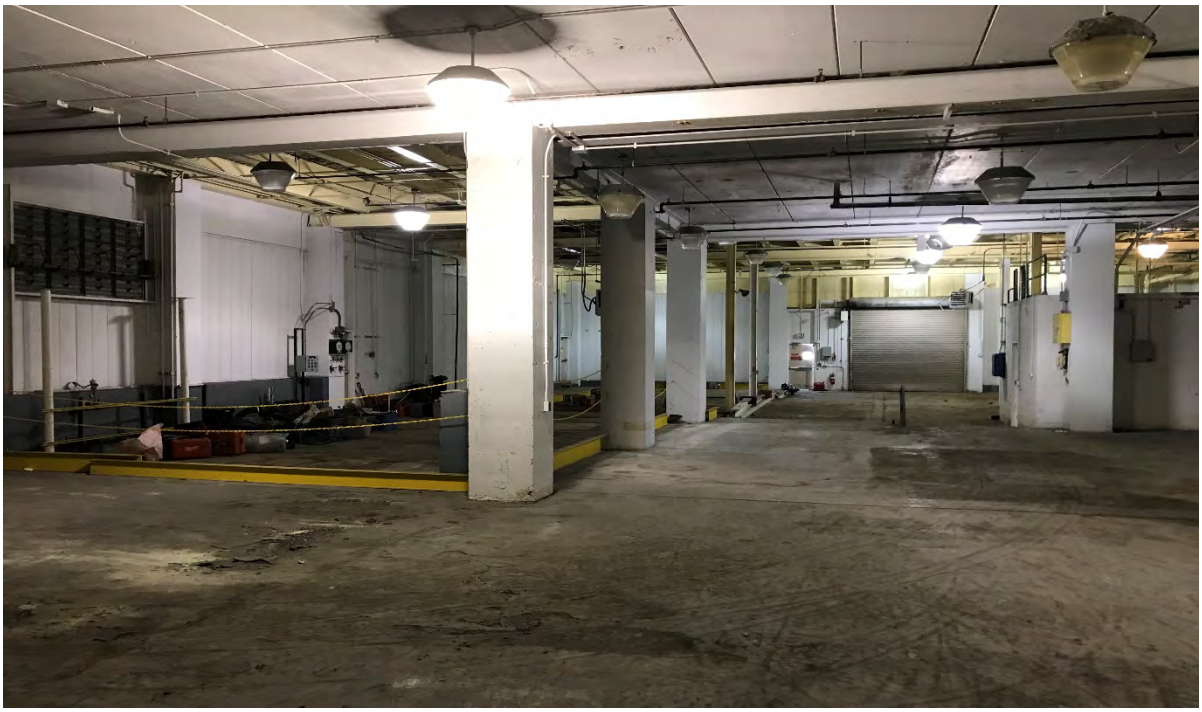


Photo 4: B335 Interior, looking southwest

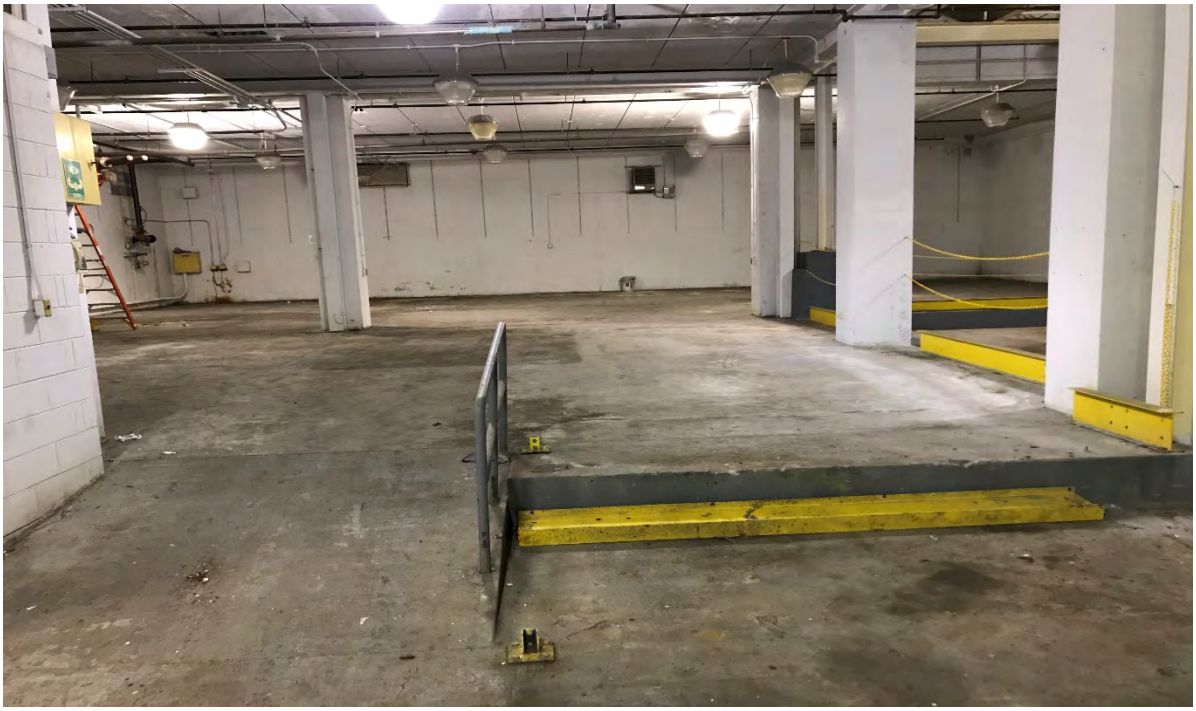


Photo 5: B335 Interior, looking northeast toward the area of the former stills (left) and PCE ASTs (right)

Photo 6: Passive sampler deployed face-down on floor slab

Photo 7: Close-up of passive sampler deployed face-down on floor slab

Photo 8: GC-ECD set-up during pressure testing

Photo 9: Fans during flush-out for pressure testing

Photo 10: Fan and surrounding plastic during positive pressure test

Photo 11: Close-up of air louvers covered with plastic during pressure testing

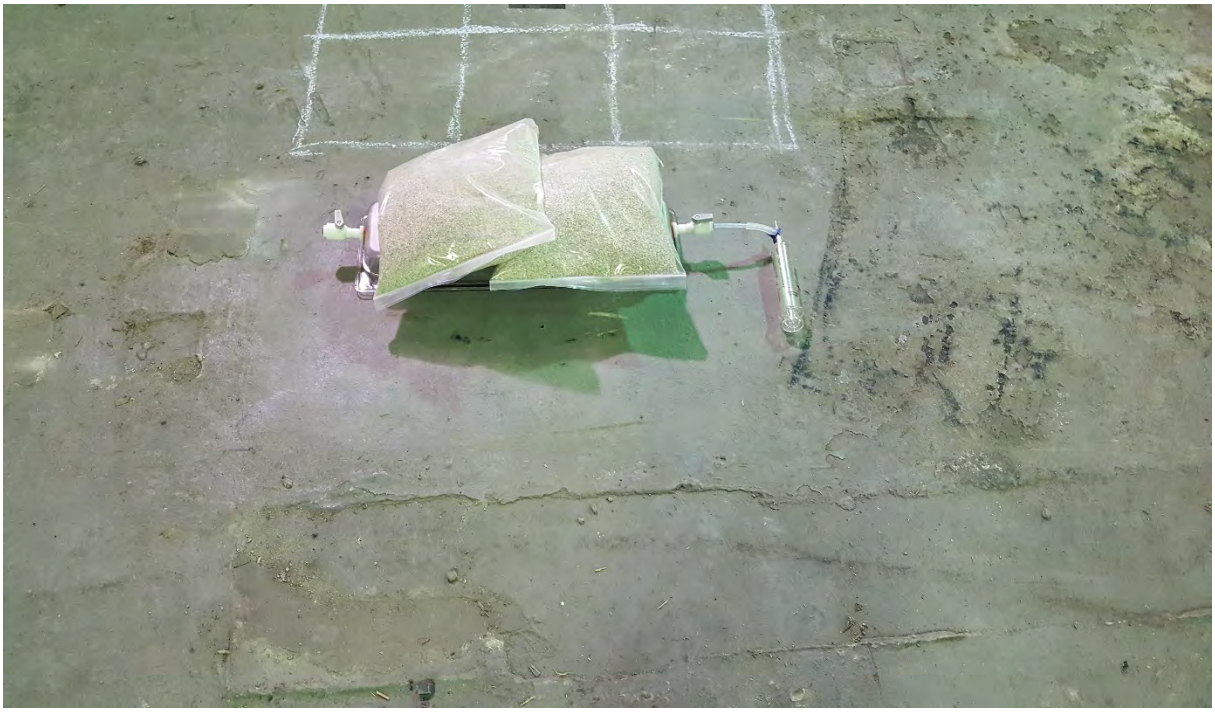


Photo 12: Flux chamber set up on floor covered with weights. Sampling syringe connected to port for GC-ECD screening

Photo 13: Close-up of flux chamber set up on floor being held down with a weight

Photo 14: Flux chamber fastened to wall with straps

Photo 15: Flux chamber fastened to wall during nitrogen flush-out

APPENDIX C

ANALYTICAL LABORATORY REPORTS

C.1 – INDOOR AIR GRAB SAMPLE

eurofins | Air Toxics

11/27/2018
Ms. Erica Bosse
Sanborn, Head & Associates
24 Wade Road

Latham NY

Project Name: IBM - EFK
Project #: 2999.00
Workorder #: 1811230A

Dear Ms. Erica Bosse

The following report includes the data for the above referenced project for sample(s) received on 11/12/2018 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Ausha Scott
Project Manager

eurofins | Air Toxics

WORK ORDER #: 1811230A

Work Order Summary

CLIENT:	Ms. Erica Bosse Sanborn, Head & Associates 24 Wade Road Latham, NY	**BILL TO:**	Accounts Payable Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301
PHONE:	518-207-0769	**P.O. #**	
FAX:		**PROJECT #**	2999.00 IBM - EFK
DATE RECEIVED:	11/12/2018	**CONTACT:**	Ausha Scott
DATE COMPLETED:	11/26/2018		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	IAB335-Grab_20181107	Modified TO-15	4.0 "Hg	5 psi
01B	IAB335-Grab_20181107	Modified TO-15	4.0 "Hg	5 psi
02A	Lab Blank	Modified TO-15	NA	NA
02B	Lab Blank	Modified TO-15	NA	NA
03A	CCV	Modified TO-15	NA	NA
03B	CCV	Modified TO-15	NA	NA
04A	LCS	Modified TO-15	NA	NA
04AA	LCSD	Modified TO-15	NA	NA
04B	LCS	Modified TO-15	NA	NA
04BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/26/18

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP - E8 , LA NELAP - 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP CA009332018-10, VA NELAP - 9505, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2018, Expiration date: 10/17/2019.
Eurofins Air Toxics LLC. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15 Full Scan/SIM
Sanborn, Head & Associates
Workorder# 1811230A

One 6 Liter Summa Canister (SIM Certified) sample was received on November 12, 2018. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the Full Scan and SIM acquisition modes. The method involves concentrating up to 1.0 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	*TO-15*	*ATL Modifications*
ICAL %RSD acceptance criteria	</=30% RSD with 2 compounds allowed out to < 40% RSD	For Full Scan: 30% RSD with 4 compounds allowed out to < 40% RSD For SIM: Project specific; default criteria is </=30% RSD with 10% of compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	For Full Scan: </= 30% Difference with four allowed out up to </=40%.; flag and narrate outliers For SIM: Project specific; default criteria is </= 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

The results for each sample in this report were acquired from two separate data files originating from the same analytical run. The two data files have the same base file name and are differentiated with a "sim" extension on the SIM data file.

Dilution was performed on sample IAB335-Grab_20181107 due to the presence of high level target

species.

Definition of Data Qualifying Flags

Nine qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

CN - See case narrative explanation

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

Client Sample ID: IAB335-Grab_20181107

Lab ID#: 1811230A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	3.9	5.5	9.2	13
Toluene	0.78	0.96	2.9	3.6
Tetrachloroethene	0.78	83	5.2	560
m,p-Xylene	0.78	1.2	3.4	5.4

Client Sample ID: IAB335-Grab_20181107

Lab ID#: 1811230A-01B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	0.16	0.35	0.61	1.4
Trichloroethene	0.16	0.33	0.83	1.8

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Client Sample ID: IAB335-Grab_20181107

Lab ID#: 1811230A-01A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	21111607	Date of Collection:	11/7/18 09:00:00
Dil. Factor:	7.75	Date of Analysis:	11/16/18 12:10 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	3.9	Not Detected	19	Not Detected
Freon 11	0.78	Not Detected	4.4	Not Detected
Freon 113	0.78	Not Detected	5.9	Not Detected
Acetone	3.9	5.5	9.2	13
Methylene Chloride	1.6	Not Detected	5.4	Not Detected
1,1,1-Trichloroethane	0.78	Not Detected	4.2	Not Detected
Benzene	0.78	Not Detected	2.5	Not Detected
Toluene	0.78	0.96	2.9	3.6
Tetrachloroethene	0.78	83	5.2	560
Chlorobenzene	0.78	Not Detected	3.6	Not Detected
Ethyl Benzene	0.78	Not Detected	3.4	Not Detected
m,p-Xylene	0.78	1.2	3.4	5.4
o-Xylene	0.78	Not Detected	3.4	Not Detected
1,3-Dichlorobenzene	0.78	Not Detected	4.6	Not Detected
1,4-Dichlorobenzene	0.78	Not Detected	4.6	Not Detected
1,2-Dichlorobenzene	0.78	Not Detected	4.6	Not Detected
1,2,4-Trichlorobenzene	3.9	Not Detected	29	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	115	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: IAB335-Grab_20181107

Lab ID#: 1811230A-01B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**21111607sim**	**Date of Collection:**	**11/7/18 09:00:00**
Dil. Factor:	**7.75**	**Date of Analysis:**	**11/16/18 12:10 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.078	Not Detected	0.20	Not Detected
1,1-Dichloroethene	0.078	Not Detected	0.31	Not Detected
cis-1,2-Dichloroethene	0.16	0.35	0.61	1.4
Carbon Tetrachloride	0.16	Not Detected	0.98	Not Detected
Trichloroethene	0.16	0.33	0.83	1.8

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	109	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1811230A-02A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**21111606**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/16/18 11:12 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 11	0.10	Not Detected	0.56	Not Detected
Freon 113	0.10	Not Detected	0.77	Not Detected
Acetone	0.50	Not Detected	1.2	Not Detected
Methylene Chloride	0.20	Not Detected	0.69	Not Detected
1,1,1-Trichloroethane	0.10	Not Detected	0.54	Not Detected
Benzene	0.10	Not Detected	0.32	Not Detected
Toluene	0.10	Not Detected	0.38	Not Detected
Tetrachloroethene	0.10	Not Detected	0.68	Not Detected
Chlorobenzene	0.10	Not Detected	0.46	Not Detected
Ethyl Benzene	0.10	Not Detected	0.43	Not Detected
m,p-Xylene	0.10	Not Detected	0.43	Not Detected
o-Xylene	0.10	Not Detected	0.43	Not Detected
1,3-Dichlorobenzene	0.10	Not Detected	0.60	Not Detected
1,4-Dichlorobenzene	0.10	Not Detected	0.60	Not Detected
1,2-Dichlorobenzene	0.10	Not Detected	0.60	Not Detected
1,2,4-Trichlorobenzene	0.50	Not Detected	3.7	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	119	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	92	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1811230A-02B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**21111606sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/16/18 11:12 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.010	Not Detected	0.026	Not Detected
1,1-Dichloroethene	0.010	Not Detected	0.040	Not Detected
cis-1,2-Dichloroethene	0.020	Not Detected	0.079	Not Detected
Carbon Tetrachloride	0.020	Not Detected	0.12	Not Detected
Trichloroethene	0.020	Not Detected	0.11	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	114	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: CCV

Lab ID#: 1811230A-03A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**21111602**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/16/18 08:44 AM**	

Compound	%Recovery
Freon 12	94
Freon 11	100
Freon 113	97
Acetone	95
Methylene Chloride	98
1,1,1-Trichloroethane	102
Benzene	101
Toluene	100
Tetrachloroethene	99
Chlorobenzene	96
Ethyl Benzene	99
m,p-Xylene	100
o-Xylene	100
1,3-Dichlorobenzene	98
1,4-Dichlorobenzene	96
1,2-Dichlorobenzene	96
1,2,4-Trichlorobenzene	86

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: CCV

Lab ID#: 1811230A-03B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**21111602sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/16/18 08:44 AM**	

Compound	%Recovery
Vinyl Chloride	86
1,1-Dichloroethene	80
cis-1,2-Dichloroethene	86
Carbon Tetrachloride	87
Trichloroethene	85

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: LCS

Lab ID#: 1811230A-04A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**21111603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/16/18 09:23 AM**	

Compound	%Recovery	Method Limits
Freon 12	94	70-130
Freon 11	101	70-130
Freon 113	95	70-130
Acetone	96	70-130
Methylene Chloride	98	70-130
1,1,1-Trichloroethane	101	70-130
Benzene	102	70-130
Toluene	102	70-130
Tetrachloroethene	99	70-130
Chlorobenzene	100	70-130
Ethyl Benzene	103	70-130
m,p-Xylene	104	70-130
o-Xylene	107	70-130
1,3-Dichlorobenzene	104	70-130
1,4-Dichlorobenzene	105	70-130
1,2-Dichlorobenzene	104	70-130
1,2,4-Trichlorobenzene	106	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: LCSD

Lab ID#: 1811230A-04AA

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**21111604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/16/18 09:59 AM**	

Compound	%Recovery	Method Limits
Freon 12	97	70-130
Freon 11	103	70-130
Freon 113	97	70-130
Acetone	100	70-130
Methylene Chloride	101	70-130
1,1,1-Trichloroethane	103	70-130
Benzene	102	70-130
Toluene	101	70-130
Tetrachloroethene	98	70-130
Chlorobenzene	100	70-130
Ethyl Benzene	104	70-130
m,p-Xylene	101	70-130
o-Xylene	103	70-130
1,3-Dichlorobenzene	102	70-130
1,4-Dichlorobenzene	102	70-130
1,2-Dichlorobenzene	103	70-130
1,2,4-Trichlorobenzene	109	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCS

Lab ID#: 1811230A-04B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**21111603sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/16/18 09:23 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	86	70-130
1,1-Dichloroethene	79	70-130
cis-1,2-Dichloroethene	80	70-130
Carbon Tetrachloride	90	60-140
Trichloroethene	87	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: LCSD

Lab ID#: 1811230A-04BB

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**21111604sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/16/18 09:59 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	88	70-130
1,1-Dichloroethene	79	70-130
cis-1,2-Dichloroethene	80	70-130
Carbon Tetrachloride	91	60-140
Trichloroethene	87	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	102	70-130

APPENDIX C

ANALYTICAL LABORATORY REPORTS

C.2 - PASSIVE DIFFUSION SAMPLES

SGS GALSON

Mr. Joe Corsello
Sanborn, Head & Associates
20 Foundry Street
Concord, NH 03301

December 07, 2018

DOH ELAP #11626
AIHA-LAP #100324

Account# 19241

Login# L464501

Dear Mr. Corsello:

Enclosed are the analytical results for the samples received by our laboratory on November 30, 2018. All test results meet the quality control requirements of AIHA-LAP and NELAC unless otherwise stated in this report. All samples on the chain of custody were received in good condition unless otherwise noted.

Results in this report are based on the sampling data provided by the client and refer only to the samples as they were received at the laboratory. When possible, non-IOM samples will be retained for 14 days following the date of this report (unless an extension is specifically requested). IOM samples are retained for 7 days.

Current Scopes of Accreditation can be viewed at www.sgsgalson.com in the accreditations section of the "About" page.

Please contact Caroline Hudson at (888) 432-5227, if you would like any additional information regarding this report. Thank you for using SGS Galson.

Sincerely,

SGS Galson

Lisa Swab
Laboratory Director

Enclosure(s)

SGS GALSON

6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
FAX: (315) 437-0571
www.sgsgalson.com

LABORATORY ANALYSIS REPORT

Client : Sanborn, Head & Associates
Site : B335
Project No. : 2999.06
Date Sampled : 28-NOV-18
Date Received : 30-NOV-18

Account No.: 19241
Login No. : L464501

Date Analyzed : 04-DEC-18
Report ID : 1106403

Trichloroethylene

Sample ID	Lab ID	Time minutes	Raw ug	Total ug	Conc mg/m3	ppm
PD335-01 (NI8121)	L464501-1	2559	<5	<5	<0.2	<0.05
PD335-02 (NI4359)	L464501-2	2557	<5	<5	<0.2	<0.05
PD335-03 (NI5897)	L464501-3	2560	<5	<5	<0.2	<0.05
PD335-04 (NI4545)	L464501-4	2564	<5	<5	<0.2	<0.05
PD335-05 (NI4318)	L464501-5	2565	<5	<5	<0.2	<0.05
PD335-06 (NI6347)	L464501-6	2559	<5	<5	<0.2	<0.05
PD335-07 (NI8161)	L464501-7	2559	<5	<5	<0.2	<0.05
PD335-08 (NI4330)	L464501-8	2563	<5	<5	<0.2	<0.05
PD335-09 (NI4101)	L464501-9	2562	<5	<5	<0.2	<0.05
PD335-10 (NI4234)	L464501-10	2560	<5	<5	<0.2	<0.05
PD335-11 (NI4121)	L464501-11	2559	<5	<5	<0.2	<0.05

COMMENTS: Please see attached lab footnote report for any applicable footnotes.

Level of quantitation: 5 ug
Analytical Method : mod. NIOSH 1022; GC/FID BADGE
Collection Media : Assay 566-A

Submitted by: ARE
Date : 07-DEC-18
Supervisor : KAG

Approved by: MLN
NYS DOH # : 11626
QC by : MLN

< -Less Than mg -Milligrams m3 -Cubic Meters kg -Kilograms NA -Not Applicable ND -Not Detected
> -Greater Than ug -Micrograms l -Liters NS -Not Specified ppm -Parts per Million

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FAX: (315) 437-0571
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LABORATORY ANALYSIS REPORT

Client : Sanborn, Head & Associates
Site : B335
Project No. : 2999.06
Date Sampled : 28-NOV-18
Date Received : 30-NOV-18

Account No.: 19241
Login No. : L464501

Date Analyzed : 04-DEC-18
Report ID : 1106404

Tetrachloroethylene

Sample ID	Lab ID	Time minutes	Raw ug	Total ug	Conc mg/m3	ppm
PD335-01 (NI8121)	L464501-1	2559	6	6	0.3	0.05
PD335-02 (NI4359)	L464501-2	2557	7	7	0.4	0.06
PD335-03 (NI5897)	L464501-3	2560	6	6	0.3	0.05
PD335-04 (NI4545)	L464501-4	2564	7	8	0.4	0.06
PD335-05 (NI4318)	L464501-5	2565	11	11	0.62	0.091
PD335-06 (NI6347)	L464501-6	2559	6	6	0.3	0.05
PD335-07 (NI8161)	L464501-7	2559	8	8	0.5	0.07
PD335-08 (NI4330)	L464501-8	2563	10	11	0.58	0.085
PD335-09 (NI4101)	L464501-9	2562	10	11	0.60	0.089
PD335-10 (NI4234)	L464501-10	2560	7	7	0.4	0.06
PD335-11 (NI4121)	L464501-11	2559	5	5	0.3	0.04

COMMENTS: Please see attached lab footnote report for any applicable footnotes.

Level of quantitation: 5 ug
Analytical Method : mod. NIOSH 1003; GC/FID BADGE
Collection Media : Assay 566-A

Submitted by: ARE
Date : 07-DEC-18
Supervisor : KAG

Approved by: MLN
NYS DOH # : 11626
QC by : MLN

< -Less Than mg -Milligrams m3 -Cubic Meters kg -Kilograms NA -Not Applicable ND -Not Detected
> -Greater Than ug -Micrograms l -Liters NS -Not Specified ppm -Parts per Million

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LABORATORY FOOTNOTE REPORT

Client Name : Sanborn, Head & Associates
Site : B335
Project No. : 2999.06

Date Sampled : 28-NOV-18
Date Received: 30-NOV-18
Date Analyzed: 04-DEC-18

Account No.: 19241
Login No. : L464501

Unless otherwise noted below, all quality control results associated with the samples were within established control limits or did not impact reported results.

Note: The findings recorded within this report were drawn from analysis of the sample(s) provided to the laboratory by the Client (or a third party acting at the Client's direction). The laboratory does not have control over the sampling process, including but not limited to the use of field equipment and collection media, as well as the sampling duration, collection volume or any other collection parameter used by the Client. The findings herein constitute no warranty of the sample's representativeness of any sampled environment, and strictly relate to the samples as they were presented to the laboratory. For recommended sampling collection parameters, please refer to the Sampling and Analysis Guide at www.sgsgalson.com

Unrounded results are carried through the calculations that yield the final result and the final result is rounded to the number of significant figures appropriate to the accuracy of the analytical method. Please note that results appearing in the columns preceeding the final result column may have been rounded and therefore, if carried through the calculations, may not yield an identical final result to the one reported.

The stated LOQs for each analyte represent the demonstrated LOQ concentrations prior to correction for desorption efficiency (if applicable).

Unless otherwise noted below, reported results have not been blank corrected for any field blank or method blank.

L464501 (Report ID: 1106403):
Total ug corrected for a desorption efficiency of 92%.
SOPs: GC-SOP-16(19), GC-SOP-12(15), GC-SOP-9(19)

L464501 (Report ID: 1106403):
Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated accuracy applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process. The accuracy is based solely on spike recovery data from internal quality control samples. Where N/A appears below, insufficient data is available to provide statistical accuracy and mean recovery values for the associated analyte.

Parameter	Accuracy	Mean Recovery
Trichloroethylene	+/-5%	104%

L464501 (Report ID: 1106404):
Total ug corrected for a desorption efficiency of 95%.

< -Less Than mg -Milligrams m3 -Cubic Meters kg -Kilograms ppm -Parts per Million
> -Greater Than ug -Micrograms l -Liters NS -Not Specified ND -Not Detected NA -Not Applicable

SGS GALSON

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LABORATORY FOOTNOTE REPORT

Client Name : Sanborn, Head & Associates
Site : B335
Project No. : 2999.06

Date Sampled : 28-NOV-18
Date Received: 30-NOV-18
Date Analyzed: 04-DEC-18

Account No.: 19241
Login No. : L464501

L464501 (Report ID: 1106404):
SOPs: GC-SOP-16(19), GC-SOP-12(15), GC-SOP-9(19)

L464501 (Report ID: 1106404):
Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated accuracy applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process. The accuracy is based solely on spike recovery data from internal quality control samples. Where N/A appears below, insufficient data is available to provide statistical accuracy and mean recovery values for the associated analyte.

Parameter	Accuracy	Mean Recovery
Tetrachloroethylene	+/-5.2%	101%

< -Less Than mg -Milligrams m3 -Cubic Meters kg -Kilograms ppm -Parts per Million
> -Greater Than ug -Micrograms l -Liters NS -Not Specified ND -Not Detected NA -Not Applicable

1Z15685W1395718216
Date: 11/30/18
Shipper: UPS
Initials: TLS
L464501
Prep: UNKNOWN

GALSON CHAIN OF CUSTODY

120

Turn Around Time (TAT):	(surcharge)
☒ Standard	0%
☐ 4 Business Days	35%
☐ 3 Business Days	50%
☐ 2 Business Days	75%
☐ Next Day by 6pm	100%
☐ Next Day by Noon	150%
☐ Same Day	200%

☐ Samples submitted using the FreePumpLoan™ Program
☑ Samples submitted using the FreeSamplingBadges™ Program

You may edit and complete this COC electronically by logging in to your Client Portal account at https://portal.galsonlabs.com/

Client Acct No.: 19241
Original Prep No.: PSY506256
CS Rep: NTORMEY
Online COC No.: 168665

Report To:	Mr. ~~Brad Green~~ Joe Corsello
Company Name:	Sanborn, Head & Associates
Address 1:	20 Foundry Street
Address 2:	
City, State Zip:	Concord, NH 03301
Phone No.:	603 - 415 - 6160
Cell No.:	JCORSELLO
Email reports to:	~~bgreen~~@sanbornhead.com
Email EDD to:	~~bgreen~~@sanbornhead.com
Comments:	DSALTMARSH

Invoice To:	~~Mr. Brad Green~~ Accounts Payable
Company Name:	Sanborn, Head & Associates
Address 1:	20 Foundry Street
Address 2:	
City, State Zip:	Concord, NH 03301
Phone No.:	603 - 415 - 6160
Email Address:	~~bgreen~~@sanbornhead.com
Comments:	AP
P.O. No.:	2999.06
Payment info.:	☐ I will call SGS Galson to provide credit card info ☐ Card on File (enter the last five digits on the line below)

*Please email an EDD w/lab report

Comments:

State Sampled: NY

Please indicate which OEL(s) this data will be used for:
☐ OSHA PEL ☐ ACGIH TLV ☐ MSHA ☐ Cal OSHA
☐ IAQ: _____ (Specify Limit(s)) ☐ Other: _____ (Specify Other)

Site Name: B335 | Project: 2999.06 | Sampled By: J. Corsello | List description of industry or Process/interferences present in sampling area:

Sample ID * (Maximum of 20 Characters)	Date Sampled *	Collection Medium	Sample Volume / Sample Time / Sample Area *	Liters / Minutes / in², cm², ft² *	Analysis Requested	Method Reference ^	Hexavalent Chromium Process (e.g., welding, plating, painting, etc.)
PD335-01 (WT8121)	11/28/18	Assay N566-A	1454 End time on 11/28	2559	Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	

☐ ^ If the method(s) indicated on the COC are not our routine/preferred method(s), we will substitute our routine/preferred methods. If this is not acceptable, check here to have us contact you.

Chain of Custody	Print Name / Signature	Date	Time		Print Name / Signature	Date	Time
Relinquished By:				Received By:			
Relinquished By:				Received By:	Tanya Silvernail	11/30/18	10:34

*** You must fill in these columns for any samples which you are submitting.**
Samples received after 3pm will be considered as next day's business.

Online COC No.: 168665
Prep No.: PSY506256
Account No.: 19241
Draft: 11/20/2018 12:57:50 PM

All services are rendered in accordance with the applicable SGS General Conditions of Service accessible via: http://www.sgs.com/en/Terms-and-Conditions.aspx

SGS North America, Inc. | 6601 Kirkville Road E. Syracuse, NY 13057, USA t +1 888 432 5227 | +1 315 432 5227 www.galsonlabs.com | www.sgs.com

SGS GALSON CHAIN OF CUSTODY

Comments :

End time 10 11/28

Sample ID * (Maximum of 20 Characters)	Date Sampled *	Collection Medium	Sample Volume (Sample Time) Sample Area *	Liters (Minutes) in², cm², ft² *	Analysis Requested	Method Reference ^	Hexavalent Chromium Process (e.g., welding, plating, painting, etc.)
PD335-02 (NI4359)	11/28/18	Assay N566-A	1452	2557	Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	
-03 (NI 5897)		Assay N566-A 2560 mins kms 11/30/18	~~1500~~ 14:55	~~2560~~ 2555	Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	
-04 (NI4545)		Assay N566-A	~~1500~~ 1500	~~2560~~ 2564	Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	
-05 (NI4318)		Assay N566-A	1501	2565	Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	
-06 (NI6347)		Assay N566-A	1455	2559	Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	

☐ ^ If the method(s) indicated on the COC are not our routine/preferred method(s), we will substitute our routine/preferred methods. If this is not acceptable, check here to have us contact you.

Chain of Custody	Print Name / Signature		Date	Time		Print Name / Signature	Date	Time
Relinquished By :					Received By :			
Relinquished By :					Received By :	Tanya Silvaroli	11/30/18	10:39

*** You must fill in these columns for any samples which you are submitting.**

Samples received after 3pm will be considered as next day's business.

Online COC No. : 168665
Prep No. : PSY506256
Account No. : 19241
Draft : 11/20/2018 12:57:50 PM

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SGS GALSON CHAIN OF CUSTODY

Comments :

End time on 11/28

Sample ID * (Maximum of 20 Characters)	Date Sampled *	Collection Medium	Sample Volume / (Sample Time) / Sample Area *	Liters / (Minutes) in², cm², ft² *	Analysis Requested	Method Reference ^	Hexavalent Chromium Process (e.g., welding, plating, painting, etc.)
PD335-07 (NI8161)	11/28/18	Assay N566-A	1456	2559	Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	
-08 (NI4330)		Assay N566-A	1500	2563	Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	
-09 (NI4101)		Assay N566-A	1459	2562	Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	
-10 (NI4234)		Assay N566-A	1458	2560	Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	
-11 (NI4121)		Assay N566-A	1457	2559	Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	

☐ ^ If the method(s) indicated on the COC are not our routine/preferred method(s), we will substitute our routine/preferred methods. If this is not acceptable, check here to have us contact you.

Chain of Custody	Print Name / Signature		Date	Time		Print Name / Signature	Date	Time
Relinquished By :					Received By :			
Relinquished By :					Received By :	Tonya Silvernail	11/30/18	10:34

*** You must fill in these columns for any samples which you are submitting.**

Samples received after 3pm will be considered as next day's business.

Online COC No. : 168665
Prep No. : PSY506256
Account No. : 19241
Draft : 11/20/2018 12:57:50 PM

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SGS GALSON CHAIN OF CUSTODY

Comments :

Sample ID * (Maximum of 20 Characters)	Date Sampled *	Collection Medium	Sample Volume Sample Time Sample Area *	Liters Minutes in², cm², ft² *	Analysis Requested	Method Reference ^	Hexavalent Chromium Process (e.g., welding, plating, painting, etc.)
		Assay N566-A			Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	
		Assay N566-A			Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	
		Assay N566-A			Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	
		Assay N566-A			Trichloroethylene	mod. NIOSH 1022; GC/FID BADGE	
					Tetrachloroethylene	mod. NIOSH 1003; GC/FID BADGE	

☐ ^ If the method(s) indicated on the COC are not our routine/preferred method(s), we will substitute our routine/preferred methods. If this is not acceptable, check here to have us contact you.

Chain of Custody	Print Name / Signature		Date	Time		Print Name / Signature		Date	Time
Relinquished By :	Jennifer Sarton	[signature]	11/29/18	11:30	Received By :	Angela Sullivan	[signature]	11/29/18	11:30
Relinquished By :	Angela Sullivan	[signature]	11/29/18	4:36	Received By :	[signature]	[signature]	11/29/18	1636

* You must fill in these columns for any samples which you are submitting.

Samples received after 3pm will be considered as next day's business.

Online COC No. : 168665
Prep No. : PSY506256
Account No. : 19241
Draft : 11/20/2018 12:57:50 PM

APPENDIX C

ANALYTICAL LABORATORY REPORTS

C.3 – PRESSURE TESTING SPLIT SAMPLES

ANALYTICAL REPORT

Lab Number:	L1850539
Client:	Sanborn, Head & Associates, Inc. 20 Foundry Street Concord, NH 03301
ATTN:	Jennifer Sanborn
Phone:	(603) 415-6137
Project Name:	Not Specified
Project Number:	2999.02
Report Date:	12/13/18

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1850539-01	IAB335-005-G	AIR	EFK	12/05/18 07:10	12/08/18
L1850539-02	IAB335-002-G	AIR	EFK	12/06/18 14:37	12/08/18

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Case Narrative (continued)

Volatile Organics in Air

Canisters were released from the laboratory on Decemer 4, 2018. The canister certification results are provided as an addendum.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Christopher J. Anderson

Title: Technical Director/Representative Date: 12/13/18

AIR

Project Name: ***Lab Number:*** L1850539

Project Number: 2999.02 ***Report Date:*** 12/13/18

SAMPLE RESULTS

Lab ID: L1850539-01
Client ID: IAB335-005-G
Sample Location: EFK

Date Collected: 12/05/18 07:10
Date Received: 12/08/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 12/12/18 00:28
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Vinyl chloride	ND	0.020	--	ND	0.051	--		1
trans-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
cis-1,2-Dichloroethene	0.080	0.020	--	0.317	0.079	--		1
Trichloroethene	0.061	0.020	--	0.328	0.107	--		1
Tetrachloroethene	15.3	0.020	--	104	0.136	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-difluorobenzene	84		60-140
bromochloromethane	83		60-140
chlorobenzene-d5	81		60-140

Project Name: ***Lab Number:*** L1850539

Project Number: 2999.02 ***Report Date:*** 12/13/18

SAMPLE RESULTS

Lab ID: L1850539-02
Client ID: IAB335-002-G
Sample Location: EFK

Date Collected: 12/06/18 14:37
Date Received: 12/08/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 12/12/18 01:47
Analyst: RY

	ppbV			ug/m3				Dilution
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Vinyl chloride	ND	0.020	--	ND	0.051	--		1
trans-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
cis-1,2-Dichloroethene	0.200	0.020	--	0.793	0.079	--		1
Trichloroethene	0.160	0.020	--	0.860	0.107	--		1
Tetrachloroethene	31.5	0.020	--	214	0.136	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-difluorobenzene	82		60-140
bromochloromethane	81		60-140
chlorobenzene-d5	81		60-140

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15-SIM
Analytical Date: 12/11/18 15:50

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab for sample(s): 01-02 Batch: WG1188124-4								
Propylene	ND	0.500	--	ND	0.861	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.050	--	ND	0.349	--		1
Vinyl chloride	ND	0.020	--	ND	0.051	--		1
1,3-Butadiene	ND	0.020	--	ND	0.044	--		1
Bromomethane	ND	0.020	--	ND	0.078	--		1
Chloroethane	ND	0.100	--	ND	0.264	--		1
Ethyl Alcohol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.050	--	ND	0.281	--		1
iso-Propyl Alcohol	ND	0.500	--	ND	1.23	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
1,1-Dichloroethene	ND	0.020	--	ND	0.079	--		1
tert-Butyl Alcohol	ND	0.500	--	ND	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.050	--	ND	0.383	--		1
trans-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
1,1-Dichloroethane	ND	0.020	--	ND	0.081	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15-SIM
Analytical Date: 12/11/18 15:50

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab for sample(s): 01-02 Batch: WG1188124-4								
cis-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.020	--	ND	0.098	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.020	--	ND	0.081	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
1,1,1-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Benzene	ND	0.100	--	ND	0.319	--		1
Carbon tetrachloride	ND	0.020	--	ND	0.126	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
Dibromomethane	ND	0.200	--	ND	1.42	--		1
1,2-Dichloropropane	ND	0.020	--	ND	0.092	--		1
Bromodichloromethane	ND	0.020	--	ND	0.134	--		1
1,4-Dioxane	ND	0.100	--	ND	0.360	--		1
Trichloroethene	ND	0.020	--	ND	0.107	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
1,1,2-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Toluene	ND	0.050	--	ND	0.188	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.020	--	ND	0.170	--		1
1,2-Dibromoethane	ND	0.020	--	ND	0.154	--		1

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15-SIM
Analytical Date: 12/11/18 15:50

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab for sample(s): 01-02 Batch: WG1188124-4								
Tetrachloroethene	ND	0.020	--	ND	0.136	--		1
1,1,1,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
Chlorobenzene	ND	0.100	--	ND	0.461	--		1
Ethylbenzene	ND	0.020	--	ND	0.087	--		1
p/m-Xylene	ND	0.040	--	ND	0.174	--		1
Bromoform	ND	0.020	--	ND	0.207	--		1
Styrene	ND	0.020	--	ND	0.085	--		1
1,1,2,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
o-Xylene	ND	0.020	--	ND	0.087	--		1
1,2,3-Trichloropropane	ND	0.020	--	ND	0.121	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
4-Ethyltoluene	ND	0.020	--	ND	0.098	--		1
1,3,5-Trimethylbenzene	ND	0.020	--	ND	0.098	--		1
1,2,4-Trimethylbenzene	ND	0.020	--	ND	0.098	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
1,4-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Naphthalene	ND	0.050	--	ND	0.262	--		1
1,2,3-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15-SIM
Analytical Date: 12/11/18 15:50

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab for sample(s): 01-02 Batch: WG1188124-4								
Hexachlorobutadiene	ND	0.050	--	ND	0.533	--		1

Lab Control Sample Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-02 Batch: WG1188124-3								
Propylene	112		-		70-130	-		25
Dichlorodifluoromethane	97		-		70-130	-		25
Chloromethane	90		-		70-130	-		25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	96		-		70-130	-		25
Vinyl chloride	113		-		70-130	-		25
1,3-Butadiene	99		-		70-130	-		25
Bromomethane	110		-		70-130	-		25
Chloroethane	108		-		70-130	-		25
Ethyl Alcohol	98		-		70-130	-		25
Vinyl bromide	92		-		70-130	-		25
Acetone	118		-		70-130	-		25
Trichlorofluoromethane	106		-		70-130	-		25
iso-Propyl Alcohol	114		-		70-130	-		25
Acrylonitrile	88		-		70-130	-		25
1,1-Dichloroethene	109		-		70-130	-		25
tert-Butyl Alcohol[1]	**136**	Q	-		70-130	-		25
Methylene chloride	90		-		70-130	-		25
3-Chloropropene	124		-		70-130	-		25
Carbon disulfide	76		-		70-130	-		25
1,1,2-Trichloro-1,2,2-Trifluoroethane	103		-		70-130	-		25
trans-1,2-Dichloroethene	108		-		70-130	-		25
1,1-Dichloroethane	112		-		70-130	-		25
Methyl tert butyl ether	89		-		70-130	-		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-02 Batch: WG1188124-3								
Vinyl acetate	95		-		70-130	-		25
2-Butanone	95		-		70-130	-		25
cis-1,2-Dichloroethene	100		-		70-130	-		25
Ethyl Acetate	109		-		70-130	-		25
Chloroform	96		-		70-130	-		25
Tetrahydrofuran	95		-		70-130	-		25
1,2-Dichloroethane	98		-		70-130	-		25
n-Hexane	100		-		70-130	-		25
1,1,1-Trichloroethane	90		-		70-130	-		25
Benzene	81		-		70-130	-		25
Carbon tetrachloride	89		-		70-130	-		25
Cyclohexane	99		-		70-130	-		25
Dibromomethane[1]	86		-		70-130	-		25
1,2-Dichloropropane	93		-		70-130	-		25
Bromodichloromethane	95		-		70-130	-		25
1,4-Dioxane	100		-		70-130	-		25
Trichloroethene	85		-		70-130	-		25
2,2,4-Trimethylpentane	100		-		70-130	-		25
cis-1,3-Dichloropropene	76		-		70-130	-		25
4-Methyl-2-pentanone	95		-		70-130	-		25
trans-1,3-Dichloropropene	86		-		70-130	-		25
1,1,2-Trichloroethane	87		-		70-130	-		25
Toluene	97		-		70-130	-		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-02 Batch: WG1188124-3								
2-Hexanone	99		-		70-130	-		25
Dibromochloromethane	102		-		70-130	-		25
1,2-Dibromoethane	87		-		70-130	-		25
Tetrachloroethene	93		-		70-130	-		25
1,1,1,2-Tetrachloroethane	87		-		70-130	-		25
Chlorobenzene	97		-		70-130	-		25
Ethylbenzene	103		-		70-130	-		25
p/m-Xylene	104		-		70-130	-		25
Bromoform	101		-		70-130	-		25
Styrene	94		-		70-130	-		25
1,1,2,2-Tetrachloroethane	111		-		70-130	-		25
o-Xylene	109		-		70-130	-		25
1,2,3-Trichloropropane[1]	93		-		70-130	-		25
Isopropylbenzene	94		-		70-130	-		25
Bromobenzene[1]	96		-		70-130	-		25
4-Ethyltoluene	102		-		70-130	-		25
1,3,5-Trimethylbenzene	99		-		70-130	-		25
1,2,4-Trimethylbenzene	103		-		70-130	-		25
Benzyl chloride	104		-		70-130	-		25
1,3-Dichlorobenzene	106		-		70-130	-		25
1,4-Dichlorobenzene	107		-		70-130	-		25
sec-Butylbenzene	97		-		70-130	-		25
p-Isopropyltoluene	101		-		70-130	-		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-02 Batch: WG1188124-3								
1,2-Dichlorobenzene	107		-		70-130	-		25
n-Butylbenzene	120		-		70-130	-		25
1,2,4-Trichlorobenzene	94		-		70-130	-		25
Naphthalene	90		-		70-130	-		25
1,2,3-Trichlorobenzene	92		-		70-130	-		25
Hexachlorobutadiene	105		-		70-130	-		25

Lab Duplicate Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1188124-5 QC Sample: L1850539-01 Client ID: IAB335-005-G						
Vinyl chloride	ND	ND	ppbV	NC		25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC		25
cis-1,2-Dichloroethene	0.080	0.079	ppbV	1		25
Trichloroethene	0.061	0.057	ppbV	7		25
Tetrachloroethene	15.3	15.2	ppbV	1		25

Project Name:

Lab Number: L1850539

Project Number: 2999.02

Report Date: 12/13/18

Canister and Flow Controller Information

Samplenum	Client ID	Media ID	Media Type	Date Prepared	Bottle Order	Cleaning Batch ID	Can Leak Check	Initial Pressure (in. Hg)	Pressure on Receipt (in. Hg)	Flow Controler Leak Chk	Flow Out mL/min	Flow In mL/min	% RPD
L1850539-01	IAB335-005-G	1729	2.7L Can	12/04/18	280033	L1848913-02	Pass	-29.0	-3.7	-	-	-	-
L1850539-02	IAB335-002-G	420	2.7L Can	12/04/18	280033	L1848913-01	Pass	-29.0	-5.2	-	-	-	-

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-01
Client ID: CAN 420 SHELF 2
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 11/30/18 09:59
Analyst: RY

	ppbV			ug/m3				
Parameter	Results	RL	MDL	Results	RL	MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Chlorodifluoromethane	ND	0.200	--	ND	0.707	--		1
Propylene	ND	0.500	--	ND	0.861	--		1
Propane	ND	0.500	--	ND	0.902	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Methanol	ND	5.00	--	ND	6.55	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Butane	ND	0.200	--	ND	0.475	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Dichlorofluoromethane	ND	0.200	--	ND	0.842	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acrolein	ND	0.500	--	ND	1.15	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Acetonitrile	ND	0.200	--	ND	0.336	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
Pentane	ND	0.200	--	ND	0.590	--		1
Ethyl ether	ND	0.200	--	ND	0.606	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-01
Client ID: CAN 420 SHELF 2
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
2,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
Diisopropyl ether	ND	0.200	--	ND	0.836	--		1
tert-Butyl Ethyl Ether	ND	0.200	--	ND	0.836	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
1,1-Dichloropropene	ND	0.200	--	ND	0.908	--		1
Benzene	ND	0.200	--	ND	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
tert-Amyl Methyl Ether	ND	0.200	--	ND	0.836	--		1
Dibromomethane	ND	0.200	--	ND	1.42	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-01
Client ID: CAN 420 SHELF 2
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Methyl Methacrylate	ND	0.500	--	ND	2.05	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	ND	0.200	--	ND	0.754	--		1
1,3-Dichloropropane	ND	0.200	--	ND	0.924	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Butyl acetate	ND	0.500	--	ND	2.38	--		1
Octane	ND	0.200	--	ND	0.934	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
1,1,1,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
1,2,3-Trichloropropane	ND	0.200	--	ND	1.21	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-01
Client ID: CAN 420 SHELF 2
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
2-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
n-Propylbenzene	ND	0.200	--	ND	0.983	--		1
4-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
tert-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Decane	ND	0.200	--	ND	1.16	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2-Dibromo-3-chloropropane	ND	0.200	--	ND	1.93	--		1
Undecane	ND	0.200	--	ND	1.28	--		1
Dodecane	ND	0.200	--	ND	1.39	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Naphthalene	ND	0.200	--	ND	1.05	--		1
1,2,3-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-01
Client ID: CAN 420 SHELF 2
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	77		60-140
Bromochloromethane	84		60-140
chlorobenzene-d5	82		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-01
Client ID: CAN 420 SHELF 2
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 11/30/18 09:59
Analyst: RY

	ppbV			ug/m3				
Parameter	Results	RL	MDL	Results	RL	MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.050	--	ND	0.349	--		1
Vinyl chloride	ND	0.020	--	ND	0.051	--		1
1,3-Butadiene	ND	0.020	--	ND	0.044	--		1
Bromomethane	ND	0.020	--	ND	0.078	--		1
Chloroethane	ND	0.100	--	ND	0.264	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.050	--	ND	0.281	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
1,1-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
Freon-113	ND	0.050	--	ND	0.383	--		1
trans-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
1,1-Dichloroethane	ND	0.020	--	ND	0.081	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Chloroform	ND	0.020	--	ND	0.098	--		1
1,2-Dichloroethane	ND	0.020	--	ND	0.081	--		1
1,1,1-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Benzene	ND	0.100	--	ND	0.319	--		1
Carbon tetrachloride	ND	0.020	--	ND	0.126	--		1
1,2-Dichloropropane	ND	0.020	--	ND	0.092	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-01
Client ID: CAN 420 SHELF 2
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
Bromodichloromethane	ND	0.020	--	ND	0.134	--		1
1,4-Dioxane	ND	0.100	--	ND	0.360	--		1
Trichloroethene	ND	0.020	--	ND	0.107	--		1
cis-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
1,1,2-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Toluene	ND	0.050	--	ND	0.188	--		1
Dibromochloromethane	ND	0.020	--	ND	0.170	--		1
1,2-Dibromoethane	ND	0.020	--	ND	0.154	--		1
Tetrachloroethene	ND	0.020	--	ND	0.136	--		1
1,1,1,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
Chlorobenzene	ND	0.100	--	ND	0.461	--		1
Ethylbenzene	ND	0.020	--	ND	0.087	--		1
p/m-Xylene	ND	0.040	--	ND	0.174	--		1
Bromoform	ND	0.020	--	ND	0.207	--		1
Styrene	ND	0.020	--	ND	0.085	--		1
1,1,2,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
o-Xylene	ND	0.020	--	ND	0.087	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
4-Ethyltoluene	ND	0.020	--	ND	0.098	--		1
1,3,5-Trimethybenzene	ND	0.020	--	ND	0.098	--		1
1,2,4-Trimethylbenzene	ND	0.020	--	ND	0.098	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
1,4-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-01
Client ID: CAN 420 SHELF 2
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Naphthalene	ND	0.050	--	ND	0.262	--		1
1,2,3-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Hexachlorobutadiene	ND	0.050	--	ND	0.533	--		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	79		60-140
bromochloromethane	86		60-140
chlorobenzene-d5	82		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-02
Client ID: CAN 1729 SHELF 3
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 11/30/18 10:31
Analyst: RY

	ppbV			ug/m3				
Parameter	Results	RL	MDL	Results	RL	MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Chlorodifluoromethane	ND	0.200	--	ND	0.707	--		1
Propylene	ND	0.500	--	ND	0.861	--		1
Propane	ND	0.500	--	ND	0.902	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Methanol	ND	5.00	--	ND	6.55	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Butane	ND	0.200	--	ND	0.475	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Dichlorofluoromethane	ND	0.200	--	ND	0.842	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acrolein	ND	0.500	--	ND	1.15	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Acetonitrile	ND	0.200	--	ND	0.336	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
Pentane	ND	0.200	--	ND	0.590	--		1
Ethyl ether	ND	0.200	--	ND	0.606	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-02
Client ID: CAN 1729 SHELF 3
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
2,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
Diisopropyl ether	ND	0.200	--	ND	0.836	--		1
tert-Butyl Ethyl Ether	ND	0.200	--	ND	0.836	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
1,1-Dichloropropene	ND	0.200	--	ND	0.908	--		1
Benzene	ND	0.200	--	ND	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
tert-Amyl Methyl Ether	ND	0.200	--	ND	0.836	--		1
Dibromomethane	ND	0.200	--	ND	1.42	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-02
Client ID: CAN 1729 SHELF 3
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Methyl Methacrylate	ND	0.500	--	ND	2.05	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	ND	0.200	--	ND	0.754	--		1
1,3-Dichloropropane	ND	0.200	--	ND	0.924	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Butyl acetate	ND	0.500	--	ND	2.38	--		1
Octane	ND	0.200	--	ND	0.934	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
1,1,1,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
1,2,3-Trichloropropane	ND	0.200	--	ND	1.21	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-02
Client ID: CAN 1729 SHELF 3
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
2-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
n-Propylbenzene	ND	0.200	--	ND	0.983	--		1
4-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
tert-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Decane	ND	0.200	--	ND	1.16	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2-Dibromo-3-chloropropane	ND	0.200	--	ND	1.93	--		1
Undecane	ND	0.200	--	ND	1.28	--		1
Dodecane	ND	0.200	--	ND	1.39	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Naphthalene	ND	0.200	--	ND	1.05	--		1
1,2,3-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-02
Client ID: CAN 1729 SHELF 3
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	77		60-140
Bromochloromethane	84		60-140
chlorobenzene-d5	80		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-02
Client ID: CAN 1729 SHELF 3
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 11/30/18 10:31
Analyst: RY

	ppbV			ug/m3				
Parameter	Results	RL	MDL	Results	RL	MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.050	--	ND	0.349	--		1
Vinyl chloride	ND	0.020	--	ND	0.051	--		1
1,3-Butadiene	ND	0.020	--	ND	0.044	--		1
Bromomethane	ND	0.020	--	ND	0.078	--		1
Chloroethane	ND	0.100	--	ND	0.264	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.050	--	ND	0.281	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
1,1-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
Freon-113	ND	0.050	--	ND	0.383	--		1
trans-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
1,1-Dichloroethane	ND	0.020	--	ND	0.081	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Chloroform	ND	0.020	--	ND	0.098	--		1
1,2-Dichloroethane	ND	0.020	--	ND	0.081	--		1
1,1,1-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Benzene	ND	0.100	--	ND	0.319	--		1
Carbon tetrachloride	ND	0.020	--	ND	0.126	--		1
1,2-Dichloropropane	ND	0.020	--	ND	0.092	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-02
Client ID: CAN 1729 SHELF 3
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
Bromodichloromethane	ND	0.020	--	ND	0.134	--		1
1,4-Dioxane	ND	0.100	--	ND	0.360	--		1
Trichloroethene	ND	0.020	--	ND	0.107	--		1
cis-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
1,1,2-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Toluene	ND	0.050	--	ND	0.188	--		1
Dibromochloromethane	ND	0.020	--	ND	0.170	--		1
1,2-Dibromoethane	ND	0.020	--	ND	0.154	--		1
Tetrachloroethene	ND	0.020	--	ND	0.136	--		1
1,1,1,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
Chlorobenzene	ND	0.100	--	ND	0.461	--		1
Ethylbenzene	ND	0.020	--	ND	0.087	--		1
p/m-Xylene	ND	0.040	--	ND	0.174	--		1
Bromoform	ND	0.020	--	ND	0.207	--		1
Styrene	ND	0.020	--	ND	0.085	--		1
1,1,2,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
o-Xylene	ND	0.020	--	ND	0.087	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
4-Ethyltoluene	ND	0.020	--	ND	0.098	--		1
1,3,5-Trimethybenzene	ND	0.020	--	ND	0.098	--		1
1,2,4-Trimethylbenzene	ND	0.020	--	ND	0.098	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
1,4-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848913
Report Date: 12/13/18

Air Canister Certification Results

Lab ID: L1848913-02
Client ID: CAN 1729 SHELF 3
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Naphthalene	ND	0.050	--	ND	0.262	--		1
1,2,3-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Hexachlorobutadiene	ND	0.050	--	ND	0.533	--		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	80		60-140
bromochloromethane	87		60-140
chlorobenzene-d5	82		60-140

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
N/A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1850539-01A	Canister - 2.7 Liter	N/A	NA			Y	Absent		TO15-SIM(30)
L1850539-02A	Canister - 2.7 Liter	N/A	NA			Y	Absent		TO15-SIM(30)

*Values in parentheses indicate holding time in days

Project Name: Not Specified **Lab Number:** L1850539

Project Number: 2999.02 **Report Date:** 12/13/18

GLOSSARY

Acronyms

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample¿s toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: Data Usability Report

Project Name: Not Specified **Lab Number:** L1850539

Project Number: 2999.02 **Report Date:** 12/13/18

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name: Not Specified
Project Number: 2999.02

Lab Number: L1850539
Report Date: 12/13/18

REFERENCES

48 Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.

EPA 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

AIR ANALYSIS

PAGE ____ OF ____

CHAIN OF CUSTODY

ALPHA ANALYTICAL
320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 12/8/18

ALPHA Job #: L1850539

Client Information

Client: Sanborn Head
Address: 20 Foundry St.
Concord NH
Phone: 603-415-6137
Fax:
Email: JSanborn@SanbornHead.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name:
Project Location: EFK
Project #: 29991.02
Project Manager: Jenn Sanborn
ALPHA Quote #:

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved)

Date Due: Time:

Report Information - Data Deliverables

☐ FAX
☐ ADEx
Criteria Checker:
(Default based on Regulatory Criteria Indicated)
Other Formats:
☑ EMAIL (standard pdf report)
☐ Additional Deliverables:
Report to: (if different than Project Manager)

Billing Information

☑ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed	Program	Res / Comm

Other Project Specific Requirements/Comments:

Project-Specific Target Compound List: ☐

All Columns Below Must Be Filled Out

ALPHA Lab ID (Lab Use Only)	Sample ID	COLLECTION End Date	Start Time	End Time	Initial Vacuum	Final Vacuum	Sample Matrix*	Sampler's Initials	Can Size	ID Can	ID - Flow Controller	ANALYSIS TO-15	TO-15 SIM	APH (Subset Nonaromatics HCs)	Fixed Gases	Sulfides & Mercaptans by TO-15	☐	Sample Comments (i.e. PID)
50539-01	IAB335-005-G	12-5-18		7:10	-29.0	-4.5	AA	JVF	27	1729			X					Grab Sample
-02	IAB335-002-G	12-6-18		11:37	-29.0	-5.0	AA	JVF	27	420			X					"

*SAMPLE MATRIX CODES

AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Relinquished By:	Date/Time	Received By:	Date/Time:
FedEx		[illegible]	12/8/18 20:01

APPENDIX C

ANALYTICAL LABORATORY REPORTS

C.4 – SUBSLAB VAPOR AND FLUX CHAMBER SAMPLES

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2/18/2019
Ms. Erica Bosse
Sanborn, Head & Associates
24 Wade Road

Latham NY

Project Name: EFK
Project #: 2999.00
Workorder #: 1902058

Dear Ms. Erica Bosse

The following report includes the data for the above referenced project for sample(s) received on 2/5/2019 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Ausha Scott
Project Manager

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WORK ORDER #: 1902058

Work Order Summary

CLIENT:	Ms. Erica Bosse Sanborn, Head & Associates 24 Wade Road Latham, NY	**BILL TO:**	Accounts Payable Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301
PHONE:	518-207-0769	**P.O. #**	
FAX:		**PROJECT #**	2999.00 EFK
DATE RECEIVED:	02/05/2019	**CONTACT:**	Ausha Scott
DATE COMPLETED:	02/18/2019		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	FT335-001-60G_20190129	TO-15	6.7 "Hg	15.9 psi
02A	FT335-002-40G_20190129	TO-15	5.5 "Hg	15.2 psi
03A	FT335-003-40G_20190129	TO-15	0.2 "Hg	15.9 psi
04A	FT335-004-40G_20190129	TO-15	5.5 "Hg	15.3 psi
05A	FT335-005-40G_20190130	TO-15	4.9 "Hg	15.5 psi
05B	FT335-005-40G_20190130	TO-15	4.9 "Hg	15.5 psi
06A	FT335-006-40G_20190130	TO-15	4.3 "Hg	15.5 psi
07A	SSV335-001_20190130	TO-15	5.7 "Hg	14.7 psi
08A	SSV335-002_20190130	TO-15	4.7 "Hg	15.5 psi
09A	SSV335-003_20190130	TO-15	5.5 "Hg	15.3 psi
10A	SSV335-004_20190130	TO-15	5.5 "Hg	14.6 psi
11A	SSV335-005_20190130	TO-15	5.7 "Hg	15 psi
12A	SSV335-006_20190130	TO-15	3.9 "Hg	14.6 psi
13A	SSV335-007_20190130	TO-15	4.9 "Hg	15.6 psi
14A	SSV335-008_20190130	TO-15	6.7 "Hg	14.6 psi
15A	SSV335-009_20190130	TO-15	4.5 "Hg	15.7 psi
16A	SSV335-010_20190130	TO-15	4.9 "Hg	15.5 psi
17A	SSV335-011_20190130	TO-15	4.5 "Hg	15.6 psi
18A	SSV335-011_20190130_FD	TO-15	0.4 psi	16.2 psi
19A	SSV335-012_20190130	TO-15	5.1 "Hg	15.3 psi
20A	Lab Blank	TO-15	NA	NA
20B	Lab Blank	TO-15	NA	NA
20C	Lab Blank	TO-15	NA	NA

Continued on next page

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WORK ORDER #: 1902058

Work Order Summary

CLIENT:	Ms. Erica Bosse Sanborn, Head & Associates 24 Wade Road Latham, NY	**BILL TO:**	Accounts Payable Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301
PHONE:	518-207-0769	**P.O. #**	
FAX:		**PROJECT #**	2999.00 EFK
DATE RECEIVED:	02/05/2019	**CONTACT:**	Ausha Scott
DATE COMPLETED:	02/18/2019		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
20D	Lab Blank	TO-15	NA	NA
21A	CCV	TO-15	NA	NA
21B	CCV	TO-15	NA	NA
21C	CCV	TO-15	NA	NA
21D	CCV	TO-15	NA	NA
22A	LCS	TO-15	NA	NA
22AA	LCSD	TO-15	NA	NA
22B	LCS	TO-15	NA	NA
22BB	LCSD	TO-15	NA	NA
22C	LCS	TO-15	NA	NA
22CC	LCSD	TO-15	NA	NA
22D	LCS	TO-15	NA	NA
22DD	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 02/18/19

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP - E8 , LA NELAP - 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP CA009332018-10, VA NELAP - 9505, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2018, Expiration date: 10/17/2019.
Eurofins Air Toxics LLC. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
Sanborn, Head & Associates
Workorder# 1902058

Nineteen 1 Liter Summa Canister samples were received on February 05, 2019. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

Due to omission of the sampling date from the ID format on the sample tags, the information on the Chain of Custody (COC) for samples FT335-001-60G_20190129, FT335-002-40G_20190129, FT335-003-40G_20190129, FT335-004-40G_20190129, FT335-005-40G_20190130, FT335-006-40G_20190130, SSV335-001_20190130, SSV335-002_20190130, SSV335-003_20190130, SSV335-004_20190130, SSV335-005_20190130, SSV335-006_20190130, SSV335-007_20190130, SSV335-008_20190130, SSV335-009_20190130, SSV335-010_20190130, SSV335-011_20190130, SSV335-011_20190130_FD and SSV335-012_20190130 was used to process and report the samples.

There was a difference (greater than or equal to 5.0" Hg) between the measured canister receipt vacuum and that which was reported on the Chain of Custody (COC) for sample SSV335-011_20190130_FD. A leak test indicated that the valve was functioning properly.

Analytical Notes

Due to high-level target compounds, sample FT335-005-40G_20190130 was analyzed twice. In the "A" fraction, the sample was diluted to bring the highest-level compounds within the calibration range. The "B" fraction is also reported by client request and may be reported with "E" flags indicating the compound exceeds the calibration range. Both runs and associated QC are reported.

Dilution was performed on samples FT335-005-40G_20190130, SSV335-001_20190130, SSV335-002_20190130, SSV335-003_20190130, SSV335-004_20190130, SSV335-005_20190130, SSV335-006_20190130, SSV335-007_20190130, SSV335-008_20190130, SSV335-009_20190130, SSV335-010_20190130, SSV335-011_20190130, SSV335-011_20190130_FD and SSV335-012_20190130 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: FT335-001-60G_20190129

Lab ID#: 1902058-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	13	14	32	33
Tetrachloroethene	1.3	27	9.1	180

Client Sample ID: FT335-002-40G_20190129

Lab ID#: 1902058-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	27	8.4	180

Client Sample ID: FT335-003-40G_20190129

Lab ID#: 1902058-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	1.0	1.5	4.0	5.6
Tetrachloroethene	1.0	59	7.1	400
Ethyl Benzene	1.0	3.0	4.6	13
m,p-Xylene	1.0	16	4.6	70
o-Xylene	1.0	4.9	4.6	21

Client Sample ID: FT335-004-40G_20190129

Lab ID#: 1902058-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	1.2	2.0	5.0	7.9
Trichloroethene	1.2	2.1	6.7	11
Toluene	1.2	1.4	4.7	5.2
Tetrachloroethene	1.2	460	8.5	3100
Ethyl Benzene	1.2	2.9	5.4	13
m,p-Xylene	1.2	15	5.4	66
o-Xylene	1.2	5.1	5.4	22

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: FT335-005-40G_20190130

Lab ID#: 1902058-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	9.8	3400	66	23000

Client Sample ID: FT335-005-40G_20190130

Lab ID#: 1902058-05B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	4.9	6.4	26	34
Tetrachloroethene	4.9	3100 E	33	21000 E
m,p-Xylene	4.9	8.8	21	38

Client Sample ID: FT335-006-40G_20190130

Lab ID#: 1902058-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	6.9	6.4	37
Tetrachloroethene	1.2	390	8.1	2600
m,p-Xylene	1.2	4.7	5.2	20
o-Xylene	1.2	1.9	5.2	8.4

Client Sample ID: SSV335-001_20190130

Lab ID#: 1902058-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	6.2	31	33	160
Tetrachloroethene	6.2	1900	42	13000

Client Sample ID: SSV335-002_20190130

Lab ID#: 1902058-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	87	320	470	1700
Tetrachloroethene	87	15000	590	100000

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS

Client Sample ID: SSV335-003_20190130

Lab ID#: 1902058-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	620	86000	4200	580000

Client Sample ID: SSV335-004_20190130

Lab ID#: 1902058-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	2400	98000	16000	660000

Client Sample ID: SSV335-005_20190130

Lab ID#: 1902058-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1200	55000	8500	370000

Client Sample ID: SSV335-006_20190130

Lab ID#: 1902058-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	9.2	37	36	150
Trichloroethene	9.2	64	49	350
Tetrachloroethene	9.2	2100	62	14000

Client Sample ID: SSV335-007_20190130

Lab ID#: 1902058-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	12000	28000	49000	110000
Trichloroethene	12000	13000	66000	70000
Tetrachloroethene	12000	2200000	83000	15000000

Client Sample ID: SSV335-008_20190130

Lab ID#: 1902058-14A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS

Client Sample ID: SSV335-008_20190130

Lab ID#: 1902058-14A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	21000	3700000	140000	25000000

Client Sample ID: SSV335-009_20190130

Lab ID#: 1902058-15A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	3000	370000	21000	2500000

Client Sample ID: SSV335-010_20190130

Lab ID#: 1902058-16A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	120	13000	830	88000

Client Sample ID: SSV335-011_20190130

Lab ID#: 1902058-17A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	6000	560000	41000	3800000

Client Sample ID: SSV335-011_20190130_FD

Lab ID#: 1902058-18A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	5100	450000	35000	3000000

Client Sample ID: SSV335-012_20190130

Lab ID#: 1902058-19A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	7700	1100000	52000	7700000

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Client Sample ID: FT335-001-60G_20190129

Lab ID#: 1902058-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020708**	**Date of Collection:**	**1/29/19 2:28:00 PM**
Dil. Factor:	**2.68**	**Date of Analysis:**	**2/7/19 03:43 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	Not Detected	6.6	Not Detected
Vinyl Chloride	1.3	Not Detected	3.4	Not Detected
Freon 11	1.3	Not Detected	7.5	Not Detected
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Acetone	13	14	32	33
Methylene Chloride	13	Not Detected	46	Not Detected
cis-1,2-Dichloroethene	1.3	Not Detected	5.3	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.3	Not Detected
Carbon Tetrachloride	1.3	Not Detected	8.4	Not Detected
Benzene	1.3	Not Detected	4.3	Not Detected
Trichloroethene	1.3	Not Detected	7.2	Not Detected
Toluene	1.3	Not Detected	5.0	Not Detected
Tetrachloroethene	1.3	27	9.1	180
Chlorobenzene	1.3	Not Detected	6.2	Not Detected
Ethyl Benzene	1.3	Not Detected	5.8	Not Detected
m,p-Xylene	1.3	Not Detected	5.8	Not Detected
o-Xylene	1.3	Not Detected	5.8	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	8.0	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	8.0	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	8.0	Not Detected
1,2,4-Trichlorobenzene	5.4	Not Detected	40	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	85	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: FT335-002-40G_20190129

Lab ID#: 1902058-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a020709	Date of Collection:	1/29/19 4:04:00 PM
Dil. Factor:	2.49	Date of Analysis:	2/7/19 04:10 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.2	Not Detected
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
Freon 11	1.2	Not Detected	7.0	Not Detected
Freon 113	1.2	Not Detected	9.5	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Acetone	12	Not Detected	30	Not Detected
Methylene Chloride	12	Not Detected	43	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.8	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.8	Not Detected
Benzene	1.2	Not Detected	4.0	Not Detected
Trichloroethene	1.2	Not Detected	6.7	Not Detected
Toluene	1.2	Not Detected	4.7	Not Detected
Tetrachloroethene	1.2	27	8.4	180
Chlorobenzene	1.2	Not Detected	5.7	Not Detected
Ethyl Benzene	1.2	Not Detected	5.4	Not Detected
m,p-Xylene	1.2	Not Detected	5.4	Not Detected
o-Xylene	1.2	Not Detected	5.4	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
1,2,4-Trichlorobenzene	5.0	Not Detected	37	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: FT335-003-40G_20190129

Lab ID#: 1902058-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020710**	**Date of Collection: 1/29/19 4:55:00 PM**	
Dil. Factor:	**2.10**	**Date of Analysis: 2/7/19 04:36 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.0	Not Detected	5.2	Not Detected
Vinyl Chloride	1.0	Not Detected	2.7	Not Detected
Freon 11	1.0	Not Detected	5.9	Not Detected
Freon 113	1.0	Not Detected	8.0	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.2	Not Detected
Acetone	10	Not Detected	25	Not Detected
Methylene Chloride	10	Not Detected	36	Not Detected
cis-1,2-Dichloroethene	1.0	Not Detected	4.2	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.7	Not Detected
Carbon Tetrachloride	1.0	Not Detected	6.6	Not Detected
Benzene	1.0	Not Detected	3.4	Not Detected
Trichloroethene	1.0	Not Detected	5.6	Not Detected
Toluene	1.0	1.5	4.0	5.6
Tetrachloroethene	1.0	59	7.1	400
Chlorobenzene	1.0	Not Detected	4.8	Not Detected
Ethyl Benzene	1.0	3.0	4.6	13
m,p-Xylene	1.0	16	4.6	70
o-Xylene	1.0	4.9	4.6	21
1,3-Dichlorobenzene	1.0	Not Detected	6.3	Not Detected
1,4-Dichlorobenzene	1.0	Not Detected	6.3	Not Detected
1,2-Dichlorobenzene	1.0	Not Detected	6.3	Not Detected
1,2,4-Trichlorobenzene	4.2	Not Detected	31	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: FT335-004-40G_20190129

Lab ID#: 1902058-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a020711	Date of Collection:	1/29/19 5:46:00 PM
Dil. Factor:	2.50	Date of Analysis:	2/7/19 05:03 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.2	Not Detected
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
Freon 11	1.2	Not Detected	7.0	Not Detected
Freon 113	1.2	Not Detected	9.6	Not Detected
1,1-Dichloroethene	1.2	Not Detected	5.0	Not Detected
Acetone	12	Not Detected	30	Not Detected
Methylene Chloride	12	Not Detected	43	Not Detected
cis-1,2-Dichloroethene	1.2	2.0	5.0	7.9
1,1,1-Trichloroethane	1.2	Not Detected	6.8	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.9	Not Detected
Benzene	1.2	Not Detected	4.0	Not Detected
Trichloroethene	1.2	2.1	6.7	11
Toluene	1.2	1.4	4.7	5.2
Tetrachloroethene	1.2	460	8.5	3100
Chlorobenzene	1.2	Not Detected	5.8	Not Detected
Ethyl Benzene	1.2	2.9	5.4	13
m,p-Xylene	1.2	15	5.4	66
o-Xylene	1.2	5.1	5.4	22
1,3-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
1,2,4-Trichlorobenzene	5.0	Not Detected	37	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: FT335-005-40G_20190130

Lab ID#: 1902058-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	a020716	Date of Collection:	1/30/19 7:48:00 AM
Dil. Factor:	19.6	Date of Analysis:	2/7/19 07:11 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	9.8	3400	66	23000

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	86	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: FT335-005-40G_20190130

Lab ID#: 1902058-05B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020807**	**Date of Collection: 1/30/19 7:48:00 AM**	
Dil. Factor:	**9.82**	**Date of Analysis: 2/8/19 03:42 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	4.9	Not Detected	24	Not Detected
Vinyl Chloride	4.9	Not Detected	12	Not Detected
Freon 11	4.9	Not Detected	28	Not Detected
Freon 113	4.9	Not Detected	38	Not Detected
1,1-Dichloroethene	4.9	Not Detected	19	Not Detected
Acetone	49	Not Detected	120	Not Detected
Methylene Chloride	49	Not Detected	170	Not Detected
cis-1,2-Dichloroethene	4.9	Not Detected	19	Not Detected
1,1,1-Trichloroethane	4.9	Not Detected	27	Not Detected
Carbon Tetrachloride	4.9	Not Detected	31	Not Detected
Benzene	4.9	Not Detected	16	Not Detected
Trichloroethene	4.9	6.4	26	34
Toluene	4.9	Not Detected	18	Not Detected
Tetrachloroethene	4.9	3100 E	33	21000 E
Chlorobenzene	4.9	Not Detected	23	Not Detected
Ethyl Benzene	4.9	Not Detected	21	Not Detected
m,p-Xylene	4.9	8.8	21	38
o-Xylene	4.9	Not Detected	21	Not Detected
1,3-Dichlorobenzene	4.9	Not Detected	30	Not Detected
1,4-Dichlorobenzene	4.9	Not Detected	30	Not Detected
1,2-Dichlorobenzene	4.9	Not Detected	30	Not Detected
1,2,4-Trichlorobenzene	20	Not Detected	140	Not Detected

E = Exceeds instrument calibration range.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: FT335-006-40G_20190130

Lab ID#: 1902058-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020712**	**Date of Collection: 1/30/19 8:43:00 AM**	
Dil. Factor:	**2.40**	**Date of Analysis: 2/7/19 05:29 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	5.9	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
Freon 11	1.2	Not Detected	6.7	Not Detected
Freon 113	1.2	Not Detected	9.2	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	Not Detected	28	Not Detected
Methylene Chloride	12	Not Detected	42	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.6	Not Detected
Benzene	1.2	Not Detected	3.8	Not Detected
Trichloroethene	1.2	6.9	6.4	37
Toluene	1.2	Not Detected	4.5	Not Detected
Tetrachloroethene	1.2	390	8.1	2600
Chlorobenzene	1.2	Not Detected	5.5	Not Detected
Ethyl Benzene	1.2	Not Detected	5.2	Not Detected
m,p-Xylene	1.2	4.7	5.2	20
o-Xylene	1.2	1.9	5.2	8.4
1,3-Dichlorobenzene	1.2	Not Detected	7.2	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.2	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.2	Not Detected
1,2,4-Trichlorobenzene	4.8	Not Detected	36	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: SSV335-001_20190130

Lab ID#: 1902058-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020715**	**Date of Collection: 1/30/19 9:15:00 AM**	
Dil. Factor:	**12.3**	**Date of Analysis: 2/7/19 06:46 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	6.2	Not Detected	30	Not Detected
Vinyl Chloride	6.2	Not Detected	16	Not Detected
Freon 11	6.2	Not Detected	34	Not Detected
Freon 113	6.2	Not Detected	47	Not Detected
1,1-Dichloroethene	6.2	Not Detected	24	Not Detected
Acetone	62	Not Detected	150	Not Detected
Methylene Chloride	62	Not Detected	210	Not Detected
cis-1,2-Dichloroethene	6.2	Not Detected	24	Not Detected
1,1,1-Trichloroethane	6.2	Not Detected	34	Not Detected
Carbon Tetrachloride	6.2	Not Detected	39	Not Detected
Benzene	6.2	Not Detected	20	Not Detected
Trichloroethene	6.2	31	33	160
Toluene	6.2	Not Detected	23	Not Detected
Tetrachloroethene	6.2	1900	42	13000
Chlorobenzene	6.2	Not Detected	28	Not Detected
Ethyl Benzene	6.2	Not Detected	27	Not Detected
m,p-Xylene	6.2	Not Detected	27	Not Detected
o-Xylene	6.2	Not Detected	27	Not Detected
1,3-Dichlorobenzene	6.2	Not Detected	37	Not Detected
1,4-Dichlorobenzene	6.2	Not Detected	37	Not Detected
1,2-Dichlorobenzene	6.2	Not Detected	37	Not Detected
1,2,4-Trichlorobenzene	25	Not Detected	180	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: SSV335-002_20190130

Lab ID#: 1902058-08A

EPA METHOD TO-15 GC/MS

File Name:	**14021220**	**Date of Collection: 1/30/19 9:21:00 AM**	
Dil. Factor:	**17.4**	**Date of Analysis: 2/12/19 07:06 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	87	Not Detected	430	Not Detected
Vinyl Chloride	87	Not Detected	220	Not Detected
Freon 11	87	Not Detected	490	Not Detected
Freon 113	87	Not Detected	670	Not Detected
1,1-Dichloroethene	87	Not Detected	340	Not Detected
Acetone	350	Not Detected	830	Not Detected
Methylene Chloride	350	Not Detected	1200	Not Detected
cis-1,2-Dichloroethene	87	Not Detected	340	Not Detected
1,1,1-Trichloroethane	87	Not Detected	470	Not Detected
Carbon Tetrachloride	87	Not Detected	550	Not Detected
Benzene	87	Not Detected	280	Not Detected
Trichloroethene	87	320	470	1700
Toluene	87	Not Detected	330	Not Detected
Tetrachloroethene	87	15000	590	100000
Chlorobenzene	87	Not Detected	400	Not Detected
Ethyl Benzene	87	Not Detected	380	Not Detected
m,p-Xylene	87	Not Detected	380	Not Detected
o-Xylene	87	Not Detected	380	Not Detected
1,3-Dichlorobenzene	87	Not Detected	520	Not Detected
1,4-Dichlorobenzene	87	Not Detected	520	Not Detected
1,2-Dichlorobenzene	87	Not Detected	520	Not Detected
1,2,4-Trichlorobenzene	350	Not Detected	2600	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: SSV335-003_20190130

Lab ID#: 1902058-09A

EPA METHOD TO-15 GC/MS

File Name:	**14021320**	**Date of Collection: 1/30/19 9:29:00 AM**	
Dil. Factor:	**125**	**Date of Analysis: 2/13/19 04:18 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	620	Not Detected	3100	Not Detected
Vinyl Chloride	620	Not Detected	1600	Not Detected
Freon 11	620	Not Detected	3500	Not Detected
Freon 113	620	Not Detected	4800	Not Detected
1,1-Dichloroethene	620	Not Detected	2500	Not Detected
Acetone	2500	Not Detected	5900	Not Detected
Methylene Chloride	2500	Not Detected	8700	Not Detected
cis-1,2-Dichloroethene	620	Not Detected	2500	Not Detected
1,1,1-Trichloroethane	620	Not Detected	3400	Not Detected
Carbon Tetrachloride	620	Not Detected	3900	Not Detected
Benzene	620	Not Detected	2000	Not Detected
Trichloroethene	620	Not Detected	3400	Not Detected
Toluene	620	Not Detected	2400	Not Detected
Tetrachloroethene	620	86000	4200	580000
Chlorobenzene	620	Not Detected	2900	Not Detected
Ethyl Benzene	620	Not Detected	2700	Not Detected
m,p-Xylene	620	Not Detected	2700	Not Detected
o-Xylene	620	Not Detected	2700	Not Detected
1,3-Dichlorobenzene	620	Not Detected	3800	Not Detected
1,4-Dichlorobenzene	620	Not Detected	3800	Not Detected
1,2-Dichlorobenzene	620	Not Detected	3800	Not Detected
1,2,4-Trichlorobenzene	2500	Not Detected	18000	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	91	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: SSV335-004_20190130

Lab ID#: 1902058-10A

EPA METHOD TO-15 GC/MS

File Name:	**14021313**	**Date of Collection: 1/30/19 9:36:00 AM**	
Dil. Factor:	**488**	**Date of Analysis: 2/13/19 12:37 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	2400	Not Detected	12000	Not Detected
Vinyl Chloride	2400	Not Detected	6200	Not Detected
Freon 11	2400	Not Detected	14000	Not Detected
Freon 113	2400	Not Detected	19000	Not Detected
1,1-Dichloroethene	2400	Not Detected	9700	Not Detected
Acetone	9800	Not Detected	23000	Not Detected
Methylene Chloride	9800	Not Detected	34000	Not Detected
cis-1,2-Dichloroethene	2400	Not Detected	9700	Not Detected
1,1,1-Trichloroethane	2400	Not Detected	13000	Not Detected
Carbon Tetrachloride	2400	Not Detected	15000	Not Detected
Benzene	2400	Not Detected	7800	Not Detected
Trichloroethene	2400	Not Detected	13000	Not Detected
Toluene	2400	Not Detected	9200	Not Detected
Tetrachloroethene	2400	98000	16000	660000
Chlorobenzene	2400	Not Detected	11000	Not Detected
Ethyl Benzene	2400	Not Detected	10000	Not Detected
m,p-Xylene	2400	Not Detected	10000	Not Detected
o-Xylene	2400	Not Detected	10000	Not Detected
1,3-Dichlorobenzene	2400	Not Detected	15000	Not Detected
1,4-Dichlorobenzene	2400	Not Detected	15000	Not Detected
1,2-Dichlorobenzene	2400	Not Detected	15000	Not Detected
1,2,4-Trichlorobenzene	9800	Not Detected	72000	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	93	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: SSV335-005_20190130

Lab ID#: 1902058-11A

EPA METHOD TO-15 GC/MS

File Name:	**14021314**	**Date of Collection:**	**1/30/19 9:42:00 AM**
Dil. Factor:	**250**	**Date of Analysis:**	**2/13/19 01:06 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1200	Not Detected	6200	Not Detected
Vinyl Chloride	1200	Not Detected	3200	Not Detected
Freon 11	1200	Not Detected	7000	Not Detected
Freon 113	1200	Not Detected	9600	Not Detected
1,1-Dichloroethene	1200	Not Detected	5000	Not Detected
Acetone	5000	Not Detected	12000	Not Detected
Methylene Chloride	5000	Not Detected	17000	Not Detected
cis-1,2-Dichloroethene	1200	Not Detected	5000	Not Detected
1,1,1-Trichloroethane	1200	Not Detected	6800	Not Detected
Carbon Tetrachloride	1200	Not Detected	7900	Not Detected
Benzene	1200	Not Detected	4000	Not Detected
Trichloroethene	1200	Not Detected	6700	Not Detected
Toluene	1200	Not Detected	4700	Not Detected
Tetrachloroethene	1200	55000	8500	370000
Chlorobenzene	1200	Not Detected	5800	Not Detected
Ethyl Benzene	1200	Not Detected	5400	Not Detected
m,p-Xylene	1200	Not Detected	5400	Not Detected
o-Xylene	1200	Not Detected	5400	Not Detected
1,3-Dichlorobenzene	1200	Not Detected	7500	Not Detected
1,4-Dichlorobenzene	1200	Not Detected	7500	Not Detected
1,2-Dichlorobenzene	1200	Not Detected	7500	Not Detected
1,2,4-Trichlorobenzene	5000	Not Detected	37000	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	95	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: SSV335-006_20190130

Lab ID#: 1902058-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020808**	**Date of Collection: 1/30/19 9:57:00 AM**	
Dil. Factor:	**18.3**	**Date of Analysis: 2/8/19 04:06 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	9.2	Not Detected	45	Not Detected
Vinyl Chloride	9.2	Not Detected	23	Not Detected
Freon 11	9.2	Not Detected	51	Not Detected
Freon 113	9.2	Not Detected	70	Not Detected
1,1-Dichloroethene	9.2	Not Detected	36	Not Detected
Acetone	92	Not Detected	220	Not Detected
Methylene Chloride	92	Not Detected	320	Not Detected
cis-1,2-Dichloroethene	9.2	37	36	150
1,1,1-Trichloroethane	9.2	Not Detected	50	Not Detected
Carbon Tetrachloride	9.2	Not Detected	58	Not Detected
Benzene	9.2	Not Detected	29	Not Detected
Trichloroethene	9.2	64	49	350
Toluene	9.2	Not Detected	34	Not Detected
Tetrachloroethene	9.2	2100	62	14000
Chlorobenzene	9.2	Not Detected	42	Not Detected
Ethyl Benzene	9.2	Not Detected	40	Not Detected
m,p-Xylene	9.2	Not Detected	40	Not Detected
o-Xylene	9.2	Not Detected	40	Not Detected
1,3-Dichlorobenzene	9.2	Not Detected	55	Not Detected
1,4-Dichlorobenzene	9.2	Not Detected	55	Not Detected
1,2-Dichlorobenzene	9.2	Not Detected	55	Not Detected
1,2,4-Trichlorobenzene	37	Not Detected	270	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: SSV335-007_20190130

Lab ID#: 1902058-13A

EPA METHOD TO-15 GC/MS

File Name:	**14021219**	**Date of Collection:**	**1/30/19 9:49:00 AM**
Dil. Factor:	**2460**	**Date of Analysis:**	**2/12/19 06:34 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	12000	Not Detected	61000	Not Detected
Vinyl Chloride	12000	Not Detected	31000	Not Detected
Freon 11	12000	Not Detected	69000	Not Detected
Freon 113	12000	Not Detected	94000	Not Detected
1,1-Dichloroethene	12000	Not Detected	49000	Not Detected
Acetone	49000	Not Detected	120000	Not Detected
Methylene Chloride	49000	Not Detected	170000	Not Detected
cis-1,2-Dichloroethene	12000	28000	49000	110000
1,1,1-Trichloroethane	12000	Not Detected	67000	Not Detected
Carbon Tetrachloride	12000	Not Detected	77000	Not Detected
Benzene	12000	Not Detected	39000	Not Detected
Trichloroethene	12000	13000	66000	70000
Toluene	12000	Not Detected	46000	Not Detected
Tetrachloroethene	12000	2200000	83000	15000000
Chlorobenzene	12000	Not Detected	57000	Not Detected
Ethyl Benzene	12000	Not Detected	53000	Not Detected
m,p-Xylene	12000	Not Detected	53000	Not Detected
o-Xylene	12000	Not Detected	53000	Not Detected
1,3-Dichlorobenzene	12000	Not Detected	74000	Not Detected
1,4-Dichlorobenzene	12000	Not Detected	74000	Not Detected
1,2-Dichlorobenzene	12000	Not Detected	74000	Not Detected
1,2,4-Trichlorobenzene	49000	Not Detected	360000	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	93	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: SSV335-008_20190130

Lab ID#: 1902058-14A

EPA METHOD TO-15 GC/MS

File Name:	**14021222**	**Date of Collection:**	**1/30/19 9:52:00 AM**
Dil. Factor:	**4280**	**Date of Analysis:**	**2/12/19 08:11 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	21000	Not Detected	100000	Not Detected
Vinyl Chloride	21000	Not Detected	55000	Not Detected
Freon 11	21000	Not Detected	120000	Not Detected
Freon 113	21000	Not Detected	160000	Not Detected
1,1-Dichloroethene	21000	Not Detected	85000	Not Detected
Acetone	86000	Not Detected	200000	Not Detected
Methylene Chloride	86000	Not Detected	300000	Not Detected
cis-1,2-Dichloroethene	21000	Not Detected	85000	Not Detected
1,1,1-Trichloroethane	21000	Not Detected	120000	Not Detected
Carbon Tetrachloride	21000	Not Detected	130000	Not Detected
Benzene	21000	Not Detected	68000	Not Detected
Trichloroethene	21000	Not Detected	120000	Not Detected
Toluene	21000	Not Detected	81000	Not Detected
Tetrachloroethene	21000	3700000	140000	25000000
Chlorobenzene	21000	Not Detected	98000	Not Detected
Ethyl Benzene	21000	Not Detected	93000	Not Detected
m,p-Xylene	21000	Not Detected	93000	Not Detected
o-Xylene	21000	Not Detected	93000	Not Detected
1,3-Dichlorobenzene	21000	Not Detected	130000	Not Detected
1,4-Dichlorobenzene	21000	Not Detected	130000	Not Detected
1,2-Dichlorobenzene	21000	Not Detected	130000	Not Detected
1,2,4-Trichlorobenzene	86000	Not Detected	640000	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: SSV335-009_20190130

Lab ID#: 1902058-15A

EPA METHOD TO-15 GC/MS

File Name:	**14021316**	**Date of Collection:**	**1/30/19 10:12:00 AM**
Dil. Factor:	**608**	**Date of Analysis:**	**2/13/19 02:04 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	3000	Not Detected	15000	Not Detected
Vinyl Chloride	3000	Not Detected	7800	Not Detected
Freon 11	3000	Not Detected	17000	Not Detected
Freon 113	3000	Not Detected	23000	Not Detected
1,1-Dichloroethene	3000	Not Detected	12000	Not Detected
Acetone	12000	Not Detected	29000	Not Detected
Methylene Chloride	12000	Not Detected	42000	Not Detected
cis-1,2-Dichloroethene	3000	Not Detected	12000	Not Detected
1,1,1-Trichloroethane	3000	Not Detected	16000	Not Detected
Carbon Tetrachloride	3000	Not Detected	19000	Not Detected
Benzene	3000	Not Detected	9700	Not Detected
Trichloroethene	3000	Not Detected	16000	Not Detected
Toluene	3000	Not Detected	11000	Not Detected
Tetrachloroethene	3000	370000	21000	2500000
Chlorobenzene	3000	Not Detected	14000	Not Detected
Ethyl Benzene	3000	Not Detected	13000	Not Detected
m,p-Xylene	3000	Not Detected	13000	Not Detected
o-Xylene	3000	Not Detected	13000	Not Detected
1,3-Dichlorobenzene	3000	Not Detected	18000	Not Detected
1,4-Dichlorobenzene	3000	Not Detected	18000	Not Detected
1,2-Dichlorobenzene	3000	Not Detected	18000	Not Detected
1,2,4-Trichlorobenzene	12000	Not Detected	90000	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: SSV335-010_20190130

Lab ID#: 1902058-16A

EPA METHOD TO-15 GC/MS

File Name:	**14021221**	**Date of Collection: 1/30/19 10:14:00 AM**	
Dil. Factor:	**24.6**	**Date of Analysis: 2/12/19 07:37 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	120	Not Detected	610	Not Detected
Vinyl Chloride	120	Not Detected	310	Not Detected
Freon 11	120	Not Detected	690	Not Detected
Freon 113	120	Not Detected	940	Not Detected
1,1-Dichloroethene	120	Not Detected	490	Not Detected
Acetone	490	Not Detected	1200	Not Detected
Methylene Chloride	490	Not Detected	1700	Not Detected
cis-1,2-Dichloroethene	120	Not Detected	490	Not Detected
1,1,1-Trichloroethane	120	Not Detected	670	Not Detected
Carbon Tetrachloride	120	Not Detected	770	Not Detected
Benzene	120	Not Detected	390	Not Detected
Trichloroethene	120	Not Detected	660	Not Detected
Toluene	120	Not Detected	460	Not Detected
Tetrachloroethene	120	13000	830	88000
Chlorobenzene	120	Not Detected	570	Not Detected
Ethyl Benzene	120	Not Detected	530	Not Detected
m,p-Xylene	120	Not Detected	530	Not Detected
o-Xylene	120	Not Detected	530	Not Detected
1,3-Dichlorobenzene	120	Not Detected	740	Not Detected
1,4-Dichlorobenzene	120	Not Detected	740	Not Detected
1,2-Dichlorobenzene	120	Not Detected	740	Not Detected
1,2,4-Trichlorobenzene	490	Not Detected	3600	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	95	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: SSV335-011_20190130

Lab ID#: 1902058-17A

EPA METHOD TO-15 GC/MS

File Name:	**14021317**	**Date of Collection:**	**1/30/19 10:42:00 AM**
Dil. Factor:	**1210**	**Date of Analysis:**	**2/13/19 02:40 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	6000	Not Detected	30000	Not Detected
Vinyl Chloride	6000	Not Detected	15000	Not Detected
Freon 11	6000	Not Detected	34000	Not Detected
Freon 113	6000	Not Detected	46000	Not Detected
1,1-Dichloroethene	6000	Not Detected	24000	Not Detected
Acetone	24000	Not Detected	57000	Not Detected
Methylene Chloride	24000	Not Detected	84000	Not Detected
cis-1,2-Dichloroethene	6000	Not Detected	24000	Not Detected
1,1,1-Trichloroethane	6000	Not Detected	33000	Not Detected
Carbon Tetrachloride	6000	Not Detected	38000	Not Detected
Benzene	6000	Not Detected	19000	Not Detected
Trichloroethene	6000	Not Detected	32000	Not Detected
Toluene	6000	Not Detected	23000	Not Detected
Tetrachloroethene	6000	560000	41000	3800000
Chlorobenzene	6000	Not Detected	28000	Not Detected
Ethyl Benzene	6000	Not Detected	26000	Not Detected
m,p-Xylene	6000	Not Detected	26000	Not Detected
o-Xylene	6000	Not Detected	26000	Not Detected
1,3-Dichlorobenzene	6000	Not Detected	36000	Not Detected
1,4-Dichlorobenzene	6000	Not Detected	36000	Not Detected
1,2-Dichlorobenzene	6000	Not Detected	36000	Not Detected
1,2,4-Trichlorobenzene	24000	Not Detected	180000	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: SSV335-011_20190130_FD

Lab ID#: 1902058-18A

EPA METHOD TO-15 GC/MS

File Name:	**14021318**	**Date of Collection: 1/30/19 10:42:00 AM**	
Dil. Factor:	**1020**	**Date of Analysis: 2/13/19 03:09 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	5100	Not Detected	25000	Not Detected
Vinyl Chloride	5100	Not Detected	13000	Not Detected
Freon 11	5100	Not Detected	29000	Not Detected
Freon 113	5100	Not Detected	39000	Not Detected
1,1-Dichloroethene	5100	Not Detected	20000	Not Detected
Acetone	20000	Not Detected	49000	Not Detected
Methylene Chloride	20000	Not Detected	71000	Not Detected
cis-1,2-Dichloroethene	5100	Not Detected	20000	Not Detected
1,1,1-Trichloroethane	5100	Not Detected	28000	Not Detected
Carbon Tetrachloride	5100	Not Detected	32000	Not Detected
Benzene	5100	Not Detected	16000	Not Detected
Trichloroethene	5100	Not Detected	28000	Not Detected
Toluene	5100	Not Detected	19000	Not Detected
Tetrachloroethene	5100	450000	35000	3000000
Chlorobenzene	5100	Not Detected	24000	Not Detected
Ethyl Benzene	5100	Not Detected	22000	Not Detected
m,p-Xylene	5100	Not Detected	22000	Not Detected
o-Xylene	5100	Not Detected	22000	Not Detected
1,3-Dichlorobenzene	5100	Not Detected	31000	Not Detected
1,4-Dichlorobenzene	5100	Not Detected	31000	Not Detected
1,2-Dichlorobenzene	5100	Not Detected	31000	Not Detected
1,2,4-Trichlorobenzene	20000	Not Detected	150000	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: SSV335-012_20190130

Lab ID#: 1902058-19A

EPA METHOD TO-15 GC/MS

File Name:	**14021319**	**Date of Collection:**	**1/30/19 10:16:00 AM**
Dil. Factor:	**1540**	**Date of Analysis:**	**2/13/19 03:46 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	7700	Not Detected	38000	Not Detected
Vinyl Chloride	7700	Not Detected	20000	Not Detected
Freon 11	7700	Not Detected	43000	Not Detected
Freon 113	7700	Not Detected	59000	Not Detected
1,1-Dichloroethene	7700	Not Detected	30000	Not Detected
Acetone	31000	Not Detected	73000	Not Detected
Methylene Chloride	31000	Not Detected	110000	Not Detected
cis-1,2-Dichloroethene	7700	Not Detected	30000	Not Detected
1,1,1-Trichloroethane	7700	Not Detected	42000	Not Detected
Carbon Tetrachloride	7700	Not Detected	48000	Not Detected
Benzene	7700	Not Detected	24000	Not Detected
Trichloroethene	7700	Not Detected	41000	Not Detected
Toluene	7700	Not Detected	29000	Not Detected
Tetrachloroethene	7700	1100000	52000	7700000
Chlorobenzene	7700	Not Detected	35000	Not Detected
Ethyl Benzene	7700	Not Detected	33000	Not Detected
m,p-Xylene	7700	Not Detected	33000	Not Detected
o-Xylene	7700	Not Detected	33000	Not Detected
1,3-Dichlorobenzene	7700	Not Detected	46000	Not Detected
1,4-Dichlorobenzene	7700	Not Detected	46000	Not Detected
1,2-Dichlorobenzene	7700	Not Detected	46000	Not Detected
1,2,4-Trichlorobenzene	31000	Not Detected	230000	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1902058-20A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020707**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/7/19 02:02 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1902058-20B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020806**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/8/19 12:35 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	88	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1902058-20C

EPA METHOD TO-15 GC/MS

File Name:	**14021205**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/12/19 11:19 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	5.0	Not Detected	25	Not Detected
Vinyl Chloride	5.0	Not Detected	13	Not Detected
Freon 11	5.0	Not Detected	28	Not Detected
Freon 113	5.0	Not Detected	38	Not Detected
1,1-Dichloroethene	5.0	Not Detected	20	Not Detected
Acetone	20	Not Detected	48	Not Detected
Methylene Chloride	20	Not Detected	69	Not Detected
cis-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
1,1,1-Trichloroethane	5.0	Not Detected	27	Not Detected
Carbon Tetrachloride	5.0	Not Detected	31	Not Detected
Benzene	5.0	Not Detected	16	Not Detected
Trichloroethene	5.0	Not Detected	27	Not Detected
Toluene	5.0	Not Detected	19	Not Detected
Tetrachloroethene	5.0	Not Detected	34	Not Detected
Chlorobenzene	5.0	Not Detected	23	Not Detected
Ethyl Benzene	5.0	Not Detected	22	Not Detected
m,p-Xylene	5.0	Not Detected	22	Not Detected
o-Xylene	5.0	Not Detected	22	Not Detected
1,3-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,4-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,2-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,2,4-Trichlorobenzene	20	Not Detected	150	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1902058-20D

EPA METHOD TO-15 GC/MS

File Name:	**14021305**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/13/19 08:33 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	5.0	Not Detected	25	Not Detected
Vinyl Chloride	5.0	Not Detected	13	Not Detected
Freon 11	5.0	Not Detected	28	Not Detected
Freon 113	5.0	Not Detected	38	Not Detected
1,1-Dichloroethene	5.0	Not Detected	20	Not Detected
Acetone	20	Not Detected	48	Not Detected
Methylene Chloride	20	Not Detected	69	Not Detected
cis-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
1,1,1-Trichloroethane	5.0	Not Detected	27	Not Detected
Carbon Tetrachloride	5.0	Not Detected	31	Not Detected
Benzene	5.0	Not Detected	16	Not Detected
Trichloroethene	5.0	Not Detected	27	Not Detected
Toluene	5.0	Not Detected	19	Not Detected
Tetrachloroethene	5.0	Not Detected	34	Not Detected
Chlorobenzene	5.0	Not Detected	23	Not Detected
Ethyl Benzene	5.0	Not Detected	22	Not Detected
m,p-Xylene	5.0	Not Detected	22	Not Detected
o-Xylene	5.0	Not Detected	22	Not Detected
1,3-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,4-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,2-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,2,4-Trichlorobenzene	20	Not Detected	150	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: CCV

Lab ID#: 1902058-21A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020702**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/7/19 09:43 AM**	

Compound	%Recovery
Freon 12	95
Vinyl Chloride	92
Freon 11	98
Freon 113	98
1,1-Dichloroethene	94
Acetone	93
Methylene Chloride	91
cis-1,2-Dichloroethene	99
1,1,1-Trichloroethane	101
Carbon Tetrachloride	103
Benzene	99
Trichloroethene	104
Toluene	97
Tetrachloroethene	104
Chlorobenzene	106
Ethyl Benzene	103
m,p-Xylene	101
o-Xylene	99
1,3-Dichlorobenzene	104
1,4-Dichlorobenzene	104
1,2-Dichlorobenzene	105
1,2,4-Trichlorobenzene	102

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	90	70-130
4-Bromofluorobenzene	98	70-130

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 1902058-21B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/8/19 09:33 AM**	

Compound	%Recovery
Freon 12	94
Vinyl Chloride	90
Freon 11	95
Freon 113	95
1,1-Dichloroethene	95
Acetone	91
Methylene Chloride	90
cis-1,2-Dichloroethene	97
1,1,1-Trichloroethane	99
Carbon Tetrachloride	100
Benzene	99
Trichloroethene	102
Toluene	97
Tetrachloroethene	105
Chlorobenzene	107
Ethyl Benzene	102
m,p-Xylene	103
o-Xylene	101
1,3-Dichlorobenzene	105
1,4-Dichlorobenzene	105
1,2-Dichlorobenzene	105
1,2,4-Trichlorobenzene	98

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: CCV
Lab ID#: 1902058-21C
EPA METHOD TO-15 GC/MS

File Name:	14021202	Date of Collection: NA	
Dil. Factor:	1.00	Date of Analysis: 2/12/19 09:13 AM	

Compound	%Recovery
Freon 12	95
Vinyl Chloride	84
Freon 11	100
Freon 113	100
1,1-Dichloroethene	94
Acetone	89
Methylene Chloride	96
cis-1,2-Dichloroethene	91
1,1,1-Trichloroethane	94
Carbon Tetrachloride	103
Benzene	91
Trichloroethene	98
Toluene	94
Tetrachloroethene	105
Chlorobenzene	103
Ethyl Benzene	98
m,p-Xylene	101
o-Xylene	97
1,3-Dichlorobenzene	106
1,4-Dichlorobenzene	106
1,2-Dichlorobenzene	104
1,2,4-Trichlorobenzene	94

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: CCV
Lab ID#: 1902058-21D
EPA METHOD TO-15 GC/MS

File Name:	**14021302**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/13/19 07:24 AM**	

Compound	%Recovery
Freon 12	96
Vinyl Chloride	89
Freon 11	104
Freon 113	104
1,1-Dichloroethene	96
Acetone	89
Methylene Chloride	97
cis-1,2-Dichloroethene	92
1,1,1-Trichloroethane	101
Carbon Tetrachloride	105
Benzene	94
Trichloroethene	102
Toluene	94
Tetrachloroethene	110
Chlorobenzene	104
Ethyl Benzene	98
m,p-Xylene	102
o-Xylene	99
1,3-Dichlorobenzene	110
1,4-Dichlorobenzene	111
1,2-Dichlorobenzene	109
1,2,4-Trichlorobenzene	98

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	102	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 1902058-22A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020704**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/7/19 11:57 AM**	

Compound	%Recovery	Method Limits
Freon 12	94	70-130
Vinyl Chloride	90	70-130
Freon 11	95	70-130
Freon 113	96	70-130
1,1-Dichloroethene	92	70-130
Acetone	93	70-130
Methylene Chloride	90	70-130
cis-1,2-Dichloroethene	100	70-130
1,1,1-Trichloroethane	99	70-130
Carbon Tetrachloride	100	70-130
Benzene	98	70-130
Trichloroethene	101	70-130
Toluene	96	70-130
Tetrachloroethene	103	70-130
Chlorobenzene	106	70-130
Ethyl Benzene	104	70-130
m,p-Xylene	101	70-130
o-Xylene	102	70-130
1,3-Dichlorobenzene	106	70-130
1,4-Dichlorobenzene	104	70-130
1,2-Dichlorobenzene	105	70-130
1,2,4-Trichlorobenzene	94	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCSD

Lab ID#: 1902058-22AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020706**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/7/19 01:34 PM**	

Compound	%Recovery	Method Limits
Freon 12	94	70-130
Vinyl Chloride	91	70-130
Freon 11	97	70-130
Freon 113	98	70-130
1,1-Dichloroethene	92	70-130
Acetone	92	70-130
Methylene Chloride	92	70-130
cis-1,2-Dichloroethene	103	70-130
1,1,1-Trichloroethane	101	70-130
Carbon Tetrachloride	101	70-130
Benzene	98	70-130
Trichloroethene	102	70-130
Toluene	98	70-130
Tetrachloroethene	104	70-130
Chlorobenzene	107	70-130
Ethyl Benzene	103	70-130
m,p-Xylene	102	70-130
o-Xylene	101	70-130
1,3-Dichlorobenzene	106	70-130
1,4-Dichlorobenzene	105	70-130
1,2-Dichlorobenzene	107	70-130
1,2,4-Trichlorobenzene	100	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	88	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: LCS

Lab ID#: 1902058-22B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/8/19 09:58 AM**	

Compound	%Recovery	Method Limits
Freon 12	93	70-130
Vinyl Chloride	90	70-130
Freon 11	96	70-130
Freon 113	98	70-130
1,1-Dichloroethene	94	70-130
Acetone	90	70-130
Methylene Chloride	90	70-130
cis-1,2-Dichloroethene	102	70-130
1,1,1-Trichloroethane	100	70-130
Carbon Tetrachloride	101	70-130
Benzene	98	70-130
Trichloroethene	103	70-130
Toluene	97	70-130
Tetrachloroethene	105	70-130
Chlorobenzene	108	70-130
Ethyl Benzene	105	70-130
m,p-Xylene	104	70-130
o-Xylene	104	70-130
1,3-Dichlorobenzene	107	70-130
1,4-Dichlorobenzene	106	70-130
1,2-Dichlorobenzene	107	70-130
1,2,4-Trichlorobenzene	89	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	85	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: LCSD

Lab ID#: 1902058-22BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a020804**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/8/19 10:23 AM**	

Compound	%Recovery	Method Limits
Freon 12	93	70-130
Vinyl Chloride	93	70-130
Freon 11	97	70-130
Freon 113	97	70-130
1,1-Dichloroethene	95	70-130
Acetone	92	70-130
Methylene Chloride	90	70-130
cis-1,2-Dichloroethene	104	70-130
1,1,1-Trichloroethane	100	70-130
Carbon Tetrachloride	103	70-130
Benzene	100	70-130
Trichloroethene	104	70-130
Toluene	98	70-130
Tetrachloroethene	104	70-130
Chlorobenzene	108	70-130
Ethyl Benzene	103	70-130
m,p-Xylene	104	70-130
o-Xylene	103	70-130
1,3-Dichlorobenzene	107	70-130
1,4-Dichlorobenzene	106	70-130
1,2-Dichlorobenzene	107	70-130
1,2,4-Trichlorobenzene	96	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCS
Lab ID#: 1902058-22C
EPA METHOD TO-15 GC/MS

File Name:	14021203	Date of Collection: NA	
Dil. Factor:	1.00	Date of Analysis: 2/12/19 09:47 AM	

Compound	%Recovery	Method Limits
Freon 12	95	70-130
Vinyl Chloride	87	70-130
Freon 11	98	70-130
Freon 113	97	70-130
1,1-Dichloroethene	87	70-130
Acetone	87	70-130
Methylene Chloride	89	70-130
cis-1,2-Dichloroethene	86	70-130
1,1,1-Trichloroethane	95	70-130
Carbon Tetrachloride	101	70-130
Benzene	89	70-130
Trichloroethene	96	70-130
Toluene	90	70-130
Tetrachloroethene	98	70-130
Chlorobenzene	96	70-130
Ethyl Benzene	93	70-130
m,p-Xylene	93	70-130
o-Xylene	91	70-130
1,3-Dichlorobenzene	100	70-130
1,4-Dichlorobenzene	101	70-130
1,2-Dichlorobenzene	101	70-130
1,2,4-Trichlorobenzene	107	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCSD
Lab ID#: 1902058-22CC
EPA METHOD TO-15 GC/MS

File Name:	14021204	Date of Collection: NA	
Dil. Factor:	1.00	Date of Analysis: 2/12/19 10:49 AM	

Compound	%Recovery	Method Limits
Freon 12	93	70-130
Vinyl Chloride	80	70-130
Freon 11	96	70-130
Freon 113	96	70-130
1,1-Dichloroethene	88	70-130
Acetone	85	70-130
Methylene Chloride	88	70-130
cis-1,2-Dichloroethene	82	70-130
1,1,1-Trichloroethane	91	70-130
Carbon Tetrachloride	99	70-130
Benzene	88	70-130
Trichloroethene	94	70-130
Toluene	89	70-130
Tetrachloroethene	103	70-130
Chlorobenzene	97	70-130
Ethyl Benzene	96	70-130
m,p-Xylene	94	70-130
o-Xylene	92	70-130
1,3-Dichlorobenzene	100	70-130
1,4-Dichlorobenzene	103	70-130
1,2-Dichlorobenzene	100	70-130
1,2,4-Trichlorobenzene	106	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCS
Lab ID#: 1902058-22D
EPA METHOD TO-15 GC/MS

File Name:	14021303	Date of Collection: NA	
Dil. Factor:	1.00	Date of Analysis: 2/13/19 07:47 AM	

Compound	%Recovery	Method Limits
Freon 12	94	70-130
Vinyl Chloride	83	70-130
Freon 11	101	70-130
Freon 113	101	70-130
1,1-Dichloroethene	91	70-130
Acetone	92	70-130
Methylene Chloride	88	70-130
cis-1,2-Dichloroethene	85	70-130
1,1,1-Trichloroethane	97	70-130
Carbon Tetrachloride	105	70-130
Benzene	88	70-130
Trichloroethene	92	70-130
Toluene	92	70-130
Tetrachloroethene	102	70-130
Chlorobenzene	99	70-130
Ethyl Benzene	98	70-130
m,p-Xylene	96	70-130
o-Xylene	96	70-130
1,3-Dichlorobenzene	106	70-130
1,4-Dichlorobenzene	110	70-130
1,2-Dichlorobenzene	105	70-130
1,2,4-Trichlorobenzene	106	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	101	70-130

eurofins | Air Toxics

Client Sample ID: LCSD
Lab ID#: 1902058-22DD
EPA METHOD TO-15 GC/MS

File Name:	**14021304**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/13/19 08:09 AM**	

Compound	%Recovery	Method Limits
Freon 12	91	70-130
Vinyl Chloride	81	70-130
Freon 11	99	70-130
Freon 113	100	70-130
1,1-Dichloroethene	87	70-130
Acetone	86	70-130
Methylene Chloride	89	70-130
cis-1,2-Dichloroethene	84	70-130
1,1,1-Trichloroethane	92	70-130
Carbon Tetrachloride	98	70-130
Benzene	88	70-130
Trichloroethene	97	70-130
Toluene	89	70-130
Tetrachloroethene	103	70-130
Chlorobenzene	98	70-130
Ethyl Benzene	94	70-130
m,p-Xylene	96	70-130
o-Xylene	95	70-130
1,3-Dichlorobenzene	108	70-130
1,4-Dichlorobenzene	106	70-130
1,2-Dichlorobenzene	108	70-130
1,2,4-Trichlorobenzene	121	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	92	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	102	70-130

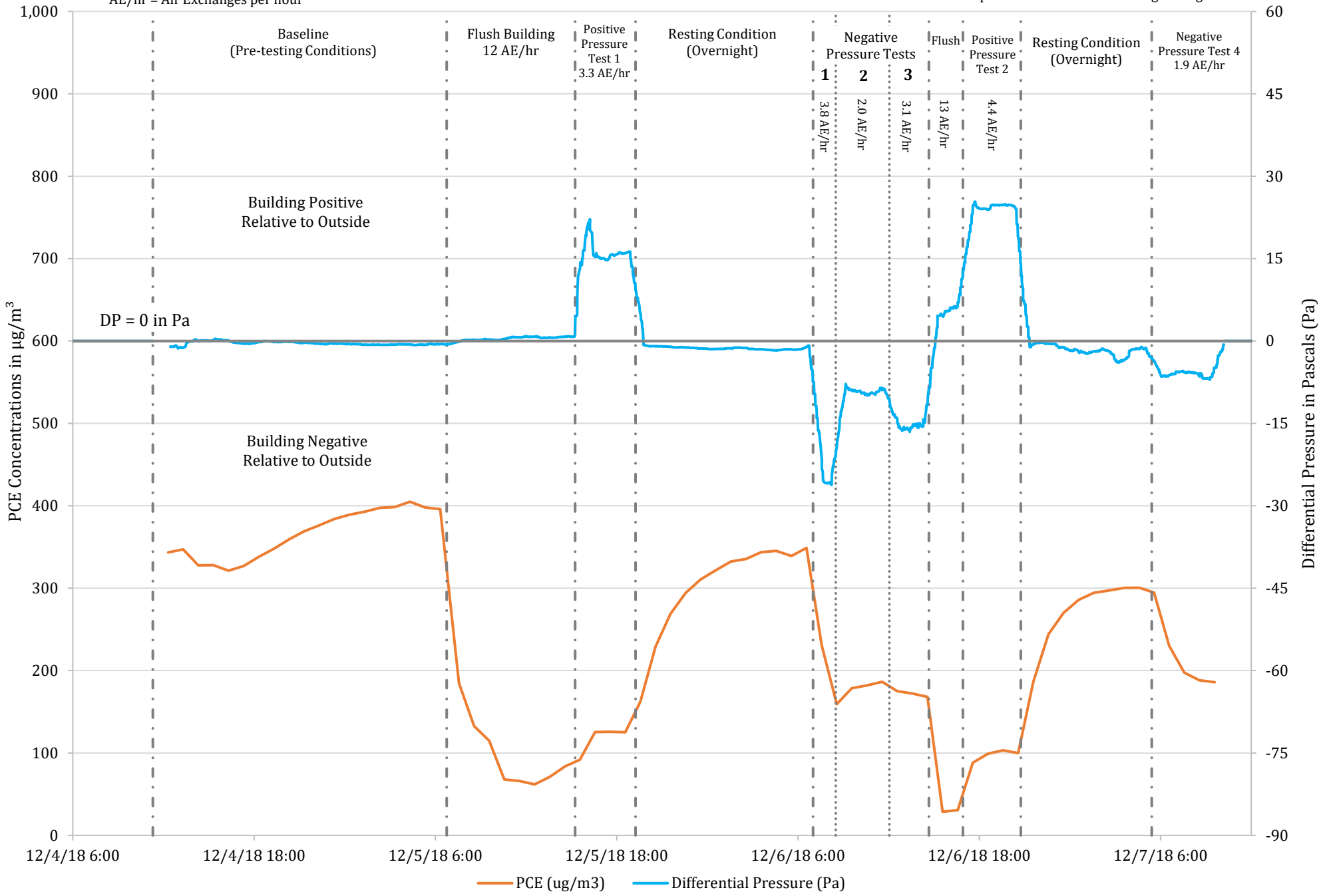
APPENDIX D

BUILDING PRESSURE TESTING TIME SERIES PLOTS

IAB335-001 / DP7 (Door 3)

AE/hr = Air Exchanges per hour

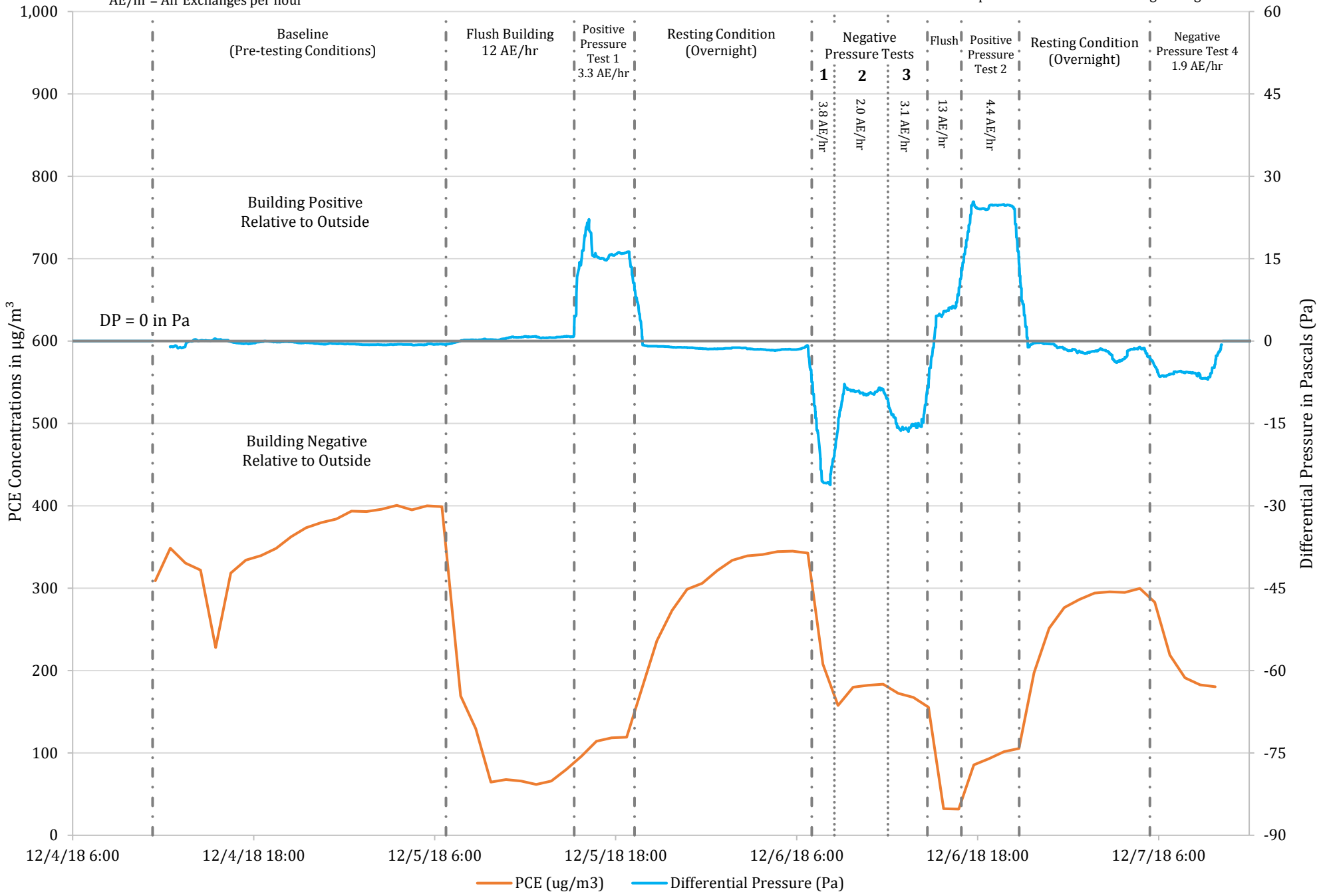
Differential Pressures (DPs) are presented as one hour rolling averages.



IAB335-002 / DP7 (Door 3)

AE/hr = Air Exchanges per hour

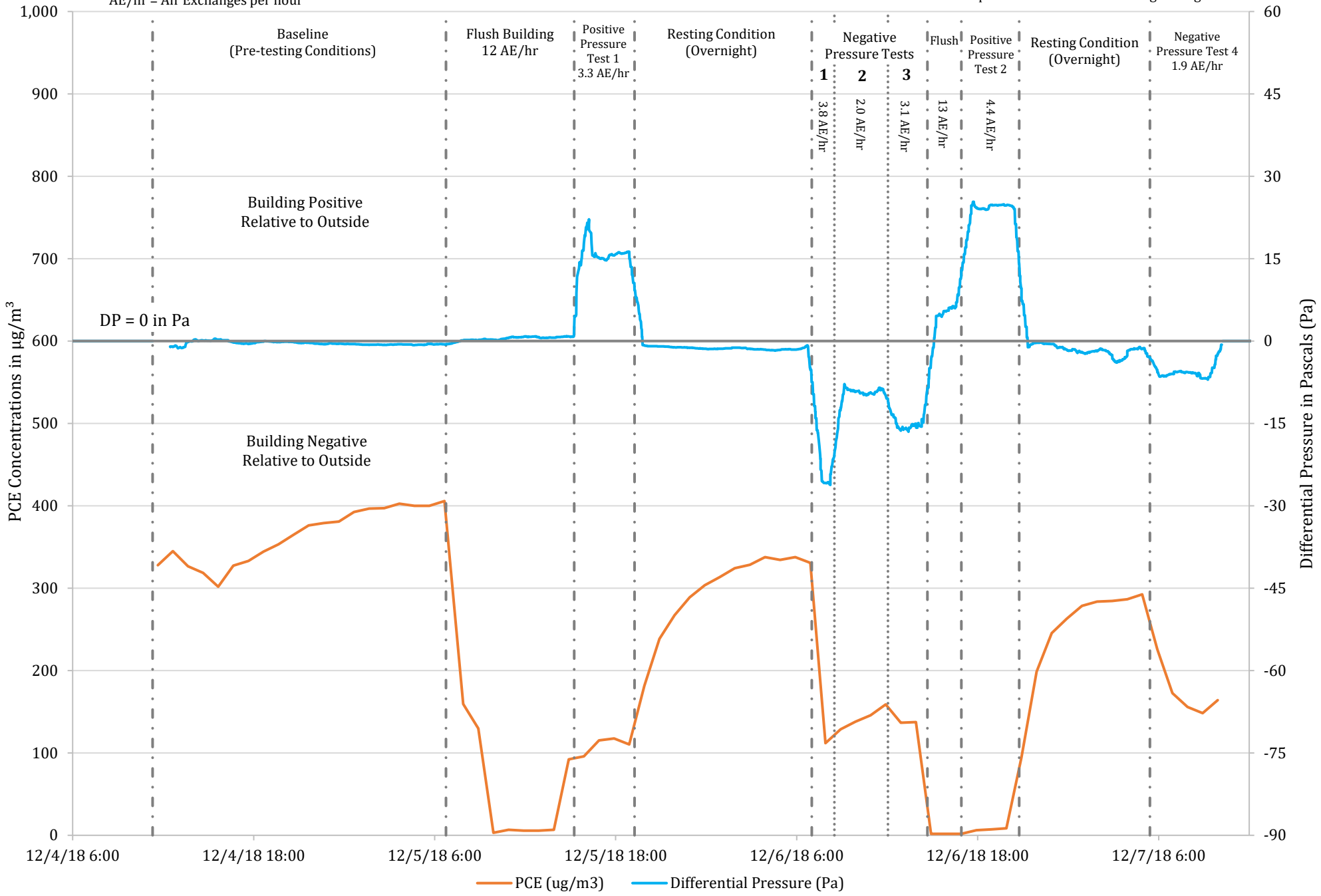
Differential Pressures (DPs) are presented as one hour rolling averages.



IAB335-003 / DP7 (Door 3)

AE/hr = Air Exchanges per hour

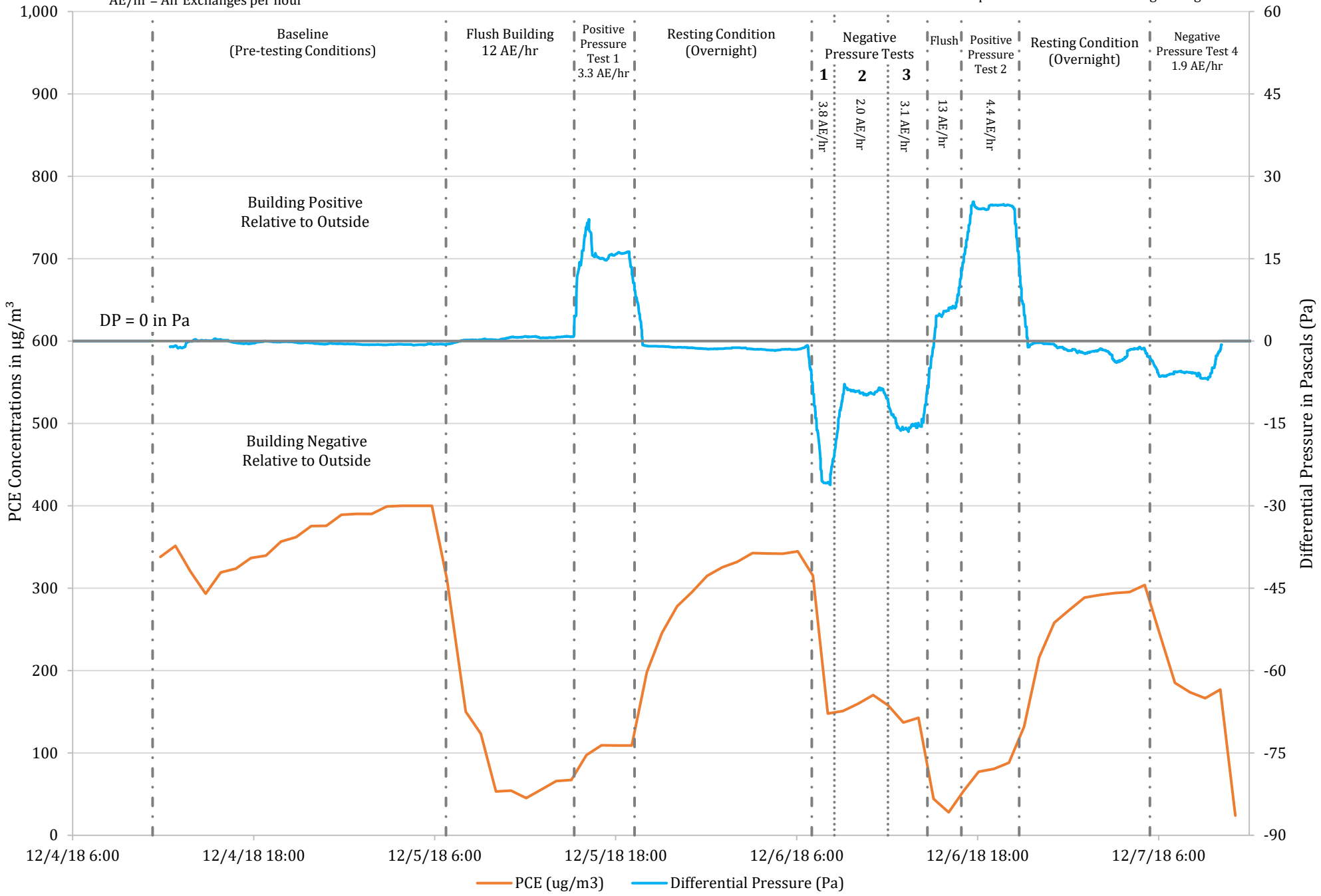
Differential Pressures (DPs) are presented as one hour rolling averages.



IAB335-004 / DP7 (Door 3)

AE/hr = Air Exchanges per hour

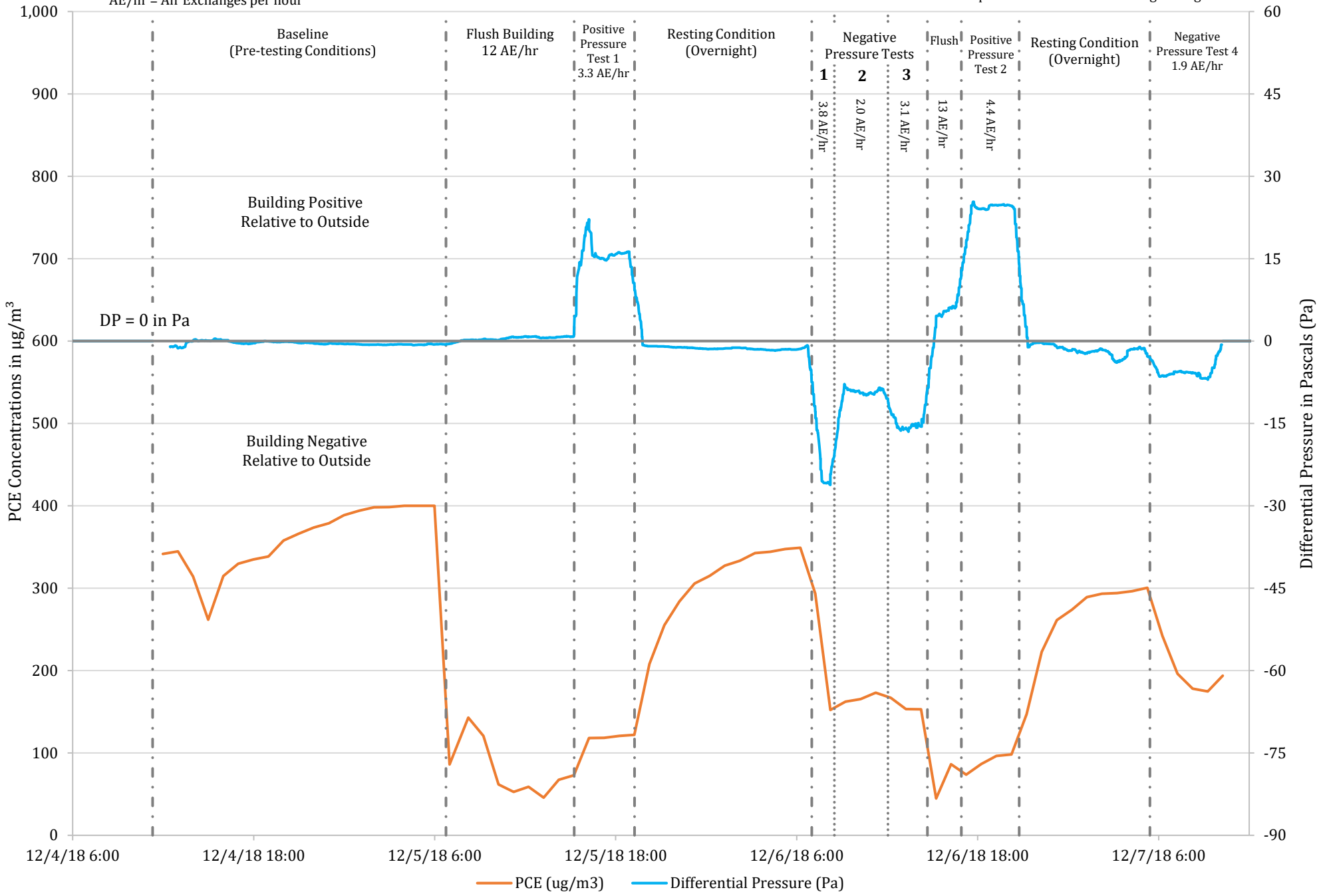
Differential Pressures (DPs) are presented as one hour rolling averages.



IAB335-005 / DP7 (Door 3)

AE/hr = Air Exchanges per hour

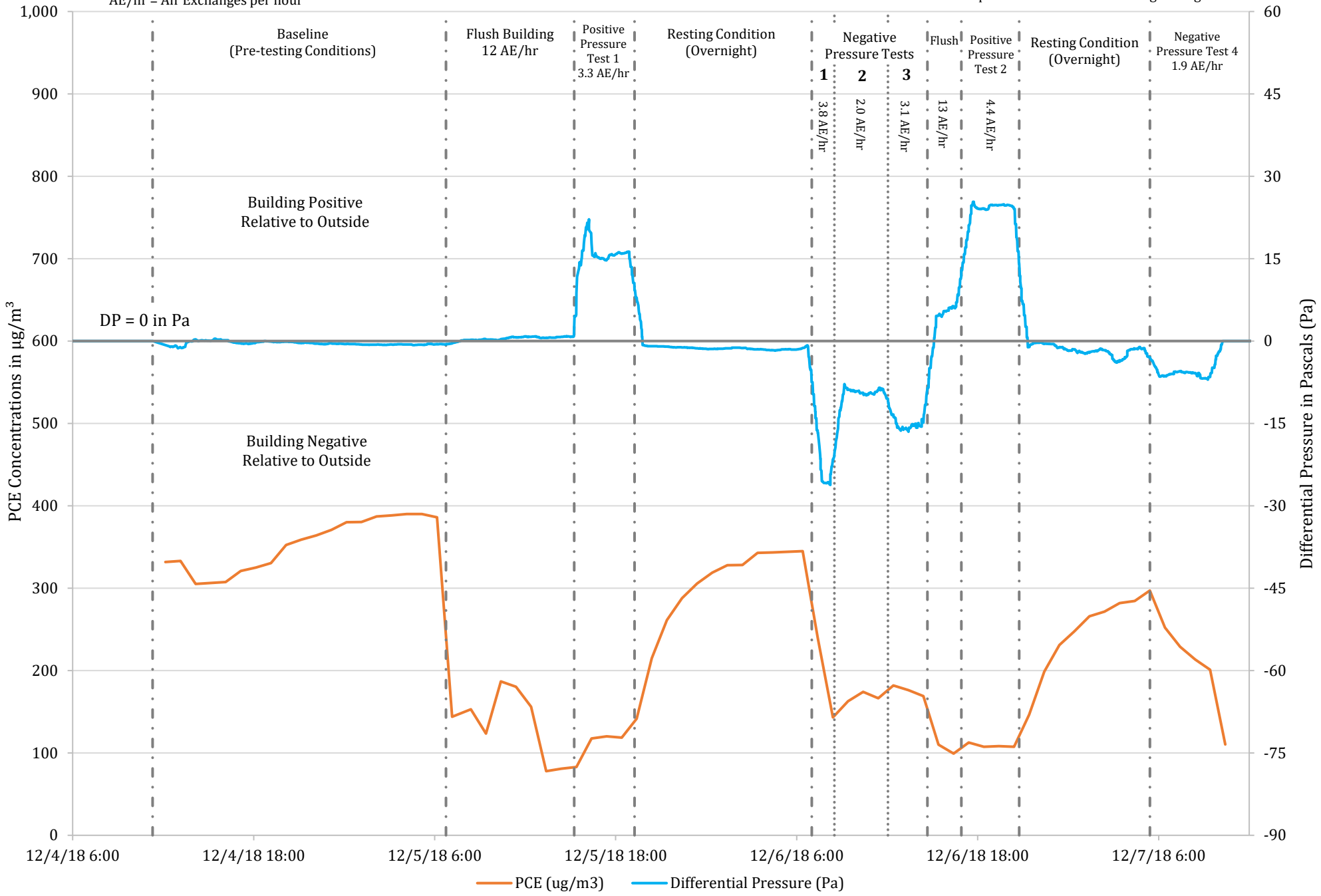
Differential Pressures (DPs) are presented as one hour rolling averages.



IAB335-006 / DP7 (Door 3)

AE/hr = Air Exchanges per hour

Differential Pressures (DPs) are presented as one hour rolling averages.



APPENDIX E

RELATIVE PERCENT DIFFERENCE SUMMARY

Appendix E
Relative Percent Difference Summary
Building 335
Former IBM East Fishkill Facility
Hopewell Junction, New York

Sample	IAB335-005		RPD	IAB335-002		RPD
Date	12/5/2018			12/6/2018		
Test	End of Positive Pressure Test			End of Negative Pressure Test		
Sample Type	GC-ECD	Summa - Grab		GC-ECD	Summa - Grab	
Units	µg/m^3	µg/m^3	%	µg/m^3	µg/m^3	%
PCE	122	104	16	156	214	31
TCE	<1.0	0.33	-	<1.0	0.86	-

Notes:

1. SUMMA® grab samples were collected by Sanborn Head Engineering P.C. on the dates indicated in 6L SUMMA® canisters at approximately the same time as the paired GC-ECD screening sample. Grab samples were analyzed by Eurofins Air Toxics of Folsom, California for trichloroethene (TCE) and tetrachloroethene (PCE) by United States Protection Agency (USEPA) Method TO-15 in selective ion monitoring (SIM) mode.

2. % RPD is the relative percent difference, calculated by the formula:
| Result1 - Result2 | / ((Result1 + Result2) / 2) * 100

3. Results are presented in micrograms per cubic meter (µg/m^3).

APPENDIX F

FIELD DOCUMENTATION

Soil Vapor Sampling Summary

SANBORN HEAD	Project No.: 2999.06
	Project Name: B335 VI Assessment
	Location: Former IBM East Fishkill Facility (B335)
Project Manager: J. Sanborn	Collector(s): M. Stein
PID Meter Used: ppbRAE	Other:

SOIL VAPOR SAMPLE RECORD

Location No.	**SSV335-001**	**SSV335-002**	**SSV335-003**	**SSV335-004**	**SSV335-005**	**SSV335-006**	**SSV335-007**	**SSV335-008**	**SSV335-009**	**SSV335-010**	**SSV335-011**	**DUP**	**SSV335-012**
Pre-purge DP (in H_20)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--	0.000
Duplicate Designation	--	--	--	--	--	--	--	--	--	--	DUP	SSV335-011	--
Sample Date	01/30/19	01/30/19	01/30/19	01/30/19	01/30/19	01/30/19	01/30/19	01/30/19	01/30/19	01/30/19	01/30/19	01/30/19	01/30/19
Sample Collection Depth (ft bgs)	0.62	0.58	1.04	0.80	0.60	0.50	1.07	1.26	~1.8	0.78	0.96	--	1.21
Ambient Air Temp (°F)	55-60	55-60	55-60	55-60	55-60	55-60	55-60	55-60	55-60	55-60	55-60	55-60	55-60
purge Vacuum in Wc	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	--	≤2
Summa Canister Sampling													
Approx. Purge Volume (mL)	12	12	15	13	12	11	15	16	20	13	14	--	16
Canister/Flow Controller ID No.	3340	3329	3459	3462	3339	3360	3327	1L 2271	3366	3458	3341	3336	3369
Start Time (hrs)	8:15	8:21	8:29	8:36	8:42	8:57	8:47	8:52	9:05	9:12	8:02	8:02	9:16
Start Pressure (inches Hg)	-30	-29.5	-30.5	-30	-29	-30	-30	-30	-30	-30	-28.5	-29	-29
Stop Time (hrs)	9:15	9:21	9:29	9:36	9:42	9:57	9:49	9:52	10:12	10:14	10:42	10:42	10:16
Stop Pressure (inches Hg)	-6.5	-5	-7.0	-7.0	-6.0	-4.5	-6.0	-7.0	-6.5	-7.0	-7.0	-5.5	-5.0
Field Screening													
PID (ppmv)	3,625	29.8	152.7	316	180.8	5,578	7,940	>10000	1,166	25.35	2,040	--	4,438
Comment No.													

COMMENTS

1.

2.

3.

Soil Vapor Implant Integrity Testing Summary

SANBORN HEAD	Project No.: 2999.06	Date: 1/30/19
	Project Name: B335 VI Assessment	
	Location: Former IBM East Fishkill Facility (B335)	
Project Manager: J. Sanborn	Collector(s): M. Stein	
PID Meter Used: ppbRAE	He Meter Used: Dielectric MGD-200	
Other: Magnehelic		

INTEGRITY TESTING RECORD

Location No.	**SSV335-004**	**SSV335-004**	**SSV335-007**	**SSV335-007**	
Vacuum (in H_20)	0.1±	0.30 max	0.1±	0.30 max	
Time to fill 1 liter Bag (min)	5.25	1.5	5	1.5	
Approx. Flow Rate (L/min)	0.2	0.7	0.2	0.7	
Tracer Gas Applied?	Y	Y	Y	Y	
Tracer Gas Concentration (ppmv)	ND	ND	ND	ND	
PID (ppmv)	15.74	139.9	837.2	2574	
Testing Date	1/30/2019	1/30/2019	1/30/2019	1/30/2019	
Screen Interval Depth (ft bgs)	0.80	--	1.07	--	
Ambient Air Temp (°F)	55-60	55-60	55-60	55-60	
Weather Conditions	Bld Interior	Bld Interior	Bld Interior	Bld Interior	
Comment No.					

COMMENTS

Abbreviations:
max = maximum obtained vacuum;
Y = Yes;
ND = Not Detected.