8976 Wellington Road
Manassas, VA 20109

Sent electronically

March 6, 2020

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: Subslab Depressurization Pilot Testing Summary Report
Building 310 – Northwest Area
Former IBM East Fishkill Facility
Hopewell Junction, New York
NYSDEC Site No. 314054

Dear Ms. LaClair:

The enclosed report presents a summary of the pilot testing completed to evaluate the feasibility of subslab depressurization as a means of mitigating soil vapor intrusion beneath the northwest portion of Building 310 located at the former IBM East Fishkill Facility in Hopewell Junction, New York. Building 310 is currently owned by iPark East Fishkill I 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: Report

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

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SUBSLAB DEPRESSURIZATION PILOT TESTING SUMMARY REPORT

NORTHWEST AREA OF BUILDING 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Prepared for IBM Corporation
File No. 2999.13
March 2020

SANBORN HEAD ENGINEERING
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20 Foundry Street
Concord, NH 03301

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

March 6, 2020
File No. 2999.13

Re: Subslab Depressurization Pilot Testing Summary Report
Northwest Area of Building 310
Former IBM East Fishkill Facility
Hopewell Junction, New York
EPA ID No. NYD000707901
NYSDEC Site No. 314054

Dear Mr. Chartrand:

The enclosed report presents a summary of the pilot testing completed to evaluate the feasibility of subslab depressurization as a means of mitigating soil vapor intrusion beneath the northwest portion of Building 310 at the former IBM East Fishkill facility, currently owned by iPark East Fishkill I LLC. Please contact us if you have any questions.

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

David Shea, P.E.
Sr. Vice President

Jennifer H. Sanborn
Project Director

Encl. Subslab Depressurization System Pilot Testing Summary Report – Northwest Area of Building 310

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SUBSLAB DEPRESSURIZATION PILOT TESTING SUMMARY REPORT
NORTHWEST AREA OF BUILDING 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Prepared for
IBM Corporation

Prepared by
Sanborn, Head Engineering, P.C.

File 2999.13
March 2020

SUBSLAB DEPRESSURIZATION PILOT TESTING SUMMARY REPORT
NORTHWEST AREA OF BUILDING 310
TABLE OF CONTENTS

EXHIBITS

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

This report presents the results of a subslab vapor assessment and subslab depressurization (SSD) pilot testing completed in the northwestern portion of Building 310 (B310) at the former IBM East Fishkill facility (the site) during the period of September 2019 through January 2020. B310 is currently owned by iPark East Fishkill I LLC (iPark), also referred to as National Resources (NR). B310 is currently vacant, except for the Model Shop area at the southern end, which is leased by Global Foundries. The location of B310 on the site is shown on Figure 1. iPark renumbered its buildings in 2019, and B310 was renumbered as Building 220. However, to be consistent with prior reports, the building will be referred to as B310 herein.

The work described herein was conducted by Sanborn, Head Engineering, PC (SHPC), on behalf of IBM, in general accordance with IBM's *Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan*[1] (RFI Work Plan) and IBM's *Work Plan for Subslab Depressurization Pilot Testing*,[2] both of which were approved by the New York State Department of Environmental Conservation and Department of Health (the Departments).

The services conducted and this report are subject to the standard limitations for this type of work, as described in Appendix A.

2.0 BACKGROUND

A source area assessment for volatile organic compounds (VOCs) was completed in B310 during the period of 2009 through 2011; the assessment included subslab vapor and indoor air sampling, as documented in previous reports[3,4] submitted to the Departments. In response to the results of the source area assessment, IBM installed an SSD system (System VE-2) in February 2012 that serves the central portion of the building, as shown on Figure 2. The area served by System VE-2 is where the highest historical concentrations of VOCs, principally tetrachloroethene (PCE), in subslab vapor were present. The SSD system, combined with heating, ventilating, and air conditioning (HVAC) system operations, was successful in mitigating soil vapor intrusion and maintaining acceptable indoor air quality (IAQ) throughout B310, as documented in previous reports[5,6] to the Departments.

The area north and west of System VE-2 (referred to herein as the northwestern area of B310) is currently vacant and has undergone major renovations, including removal of

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1 *Work Plan, RCRA Facility Investigation (RFI), VOC Source Assessment, IBM East Fishkill Facility, Hopewell Junction, New York,* prepared by Sanborn, Head Engineering, P.C., dated June 15, 2009.

2 *Work Plan for Subslab Depressurization Pilot Testing, Building 310 – Northwest Area, Former IBM East Fishkill Facility, Hopewell Junction, New York*, prepared by Sanborn, Head Engineering, P.C., dated December 4, 2019. The Work Plan was approved by the Departments in a December 20, 2019 letter to IBM.

3 *Report of Findings, Building 310 VOC Source Investigation and Implemented Measures, IBM East Fishkill Facility, Hopewell Junction, New York*, Sanborn, Head Engineering, P.C., April 7, 2010.

4 *Report of Findings, Building 310 VOC Source Assessment, Supplemental Investigations and Testing, IBM East Fishkill Facility, Hopewell Junction, New York*, Sanborn, Head Engineering, P.C., May 13, 2011.

5 *Performance Monitoring and Confirmatory Sampling Results, Building 310 VOC Source Assessment, IBM East Fishkill Facility, Hopewell Junction, NY*, Sanborn, Head Engineering, P.C., May 2013.

6 *Report of HVAC Adjustment and Indoor Air Quality Testing – Building 310*, Sanborn, Head Engineering P.C., July 22, 2016.

almost all interior walls and partitions and shut-down of the HVAC units that serve the area. We understand that iPark intends to lease the space for warehousing operations. IBM commissioned Sanborn Head to conduct a subslab vapor (SSV) and indoor / targeted air screening assessment, and SSD pilot testing activities, while the space was readily accessible. The scope of work and results of the SSV assessment, SSD pilot testing, and indoor air / targeted air screening are described in the following sections.

3.0 SUBSLAB VAPOR ASSESSMENT

A subslab vapor assessment was conducted in the northwest portion of B310 to: 1) further evaluate and update the presence and extent of VOCs beneath the floor slab, and 2) establish a subslab vapor testing and pressure monitoring network to evaluate potential SSD as a measure to control air pressure gradients across the floor slab and limit potential vapor intrusion.

The SSV port installation and sampling work described below was performed in general accordance with the methods described in the August 23, 2019 *Work Plan for Subslab Depressurization Pilot Testing*,[7] which was approved by the Departments for the south-central portion of B310. The VE-2 SSD system was shut down two weeks prior to the sampling to allow subslab vapor concentrations to equilibrate.

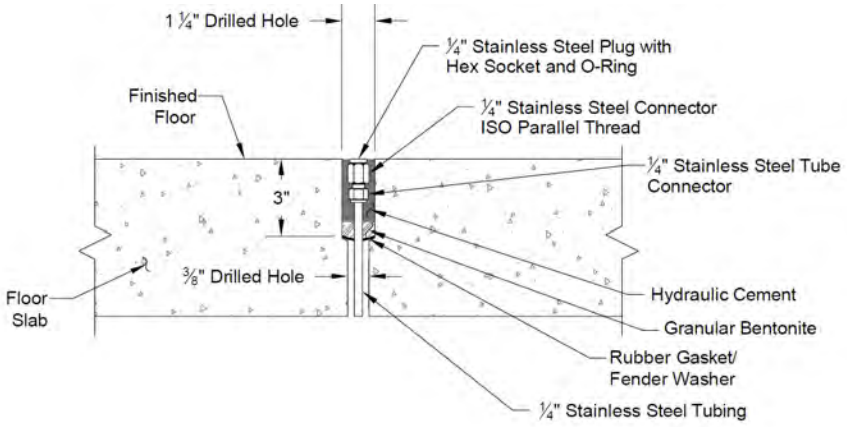
3.1 Subslab Vapor Monitoring Port Installation and Sampling of Select Ports

SSV ports SS-183 through SS-191 were installed in the northwestern portion of the building in October and December 2019, as shown on Figure 3. Three of the new ports (SSV-183, SSV-184, and SSV-185) were sampled as described below. The six remaining newly installed ports were installed for the purpose of vacuum monitoring during the SSD pilot testing described in Section 4.0 and were not sampled.

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 below in Exhibit 3.1. Helium integrity testing was performed on a subset of the SSV ports following installation to confirm airtight seals around the slab penetration.

[7] *Work Plan for Subslab Depressurization Pilot Testing, Building 310 – South-Central Area, Former IBM East Fishkill Facility, Hopewell Junction, New York*, Sanborn, Head Engineering, P.C., August 23, 2019.

Exhibit 3.1 – Subslab Vapor Monitoring Port Schematic



Subslab vapor samples were collected from 3 new and 16 existing SSV ports on October 22, 2019 into 1-L SUMMA® canisters equipped with 1-hour flow controllers. Samples were submitted to Eurofins Air Toxics, Inc. (EATI) of Folsom, California for analysis in accordance with USEPA Method TO-15 for the analytes listed in IBM's RFI Work Plan. One blind duplicate sample was collected for quality assurance/quality control (QA/QC) purposes.

3.2 Subslab Vapor Sampling Results

Subslab vapor analytical results are presented in Table 1, and laboratory analytical reports are provided in Appendix C. Tetrachloroethene (PCE) was typically the predominant compound detected in subslab vapor, and PCE concentrations and inferred concentration isopleths are shown on Figure 3. PCE was detected at all subslab vapor monitoring locations except for one (SS-141), at concentrations ranging from 39 to 59,000 µg/m^3, with the highest concentrations located to the north of the VE-2 system area of influence, and lower PCE concentrations (less than 1,000 µg/m^3) beneath the western portion of the building.

The results indicate that the subslab vapor PCE concentrations within the area of influence of the VE-2 system have decreased by several orders of magnitude since the system began operations in February 2012, with PCE concentrations ranging from non-detect to 1,000 µg/m^3, with the exception of SS-104 at the northern edge of VE-2 influence.

4.0 SUBSLAB DEPRESSURIZATION PILOT TESTING

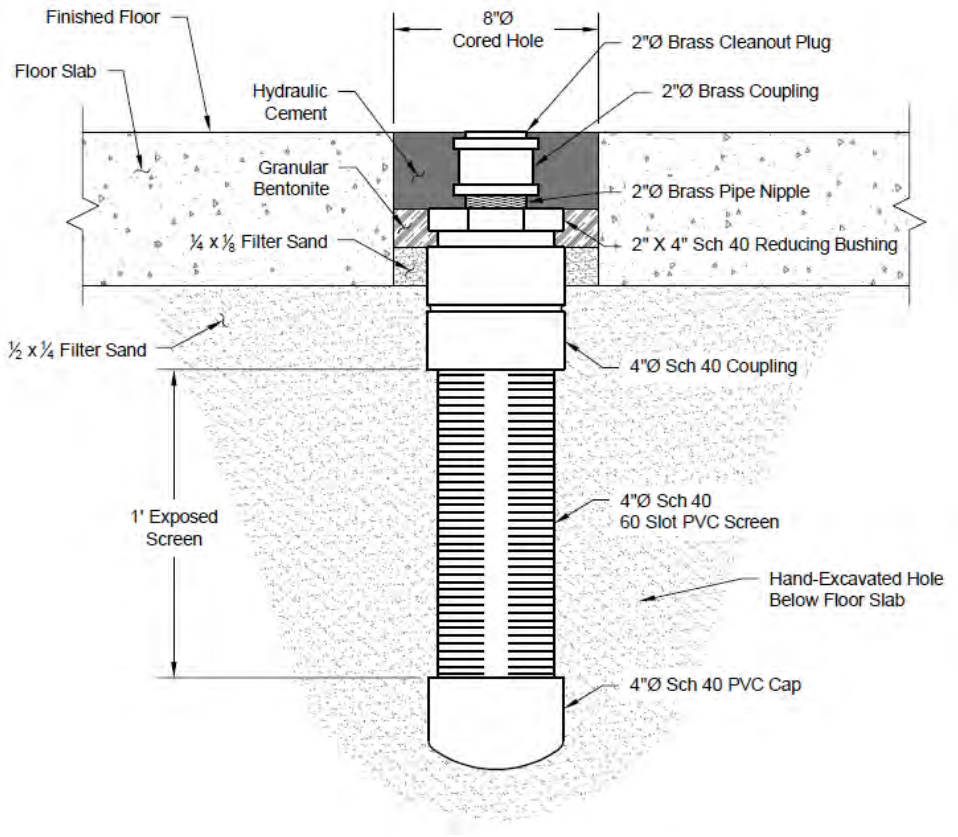
Following the subslab vapor sampling work, IBM elected to conduct SSD pilot testing in the northwest portions of the building to evaluate possible expansion of SSD in that area of B310. SSD pilot testing was conducted at new extraction ports (EPs) installed in the northwest portion of the building to evaluate the effectiveness of SSD in controlling air pressure gradients across the floor slab as means of reducing potential for vapor intrusion. This section provides a summary of the testing procedures and results.

4.1 Extraction Port Installation

Extraction ports EP-224 through EP-229 (6 new ports) were installed on December 10, 2019 at the locations shown on Figure 3. Each EP was constructed by coring a hole through

the concrete floor slab, hand excavating the underlying soil, and installing a 4-inch-diameter by 1-ft-long, 60-slot, schedule 40 PVC screen equipped with a capped port flush with the floor. A schematic of an EP is shown in Exhibit 4.1 below.

Exhibit 4.1 – Subslab Vapor Extraction Port Schematic

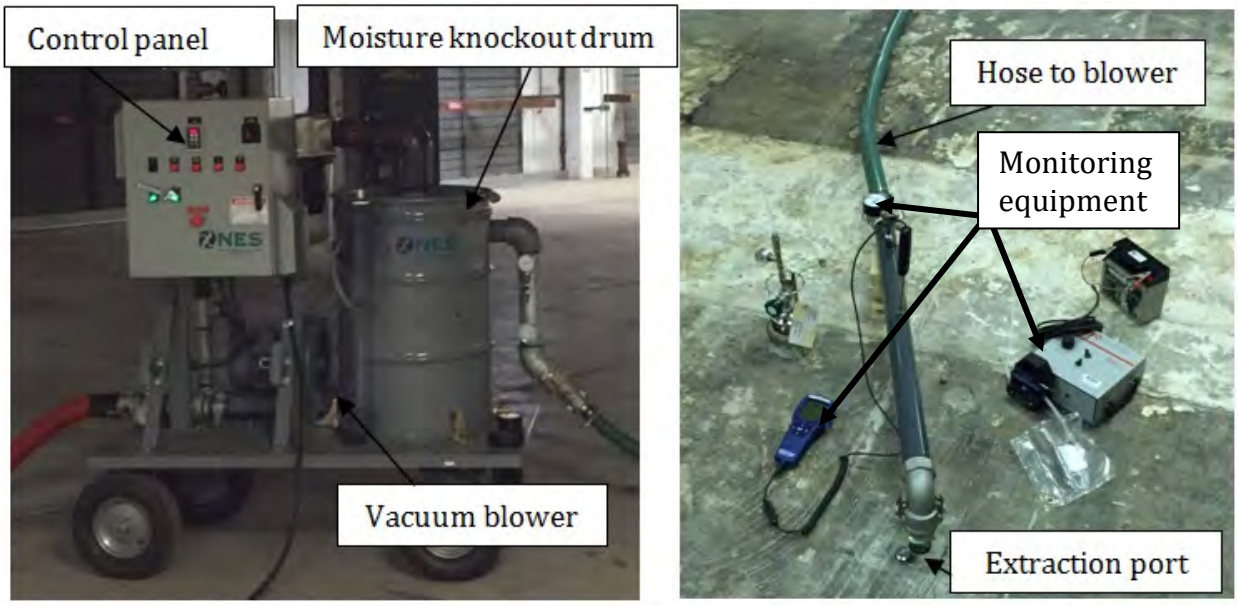


4.2 Testing Procedures

SSD pilot testing activities were conducted on December 17, 2019 after the VE-2 SSD system that serves the central portion of the building had been temporarily shut down. During pilot testing activities, individual vacuum extraction tests were conducted at each EP. Extraction ports were connected to a regenerative vacuum blower mounted on a portable cart, shown in Exhibit 4.2 below, which was used to withdraw vapor from the ports for durations of approximately 60 minutes each. The vapor flow rate, applied vacuum, and photoionization detector (PID) screening value were monitored and recorded at each EP using the assembly shown in Exhibit 4.2. For each test, the cross-slab differential pressure response was monitored at nearby SSV ports using digital micromanometers.

Extracted vapor was directed outdoors via flexible duct or hose connected to existing exhaust fan drops, or duct/hose direct to the outdoors via doorways.

Exhibit 4.2 – SSD Pilot Testing Setup
Blower cart (left) and extraction port test assembly (right)



4.3 Pilot Test Results

The subslab pressure responses for each individual test are shown on Figures B-1 through B-6 in Appendix B. On these figures, the inferred extent of subslab pressure response is depicted by the pressure differential isopleth of -0.004 inches of water column (in. wc) (or 1 pascal); this value, or lower pressure (greater vacuum), is an indication that vapor extraction has influence, and is expected to be sufficient to capture subslab soil vapor, within at least the area encompassed by the -0.004 in. wc isopleth.

Near the conclusion of each individual test, a grab sample of the vapor stream was collected into a SUMMA® canister and submitted to EATI for analysis of select VOCs by USEPA Method TO-15. The complete analytical results for the vapor grab samples are provided in Table 2, and analytical laboratory reports are provided in Appendix C.

The SSD pilot testing data for each individual test are summarized in Exhibit 4.3 below.

Exhibit 4.3 – SSD Pilot Testing Data Summary

Port Location	Applied Vacuum [in. wc]	Extracted Flow Rate [cfm]	PID Screening [ppmv]	PCE Laboratory Analysis [µg/m^3]	TCE Laboratory Analysis [µg/m^3]	PCE Removal Rate [lbs/hr]	TCE Removal Rate [lbs/hr]
EP-224	60	8	2.9	26,000	3,200	7.8×10^{-4}	9.6×10^{-5}
EP-225	60	77	2.1	18,000	1,500	5.2×10^{-3}	4.3×10^{-4}
EP-226	43	163	0.6	1,500	220	9.2×10^{-4}	1.3×10^{-4}
EP-227	60	82	0.4	240	33	7.4×10^{-5}	1.0×10^{-5}
EP-228	60	63	1.9	32,000	<120	7.6×10^{-3}	$<2.8 \times 10^{-5}$
EP-229	60	11	7.1	57,000	9,100	2.3×10^{-3}	3.7×10^{-4}

As shown on Figures B-1 and B-6, there was no measurable vacuum influence at surrounding SSV monitoring ports during pilot testing of EP-224 and EP-229, which are both located in the northernmost portion of the building in areas that exhibited the highest PCE concentrations in subslab vapor. The closest SSV ports to EP-224 and EP-229 are approximately 50 feet away from the EPs, indicating a radial vacuum influence of less than 50 feet for each of the EPs. For comparison, the typical radial distance of observed vacuum influence for VE-2 and other successful SSD systems at the site, as well as in the southern portion of B310 based on pilot testing, is generally greater than 100 feet. In the western area of B310, where PCE concentrations in SSV are generally lower, vacuum influence was observed at distances of up to 100 feet from the EPs, as shown on Figures B-2 through B-5.

As shown in Exhibit 4.3, extracted flow rates from EP-224 (8 cubic feet per minute [cfm]) and EP-229 (11 cfm) were significantly lower than from EPs in the western portion of the building (up to 163 cfm) at similar vacuums, further signifying the limited performance in the northernmost area of the building. The observations of limited subslab vacuum influence and low extraction flow rate under high applied vacuums correlate with soil conditions encountered during the installation of EPs: the soil beneath the northernmost portion of the building was observed to be a very dense, silty soil that is less conducive to propagation of subslab vacuum, while the subslab soil in the western portion of the building was observed to be a less dense, granular material.

In summary, the pilot test results indicate that the northernmost portion of the building, where subslab VOC vapor concentrations are relatively higher, is not conducive to conventional SSD that has been successful in other parts of B310 and other site buildings. The western portion of the building is more conducive to SSD, but subslab VOC vapor concentrations are relatively lower and may not require VI mitigation to achieve acceptable indoor air concentrations.

5.0 INDOOR AIR AND TARGETED AIR SCREENING

Following the SSD pilot testing, IBM elected to conduct indoor air screening in the northwest portion of the building to assess indoor air VOC concentrations under current conditions (i.e., post-interior demolition, no HVAC running). These conditions are considered to be unfavorable for IAQ given the stagnant air resulting from the absence of HVAC operations. In addition, targeted air screening was conducted to assess for potential preferential pathways for subslab vapor entry to the building. The following sections provide a summary of the screening procedures and associated results.

5.1 Indoor and Targeted Air Screening Procedures

Indoor and targeted air screening was conducted on January 21, 2020 using a field-portable gas chromatograph with electron capture detector (GC-ECD)[8] to analyze for PCE and TCE at the locations shown on Figure 4.

[8] The data obtained using the GC-ECD is referred to as "screening" data because it was used as a rough approximation of indoor air concentrations under current, unoccupied conditions, and not to evaluate potential human exposure.

Indoor air screening samples were collected from breathing zone height using a syringe for a duration of approximately 30 seconds. Targeted air samples were collected at former solvent drain cleanout ports in the northernmost portion of the building, shown on Figure 4, using a syringe for a duration of approximately 30 seconds. The contents of the syringe were injected directly into the GC-ECD for analysis.

Indoor air grab samples were collected at locations IA2024 and IA2069 at approximately the same time as the GC-ECD screening samples for comparison purposes. The grab samples were collected using 6-liter, pre-evacuated, stainless-steel SUMMA® canisters for a duration of approximately 5 minutes. The samples were submitted to EATI for analysis of the analytes listed in IBM's RFI Work Plan in accordance with USEPA Method TO-15 using a combination of full scan and selective ion monitoring (SIM).

5.2 Indoor and Targeted Air Screening Results

Indoor air screening results are provided in Table 3 and depicted on Figure 4. PCE was detected at each of the 23 indoor air screening locations, with a maximum concentration of 16 µg/m^3. TCE was detected at only 1 of the 23 indoor air screening locations (IA2071) located in the northeastern portion of the building at a concentration of 1.6 µg/m^3. The concentrations of PCE and TCE were generally lower in the western-most portion of the building and increased to the northeast, which generally corresponds with the observed distribution of PCE in subslab vapor.

Targeted air screening results at former solvent drain cleanout ports are provided in Table 4. PCE was detected at each of the six targeted air screening locations, at a maximum concentration of 370 µg/m^3. TCE was also detected in each of the six targeted air screening locations, at a maximum concentration of 200 µg/m^3.

PCE results for the two grab SUMMA® canister samples were detected at concentrations that were less than half of the PCE concentrations measured by the GC-ECD at the same location, as shown on Figure 4, indicating that the GC-ECD screening results are biased high. Calibration checks for PCE and TCE completed during field screening also indicated that the GC-ECD was reading high for both compounds. PCE and TCE results in Tables 3 and 4 that were within the calibration range of the GC-ECD have been flagged with a "JH" qualifier to signify the high bias. Targeted air samples with PCE and TCE results that exceeded the calibration range of the GC-ECD were flagged with a "JI" to indicate estimated values with an indeterminate bias.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The northwestern area of B310 has been cleared of internal walls as part of building renovations, is currently vacant, and HVAC systems are not operating. We understand that iPark intends to renovate and reconfigure the space for warehousing operations. A subslab vapor (SSV) assessment and subslab depressurization (SSD) pilot testing were completed in this area from September 2019 through January 2020 to further assess the magnitude and distribution of site-related VOCs in subslab vapor, and to evaluate SSD as a means of vapor intrusion mitigation in that area of the building. Indoor air screening was subsequently

completed to assess indoor air concentrations under current conditions, and targeted air screening was completed at former solvent drain cleanout ports to evaluate preferential pathways as a means of vapor entry into the building.

The results of the SSV sampling indicated that the highest concentrations of PCE were detected beneath the northernmost portion of the building, and decreased toward the west and south.

Results of SSD pilot testing in the northernmost area of the building were not favorable for vapor extraction in the area of the higher SSV concentrations. Specifically, subslab vacuum influence was not observed at SSV ports that were located approximately 50 feet away from the EPs being tested. In general, vacuum influence can be observed at least 100 feet away from EPs in successful SSD applications, as seen in other areas of B310 and other on-site SSD systems. In addition, the extraction flow rates were significantly lower in the northernmost area at a similar applied vacuum to other EPs tested in the western portion of the building. The limited vacuum influence and very low extraction flow rates are likely attributable to the very dense, silty material observed beneath the floor slab in that area of the building, which is not conducive to vapor extraction. Considering that indoor air screening results were generally low in this area under current conditions that are unfavorable to IAQ (i.e. stagnant air and no HVAC operation), and given the unfavorable SSD pilot testing results in this area, other measures more feasible than SSD are recommended below to maintain acceptable IAQ in the northernmost portion of the building.

In the western area of B310, where PCE concentrations in SSV are generally lower, vacuum influence was observed at distances of up to 100 feet from the EPs, and flow rates were higher than in the northernmost area of the building, which correlates with the less dense, granular material observed beneath the floor slab in that area. Indoor air screening results were generally lower in this area of the building than in the northernmost area under current, stagnant air conditions. Although the pilot testing in the western area was conducive to vapor extraction, it is not anticipated that implementation of an SSD system in this area of the building would have an appreciable impact on indoor air quality given the relatively lower SSV and IA screening concentrations observed in the western area during this assessment. The sealing measures recommended below in combination with future HVAC operations are expected to have a greater impact on reducing indoor air concentrations in this area, which are expected to be acceptable without implementing SSD.

As part of iPark's building renovations prior to re-occupancy of the northwestern area, we recommend that the open floor drains connected to the former solvent drains, which exhibited higher concentrations of PCE and TCE than indoor air and are likely impacting indoor air quality, be properly sealed. In addition, we recommend that iPark seal or coat the concrete floor slab during renovations to further reduce the potential for vapor intrusion through the floor slab. These actions, in combination with future HVAC operations, are expected to be sufficient to maintain indoor air quality at acceptable levels more effectively than implementing SSD in the northwest area.

In summary, further testing and design of SSD in the northwestern area of the building is not proposed at this time for the following reasons:

- SSD using conventional extraction ports does not appear to be a feasible means of VI mitigation in the northernmost portion of the building based on the results of pilot testing;
- SSD may be a feasible means of VI mitigation in the western area of the building; however, subslab vapor data and indoor air screening data suggest that SSD may not significantly reduce indoor air concentrations, which are expected to be acceptable without implementing SSD in this area; and
- Indoor air screening results indicate that PCE and TCE concentrations are generally low throughout the northwest portion of the building, even under current, stagnant air conditions.

Re-sampling of indoor air in the northwestern portion of the building should be conducted following the completion of building renovations, including floor drain sealing, floor coating / sealing, and HVAC installation and startup, to confirm these measures achieve appropriate indoor air quality.

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TABLES

Table 1
Summary of Subslab Vapor Sample Analytical Results
Building 310
Former IBM East Fishkill Facility
Hopewell Junction, New York

Analyte	Sample Name	SS14	SS15	SS16	SS17	SS18	SS19	SS20	SS104	SS110	SS117	SS121	SS125	SS127	SS134	SS134 Dup.	SS138	SS141	SS183	SS184	SS185
	Collection Date	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19	10/22/19
Acetone	µg/m3	<31	<27	<29	<270	<30	<27	<29	<180	<29	<29	<28	<30	<29	<29	<29	<28	<28	<360	<160	79
Benzene	µg/m3	<4.2	<3.7	<3.9	<36	<4.0	<3.7	<3.9	<24	<3.8	<4.0	<3.8	<4.0	<3.9	<3.9	<3.9	<3.8	<3.8	<49	<52	<3.9
Carbon tetrachloride	µg/m3	<8.3	<7.2	<7.7	<71	<7.9	<7.3	<7.6	<48	<7.6	<7.8	<7.4	<7.8	<7.7	<7.6	<7.7	<7.5	<7.4	<96	<100	<7.6
CFC113 (Ethane, 1,1,2-trichloro-1,2,2-trifluoro-)	µg/m3	<10	<8.8	51	6,500	<9.6	210	12	3,900	91	140	21	<9.5	20	15	13	55	<9.0	3,000	76,000	27
Chlorobenzene (Monochlorobenzene)	µg/m3	<6.1	<5.3	<5.6	<52	<5.8	<5.3	<5.6	<35	<5.5	<5.7	<5.4	<5.7	<5.6	<5.6	<5.6	<5.5	<5.4	<71	<76	<5.6
Dichlorobenzene (1,2-)	µg/m3	<8.0	<6.9	<7.4	<68	<7.5	<6.9	<7.3	<46	<7.2	<7.4	<7.1	<7.5	<7.3	<7.3	<7.3	<7.2	<7.1	<92	<99	<7.3
Dichlorobenzene (1,3-)	µg/m3	<8.0	<6.9	<7.4	<68	<7.5	<6.9	<7.3	<46	<7.2	<7.4	<7.1	<7.5	<7.3	<7.3	<7.3	<7.2	<7.1	<92	<99	<7.3
Dichlorobenzene (1,4-)	µg/m3	<8.0	<6.9	<7.4	<68	<7.5	<6.9	<7.3	<46	<7.2	<7.4	<7.1	<7.5	<7.3	<7.3	<7.3	<7.2	<7.1	<92	<99	<7.3
Dichlorodifluoromethane (CFC12)	µg/m3	<6.6	<5.7	<6.0	<56	8.5	<5.7	<6.0	<38	<6.0	<6.1	<5.8	<6.2	<6.0	6.0	<6.0	<5.9	<5.8	<76	<81	<6.0
Dichloroethene (1,1-)	µg/m3	<5.2	<4.6	<4.8	100	<5.0	<4.6	<4.8	41	<4.8	<4.9	<4.6	<4.9	<4.8	<4.8	<4.8	<4.7	<4.7	<61	<65	<4.8
Dichloroethene (cis-1,2-)	µg/m3	<5.2	<4.6	420	340	<5.0	<4.6	<4.8	32	14	11	<4.6	<4.9	7.4	<4.8	<4.8	<4.7	<4.7	120	<65	<4.8
Ethylbenzene	µg/m3	<5.8	<5.0	<5.3	<49	<5.4	<5.0	<5.2	<33	<5.2	<5.4	<5.1	<5.4	<5.3	<5.2	<5.3	<5.2	<5.1	<67	<71	<5.2
Methylene Chloride (Dichloromethane)	µg/m3	<46	<40	<42	<390	<43	<40	<42	<260	<42	<43	<41	<43	<42	<42	<42	<41	<41	<530	<230	<42
Tetrachloroethene (PCE)	µg/m3	39	200	1,100	14,000	240	940	560	11,000	1,000	410	330	880	970	210	210	290	<8.0	25,000	59,000	2,600
Toluene	µg/m3	<5.0	<4.3	<4.6	<42	<4.7	<4.4	<4.6	<29	<4.5	<4.7	<4.4	<4.7	<4.6	5.8	7.0	<4.5	<4.4	<58	<62	15
Trichlorobenzene (1,2,4-)	µg/m3	<39	<34	<36	<330	<37	<34	<36	<230	<36	<37	<35	<37	<36	<36	<36	<35	<35	<460	<490	<36
Trichloroethane (1,1,1-)	µg/m3	<7.2	<6.3	7.1	<61	<6.8	<6.3	<6.6	<42	<6.6	<6.8	<6.4	<6.8	<6.6	<6.6	<6.6	<6.5	<6.4	<84	<90	<6.6
Trichloroethene (TCE)	µg/m3	8.4	110	380	2,200	12	120	42	1,100	180	77	64	11	40	14	16	30	<6.3	2,300	1,800	230
Trichlorofluoromethane (CFC11)	µg/m3	21	130	<6.9	130	14	13	30	100	57	37	12	54	42	190	190	32	<6.6	<86	590	52
Vinyl chloride	µg/m3	<3.4	<2.9	<3.1	<29	<3.2	<3.0	<3.1	<20	<3.1	<3.2	<3.0	<3.2	<3.1	<3.1	<3.1	<3.0	<3.0	<39	<42	<3.1
Xylene (m,p-)	µg/m3	<5.8	<5.0	<5.3	<49	<5.4	<5.0	<5.2	<33	<5.2	<5.4	<5.1	<5.4	<5.3	<5.2	<5.3	<5.2	<5.1	<67	<71	<5.2
Xylene (o-)	µg/m3	<5.8	<5.0	<5.3	<49	<5.4	<5.0	<5.2	<33	<5.2	<5.4	<5.1	<5.4	<5.3	<5.2	<5.3	<5.2	<5.1	<67	<71	<5.2

Notes:

1. Samples were collected by Sanborn Head Engineering P.C. on the dates indicated into 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.

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 Subslab Vapor Extraction Pilot Test Analytical Results
Building 310
Former IBM East Fishkill Facility
Hopewell Junction, New York

Analyte	Sample Name	EP-224	EP-225	EP-226	EP-227	EP-228	EP-229
	Collection Date	12/28/19	12/28/19	12/28/19	12/28/19	12/28/19	12/28/19
Dichloroethene (cis-1,2-)	µg/m3	170	<48	<4.7	<4.7	<89	3,200
Dichloroethene (trans-1,2-)	µg/m3	<67	<48	<4.7	<4.7	<89	<250
Tetrachloroethene (PCE)	µg/m3	26,000	18,000	1,500	240	32,000	57,000
Trichloroethene (TCE)	µg/m3	3,200	1,500	220	33	<120	9,100
Vinyl chloride	µg/m3	<43	<31	<3.0	<3.0	<58	<160

Notes:

1. Samples were collected by Sanborn Head Engineering P.C. on the dates indicated into 1L SUMMA canisters as grab samples. The samples were analyzed by Eurofins Air Toxics of Folsom, California for a select list of volatile organic compounds (VOCs) by United States Protection Agency (USEPA) Method TO-15.

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 3
Summary of Indoor Air Screening Results
Building 310
Former IBM East Fishkill Facility
Hopewell Junction, New York

Sample Name	Collection Date	Concentrations in µg/m^3	
		TCE	PCE
IA2001	01/21/20	<1.3	5.6 JH
IA2002	01/21/20	<1.3	13 JH
IA2005	01/21/20	<1.3	12 JH
IA2006	01/21/20	<1.3	10 JH
IA2007	01/21/20	<1.3	7.6 JH
IA2009	01/21/20	<1.3	11 JH
IA2024	01/21/20	<1.3	5.4 JH
IA2025	01/21/20	<1.3	15 JH
IA2029	01/21/20	<1.3	5.5 JH
IA2035	01/21/20	<1.3	9.3 JH
IA2055	01/21/20	<1.3	4.6 JH
IA2067	01/21/20	<1.3	12 JH
IA2068	01/21/20	<1.3	5.4 JH
IA2069	01/21/20	<1.3	10 JH
IA2070	01/21/20	<1.3	3.2 JH
IA2071	01/21/20	1.6 JH	16 JH
IA2092	01/21/20	<1.3	9.3 JH
IA2093	01/21/20	<1.3	11 JH
IA2094	01/21/20	<1.3	9.6 JH
IA2096	01/21/20	<1.3	14 JH
IA2097	01/21/20	<1.3	11 JH
IA2098	01/21/20	<1.3	5.8 JH
IA2099	01/21/20	<1.3	3.7 JH

Notes:

1. "GC-ECD" samples were collected using a gas chromatograph with electron capture detection (GC-ECD). The instrument was calibrated to vendor prepared standards ranging from 1 part per billion on a volumetric basis (ppbv) to 10 ppbv, for trichloroethene (TCE) and tetrachloroethene (PCE). Results were converted to micrograms per cubic meter (µg/m^3) assuming standard temperature (25 °C) and pressure (1 atmosphere) for the conversion.

2. Results are displayed with two significant figures.

3. "<" indicates the analyte is non-detect at or above the indicated sample specific practical quantification limit (PQL).
"JH" indicates the result is estimated with potential high bias due to high field calibration check recoveries.

Table 4
Summary of Targeted Air Screening Results
Building 310
Former IBM East Fishkill Facility Hopewell Junction, New York

Sample Name	Collection Date	Concentrations in µg/m^3			
		TCE		PCE	
TA2014	01/21/20	9.0	JH	35	JH
TA2015	01/21/20	48	JH	160	JI
TA2016	01/21/20	2.5	JH	24	JH
TA2017	01/21/20	100	JI	230	JI
TA2018	01/21/20	26	JH	140	JI
TA2019	01/21/20	200	JI	370	JI

Notes:

1. "GC-ECD" samples were collected using a gas chromatograph with electron capture detection (GC-ECD). The instrument was calibrated to vendor prepared standards ranging from 1 part per billion on a volumetric basis (ppbv) to 10 ppbv, for trichloroethene (TCE) and tetrachloroethene (PCE). Results were converted to micrograms per cubic meter (µg/m^3) assuming standard temperature (25 °C) and pressure (1 atmosphere) for the conversion.

2. Results are displayed with two significant figures.

3. "JH" indicates the result is estimated with potential high bias due to high calibration check recoveries.
"JI" indicates the result is estimated with indeterminate bias due to exceedance of the instrument calibration range.

Table 5
Summary of Indoor Air Grab Summa Canister Analytical Results
Building 310
Former IBM East Fishkill Facility
Hopewell Junction, New York

Analyte	Sample Name	IA2024_G	IA2069_G
	Collection Date	01/21/20	01/21/20
Acetone	µg/m3	7.4	8.2
Benzene	µg/m3	1.3	2.1
Carbon tetrachloride	µg/m3	0.48	0.41
CFC113 (Ethane, 1,1,2-trichloro-1,2,2-trifluoro-)	µg/m3	<1.2	1.6
Chlorobenzene (Monochlorobenzene)	µg/m3	<0.76	<0.82
Dichlorobenzene (1,2-)	µg/m3	<0.99	<1.1
Dichlorobenzene (1,3-)	µg/m3	<0.99	<1.1
Dichlorobenzene (1,4-)	µg/m3	<0.99	<1.1
Dichlorodifluoromethane (CFC12)	µg/m3	<4.0	<4.4
Dichloroethene (1,1-)	µg/m3	<0.065	<0.071
Dichloroethene (cis-1,2-)	µg/m3	<0.13	0.14
Ethylbenzene	µg/m3	<0.71	1.0
Methylene Chloride (Dichloromethane)	µg/m3	<1.1	<1.2
Tetrachloroethene (PCE)	µg/m3	1.7	3.3
Toluene	µg/m3	1.2	4.6
Trichlorobenzene (1,2,4-)	µg/m3	<6.1	<6.6
Trichloroethane (1,1,1-)	µg/m3	<0.89	<0.98
Trichloroethene (TCE)	µg/m3	<0.18	0.31
Trichlorofluoromethane (CFC11)	µg/m3	50	49
Vinyl chloride	µg/m3	<0.042	<0.046
Xylene (m,p-)	µg/m3	<0.71	2.2
Xylene (o-)	µg/m3	<0.71	0.82

Notes:

1. Samples were collected by Sanborn Head Engineering P.C. on the dates indicated in 6-L SUMMA canisters as grab samples. The samples were 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.

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

Figure 1

B310 Location Plan

Subslab Depressurization Pilot Testing
Summary Report

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By: E. Wright
Designed By: J. Flood
Reviewed By: J. Sanborn
Project No: 2999.13
Date: March 2020

Figure Narrative

This figure shows the buildings at the former IBM East Fishkill facility. Building B310 is highlighted.

Legend

— - - - — Property Line

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

B310 Indicates building number

Indicates the location of B310

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\B310\B310 SSD ConceptDesign\B310_SSD_LocationPlan.dwg Plot Date: 2-6-20

Figure 2

Building 310 Layout

Subslab Depressurization Pilot Testing
Summary Report
Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	J. Flood
Reviewed By:	J. Sanborn
Project No:	2999.13
Date:	March 2020

Figure Narrative

This figure shows the extent of subslab depressurization (SSD) pilot testing area located in the northwest portion of Building 310. SSD pilot testing was performed on December 17, 2019. Note that most of the interior walls and rooms in this area have been demolished and the building cleared. The building layout and HVAC zones in this area reflect the pre-demolition conditions.

This figure also shows the location of the Model Shop area, and the layout of the existing SSD system (VE-2), including the approximate area of subslab vapor vacuum influence. The presumed area of vacuum influence represents the inferred apparent vacuum conditions based on subslab differential pressure readings collected on December 18, 2018.

Legend

- Existing subslab vapor extraction port
- Existing subslab vapor extraction port actively connected to VE-2
- Subslab vapor extraction port installed for December 2019 pilot testing
- HVAC Zone
- Occupied areas
- Overhead vacuum/discharge piping for existing SSD system VE-2
- -0.004 — Inferred area of vacuum influence for existing SSD system VE-2
- Area of December 2019 SSD pilot testing

Feet
40 20 0 40 80

SANBORN HEAD ENGINEERING

Last Edited By: ewright

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Figure 3

Summary of PCE Concentrations in Subslab Vapor

Subslab Depressurization Pilot Testing
Summary Report
Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	J. Flood
Reviewed By:	J. Sanborn
Project No:	2999.13
Date:	March 2020

Figure Narrative

This figure shows the concentrations of tetrachloroethene (PCE) detected in subslab vapor samples in units of micrograms per cubic meter (ug/m3). Subslab vapor samples were collected on October 22, 2019 into 1-L Summa canisters equipped with 1-hour flow controllers approximately 2 weeks after SSD system VE-2 was turned off. 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. Refer to Table 1 for other analyte concentrations.

Legend

- Subslab vapor monitoring port
- Existing subslab vapor extraction port
- Subslab vapor extraction port installed for December 2019 pilot testing
- -0.004 — Inferred area of vacuum influence for existing SSD system VE-2
- 970 — PCE concentration (µg/m³) ( ) indicates duplicate sample

PCE Concentrations in Subslab Vapor (µg/m³)

- <1,000
- 1,000 10,000
- 10,000 - 50,000
- >50,000

25 12.5 0 25 50 Feet

SANBORN HEAD ENGINEERING

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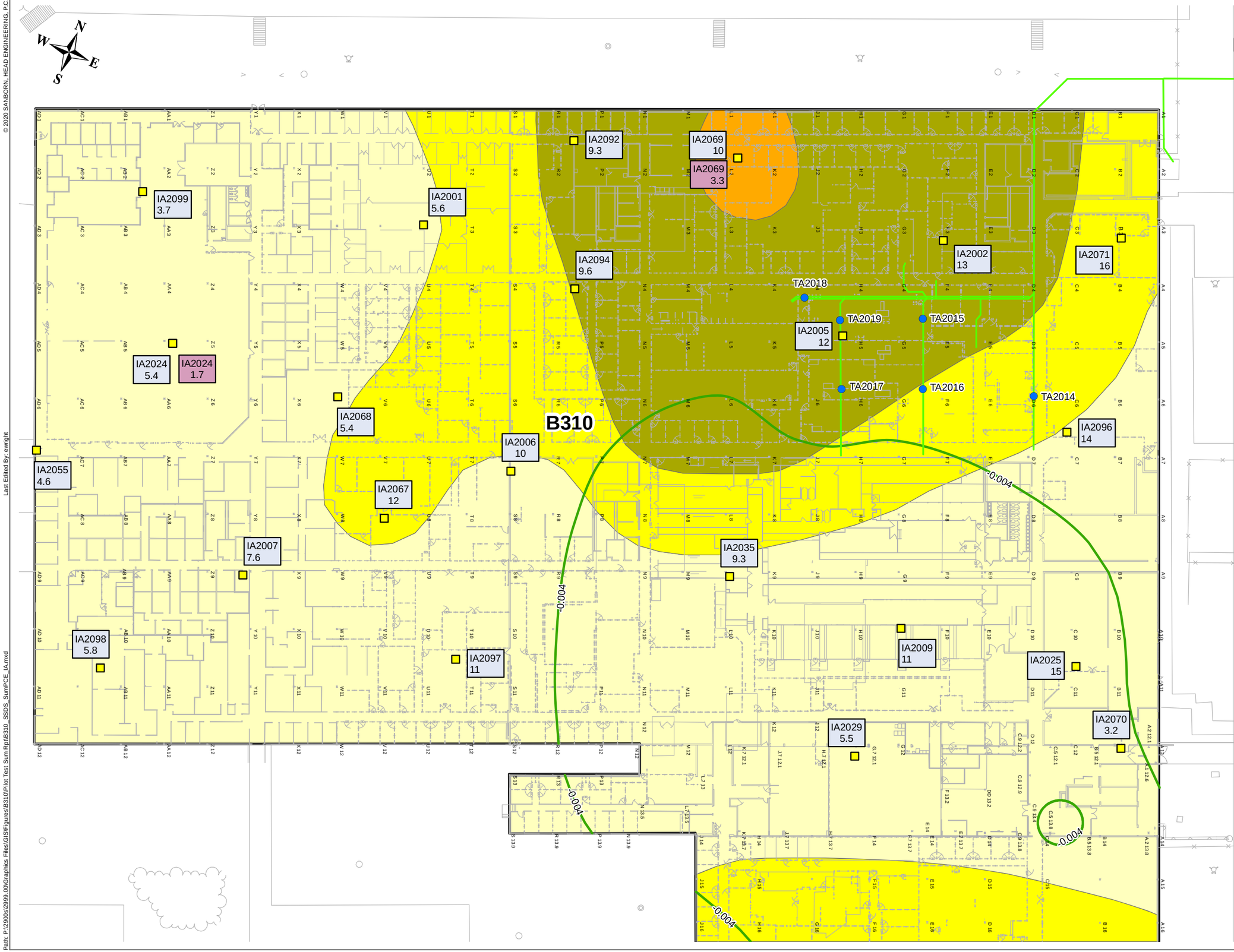

Figure 4

Summary of PCE Field Screening Data in Indoor Air

Subslab Depressurization Pilot Testing
Summary Report
Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	J. Flood
Reviewed By:	J. Sanborn
Project No:	2999.13
Date:	March 2020

Figure Narrative

This figure shows the concentrations of tetrachloroethene (PCE) detected in indoor air screening samples collected using a field-portable gas chromatograph with electron capture detector (GC-ECD), as well as two grab Summa canister samples collected for quality assurance / quality control (QA/QC) purposes. Indoor air screening was conducted on January 21, 2020. Results are shown in micrograms per cubic meter (µg/m³).

This figure also shows the inferred subslab vapor PCE concentration isopleths based on subslab vapor samples collected in October 2019.

Legend

- Indoor air screening location
- Targeted air screening location
- Subsurface solvent lines
- Inferred area of vacuum influence for existing SSD system VE-2
- 11 — PCE screening concentration measured using the GC-ECD (µg/m³)
- 3.3 — PCE concentration in Summa grab sample (µg/m³)

PCE Concentrations in Subslab Vapor (µg/m³)

- <1,000
- 1,000 10,000
- 10,000 - 50,000
- >50,000

25 12.5 0 25 50 Feet

SANBORN HEAD ENGINEERING

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. Sampling and quantitative laboratory testing was performed by others as part of the investigation as noted within the report. Where such analyses have been conducted by an outside laboratory, unless otherwise stated in the report, SHPC has relied upon the data provided, and has not conducted an independent evaluation of the reliability of these data. It must be noted that 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

SUBSLAB PRESSURE RESPONSE TO VAPOR EXTRACTION TESTS

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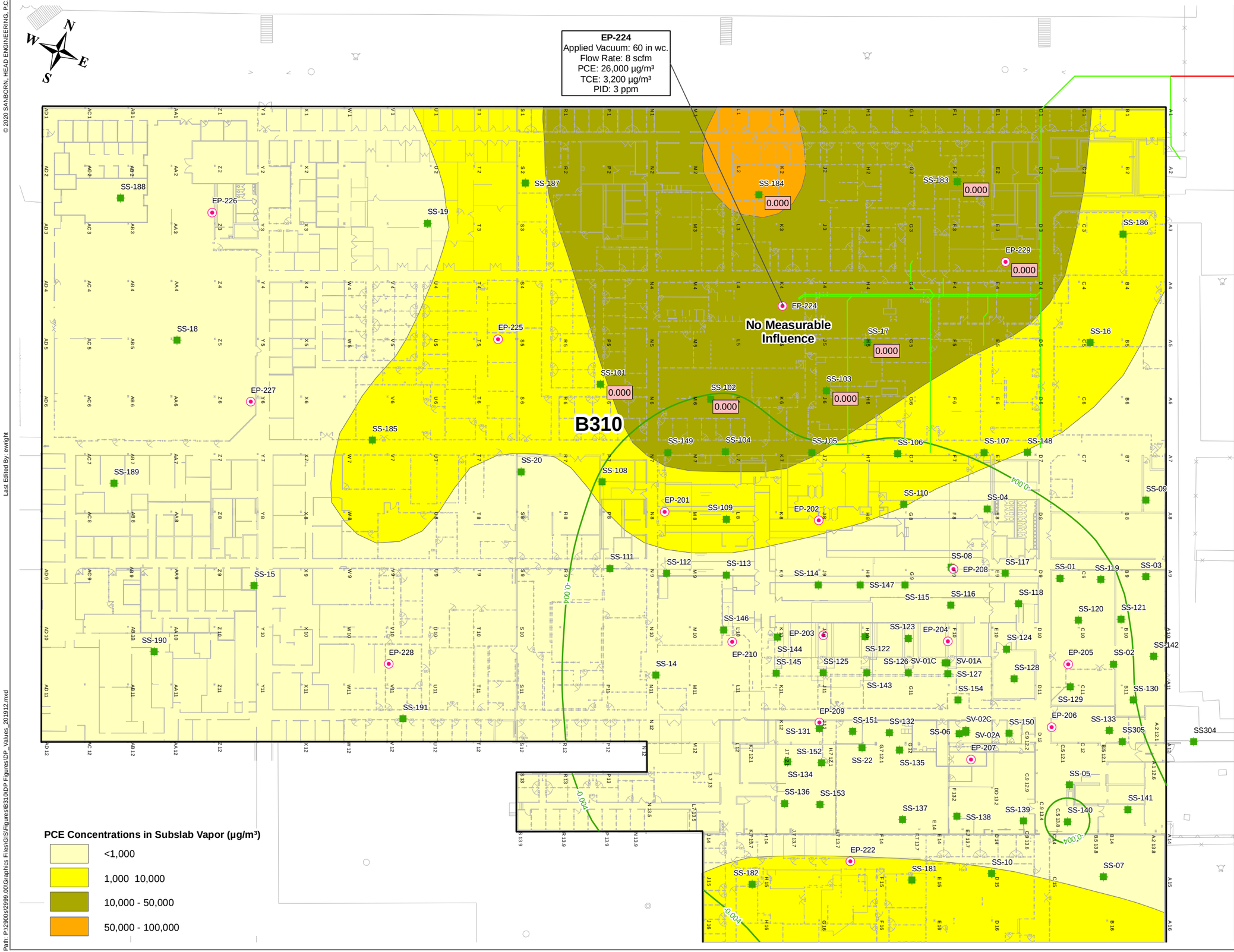

Figure B-1

Subslab Pressure Response to Vapor Extraction Testing

EP-224
Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	J. Flood
Reviewed By:	D. Shea
Project No:	2999.13
Date:	March 2020

Figure Narrative

This figure shows the individual port vapor extraction test data and inferred subslab pressure response observed during testing. Differential pressure measurements were collected on December 17, 2019 with a digital micromanometer. Negative values indicate subsurface pressures less than indoor air pressure, or under vacuum, at the time of recording.

PCE and TCE data represent results of Summa grab samples collected from the extraction port at the conclusion of pilot testing.

Legend

- Subslab Extraction Port Location
- Subslab Sample Port Location
- **EP-224** — Extraction Port
- in. wc — Applied Vacuum (extraction port) inches of water column (in. wc)
- scfm — Flow Rate (std. cu. ft. per min.)
- µg/m³ — Tetrachloroethene (PCE) (micrograms per cubic meter)
- µg/m³ — Trichloroethene (TCE) (micrograms per cubic meter)
- ppm — Total VOC Concentration (PID)
- -0.000 — Observed pressure differential between the subslab and room during subslab vapor extraction test (in. wc.).Negative values indicate subslab pressure is less than indoor air pressure.
- Solvent drain line
- -0.004 — Approximate extent of subslab vacuum influence from existing SSD system VE-2 (inches of water column).

SANBORN HEAD ENGINEERING

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Figure B-2

Subslab Pressure Response to Vapor Extraction Testing

EP-225
Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	J. Flood
Reviewed By:	D. Shea
Project No:	2999.13
Date:	March 2020

Figure Narrative

This figure shows the individual port vapor extraction test data and inferred subslab pressure response observed during testing. Differential pressure measurements were collected on December 17, 2019 with a digital micromanometer. Negative values indicate subsurface pressures less than indoor air pressure, or under vacuum, at the time of recording.

PCE and TCE data represent results of Summa grab samples collected from the extraction port at the conclusion of pilot testing.

The contour represents the inferred apparent extent of vacuum conditions observed. Other interpretations are possible.

Legend

- Subslab Extraction Port Location
- Subslab Sample Port Location

EP-224	Extraction Port
in. wc	Applied Vacuum (extraction port) inches of water column (in. wc)
scfm	Flow Rate (std. cu. ft. per min.)
µg/m³	Tetrachloroethene (PCE) (micrograms per cubic meter)
µg/m³	Trichloroethene (TCE) (micrograms per cubic meter)
ppm	Total VOC Concentration (PID)
-0.000	Observed pressure differential between the subslab and room during subslab vapor extraction test (in. wc.).Negative values indicate subslab pressure is less than indoor air pressure.
	Solvent drain line
-0.004	Approximate extent of subslab vacuum influence from existing SSD system VE-2 (inches of water column).
-0.004	Differential pressure contour (inches of water column). Dashed where inferred.

25 12.5 0 25 50 Feet

SANBORN HEAD ENGINEERING

EP-225
Applied Vacuum: 60 in wc.
Flow Rate:77 scfm
PCE: 18,000 µg/m³
TCE: 1,500 µg/m³
PID: 2 ppm

B310

PCE Concentrations in Subslab Vapor (µg/m³)

- <1,000
- 1,000 10,000
- 10,000 - 50,000
- 50,000 - 100,000

Last Edited By: ewright

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Figure B-3

Subslab Pressure Response to Vapor Extraction Testing

EP-226
Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	J. Flood
Reviewed By:	D. Shea
Project No:	2999.13
Date:	March 2020

Figure Narrative

This figure shows the individual port vapor extraction test data and inferred subslab pressure response observed during testing. Differential pressure measurements were collected on December 17, 2019 with a digital micromanometer. Negative values indicate subsurface pressures less than indoor air pressure, or under vacuum, at the time of recording.

PCE and TCE data represent results of Summa grab samples collected from the extraction port at the conclusion of pilot testing.

The contour represents the inferred apparent extent of vacuum conditions observed. Other interpretations are possible.

Legend

- Subslab Extraction Port Location
- Subslab Sample Port Location

EP-224	Extraction Port
in. wc	Applied Vacuum (extraction port) inches of water column (in. wc)
scfm	Flow Rate (std. cu. ft. per min.)
µg/m³	Tetrachloroethene (PCE) (micrograms per cubic meter)
µg/m³	Trichloroethene (TCE) (micrograms per cubic meter)
ppm	Total VOC Concentration (PID)
-0.000	Observed pressure differential between the subslab and room during subslab vapor extraction test (in. wc.).Negative values indicate subslab pressure is less than indoor air pressure.
	Solvent drain line
-0.004	Approximate extent of subslab vacuum influence from existing SSD system VE-2 (inches of water column).
-0.004	Differential pressure contour (inches of water column). Dashed where inferred.

25 12.5 0 25 50 Feet

SANBORN HEAD ENGINEERING

EP-226
Applied Vacuum: 43 in wc.
Flow Rate:163 scfm
PCE: 1,500 µg/m³
TCE: 220 µg/m³
PID: 0.6 ppm

PCE Concentrations in Subslab Vapor (µg/m³)

- <1,000
- 1,000 10,000
- 10,000 - 50,000
- 50,000 - 100,000

B310

SS-188 -0.094
SS-189 0.000
SS-190
SS-191
SS-15
SS-18 -0.026
SS-19 0.000
SS-185 0.000
SS-20
SS-14
SS-187
SS-184
SS-183
SS-186
SS-16
SS-17
SS-101
SS-102
SS-103
SS-149
SS-104
SS-105
SS-106
SS-107
SS-148
SS-108
SS-109
SS-110
SS-04
SS-09
SS-111
SS-112
SS-113
SS-114
SS-147
SS-115
SS-116
SS-08
SS-117
SS-118
SS-01
SS-119
SS-03
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SS-126
SS-01C
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SS-122
SS-124
SS-128
SS-127
SS-154
SS-143
SS-02
SS-130
SS-129
SS-131
SS-151
SS-132
SS-06
SS-02C
SS-150
SS-133
SS305
SS304
SS-152
SS-22
SS-135
SS-05
SS-134
SS-136
SS-153
SS-137
SS-138
SS-139
SS-140
SS-141
SS-222
SS-182
SS-181
SS-10
SS-07

EP-226 -0.004
EP-227 -0.004
EP-228
EP-225 0.000
EP-229
EP-224
EP-201
EP-202
EP-203
EP-204
EP-210
EP-205
EP-206
EP-209
EP-207
EP-208

-0.004 -0.004 -0.004 -0.004 -0.004 -0.004 -0.004

Last Edited By: ewright

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Figure B-4

Subslab Pressure Response to Vapor Extraction Testing

EP-227
Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	J. Flood
Reviewed By:	D. Shea
Project No:	2999.13
Date:	March 2020

Figure Narrative

This figure shows the individual port vapor extraction test data and inferred subslab pressure response observed during testing. Differential pressure measurements were collected on December 17, 2019 with a digital micromanometer. Negative values indicate subsurface pressures less than indoor air pressure, or under vacuum, at the time of recording.

PCE and TCE data represent results of Summa grab samples collected from the extraction port at the conclusion of pilot testing.

The contour represents the inferred apparent extent of vacuum conditions observed. Other interpretations are possible.

Legend

- Subslab Extraction Port Location
- Subslab Sample Port Location

EP-224	Extraction Port
in. wc	Applied Vacuum (extraction port) inches of water column (in. wc)
scfm	Flow Rate (std. cu. ft. per min.)
µg/m³	Tetrachloroethene (PCE) (micrograms per cubic meter)
µg/m³	Trichloroethene (TCE) (micrograms per cubic meter)
ppm	Total VOC Concentration (PID)
-0.000	Observed pressure differential between the subslab and room during subslab vapor extraction test (in. wc.).Negative values indicate subslab pressure is less than indoor air pressure.

- Solvent drain line
- -0.004 — Approximate extent of subslab vacuum influence from existing SSD system VE-2 (inches of water column).
- -0.004 — Differential pressure contour (inches of water column). Dashed where inferred.

25 12.5 0 25 50 Feet

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EP-227
Applied Vacuum: 60 in wc.
Flow Rate:82 scfm
PCE: 240 µg/m³
TCE: 33 µg/m³
PID: 0.4 ppm

PCE Concentrations in Subslab Vapor (µg/m³)

- <1,000
- 1,000 10,000
- 10,000 - 50,000
- 50,000 - 100,000

B310

SS-188 0.000
EP-226 0.000
SS-19 0.000
SS-18 -0.004
EP-227
SS-185 -0.003
SS-189 0.000
SS-15 0.000
SS-190
EP-228
SS-191
SS-187
SS-184
SS-183
SS-186
EP-229
EP-224
EP-225
SS-17
SS-16
SS-101
SS-102
SS-103
SS-149
SS-104
SS-105
SS-106
SS-107
SS-148
SS-20
SS-108
EP-201
SS-109
EP-202
SS-110
SS-04
SS-09
SS-111
SS-112
SS-113
SS-08
EP-208
SS-117
SS-01
SS-119
SS-03
SS-114
SS-147
SS-115
SS-116
SS-118
SS-120
SS-121
SS-146
EP-203
EP-204
SS-123
SS-124
SS-142
EP-210
SS-144
SS-122
EP-205
SS-02
SS-14
SS-145
SS-125
SS-126
SV-01C
SV-01A
SS-127
SS-128
SS-143
SS-154
SS-130
SS-129
EP-209
SS-151
SS-132
SV-02C
SS-150
EP-206
SS-133
SS305
SS304
SS-131
SS-06
SV-02A
EP-207
SS-152
SS-22
SS-135
SS-05
SS-134
SS-136
SS-153
SS-141
SS-137
SS-139
SS-140
SS-138
EP-222
SS-10
SS-07
SS-182
SS-181
-0.004

Figure B-5

Subslab Pressure Response to Vapor Extraction Testing

EP-228
Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By: E. Wright
Designed By: J. Flood
Reviewed By: D. Shea
Project No: 2999.13
Date: March 2020

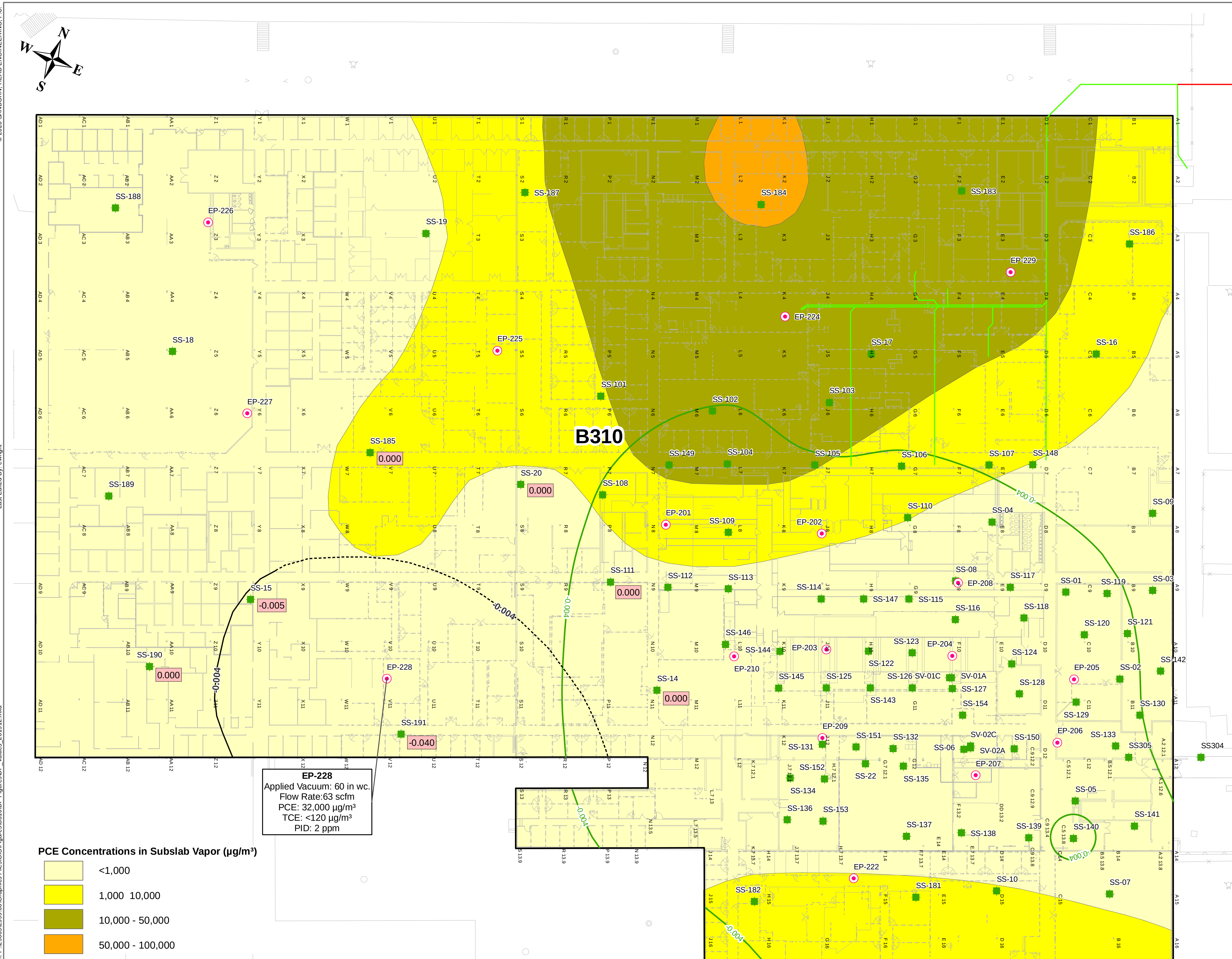

Figure Narrative

This figure shows the individual port vapor extraction test data and inferred subslab pressure response observed during testing. Differential pressure measurements were collected on December 17, 2019 with a digital micromanometer. Negative values indicate subsurface pressures less than indoor air pressure, or under vacuum, at the time of recording.

PCE and TCE data represent results of Summa grab samples collected from the extraction port at the conclusion of pilot testing.

The contour represents the inferred apparent extent of vacuum conditions observed. Other interpretations are possible.

Legend

- Subslab Extraction Port Location
- Subslab Sample Port Location

EP-224	Extraction Port
in. wc	Applied Vacuum (extraction port) inches of water column (in. wc)
scfm	Flow Rate (std. cu. ft. per min.)
µg/m³	Tetrachloroethene (PCE) (micrograms per cubic meter)
µg/m³	Trichloroethene (TCE) (micrograms per cubic meter)
ppm	Total VOC Concentration (PID)
-0.000	Observed pressure differential between the subslab and room during subslab vapor extraction test (in. wc.).Negative values indicate subslab pressure is less than indoor air pressure.

- Solvent drain line
- -0.004 Approximate extent of subslab vacuum influence from existing SSD system VE-2 (inches of water column).
- -0.004 Differential pressure contour (inches of water column). Dashed where inferred.

Feet: 25 12.5 0 25 50

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Last Edited By: ewright

Path: P:\2900s\2999.00\Graphics Files\GIS\Figures\B310\DP Figures\DP_Values_201912.mxd

Last Edited By: ewright
Path: P:\2900s\2999.00\Graphics Files\GIS\Figures\B310\DP Figures\DP_Values_201912.mxd

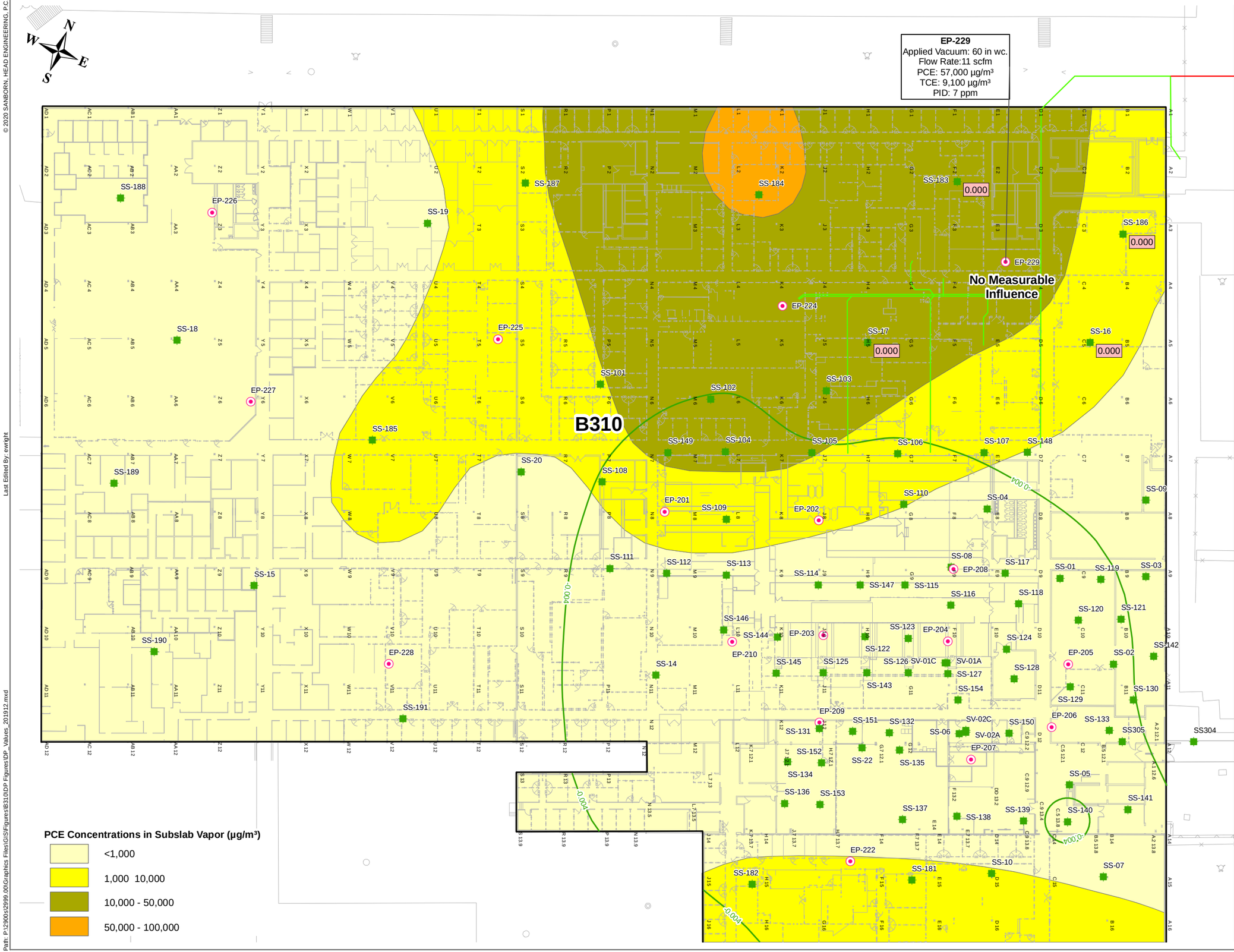

Figure B-6

Subslab Pressure Response to Vapor Extraction Testing

EP-229
Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	J. Flood
Reviewed By:	D. Shea
Project No:	2999.13
Date:	March 2020

Figure Narrative

This figure shows the individual port vapor extraction test data and inferred subslab pressure response observed during testing. Differential pressure measurements were collected on December 17, 2019 with a digital micromanometer. Negative values indicate subsurface pressures less than indoor air pressure, or under vacuum, at the time of recording.

PCE and TCE data represent results of Summa grab samples collected from the extraction port at the conclusion of pilot testing.

Legend

- Subslab Extraction Port Location
- Subslab Sample Port Location
- **EP-224** — Extraction Port
- in. wc — Applied Vacuum (extraction port) inches of water column (in. wc)
- scfm — Flow Rate (std. cu. ft. per min.)
- µg/m³ — Tetrachloroethene (PCE) (micrograms per cubic meter)
- µg/m³ — Trichloroethene (TCE) (micrograms per cubic meter)
- ppm — Total VOC Concentration (PID)
- -0.000 — Observed pressure differential between the subslab and room during subslab vapor extraction test (in. wc.).Negative values indicate subslab pressure is less than indoor air pressure.
- Solvent drain line
- -0.004 — Approximate extent of subslab vacuum influence from existing SSD system VE-2 (inches of water column).

SANBORN HEAD ENGINEERING

APPENDIX C

ANALYTICAL LABORATORY REPORTS

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11/6/2019
Ms. Jennifer Sanborn
Sanborn, Head & Associates
20 Foundry Street

Concord NH 03301

Project Name: EFK
Project #: 2999.13
Workorder #: 1910617

Dear Ms. Jennifer Sanborn

The following report includes the data for the above referenced project for sample(s) received on 10/24/2019 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 #: 1910617

Work Order Summary

CLIENT:	Ms. Jennifer Sanborn Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301	**BILL TO:**	Accounts Payable Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301
PHONE:	603-229-1900	**P.O. #**	
FAX:	603-229-1919	**PROJECT #**	2999.13 EFK
DATE RECEIVED:	10/24/2019	**CONTACT:**	Ausha Scott
DATE COMPLETED:	11/06/2019		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SS-134_20191022	TO-15	4.3 "Hg	15.8 psi
02A	FD-01_20191022	TO-15	4.3 "Hg	16.1 psi
03A	SS-138_20191022	TO-15	4.1 "Hg	15.5 psi
04A	SS-141_20191022	TO-15	3.7 "Hg	15.7 psi
05A	SS-121_20191022	TO-15	3.1 "Hg	16.3 psi
06A	SS-127_20191022	TO-15	4.7 "Hg	15.5 psi
07A	SS-125_20191022	TO-15	5.7 "Hg	15 psi
08A	SS-14_20191022	TO-15	7.1 "Hg	15 psi
09A	SS-117_20191022	TO-15	4.9 "Hg	15.8 psi
10A	SS-110_20191022	TO-15	4.7 "Hg	15.2 psi
11A	SS-104_20191022	TO-15	5.1 "Hg	15.1 psi
12A	SS-16_20191022	TO-15	4.3 "Hg	16.2 psi
13A	SS-17_20191022	TO-15	3.3 "Hg	14.8 psi
14A	SS-183_20191022	TO-15	3.5 "Hg	15.2 psi
15A	SS-184_20191022	TO-15	6.9 "Hg	15.1 psi
16A	SS-19_20191022	TO-15	3.5 "Hg	15.3 psi
17A	SS-185_20191022	TO-15	4.7 "Hg	15.3 psi
18A	SS-18_20191022	TO-15	5.3 "Hg	15.5 psi
19A	SS-15_20191022	TO-15	2.6 "Hg	16.2 psi
20A	SS-20_20191022	TO-15	3.9 "Hg	16.2 psi
21A	Lab Blank	TO-15	NA	NA
21B	Lab Blank	TO-15	NA	NA
21C	Lab Blank	TO-15	NA	NA

Continued on next page

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WORK ORDER #: 1910617

Work Order Summary

CLIENT:	Ms. Jennifer Sanborn Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301	**BILL TO:**	Accounts Payable Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301
PHONE:	603-229-1900	**P.O. #**	
FAX:	603-229-1919	**PROJECT #**	2999.13 EFK
DATE RECEIVED:	10/24/2019	**CONTACT:**	Ausha Scott
DATE COMPLETED:	11/06/2019		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
22A	CCV	TO-15	NA	NA
22B	CCV	TO-15	NA	NA
22C	CCV	TO-15	NA	NA
23A	LCS	TO-15	NA	NA
23AA	LCSD	TO-15	NA	NA
23B	LCS	TO-15	NA	NA
23BB	LCSD	TO-15	NA	NA
23C	LCS	TO-15	NA	NA
23CC	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/06/19

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2019, Expiration date: 10/17/2020.
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) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
Sanborn, Head & Associates
Workorder# 1910617

Twenty 1 Liter Summa Canister samples were received on October 24, 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

The Chain of Custody (COC) information for sample SS-14_20191022 did not match the entry on the sample tag with regard to sample identification. The information on the Tag was used to process and report the sample.

Analytical Notes

Dilution was performed on samples SS-104_20191022, SS-17_20191022, SS-183_20191022 and SS-184_20191022 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: SS-134_20191022

Lab ID#: 1910617-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	1.2	6.0	6.0
Freon 11	1.2	34	6.8	190
Freon 113	1.2	2.0	9.3	15
Trichloroethene	1.2	2.7	6.5	14
Toluene	1.2	1.5	4.6	5.8
Tetrachloroethene	1.2	31	8.2	210

Client Sample ID: FD-01_20191022

Lab ID#: 1910617-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.2	34	6.8	190
Freon 113	1.2	1.8	9.4	13
Trichloroethene	1.2	2.9	6.6	16
Toluene	1.2	1.8	4.6	7.0
Tetrachloroethene	1.2	31	8.3	210

Client Sample ID: SS-138_20191022

Lab ID#: 1910617-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.2	5.7	6.7	32
Freon 113	1.2	7.2	9.1	55
Trichloroethene	1.2	5.6	6.4	30
Tetrachloroethene	1.2	42	8.1	290

Client Sample ID: SS-141_20191022

Lab ID#: 1910617-04A

No Detections Were Found.

Client Sample ID: SS-121_20191022

Lab ID#: 1910617-05A

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

Client Sample ID: SS-121_20191022

Lab ID#: 1910617-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.2	2.2	6.6	12
Freon 113	1.2	2.7	9.0	21
Trichloroethene	1.2	12	6.3	64
Tetrachloroethene	1.2	48	8.0	330

Client Sample ID: SS-127_20191022

Lab ID#: 1910617-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.2	7.5	6.8	42
Freon 113	1.2	2.6	9.4	20
cis-1,2-Dichloroethene	1.2	1.8	4.8	7.4
Trichloroethene	1.2	7.5	6.6	40
Tetrachloroethene	1.2	140	8.3	970

Client Sample ID: SS-125_20191022

Lab ID#: 1910617-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.2	9.6	7.0	54
Trichloroethene	1.2	2.1	6.7	11
Tetrachloroethene	1.2	130	8.4	880

Client Sample ID: SS-14_20191022

Lab ID#: 1910617-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.3	3.8	7.4	21
Trichloroethene	1.3	1.6	7.1	8.4
Tetrachloroethene	1.3	5.8	9.0	39

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

Client Sample ID: SS-117_20191022

Lab ID#: 1910617-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.2	6.5	7.0	37
Freon 113	1.2	18	9.5	140
cis-1,2-Dichloroethene	1.2	2.9	4.9	11
Trichloroethene	1.2	14	6.7	77
Tetrachloroethene	1.2	60	8.4	410

Client Sample ID: SS-110_20191022

Lab ID#: 1910617-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.2	10	6.8	57
Freon 113	1.2	12	9.2	91
cis-1,2-Dichloroethene	1.2	3.6	4.8	14
Trichloroethene	1.2	34	6.5	180
Tetrachloroethene	1.2	150	8.2	1000

Client Sample ID: SS-104_20191022

Lab ID#: 1910617-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	7.6	18	43	100
Freon 113	7.6	510	59	3900
1,1-Dichloroethene	7.6	10	30	41
cis-1,2-Dichloroethene	7.6	8.1	30	32
Trichloroethene	7.6	210	41	1100
Tetrachloroethene	7.6	1600	52	11000

Client Sample ID: SS-16_20191022

Lab ID#: 1910617-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 113	1.2	6.6	9.4	51

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

Client Sample ID: SS-16_20191022

Lab ID#: 1910617-12A

cis-1,2-Dichloroethene	1.2	110	4.8	420
1,1,1-Trichloroethane	1.2	1.3	6.7	7.1
Trichloroethene	1.2	72	6.6	380
Tetrachloroethene	1.2	170	8.3	1100

Client Sample ID: SS-17_20191022

Lab ID#: 1910617-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	11	24	63	130
Freon 113	11	850	86	6500
1,1-Dichloroethene	11	26	45	100
cis-1,2-Dichloroethene	11	84	45	340
Trichloroethene	11	420	60	2200
Tetrachloroethene	11	2100	76	14000

Client Sample ID: SS-183_20191022

Lab ID#: 1910617-14A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 113	15	390	120	3000
cis-1,2-Dichloroethene	15	31	61	120
Trichloroethene	15	440	82	2300
Tetrachloroethene	15	3700	100	25000

Client Sample ID: SS-184_20191022

Lab ID#: 1910617-15A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	16	100	92	590
Freon 113	16	10000	130	76000
Trichloroethene	16	330	88	1800
Tetrachloroethene	16	8700	110	59000

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

Client Sample ID: SS-19_20191022

Lab ID#: 1910617-16A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.2	2.4	6.5	13
Freon 113	1.2	28	8.8	210
Trichloroethene	1.2	22	6.2	120
Tetrachloroethene	1.2	140	7.8	940

Client Sample ID: SS-185_20191022

Lab ID#: 1910617-17A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.2	9.3	6.8	52
Freon 113	1.2	3.5	9.3	27
Acetone	12	33	29	79
Trichloroethene	1.2	43	6.5	230
Toluene	1.2	4.1	4.6	15
Tetrachloroethene	1.2	390	8.2	2600

Client Sample ID: SS-18_20191022

Lab ID#: 1910617-18A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	1.7	6.2	8.5
Freon 11	1.2	2.6	7.0	14
Trichloroethene	1.2	2.2	6.7	12
Tetrachloroethene	1.2	35	8.5	240

Client Sample ID: SS-15_20191022

Lab ID#: 1910617-19A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.2	24	6.5	130
Trichloroethene	1.2	21	6.2	110
Tetrachloroethene	1.2	30	7.8	200

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

Client Sample ID: SS-20_20191022

Lab ID#: 1910617-20A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.2	5.3	6.8	30
Freon 113	1.2	1.5	9.3	12
Trichloroethene	1.2	7.9	6.5	42
Tetrachloroethene	1.2	82	8.2	560

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Client Sample ID: SS-134_20191022

Lab ID#: 1910617-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102911**	**Date of Collection:**	**10/22/19 10:58:00 A**
Dil. Factor:	**2.42**	**Date of Analysis:**	**10/29/19 03:18 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	1.2	6.0	6.0
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
Freon 11	1.2	34	6.8	190
Freon 113	1.2	2.0	9.3	15
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	Not Detected	29	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	6.6	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.6	Not Detected
Benzene	1.2	Not Detected	3.9	Not Detected
Trichloroethene	1.2	2.7	6.5	14
Toluene	1.2	1.5	4.6	5.8
Tetrachloroethene	1.2	31	8.2	210
Chlorobenzene	1.2	Not Detected	5.6	Not Detected
Ethyl Benzene	1.2	Not Detected	5.2	Not Detected
m,p-Xylene	1.2	Not Detected	5.2	Not Detected
o-Xylene	1.2	Not Detected	5.2	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.3	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	95	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: FD-01_20191022

Lab ID#: 1910617-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102912**	**Date of Collection:**	**10/22/19 10:58:00 A**
Dil. Factor:	**2.44**	**Date of Analysis:**	**10/29/19 03:45 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.0	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
Freon 11	1.2	34	6.8	190
Freon 113	1.2	1.8	9.4	13
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	Not Detected	29	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	6.6	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.7	Not Detected
Benzene	1.2	Not Detected	3.9	Not Detected
Trichloroethene	1.2	2.9	6.6	16
Toluene	1.2	1.8	4.6	7.0
Tetrachloroethene	1.2	31	8.3	210
Chlorobenzene	1.2	Not Detected	5.6	Not Detected
Ethyl Benzene	1.2	Not Detected	5.3	Not Detected
m,p-Xylene	1.2	Not Detected	5.3	Not Detected
o-Xylene	1.2	Not Detected	5.3	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,2,4-Trichlorobenzene	4.9	Not Detected	36	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: SS-138_20191022

Lab ID#: 1910617-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102913**	**Date of Collection: 10/22/19 9:49:00 AM**	
Dil. Factor:	**2.38**	**Date of Analysis: 10/29/19 04:11 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	3.0	Not Detected
Freon 11	1.2	5.7	6.7	32
Freon 113	1.2	7.2	9.1	55
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Acetone	12	Not Detected	28	Not Detected
Methylene Chloride	12	Not Detected	41	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.5	Not Detected
Benzene	1.2	Not Detected	3.8	Not Detected
Trichloroethene	1.2	5.6	6.4	30
Toluene	1.2	Not Detected	4.5	Not Detected
Tetrachloroethene	1.2	42	8.1	290
Chlorobenzene	1.2	Not Detected	5.5	Not Detected
Ethyl Benzene	1.2	Not Detected	5.2	Not Detected
m,p-Xylene	1.2	Not Detected	5.2	Not Detected
o-Xylene	1.2	Not Detected	5.2	Not Detected
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	35	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: SS-141_20191022

Lab ID#: 1910617-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102914**	**Date of Collection:**	**10/22/19 9:50:00 AM**
Dil. Factor:	**2.36**	**Date of Analysis:**	**10/29/19 04:38 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	5.8	Not Detected
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
Freon 11	1.2	Not Detected	6.6	Not Detected
Freon 113	1.2	Not Detected	9.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Acetone	12	Not Detected	28	Not Detected
Methylene Chloride	12	Not Detected	41	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.4	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.4	Not Detected
Benzene	1.2	Not Detected	3.8	Not Detected
Trichloroethene	1.2	Not Detected	6.3	Not Detected
Toluene	1.2	Not Detected	4.4	Not Detected
Tetrachloroethene	1.2	Not Detected	8.0	Not Detected
Chlorobenzene	1.2	Not Detected	5.4	Not Detected
Ethyl Benzene	1.2	Not Detected	5.1	Not Detected
m,p-Xylene	1.2	Not Detected	5.1	Not Detected
o-Xylene	1.2	Not Detected	5.1	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.1	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.1	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.1	Not Detected
1,2,4-Trichlorobenzene	4.7	Not Detected	35	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: SS-121_20191022

Lab ID#: 1910617-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102910**	**Date of Collection:**	**10/22/19 9:37:00 AM**
Dil. Factor:	**2.35**	**Date of Analysis:**	**10/29/19 02:52 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	5.8	Not Detected
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
Freon 11	1.2	2.2	6.6	12
Freon 113	1.2	2.7	9.0	21
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Acetone	12	Not Detected	28	Not Detected
Methylene Chloride	12	Not Detected	41	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.4	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.4	Not Detected
Benzene	1.2	Not Detected	3.8	Not Detected
Trichloroethene	1.2	12	6.3	64
Toluene	1.2	Not Detected	4.4	Not Detected
Tetrachloroethene	1.2	48	8.0	330
Chlorobenzene	1.2	Not Detected	5.4	Not Detected
Ethyl Benzene	1.2	Not Detected	5.1	Not Detected
m,p-Xylene	1.2	Not Detected	5.1	Not Detected
o-Xylene	1.2	Not Detected	5.1	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.1	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.1	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.1	Not Detected
1,2,4-Trichlorobenzene	4.7	Not Detected	35	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: SS-127_20191022

Lab ID#: 1910617-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102915**	**Date of Collection: 10/22/19 10:00:00 A**	
Dil. Factor:	**2.44**	**Date of Analysis: 10/29/19 05:04 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.0	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
Freon 11	1.2	7.5	6.8	42
Freon 113	1.2	2.6	9.4	20
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	Not Detected	29	Not Detected
Methylene Chloride	12	Not Detected	42	Not Detected
cis-1,2-Dichloroethene	1.2	1.8	4.8	7.4
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.7	Not Detected
Benzene	1.2	Not Detected	3.9	Not Detected
Trichloroethene	1.2	7.5	6.6	40
Toluene	1.2	Not Detected	4.6	Not Detected
Tetrachloroethene	1.2	140	8.3	970
Chlorobenzene	1.2	Not Detected	5.6	Not Detected
Ethyl Benzene	1.2	Not Detected	5.3	Not Detected
m,p-Xylene	1.2	Not Detected	5.3	Not Detected
o-Xylene	1.2	Not Detected	5.3	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,2,4-Trichlorobenzene	4.9	Not Detected	36	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: SS-125_20191022

Lab ID#: 1910617-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102916**	**Date of Collection:**	**10/22/19 9:51:00 AM**
Dil. Factor:	**2.49**	**Date of Analysis:**	**10/29/19 05:30 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	9.6	7.0	54
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	2.1	6.7	11
Toluene	1.2	Not Detected	4.7	Not Detected
Tetrachloroethene	1.2	130	8.4	880
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	100	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: SS-14_20191022

Lab ID#: 1910617-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102917**	**Date of Collection: 10/22/19 9:52:00 AM**	
Dil. Factor:	**2.65**	**Date of Analysis: 10/29/19 05:57 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	3.8	7.4	21
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Acetone	13	Not Detected	31	Not Detected
Methylene Chloride	13	Not Detected	46	Not Detected
cis-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.2	Not Detected
Carbon Tetrachloride	1.3	Not Detected	8.3	Not Detected
Benzene	1.3	Not Detected	4.2	Not Detected
Trichloroethene	1.3	1.6	7.1	8.4
Toluene	1.3	Not Detected	5.0	Not Detected
Tetrachloroethene	1.3	5.8	9.0	39
Chlorobenzene	1.3	Not Detected	6.1	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	5.3	Not Detected	39	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: SS-117_20191022

Lab ID#: 1910617-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102918**	**Date of Collection: 10/22/19 9:49:00 AM**	
Dil. Factor:	**2.48**	**Date of Analysis: 10/29/19 06:23 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.1	Not Detected
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
Freon 11	1.2	6.5	7.0	37
Freon 113	1.2	18	9.5	140
1,1-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Acetone	12	Not Detected	29	Not Detected
Methylene Chloride	12	Not Detected	43	Not Detected
cis-1,2-Dichloroethene	1.2	2.9	4.9	11
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	14	6.7	77
Toluene	1.2	Not Detected	4.7	Not Detected
Tetrachloroethene	1.2	60	8.4	410
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	7.4	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.4	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	96	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: SS-110_20191022

Lab ID#: 1910617-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102919**	**Date of Collection: 10/22/19 10:02:00 A**	
Dil. Factor:	**2.41**	**Date of Analysis: 10/29/19 06:50 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.0	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
Freon 11	1.2	10	6.8	57
Freon 113	1.2	12	9.2	91
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	Not Detected	29	Not Detected
Methylene Chloride	12	Not Detected	42	Not Detected
cis-1,2-Dichloroethene	1.2	3.6	4.8	14
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.6	Not Detected
Benzene	1.2	Not Detected	3.8	Not Detected
Trichloroethene	1.2	34	6.5	180
Toluene	1.2	Not Detected	4.5	Not Detected
Tetrachloroethene	1.2	150	8.2	1000
Chlorobenzene	1.2	Not Detected	5.5	Not Detected
Ethyl Benzene	1.2	Not Detected	5.2	Not Detected
m,p-Xylene	1.2	Not Detected	5.2	Not Detected
o-Xylene	1.2	Not Detected	5.2	Not Detected
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	96	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: SS-104_20191022

Lab ID#: 1910617-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103012**	**Date of Collection:**	**10/22/19 10:01:00 A**
Dil. Factor:	**15.3**	**Date of Analysis:**	**10/30/19 04:03 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	7.6	Not Detected	38	Not Detected
Vinyl Chloride	7.6	Not Detected	20	Not Detected
Freon 11	7.6	18	43	100
Freon 113	7.6	510	59	3900
1,1-Dichloroethene	7.6	10	30	41
Acetone	76	Not Detected	180	Not Detected
Methylene Chloride	76	Not Detected	260	Not Detected
cis-1,2-Dichloroethene	7.6	8.1	30	32
1,1,1-Trichloroethane	7.6	Not Detected	42	Not Detected
Carbon Tetrachloride	7.6	Not Detected	48	Not Detected
Benzene	7.6	Not Detected	24	Not Detected
Trichloroethene	7.6	210	41	1100
Toluene	7.6	Not Detected	29	Not Detected
Tetrachloroethene	7.6	1600	52	11000
Chlorobenzene	7.6	Not Detected	35	Not Detected
Ethyl Benzene	7.6	Not Detected	33	Not Detected
m,p-Xylene	7.6	Not Detected	33	Not Detected
o-Xylene	7.6	Not Detected	33	Not Detected
1,3-Dichlorobenzene	7.6	Not Detected	46	Not Detected
1,4-Dichlorobenzene	7.6	Not Detected	46	Not Detected
1,2-Dichlorobenzene	7.6	Not Detected	46	Not Detected
1,2,4-Trichlorobenzene	31	Not Detected	230	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	85	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: SS-16_20191022

Lab ID#: 1910617-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103006**	**Date of Collection:**	**10/22/19 10:12:00 A**
Dil. Factor:	**2.45**	**Date of Analysis:**	**10/30/19 01:27 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.0	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
Freon 11	1.2	Not Detected	6.9	Not Detected
Freon 113	1.2	6.6	9.4	51
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	Not Detected	29	Not Detected
Methylene Chloride	12	Not Detected	42	Not Detected
cis-1,2-Dichloroethene	1.2	110	4.8	420
1,1,1-Trichloroethane	1.2	1.3	6.7	7.1
Carbon Tetrachloride	1.2	Not Detected	7.7	Not Detected
Benzene	1.2	Not Detected	3.9	Not Detected
Trichloroethene	1.2	72	6.6	380
Toluene	1.2	Not Detected	4.6	Not Detected
Tetrachloroethene	1.2	170	8.3	1100
Chlorobenzene	1.2	Not Detected	5.6	Not Detected
Ethyl Benzene	1.2	Not Detected	5.3	Not Detected
m,p-Xylene	1.2	Not Detected	5.3	Not Detected
o-Xylene	1.2	Not Detected	5.3	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,2,4-Trichlorobenzene	4.9	Not Detected	36	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: SS-17_20191022

Lab ID#: 1910617-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103013**	**Date of Collection: 10/22/19 10:11:00 A**	
Dil. Factor:	**22.5**	**Date of Analysis: 10/30/19 04:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	11	Not Detected	56	Not Detected
Vinyl Chloride	11	Not Detected	29	Not Detected
Freon 11	11	24	63	130
Freon 113	11	850	86	6500
1,1-Dichloroethene	11	26	45	100
Acetone	110	Not Detected	270	Not Detected
Methylene Chloride	110	Not Detected	390	Not Detected
cis-1,2-Dichloroethene	11	84	45	340
1,1,1-Trichloroethane	11	Not Detected	61	Not Detected
Carbon Tetrachloride	11	Not Detected	71	Not Detected
Benzene	11	Not Detected	36	Not Detected
Trichloroethene	11	420	60	2200
Toluene	11	Not Detected	42	Not Detected
Tetrachloroethene	11	2100	76	14000
Chlorobenzene	11	Not Detected	52	Not Detected
Ethyl Benzene	11	Not Detected	49	Not Detected
m,p-Xylene	11	Not Detected	49	Not Detected
o-Xylene	11	Not Detected	49	Not Detected
1,3-Dichlorobenzene	11	Not Detected	68	Not Detected
1,4-Dichlorobenzene	11	Not Detected	68	Not Detected
1,2-Dichlorobenzene	11	Not Detected	68	Not Detected
1,2,4-Trichlorobenzene	45	Not Detected	330	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: SS-183_20191022

Lab ID#: 1910617-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103014**	**Date of Collection: 10/22/19 10:28:00 A**	
Dil. Factor:	**30.7**	**Date of Analysis: 10/30/19 04:51 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	15	Not Detected	76	Not Detected
Vinyl Chloride	15	Not Detected	39	Not Detected
Freon 11	15	Not Detected	86	Not Detected
Freon 113	15	390	120	3000
1,1-Dichloroethene	15	Not Detected	61	Not Detected
Acetone	150	Not Detected	360	Not Detected
Methylene Chloride	150	Not Detected	530	Not Detected
cis-1,2-Dichloroethene	15	31	61	120
1,1,1-Trichloroethane	15	Not Detected	84	Not Detected
Carbon Tetrachloride	15	Not Detected	96	Not Detected
Benzene	15	Not Detected	49	Not Detected
Trichloroethene	15	440	82	2300
Toluene	15	Not Detected	58	Not Detected
Tetrachloroethene	15	3700	100	25000
Chlorobenzene	15	Not Detected	71	Not Detected
Ethyl Benzene	15	Not Detected	67	Not Detected
m,p-Xylene	15	Not Detected	67	Not Detected
o-Xylene	15	Not Detected	67	Not Detected
1,3-Dichlorobenzene	15	Not Detected	92	Not Detected
1,4-Dichlorobenzene	15	Not Detected	92	Not Detected
1,2-Dichlorobenzene	15	Not Detected	92	Not Detected
1,2,4-Trichlorobenzene	61	Not Detected	460	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	84	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: SS-184_20191022

Lab ID#: 1910617-15A

EPA METHOD TO-15 GC/MS

File Name:	**j102909**	**Date of Collection:**	**10/22/19 10:30:00 A**
Dil. Factor:	**3.29**	**Date of Analysis:**	**10/29/19 02:07 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	16	Not Detected	81	Not Detected
Vinyl Chloride	16	Not Detected	42	Not Detected
Freon 11	16	100	92	590
Freon 113	16	10000	130	76000
1,1-Dichloroethene	16	Not Detected	65	Not Detected
Acetone	66	Not Detected	160	Not Detected
Methylene Chloride	66	Not Detected	230	Not Detected
cis-1,2-Dichloroethene	16	Not Detected	65	Not Detected
1,1,1-Trichloroethane	16	Not Detected	90	Not Detected
Carbon Tetrachloride	16	Not Detected	100	Not Detected
Benzene	16	Not Detected	52	Not Detected
Trichloroethene	16	330	88	1800
Toluene	16	Not Detected	62	Not Detected
Tetrachloroethene	16	8700	110	59000
Chlorobenzene	16	Not Detected	76	Not Detected
Ethyl Benzene	16	Not Detected	71	Not Detected
m,p-Xylene	16	Not Detected	71	Not Detected
o-Xylene	16	Not Detected	71	Not Detected
1,3-Dichlorobenzene	16	Not Detected	99	Not Detected
1,4-Dichlorobenzene	16	Not Detected	99	Not Detected
1,2-Dichlorobenzene	16	Not Detected	99	Not Detected
1,2,4-Trichlorobenzene	66	Not Detected	490	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	111	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: SS-19_20191022

Lab ID#: 1910617-16A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103007**	**Date of Collection: 10/22/19 10:31:00 A**	
Dil. Factor:	**2.31**	**Date of Analysis: 10/30/19 01:54 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	5.7	Not Detected
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
Freon 11	1.2	2.4	6.5	13
Freon 113	1.2	28	8.8	210
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Acetone	12	Not Detected	27	Not Detected
Methylene Chloride	12	Not Detected	40	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.3	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.3	Not Detected
Benzene	1.2	Not Detected	3.7	Not Detected
Trichloroethene	1.2	22	6.2	120
Toluene	1.2	Not Detected	4.4	Not Detected
Tetrachloroethene	1.2	140	7.8	940
Chlorobenzene	1.2	Not Detected	5.3	Not Detected
Ethyl Benzene	1.2	Not Detected	5.0	Not Detected
m,p-Xylene	1.2	Not Detected	5.0	Not Detected
o-Xylene	1.2	Not Detected	5.0	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
1,2,4-Trichlorobenzene	4.6	Not Detected	34	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	85	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: SS-185_20191022

Lab ID#: 1910617-17A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103008**	**Date of Collection: 10/22/19 10:32:00 A**	
Dil. Factor:	**2.42**	**Date of Analysis: 10/30/19 02:20 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.0	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
Freon 11	1.2	9.3	6.8	52
Freon 113	1.2	3.5	9.3	27
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	33	29	79
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	6.6	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.6	Not Detected
Benzene	1.2	Not Detected	3.9	Not Detected
Trichloroethene	1.2	43	6.5	230
Toluene	1.2	4.1	4.6	15
Tetrachloroethene	1.2	390	8.2	2600
Chlorobenzene	1.2	Not Detected	5.6	Not Detected
Ethyl Benzene	1.2	Not Detected	5.2	Not Detected
m,p-Xylene	1.2	Not Detected	5.2	Not Detected
o-Xylene	1.2	Not Detected	5.2	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.3	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	100	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: SS-18_20191022

Lab ID#: 1910617-18A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103009**	**Date of Collection: 10/22/19 10:22:00 A**	
Dil. Factor:	**2.50**	**Date of Analysis: 10/30/19 02:47 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	1.7	6.2	8.5
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
Freon 11	1.2	2.6	7.0	14
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	Not Detected	5.0	Not Detected
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	2.2	6.7	12
Toluene	1.2	Not Detected	4.7	Not Detected
Tetrachloroethene	1.2	35	8.5	240
Chlorobenzene	1.2	Not Detected	5.8	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	100	70-130
1,2-Dichloroethane-d4	85	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: SS-15_20191022

Lab ID#: 1910617-19A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103010**	**Date of Collection: 10/22/19 10:33:00 A**	
Dil. Factor:	**2.30**	**Date of Analysis: 10/30/19 03:13 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	5.7	Not Detected
Vinyl Chloride	1.2	Not Detected	2.9	Not Detected
Freon 11	1.2	24	6.5	130
Freon 113	1.2	Not Detected	8.8	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Acetone	12	Not Detected	27	Not Detected
Methylene Chloride	12	Not Detected	40	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.3	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.2	Not Detected
Benzene	1.2	Not Detected	3.7	Not Detected
Trichloroethene	1.2	21	6.2	110
Toluene	1.2	Not Detected	4.3	Not Detected
Tetrachloroethene	1.2	30	7.8	200
Chlorobenzene	1.2	Not Detected	5.3	Not Detected
Ethyl Benzene	1.2	Not Detected	5.0	Not Detected
m,p-Xylene	1.2	Not Detected	5.0	Not Detected
o-Xylene	1.2	Not Detected	5.0	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
1,2,4-Trichlorobenzene	4.6	Not Detected	34	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	82	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: SS-20_20191022

Lab ID#: 1910617-20A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103011**	**Date of Collection: 10/22/19 10:42:00 A**	
Dil. Factor:	**2.42**	**Date of Analysis: 10/30/19 03:40 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.0	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
Freon 11	1.2	5.3	6.8	30
Freon 113	1.2	1.5	9.3	12
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	Not Detected	29	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	6.6	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.6	Not Detected
Benzene	1.2	Not Detected	3.9	Not Detected
Trichloroethene	1.2	7.9	6.5	42
Toluene	1.2	Not Detected	4.6	Not Detected
Tetrachloroethene	1.2	82	8.2	560
Chlorobenzene	1.2	Not Detected	5.6	Not Detected
Ethyl Benzene	1.2	Not Detected	5.2	Not Detected
m,p-Xylene	1.2	Not Detected	5.2	Not Detected
o-Xylene	1.2	Not Detected	5.2	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.3	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	100	70-130
1,2-Dichloroethane-d4	88	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1910617-21A

EPA METHOD TO-15 GC/MS

File Name:	**j102907**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/29/19 12:49 PM**	

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	113	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1910617-21B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102909**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/29/19 01:23 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	98	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1910617-21C

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103005**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/30/19 11:55 AM**	

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	100	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: CCV

Lab ID#: 1910617-22A

EPA METHOD TO-15 GC/MS

File Name:	**j102902**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/29/19 09:44 AM**	

Compound	%Recovery
Freon 12	118
Vinyl Chloride	86
Freon 11	128
Freon 113	110
1,1-Dichloroethene	102
Acetone	100
Methylene Chloride	97
cis-1,2-Dichloroethene	101
1,1,1-Trichloroethane	114
Carbon Tetrachloride	117
Benzene	88
Trichloroethene	98
Toluene	90
Tetrachloroethene	104
Chlorobenzene	92
Ethyl Benzene	88
m,p-Xylene	88
o-Xylene	87
1,3-Dichlorobenzene	94
1,4-Dichlorobenzene	93
1,2-Dichlorobenzene	94
1,2,4-Trichlorobenzene	91

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	111	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	111	70-130

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Client Sample ID: CCV

Lab ID#: 1910617-22B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102902**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/29/19 10:04 AM**	

Compound	%Recovery
Freon 12	92
Vinyl Chloride	84
Freon 11	96
Freon 113	96
1,1-Dichloroethene	92
Acetone	87
Methylene Chloride	78
cis-1,2-Dichloroethene	96
1,1,1-Trichloroethane	99
Carbon Tetrachloride	102
Benzene	99
Trichloroethene	100
Toluene	100
Tetrachloroethene	107
Chlorobenzene	99
Ethyl Benzene	103
m,p-Xylene	103
o-Xylene	103
1,3-Dichlorobenzene	101
1,4-Dichlorobenzene	103
1,2-Dichlorobenzene	103
1,2,4-Trichlorobenzene	107

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: CCV

Lab ID#: 1910617-22C

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103002**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/30/19 10:12 AM**	

Compound	%Recovery
Freon 12	85
Vinyl Chloride	88
Freon 11	88
Freon 113	94
1,1-Dichloroethene	97
Acetone	91
Methylene Chloride	74
cis-1,2-Dichloroethene	102
1,1,1-Trichloroethane	89
Carbon Tetrachloride	92
Benzene	101
Trichloroethene	96
Toluene	99
Tetrachloroethene	102
Chlorobenzene	96
Ethyl Benzene	99
m,p-Xylene	99
o-Xylene	100
1,3-Dichlorobenzene	93
1,4-Dichlorobenzene	94
1,2-Dichlorobenzene	94
1,2,4-Trichlorobenzene	99

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	88	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: LCS

Lab ID#: 1910617-23A

EPA METHOD TO-15 GC/MS

File Name:	**j102903**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/29/19 10:12 AM**	

Compound	%Recovery	Method Limits
Freon 12	116	70-130
Vinyl Chloride	91	70-130
Freon 11	122	70-130
Freon 113	108	70-130
1,1-Dichloroethene	98	70-130
Acetone	98	70-130
Methylene Chloride	99	70-130
cis-1,2-Dichloroethene	88	70-130
1,1,1-Trichloroethane	116	70-130
Carbon Tetrachloride	113	70-130
Benzene	93	70-130
Trichloroethene	100	70-130
Toluene	94	70-130
Tetrachloroethene	106	70-130
Chlorobenzene	98	70-130
Ethyl Benzene	97	70-130
m,p-Xylene	96	70-130
o-Xylene	95	70-130
1,3-Dichlorobenzene	104	70-130
1,4-Dichlorobenzene	103	70-130
1,2-Dichlorobenzene	104	70-130
1,2,4-Trichlorobenzene	91	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	109	70-130

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Client Sample ID: LCSD

Lab ID#: 1910617-23AA

EPA METHOD TO-15 GC/MS

File Name:	**j102904**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/29/19 10:40 AM**	

Compound	%Recovery	Method Limits
Freon 12	119	70-130
Vinyl Chloride	96	70-130
Freon 11	124	70-130
Freon 113	117	70-130
1,1-Dichloroethene	99	70-130
Acetone	100	70-130
Methylene Chloride	102	70-130
cis-1,2-Dichloroethene	88	70-130
1,1,1-Trichloroethane	116	70-130
Carbon Tetrachloride	114	70-130
Benzene	98	70-130
Trichloroethene	103	70-130
Toluene	98	70-130
Tetrachloroethene	104	70-130
Chlorobenzene	96	70-130
Ethyl Benzene	96	70-130
m,p-Xylene	100	70-130
o-Xylene	99	70-130
1,3-Dichlorobenzene	100	70-130
1,4-Dichlorobenzene	102	70-130
1,2-Dichlorobenzene	100	70-130
1,2,4-Trichlorobenzene	98	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	113	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	107	70-130

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Client Sample ID: LCS

Lab ID#: 1910617-23B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102903**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/29/19 10:29 AM**	

Compound	%Recovery	Method Limits
Freon 12	93	70-130
Vinyl Chloride	87	70-130
Freon 11	91	70-130
Freon 113	93	70-130
1,1-Dichloroethene	93	70-130
Acetone	90	70-130
Methylene Chloride	75	70-130
cis-1,2-Dichloroethene	105	70-130
1,1,1-Trichloroethane	94	70-130
Carbon Tetrachloride	100	70-130
Benzene	97	70-130
Trichloroethene	94	70-130
Toluene	96	70-130
Tetrachloroethene	101	70-130
Chlorobenzene	92	70-130
Ethyl Benzene	99	70-130
m,p-Xylene	98	70-130
o-Xylene	101	70-130
1,3-Dichlorobenzene	92	70-130
1,4-Dichlorobenzene	92	70-130
1,2-Dichlorobenzene	95	70-130
1,2,4-Trichlorobenzene	83	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCSD

Lab ID#: 1910617-23BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3102904**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/29/19 10:54 AM**	

Compound	%Recovery	Method Limits
Freon 12	92	70-130
Vinyl Chloride	83	70-130
Freon 11	91	70-130
Freon 113	94	70-130
1,1-Dichloroethene	92	70-130
Acetone	89	70-130
Methylene Chloride	76	70-130
cis-1,2-Dichloroethene	108	70-130
1,1,1-Trichloroethane	94	70-130
Carbon Tetrachloride	100	70-130
Benzene	97	70-130
Trichloroethene	95	70-130
Toluene	98	70-130
Tetrachloroethene	103	70-130
Chlorobenzene	95	70-130
Ethyl Benzene	101	70-130
m,p-Xylene	100	70-130
o-Xylene	102	70-130
1,3-Dichlorobenzene	94	70-130
1,4-Dichlorobenzene	94	70-130
1,2-Dichlorobenzene	97	70-130
1,2,4-Trichlorobenzene	87	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: LCS

Lab ID#: 1910617-23C

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103003**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/30/19 10:37 AM**	

Compound	%Recovery	Method Limits
Freon 12	86	70-130
Vinyl Chloride	87	70-130
Freon 11	83	70-130
Freon 113	91	70-130
1,1-Dichloroethene	95	70-130
Acetone	90	70-130
Methylene Chloride	70	70-130
cis-1,2-Dichloroethene	111	70-130
1,1,1-Trichloroethane	86	70-130
Carbon Tetrachloride	91	70-130
Benzene	98	70-130
Trichloroethene	91	70-130
Toluene	97	70-130
Tetrachloroethene	98	70-130
Chlorobenzene	90	70-130
Ethyl Benzene	94	70-130
m,p-Xylene	96	70-130
o-Xylene	97	70-130
1,3-Dichlorobenzene	88	70-130
1,4-Dichlorobenzene	88	70-130
1,2-Dichlorobenzene	90	70-130
1,2,4-Trichlorobenzene	79	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: LCSD

Lab ID#: 1910617-23CC

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3103004**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/30/19 11:02 AM**	

Compound	%Recovery	Method Limits
Freon 12	83	70-130
Vinyl Chloride	86	70-130
Freon 11	80	70-130
Freon 113	90	70-130
1,1-Dichloroethene	93	70-130
Acetone	88	70-130
Methylene Chloride	70	70-130
cis-1,2-Dichloroethene	105	70-130
1,1,1-Trichloroethane	84	70-130
Carbon Tetrachloride	87	70-130
Benzene	96	70-130
Trichloroethene	92	70-130
Toluene	96	70-130
Tetrachloroethene	97	70-130
Chlorobenzene	89	70-130
Ethyl Benzene	96	70-130
m,p-Xylene	95	70-130
o-Xylene	96	70-130
1,3-Dichlorobenzene	86	70-130
1,4-Dichlorobenzene	87	70-130
1,2-Dichlorobenzene	89	70-130
1,2,4-Trichlorobenzene	79	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	85	70-130
4-Bromofluorobenzene	104	70-130

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1/7/2020
Ms. Jennifer Sanborn
Sanborn, Head & Associates
20 Foundry Street

Concord NH 03301

Project Name: EFK
Project #: 2999.13
Workorder #: 1912616

Dear Ms. Jennifer Sanborn

The following report includes the data for the above referenced project for sample(s) received on 12/20/2019 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 #: 1912616

Work Order Summary

CLIENT:	Ms. Jennifer Sanborn Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301	**BILL TO:**	Accounts Payable Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301
PHONE:	603-229-1900	**P.O. #**	
FAX:	603-229-1919	**PROJECT #**	2999.13 EFK
DATE RECEIVED:	12/20/2019	**CONTACT:**	Ausha Scott
DATE COMPLETED:	01/07/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	EP-229_20191217	TO-15	5.5 "Hg	15.2 psi
02A	EP-224_20191217	TO-15	6.5 "Hg	16.3 psi
03A	EP-225_20191217	TO-15	4.3 "Hg	15.7 psi
04A	EP-226_20191217	TO-15	4.5 "Hg	15.1 psi
05A	EP-227_20191217	TO-15	4.3 "Hg	15.2 psi
06A	EP-228_20191217	TO-15	2.6 "Hg	15.5 psi
07A	Lab Blank	TO-15	NA	NA
08A	CCV	TO-15	NA	NA
09A	LCS	TO-15	NA	NA
09AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 01/07/20

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2019, Expiration date: 10/17/2020.
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) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
Sanborn, Head & Associates
Workorder# 1912616

Six 1 Liter Summa Canister samples were received on December 20, 2019. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

A revised Chain of Custody (COC) was provided by the client on 1/06/2020.

Analytical Notes

Dilution was performed on samples EP-229_20191217, EP-224_20191217, EP-225_20191217 and EP-228_20191217 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

Client Sample ID: EP-229_20191217

Lab ID#: 1912616-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	62	810	250	3200
Trichloroethene	62	1700	340	9100
Tetrachloroethene	62	8400	420	57000

Client Sample ID: EP-224_20191217

Lab ID#: 1912616-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	17	42	67	170
Trichloroethene	17	590	90	3200
Tetrachloroethene	17	3900	110	26000

Client Sample ID: EP-225_20191217

Lab ID#: 1912616-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	12	280	65	1500
Tetrachloroethene	12	2600	82	18000

Client Sample ID: EP-226_20191217

Lab ID#: 1912616-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	41	6.4	220
Tetrachloroethene	1.2	220	8.1	1500

Client Sample ID: EP-227_20191217

Lab ID#: 1912616-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	6.1	6.4	33
Tetrachloroethene	1.2	35	8.0	240

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

Client Sample ID: EP-228_20191217

Lab ID#: 1912616-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	22	4700	150	32000

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Client Sample ID: EP-229_20191217

Lab ID#: 1912616-01A

EPA METHOD TO-15 GC/MS

File Name:	**p122817**	**Date of Collection: 12/17/19 8:04:00 AM**	
Dil. Factor:	**125**	**Date of Analysis: 12/28/19 09:49 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	62	Not Detected	160	Not Detected
cis-1,2-Dichloroethene	62	810	250	3200
Trichloroethene	62	1700	340	9100
Tetrachloroethene	62	8400	420	57000
trans-1,2-Dichloroethene	62	Not Detected	250	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	110	70-130

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Client Sample ID: EP-224_20191217

Lab ID#: 1912616-02A

EPA METHOD TO-15 GC/MS

File Name:	**p122814**	**Date of Collection: 12/17/19 9:34:00 AM**	
Dil. Factor:	**33.6**	**Date of Analysis: 12/28/19 06:05 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	17	Not Detected	43	Not Detected
cis-1,2-Dichloroethene	17	42	67	170
Trichloroethene	17	590	90	3200
Tetrachloroethene	17	3900	110	26000
trans-1,2-Dichloroethene	17	Not Detected	67	Not Detected

Container Type: 1 Liter Summa Canister

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

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Client Sample ID: EP-225_20191217

Lab ID#: 1912616-03A

EPA METHOD TO-15 GC/MS

File Name:	**p122813**	**Date of Collection: 12/17/19 11:26:00 A**	
Dil. Factor:	**24.1**	**Date of Analysis: 12/28/19 05:40 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	12	Not Detected	31	Not Detected
cis-1,2-Dichloroethene	12	Not Detected	48	Not Detected
Trichloroethene	12	280	65	1500
Tetrachloroethene	12	2600	82	18000
trans-1,2-Dichloroethene	12	Not Detected	48	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: EP-226_20191217

Lab ID#: 1912616-04A

EPA METHOD TO-15 GC/MS

File Name:	**p122810**	**Date of Collection: 12/17/19 12:37:00 P**	
Dil. Factor:	**2.38**	**Date of Analysis: 12/28/19 04:21 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	41	6.4	220
Tetrachloroethene	1.2	220	8.1	1500
trans-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: EP-227_20191217

Lab ID#: 1912616-05A

EPA METHOD TO-15 GC/MS

File Name:	**p122811**	**Date of Collection: 12/17/19 1:45:00 PM**	
Dil. Factor:	**2.37**	**Date of Analysis: 12/28/19 04:49 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	6.1	6.4	33
Tetrachloroethene	1.2	35	8.0	240
trans-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: EP-228_20191217

Lab ID#: 1912616-06A

EPA METHOD TO-15 GC/MS

File Name:	**p122815**	**Date of Collection: 12/17/19 3:10:00 PM**	
Dil. Factor:	**45.0**	**Date of Analysis: 12/28/19 06:30 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	22	Not Detected	58	Not Detected
cis-1,2-Dichloroethene	22	Not Detected	89	Not Detected
Trichloroethene	22	Not Detected	120	Not Detected
Tetrachloroethene	22	4700	150	32000
trans-1,2-Dichloroethene	22	Not Detected	89	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1912616-07A

EPA METHOD TO-15 GC/MS

File Name:	**p122807**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/28/19 02:35 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: CCV

Lab ID#: 1912616-08A

EPA METHOD TO-15 GC/MS

File Name:	**p122802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/28/19 11:23 AM**	

Compound	%Recovery
Vinyl Chloride	97
cis-1,2-Dichloroethene	100
Trichloroethene	100
Tetrachloroethene	105
trans-1,2-Dichloroethene	101

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: LCS

Lab ID#: 1912616-09A

EPA METHOD TO-15 GC/MS

File Name:	**p122803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/28/19 11:48 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	95	70-130
cis-1,2-Dichloroethene	109	70-130
Trichloroethene	96	70-130
Tetrachloroethene	104	70-130
trans-1,2-Dichloroethene	91	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: LCSD

Lab ID#: 1912616-09AA

EPA METHOD TO-15 GC/MS

File Name:	**p122804**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/28/19 12:13 PM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	96	70-130
cis-1,2-Dichloroethene	110	70-130
Trichloroethene	96	70-130
Tetrachloroethene	103	70-130
trans-1,2-Dichloroethene	92	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	106	70-130

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2/7/2020
Ms. Jennifer Sanborn
Sanborn, Head & Associates
20 Foundry Street

Concord NH 03301

Project Name: EFK
Project #: 2999.14
Workorder #: 2001639

Dear Ms. Jennifer Sanborn

The following report includes the data for the above referenced project for sample(s) received on 1/27/2020 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

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WORK ORDER #: 2001639

Work Order Summary

CLIENT:	Ms. Jennifer Sanborn Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301	**BILL TO:**	Accounts Payable Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301
PHONE:	603-229-1900	**P.O. #**	
FAX:	603-229-1919	**PROJECT #**	2999.14 EFK
DATE RECEIVED:	01/27/2020	**CONTACT:**	Ausha Scott
DATE COMPLETED:	02/07/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	IA2069_G_20200121	Modified TO-15	7.5 "Hg	5 psi
01B	IA2069_G_20200121	Modified TO-15	7.5 "Hg	5 psi
02A	IA2024_G_20200121	Modified TO-15	5.5 "Hg	5 psi
02B	IA2024_G_20200121	Modified TO-15	5.5 "Hg	5 psi
03A	Lab Blank	Modified TO-15	NA	NA
03B	Lab Blank	Modified TO-15	NA	NA
04A	CCV	Modified TO-15	NA	NA
04B	CCV	Modified TO-15	NA	NA
05A	LCS	Modified TO-15	NA	NA
05AA	LCSD	Modified TO-15	NA	NA
05B	LCS	Modified TO-15	NA	NA
05BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 02/07/20

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2019, Expiration date: 10/17/2020.
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) 351-8279

LABORATORY NARRATIVE
Modified TO-15 Full Scan/SIM
Sanborn, Head & Associates
Workorder# 2001639

Two 6 Liter Summa Canister (SIM Certified) samples were received on January 27, 2020. 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.

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

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: IA2069_G_20200121

Lab ID#: 2001639-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	0.18	8.8	1.0	49
Freon 113	0.18	0.21	1.4	1.6
Acetone	1.8	3.5	4.2	8.2
Benzene	0.18	0.66	0.57	2.1
Toluene	0.18	1.2	0.67	4.6
Tetrachloroethene	0.18	0.48	1.2	3.3
Ethyl Benzene	0.18	0.24	0.78	1.0
m,p-Xylene	0.18	0.50	0.78	2.2
o-Xylene	0.18	0.19	0.78	0.82

Client Sample ID: IA2069_G_20200121

Lab ID#: 2001639-01B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	0.036	0.036	0.14	0.14
Carbon Tetrachloride	0.036	0.065	0.22	0.41
Trichloroethene	0.036	0.057	0.19	0.31

Client Sample ID: IA2024_G_20200121

Lab ID#: 2001639-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	0.16	8.8	0.92	50
Acetone	1.6	3.1	3.9	7.4
Benzene	0.16	0.40	0.52	1.3
Toluene	0.16	0.31	0.62	1.2
Tetrachloroethene	0.16	0.26	1.1	1.7

Client Sample ID: IA2024_G_20200121

Lab ID#: 2001639-02B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)

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

Client Sample ID: IA2024_G_20200121

Lab ID#: 2001639-02B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.033	0.076	0.21	0.48

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Client Sample ID: IA2069_G_20200121

Lab ID#: 2001639-01A

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

File Name:	**v020610**	**Date of Collection:**	**1/21/20 10:37:00 AM**
Dil. Factor:	**1.79**	**Date of Analysis:**	**2/6/20 03:29 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.90	Not Detected	4.4	Not Detected
Freon 11	0.18	8.8	1.0	49
Freon 113	0.18	0.21	1.4	1.6
Acetone	1.8	3.5	4.2	8.2
Methylene Chloride	0.36	Not Detected	1.2	Not Detected
1,1,1-Trichloroethane	0.18	Not Detected	0.98	Not Detected
Benzene	0.18	0.66	0.57	2.1
Toluene	0.18	1.2	0.67	4.6
Tetrachloroethene	0.18	0.48	1.2	3.3
Chlorobenzene	0.18	Not Detected	0.82	Not Detected
Ethyl Benzene	0.18	0.24	0.78	1.0
m,p-Xylene	0.18	0.50	0.78	2.2
o-Xylene	0.18	0.19	0.78	0.82
1,3-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
1,4-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
1,2-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
1,2,4-Trichlorobenzene	0.90	Not Detected	6.6	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	126	70-130
Toluene-d8	108	70-130
4-Bromofluorobenzene	92	70-130

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Client Sample ID: IA2069_G_20200121

Lab ID#: 2001639-01B

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

File Name:	**v020610sim**	**Date of Collection: 1/21/20 10:37:00 AM**	
Dil. Factor:	**1.79**	**Date of Analysis: 2/6/20 03:29 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.018	Not Detected	0.046	Not Detected
1,1-Dichloroethene	0.018	Not Detected	0.071	Not Detected
cis-1,2-Dichloroethene	0.036	0.036	0.14	0.14
Carbon Tetrachloride	0.036	0.065	0.22	0.41
Trichloroethene	0.036	0.057	0.19	0.31

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	121	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	89	70-130

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Client Sample ID: IA2024_G_20200121

Lab ID#: 2001639-02A

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

File Name:	**v020611**	**Date of Collection:**	**1/21/20 11:15:00 AM**
Dil. Factor:	**1.64**	**Date of Analysis:**	**2/6/20 04:07 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.82	Not Detected	4.0	Not Detected
Freon 11	0.16	8.8	0.92	50
Freon 113	0.16	Not Detected	1.2	Not Detected
Acetone	1.6	3.1	3.9	7.4
Methylene Chloride	0.33	Not Detected	1.1	Not Detected
1,1,1-Trichloroethane	0.16	Not Detected	0.89	Not Detected
Benzene	0.16	0.40	0.52	1.3
Toluene	0.16	0.31	0.62	1.2
Tetrachloroethene	0.16	0.26	1.1	1.7
Chlorobenzene	0.16	Not Detected	0.76	Not Detected
Ethyl Benzene	0.16	Not Detected	0.71	Not Detected
m,p-Xylene	0.16	Not Detected	0.71	Not Detected
o-Xylene	0.16	Not Detected	0.71	Not Detected
1,3-Dichlorobenzene	0.16	Not Detected	0.99	Not Detected
1,4-Dichlorobenzene	0.16	Not Detected	0.99	Not Detected
1,2-Dichlorobenzene	0.16	Not Detected	0.99	Not Detected
1,2,4-Trichlorobenzene	0.82	Not Detected	6.1	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	127	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	90	70-130

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Client Sample ID: IA2024_G_20200121

Lab ID#: 2001639-02B

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

File Name:	**v020611sim**	**Date of Collection: 1/21/20 11:15:00 AM**	
Dil. Factor:	**1.64**	**Date of Analysis: 2/6/20 04:07 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.016	Not Detected	0.042	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.065	Not Detected
cis-1,2-Dichloroethene	0.033	Not Detected	0.13	Not Detected
Carbon Tetrachloride	0.033	0.076	0.21	0.48
Trichloroethene	0.033	Not Detected	0.18	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	120	70-130
Toluene-d8	107	70-130
4-Bromofluorobenzene	89	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2001639-03A

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

File Name:	**v020608c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 01:46 PM**	

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	1.0	Not Detected	2.4	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	126	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	92	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2001639-03B

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

File Name:	**v020608simc**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 01:46 PM**	

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	122	70-130
Toluene-d8	108	70-130
4-Bromofluorobenzene	88	70-130

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Client Sample ID: CCV

Lab ID#: 2001639-04A

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

File Name:	**v020602**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 07:58 AM**	

Compound	%Recovery
Freon 12	107
Freon 11	105
Freon 113	86
Acetone	117
Methylene Chloride	105
1,1,1-Trichloroethane	99
Benzene	119
Toluene	105
Tetrachloroethene	82
Chlorobenzene	95
Ethyl Benzene	93
m,p-Xylene	89
o-Xylene	84
1,3-Dichlorobenzene	86
1,4-Dichlorobenzene	85
1,2-Dichlorobenzene	87
1,2,4-Trichlorobenzene	78

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	120	70-130
Toluene-d8	108	70-130
4-Bromofluorobenzene	83	70-130

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Client Sample ID: CCV

Lab ID#: 2001639-04B

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

File Name:	**v020602sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 07:58 AM**	

Compound	%Recovery
Vinyl Chloride	106
1,1-Dichloroethene	89
cis-1,2-Dichloroethene	97
Carbon Tetrachloride	112
Trichloroethene	92

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	120	70-130
Toluene-d8	110	70-130
4-Bromofluorobenzene	82	70-130

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Client Sample ID: LCS

Lab ID#: 2001639-05A

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

File Name:	**v020603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 08:36 AM**	

Compound	%Recovery	Method Limits
Freon 12	103	70-130
Freon 11	100	70-130
Freon 113	79	70-130
Acetone	109	70-130
Methylene Chloride	98	70-130
1,1,1-Trichloroethane	94	70-130
Benzene	110	70-130
Toluene	99	70-130
Tetrachloroethene	81	70-130
Chlorobenzene	93	70-130
Ethyl Benzene	91	70-130
m,p-Xylene	88	70-130
o-Xylene	82	70-130
1,3-Dichlorobenzene	83	70-130
1,4-Dichlorobenzene	84	70-130
1,2-Dichlorobenzene	83	70-130
1,2,4-Trichlorobenzene	80	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	116	70-130
Toluene-d8	109	70-130
4-Bromofluorobenzene	84	70-130

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Client Sample ID: LCSD

Lab ID#: 2001639-05AA

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

File Name:	**v020604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 09:14 AM**	

Compound	%Recovery	Method Limits
Freon 12	99	70-130
Freon 11	97	70-130
Freon 113	77	70-130
Acetone	107	70-130
Methylene Chloride	95	70-130
1,1,1-Trichloroethane	91	70-130
Benzene	108	70-130
Toluene	99	70-130
Tetrachloroethene	80	70-130
Chlorobenzene	92	70-130
Ethyl Benzene	89	70-130
m,p-Xylene	86	70-130
o-Xylene	82	70-130
1,3-Dichlorobenzene	83	70-130
1,4-Dichlorobenzene	85	70-130
1,2-Dichlorobenzene	84	70-130
1,2,4-Trichlorobenzene	75	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	112	70-130
Toluene-d8	109	70-130
4-Bromofluorobenzene	86	70-130

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Client Sample ID: LCS

Lab ID#: 2001639-05B

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

File Name:	**v020603sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 08:36 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	105	70-130
1,1-Dichloroethene	85	70-130
cis-1,2-Dichloroethene	83	70-130
Carbon Tetrachloride	72	60-140
Trichloroethene	87	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	116	70-130
Toluene-d8	110	70-130
4-Bromofluorobenzene	82	70-130

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Client Sample ID: LCSD

Lab ID#: 2001639-05BB

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

File Name:	**v020604sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 09:14 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	104	70-130
1,1-Dichloroethene	85	70-130
cis-1,2-Dichloroethene	83	70-130
Carbon Tetrachloride	72	60-140
Trichloroethene	87	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	116	70-130
Toluene-d8	109	70-130
4-Bromofluorobenzene	83	70-130