8976 Wellington Road
Manassas, VA 20109

Sent via email

October 22, 2020

Jessica LaClair
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau E, 12th Floor
625 Broadway
Albany, New York 12233-7017

Re: Subslab Depressurization System Completion and Startup Report – Building 310
Former IBM East Fishkill Facility
Hopewell Junction, New York
EPA ID No. NYD000707901, NYSDEC Site No. 314054

Dear Ms. LaClair:

The enclosed document is the *Subslab Depressurization System Completion and Startup Report – Building 310* for the southern portion of Building 310, including the Model Shop tenant space, at the former IBM East Fishkill facility in Hopewell Junction, New York. The work described in the report was conducted in accordance with IBM's November 22, 2019 *Subslab Depressurization Conceptual Design Report - Building 310* which was approved by the New York State Department of Environmental Conservation (NYSDEC) and Department of Health (NYSDOH) in a December 20, 2019 letter.

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: *Subslab Depressurization System Completion and Startup Report – Building 310*

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

SANBORN HEAD ENGINEERING
Building Trust. Engineering Success.

20 Foundry Street
Concord, NH 03301

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

October 22, 2020
File No. 2999.16

Re: Subslab Depressurization System Completion and Startup Report – 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 documents the completion of installation, and presents the results of startup performance monitoring, of the subslab depressurization (SSD) system for the southern portion of Building 310 at the former IBM East Fishkill facility, currently owned by iPark East Fishkill LLC.

Please contact us if you require additional information.

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

David Shea

David Shea, P.E.
Sr. Vice President

Encl. Subslab Depressurization System Completion and Startup Report – Building 310

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SANBORN HEAD ENGINEERING

Building Trust. Engineering Success.

SUBSLAB DEPRESSURIZATION SYSTEM COMPLETION AND STARTUP REPORT

BUILDING 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Prepared for IBM Corporate Environmental Affairs
File No. 2999.16
October 2020

SANBORN HEAD ENGINEERING

Building Trust. Engineering Success.

NYS Professional Engineer Certification
Subslab Depressurization System Completion and Startup Report – Building 310
Former IBM East Fishkill Facility
EPA ID No. NYD000707901
NYSDEC Site No. 314054

I, David Shea, certify that I am currently a NYS registered professional engineer. I had primary direct responsibility for implementation of the subject construction program, and I certify that the subslab depressurization (SSD) system for the southern portion of Building 310 was implemented and that all construction activities were completed in substantial conformance with the design plans and specifications prepared by Sanborn, Head Engineering, PC (SHPC). This statement of conformance of the installation with the design documents is based on SHPC's on-site observations during construction and start-up of the SSD system for the southern portion of Building 310.

Date: October 22, 2020

Name: David Shea

NYS P.E. License No. 70026

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SUBSLAB DEPRESSURIZATION SYSTEM
COMPLETION AND STARTUP REPORT – BUILDING 310
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1.0 INTRODUCTION

This report documents the completion and startup performance monitoring results, including confirmatory indoor air sampling, associated with the subslab depressurization (SSD) system for the southern portion of Building 310 (B310) at the former IBM East Fishkill facility located in Hopewell Junction, New York (the site). A site location plan is provided as Figure 1, and the location of B310 at the site is shown on Figure 2. B310 is currently owned by iPark East Fishkill I LLC (iPark), also referred to as National Resources (NR). The Model Shop tenant space located at the southern end of B310 is currently being leased from NR by Global Foundries. The remainder of B310, including the southern portion not part of the Model Shop, is currently used as a warehouse for the New York State Office of General Services. iPark renumbered its buildings in 2019, and B310 was renumbered as Building 200. However, to be consistent with prior reports, the building will be referred to as B310 herein.

The work described herein was conducted on behalf of IBM by Sanborn, Head Engineering, PC (SHPC). Progress updates and relevant data have been communicated to the New York State Department of Environmental Conservation and Department of Health (the Departments) through periodic correspondence and meetings.

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 INFORMATION

B310 is equipped with an existing SSD system (designated System VE-2) that serves the central portion of the building, as shown on Figure 3. System VE-2, combined with heating, ventilating, and air conditioning (HVAC) system operations, was successful in mitigating soil vapor intrusion and maintaining acceptable indoor air quality (IAQ), as documented in previous reports[1,2] to the Departments.

In late 2018, NR completed construction of a new wall to partition off the Model Shop area from the remaining areas of B310, as shown on Figure 3. The partition wall extends from the floor to the roof deck, effectively isolating the Model Shop from the remainder of the building. The remainder of B310 is currently used for storage and has undergone major renovations, including removal of almost all interior walls and partitions. In November 2018, IBM performed IAQ testing within the Model Shop area to assess whether the changes to building conditions affected the potential for soil vapor intrusion and resulting IAQ. The IAQ testing results were reported to the Departments in a letter dated January 23, 2019.[3]

As documented in the January 2019 letter, indoor air concentrations of certain volatile organic compounds (VOCs), primarily tetrachloroethene (PCE) and trichloroethene (TCE), in the Model Shop area had increased compared to the previous round of IAQ sampling

---

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

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

3 Sanborn, Head Engineering, P.C., *Indoor Air Quality Testing Results, Building 310 – Model Shop Tenant Space, Former IBM East Fishkill Facility, Hopewell Junction, New York*, January 23, 2019.

conducted in April 2016 prior to the construction of the partition wall and other changes to the building. Based on these results, IBM elected to conduct subslab vapor sampling and SSD pilot testing in the southern portion of B310, including the Model Shop, in May and September 2019 in accordance with workplans approved by the Departments.[4,5] The purpose of this work was to evaluate the feasibility of SSD as a means of mitigating soil vapor intrusion in the southern portion of B310, including the Model Shop.

Results of the subslab vapor assessment, SSD pilot testing, and the conceptual design of an SSD system for the southern portion of B310 were submitted to the Departments in a November 2019 report.[6] The Departments approved the design in a letter to IBM dated December 20, 2019, and indicated IBM may proceed with construction and operation of the SSD system. This report documents the installation, startup, and subsequent IAQ testing of the SSD system targeting the southern portion of B310, including the Model Shop.

3.0 SUBSLAB DEPRESSURIZATION SYSTEM INSTALLATION AND PERFORMANCE

The purpose of the SSD system (designated System VE-9) is to capture subslab VOC vapors and establish control of cross-slab pressure gradients to reduce the potential for vapor intrusion to impact IAQ. The equipment enclosure (shown on Figure 3) and the associated SSD system piping were constructed in March through June 2020, in general accordance with the conceptual design and began operation on June 16, 2020. The layout of the system is shown on Figure 3.

The following sections provide a description of the SSD system and summarizes the startup activities, including operating conditions and performance results.

3.1 System Description

The SSD system was designed to depressurize all of the southern portion of B310, including the areas with highest concentrations of PCE and TCE in subslab vapor, and overlap with the area of subslab vacuum influence associated with the existing System VE-2.

Subslab vapor is withdrawn from six extraction ports (EP-212, EP-215, EP-216, EP-218, EP-220, and EP-222) shown on Figure 3, using a 20-horsepower, regenerative-type vacuum blower installed inside an equipment enclosure located on the south side of B310. Subslab vapor is pulled through a vapor-liquid separator and treated via three 700-lb granular activated carbon (GAC) adsorber units plumbed in a lead-lag-polish series configuration. The treated vapor then enters the vacuum blower and is discharged above the B310 roofline and away from any outside air intakes. The system is equipped with instruments, controls, and

[4] Sanborn, Head Engineering, P.C., *Work Plan for Subslab Depressurization Pilot Testing, Building 310 – Model Shop Area, Former IBM East Fishkill Facility, Hopewell Junction, New York*, April 18, 2019.

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

[6] Sanborn, Head Engineering, P.C., *Subslab Depressurization Conceptual Design Report, Building 310, Former IBM East Fishkill Facility, Hopewell Junction, New York*, November 22, 2019.

alarms so that the appropriate personnel are notified automatically in the event of a malfunction. Photographs of the system enclosure are provided in Exhibits 3.1 and 3.2 below.

Exhibit 3.1: SSD Equipment Enclosure Interior

Exhibit 3.2: SSD Equipment Enclosure Exterior

3.2 Vapor Extraction Performance Monitoring

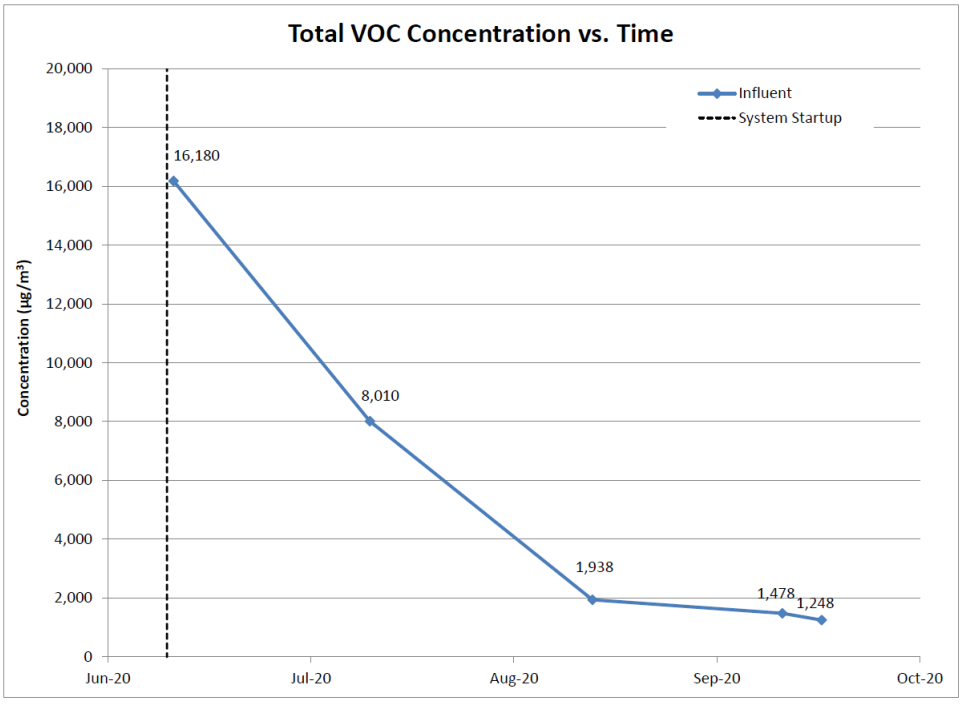
The applied vacuums and flow rates measured at the six extraction ports during startup are shown on Figure 4. A combined total of approximately 530 standard cubic feet per minute (scfm) of subslab vapor is being extracted by the system. The resulting cross-slab differential pressure readings at these conditions are also shown on Figure 4, along with the inferred extent of the subslab pressure response depicted by the differential pressure isopleth at -0.004 inches of water column (in. wc). The applied vacuums, extracted vapor flow rates, and subslab differential pressure response are generally consistent with observations made during pilot testing activities that provided the basis for the SSD system design.

The area of influence of System VE-2 is also shown on Figure 4 for reference and is based on differential pressure measurements recorded on September 17, 2019.

3.3 VOC Mass Removal

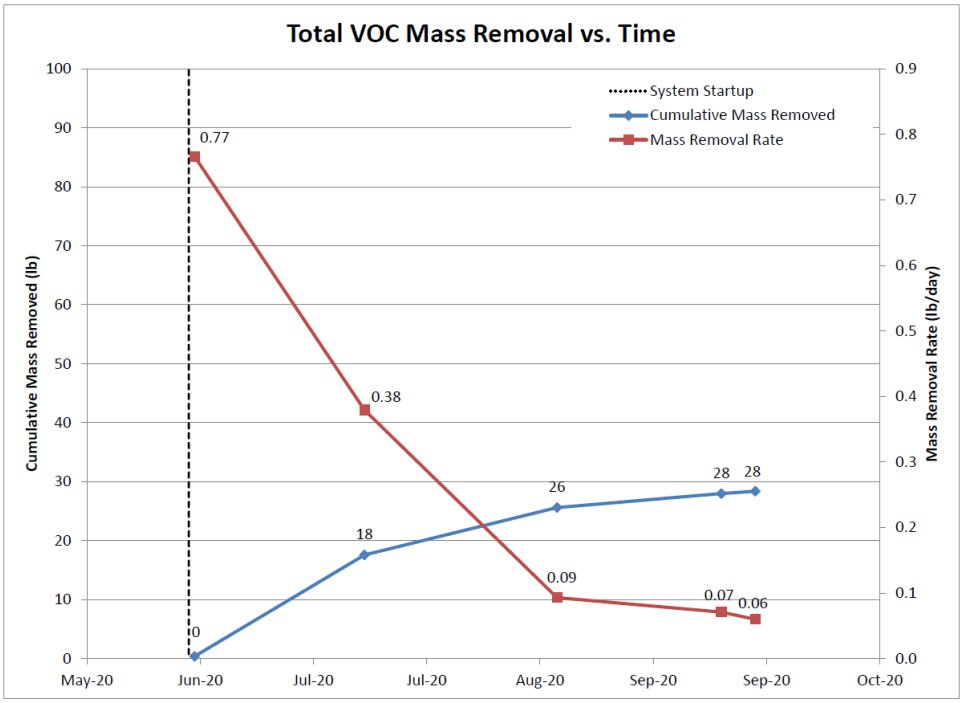
The SSD system is successfully removing VOC mass from beneath the building slab. To estimate the total VOC mass removed by the system, process vapor samples have been collected from the influent of the GAC treatment train a total of five times since startup of the system in June 2020. The plot in Exhibit 3.3 below shows total VOC concentrations versus time at the influent point of the system. The initial VOC vapor stream concentrations were generally consistent with the levels of VOCs in subslab soil vapor observed during the subslab vapor assessment. As expected, influent total VOC concentrations demonstrate a steep decrease after initial startup and subsequent gradual decrease over time thereafter.

Exhibit 3.3: SSD System Influent Total VOC Concentration vs. Time



The plot in Exhibit 3.4 below shows the total VOC mass removal rate and cumulative mass removed since startup. A total of approximately 28 pounds of VOCs have been removed since startup through September 24, 2020.

Exhibit 3.4: SSD System Total VOC Mass Removal vs. Time



To monitor treatment performance of the extracted vapor stream, grab samples will be collected downstream of each of the three GAC vessels, on an approximately quarterly basis. Once the sampling data indicates the existing GAC is near exhaustion, it is replaced with virgin GAC.

3.4 Operations and Maintenance

The SSD system operations and maintenance monitoring program is outlined below in Exhibit 3.5. In addition to the monitoring described below, the SSD system is equipped with system shut-down alarms that notify operators when the system is not operational (e.g., during power outages, equipment malfunction).

Exhibit 3.5: SSD System Operations and Maintenance Plan

Task	Frequency
SSD system operational monitoring (blower run, vacuum, and flow – manual checks)	Weekly
SSD system combined influent vapor grab Summa® sampling and VOC analysis	Monthly
SSD system GAC treatment train grab Summa® sampling and VOC analysis	Quarterly
SSD system performance monitoring (extraction port flow rates and subslab differential pressures)	Annually

4.0 INDOOR AIR CONFIRMATORY SAMPLING

On August 14, 2020, approximately 60 days following system startup, seven indoor air samples were collected in B310 at the locations shown on Figure 5. The samples were collected while Systems VE-2 and VE-9 were operating, and the HVAC system in the Model Shop was operating under normal building occupancy conditions. The HVAC systems in the warehouse area were off during sampling. A summary of the HVAC operating conditions at the time of sampling, as well as a figure showing the HVAC zone locations, are provided in Appendix B.

The indoor air samples were collected over an 8-hour period into individually certified-clean SUMMA® canisters in accordance with the procedures described in IBM's Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan.[7] The samples were submitted to Eurofins/Air Toxics of Folsom, California for analysis of 22 VOCs listed in the RFI Work Plan using modified USEPA Method TO-15. The samples were typically collected at a height between 3 and 4 feet above the floor level. A field duplicate sample, ambient outdoor air sample, and nitrogen blank were also collected for quality assurance/quality control (QA/QC) purposes, which are discussed in Section 5. A summary of field sampling information, including location description, sample identifiers, sample collection times, and initial and final canister vacuums is provided in Table 2.

4.1 IA Sampling Results

The PCE and TCE indoor air concentrations are shown on Figure 5, and results for all analytes are summarized in Table 1. The analytical laboratory report is provided in Appendix C.

[7] Sanborn, Head Engineering, P.C., *Work Plan, RCRA Facility Investigation (RFI), VOC Source Assessment, IBM East Fishkill Facility, Hopewell Junction, NY*, June 15, 2009.

Low levels of PCE were detected at four of the seven locations sampled at concentrations ranging from 2.4 to 3.1 µg/m^3; the balance of the PCE results were less than the laboratory reporting limit. TCE was not detected in any of the samples. PCE was only detected in samples collected to the north of the partitioning wall in the warehouse area, which is only occupied during loading / unloading of materials. PCE and TCE were not detected in any of the samples collected from the Model Shop.

Low levels of eight other analytes were detected in indoor air, including: acetone (14 to 20 µg/m^3 across all samples); benzene (0.68 to 0.97 µg/m^3 across all samples); carbon tetrachloride (0.46 to 0.48 µg/m^3 across all samples); dichlorodifluoromethane (CFC12) (3.9 µg/m^3 in one sample); methylene chloride (2.3 µg/m^3 in one sample); toluene (1.8 to 3.2 µg/m^3 across all samples); trichlorofluoromethane (CFC11) (1.8 to 28 µg/m^3 across all samples); and xylene (m, p-) (0.8 to 1.2 µg/m^3 in six samples). With the exception of benzene, CFC12, and xylene (m, p-), these compounds were also detected in the ambient outside air sample, indicating that the concentrations detected at interior locations are likely attributable to the presence of these analytes in ambient outdoor air.

The 8-hour indoor air sample data demonstrate that the SSD system is achieving its design objective of intercepting VOCs in subslab soil gas and preventing migration into indoor air.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

The analytical data for the confirmatory samples were provided to New Environmental Horizons, Inc. (NEH) of Arlington, MA and Skillman, NJ who conducted an in-depth data usability review. The Data Usability Summary Report (DUSR) is provided in Appendix D. The review found that all results were considered usable for project objectives/decisions.

6.0 TENANT NOTIFICATIONS

We understand that the property owner, NR, is responsible for notifying its tenant of these IAQ testing results under the tenant notification requirements of New York Environmental Conservation Law ENV Section 27-2405.

7.0 CONCLUSIONS

The results of the System VE-9 startup performance monitoring and indoor air sampling indicate the system is meeting its design objectives of depressurizing the subslab and reducing VOC vapor intrusion to achieve acceptable indoor air quality. Confirmatory indoor air sampling indicates that the SSD system has reduced PCE and TCE concentrations within the building to levels at or approaching non-detectable concentrations.

IBM intends to operate and maintain the B310 SSD system as described in Section 3.4.

TABLES

Table 1
Summary of 8-Hour Indoor Air Analytical Results - B310
Former IBM East Fishkill Facility
Hopewell Junction, New York

Analyte	Sample Location	AA2001			IA2013			IA2014			IA2015			IA2016			IA2017			IA2017 Dup			IA2081			IA2084			Equipment Blank		
	Collection Date	8/14/2020			8/14/2020			8/14/2020			8/14/2020			8/14/2020			8/14/2020			8/14/2020			8/14/2020			8/14/2020			8/14/2020		
	Units	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias
Acetone	µg/m3	14	J	I	17	J	I	16	J	I	20	J	I	19	J	I	15	J	I	20	J	I	14	J	I	14	J	I	4.8	UJ	I
Benzene	µg/m3	0.55	U		0.94			0.80			0.88			0.87			0.69			0.97			0.68			0.78			0.65	U	
Carbon tetrachloride	µg/m3	0.46			0.46			0.46			0.47			0.47			0.46			0.46			0.48			0.46			0.26	U	
CFC113 (Ethane, 1,1,2-trichloro-1,2,2-trifluoro-)	µg/m3	1.3	U		1.2	U		1.2	U		1.2	U		1.2	U		1.1	U		1.2	U		1.2	U		1.3	U		1.6	U	
Chlorobenzene (Monochlorobenzene)	µg/m3	0.79	U		0.70	U		0.74	U		0.74	U		0.72	U		0.68	U		0.74	U		0.70	U		0.77	U		0.93	U	
Dichlorobenzene (1,2-)	µg/m3	1.0	U		0.91	U		0.97	U		0.97	U		0.94	U		0.90	U		0.97	U		0.92	U		1.0	U		1.2	U	
Dichlorobenzene (1,3-)	µg/m3	1.0	U		0.91	U		0.97	U		0.97	U		0.94	U		0.90	U		0.97	U		0.92	U		1.0	U		1.2	U	
Dichlorobenzene (1,4-)	µg/m3	1.0	U		0.91	U		0.97	U		0.97	U		0.94	U		0.90	U		0.97	U		0.92	U		1.0	U		1.2	U	
Dichlorodifluoromethane (CFC12)	µg/m3	4.2	U		3.7	U		4.0	U		4.0	U		3.9	U		3.9			4.0	U		3.8	U		4.1	U		5.0	U	
Dichloroethene (1,1-)	µg/m3	0.068	U		0.060	U		0.064	U		0.064	U		0.062	U		0.059	U		0.064	U		0.061	U		0.066	U		0.080	U	
Dichloroethene (cis-1,2-)	µg/m3	0.14	U		0.12	U		0.13	U		0.13	U		0.12	U		0.12	U		0.13	U		0.12	U		0.13	U		0.16	U	
Ethylbenzene	µg/m3	0.75	U		0.66	U		0.70	U		0.70	U		0.68	U		0.65	U		0.70	U		0.66	U		0.72	U		0.88	U	
Methylene Chloride (Dichloromethane)	µg/m3	1.6			1.0	U		2.3			1.1	U		1.1	U		1.0	U		1.1	U		1.1	U		1.2	U		1.4	U	
Tetrachloroethene (PCE)	µg/m3	1.2	U		3.1			2.4			2.4			2.4			1.0	U		1.1	U		1.0	U		1.1	U		1.4	U	
Toluene	µg/m3	0.66			1.9			2.0			2.2			2.0			3.0			3.2			1.8			3.0			0.76	U	
Trichlorobenzene (1,2,4-)	µg/m3	13	U		11	U		12	U		12	U		12	U		11	U		12	U		11	U		12	U		15	U	
Trichloroethane (1,1,1-)	µg/m3	0.94	U		0.82	U		0.88	U		0.88	U		0.86	U		0.81	U		0.88	U		0.83	U		0.91	U		1.1	U	
Trichloroethene (TCE)	µg/m3	0.18	U		0.16	U		0.17	U		0.17	U		0.17	U		0.16	U		0.17	U		0.16	U		0.18	U		0.22	U	
Trichlorofluoromethane (CFC11)	µg/m3	1.6			24			28			15			26			2.0			2.0			2.1			1.8			1.1	U	
Vinyl chloride	µg/m3	0.044	U		0.038	U		0.041	U		0.041	U		0.040	U		0.038	U		0.041	U		0.039	U		0.043	U		0.052	U	
Xylene (m,p-)	µg/m3	0.75	U		1.0			1.1			0.81			1.1			1.2			0.93			0.66	U		1.0			0.88	U	
Xylene (o-)	µg/m3	0.75	U		0.66	U		0.70	U		0.70	U		0.68	U		0.65	U		0.70	U		0.66	U		0.72	U		0.88	U	

Notes:

1. Samples were collected by Sanborn, Head Engineering P.C. on behalf of IBM Corporation on the dates indicated over an approximately 8-hour sampling interval using 6-liter, stainless steel, pre-evacuated SUMMA® canisters. The samples were analyzed by Eurofins Air Toxics of Folsom, California for the project-specific list of volatile organic compounds (VOCs) by United States Protection Agency (USEPA) Method TO-15 using a combination of full scan and selective ion monitoring (SIM) mode.

2. The "AA" designation indicates that the sample consists of ambient air collected from outside the building. "Equipment Blank" represents a field blank sample, where laboratory-supplied nitrogen was transferred from one SUMMA® canister into another.

3. Results are displayed with two significant figures.

4. A data usability summary report (DUSR) was performed on the data by New Environmental Horizons, Inc. (NEH) . All results were considered acceptable, with the understanding of the potential uncertainty (bias) in the qualified results. In some cases, NEH assigned the following qualifiers and biases to the data. Refer to the DUSR report for further details.
"U" indicates the analyte is non-detect at or above the indicated sample specific practical quantification limit (PQL).
"J" indicates the result is estimated.
"I" indicates an indeterminate bias.

Table 2
Summary of Indoor Air Sample Information
Building 310
Former IBM East Fishkill Facility
Hopewell Junction, NY

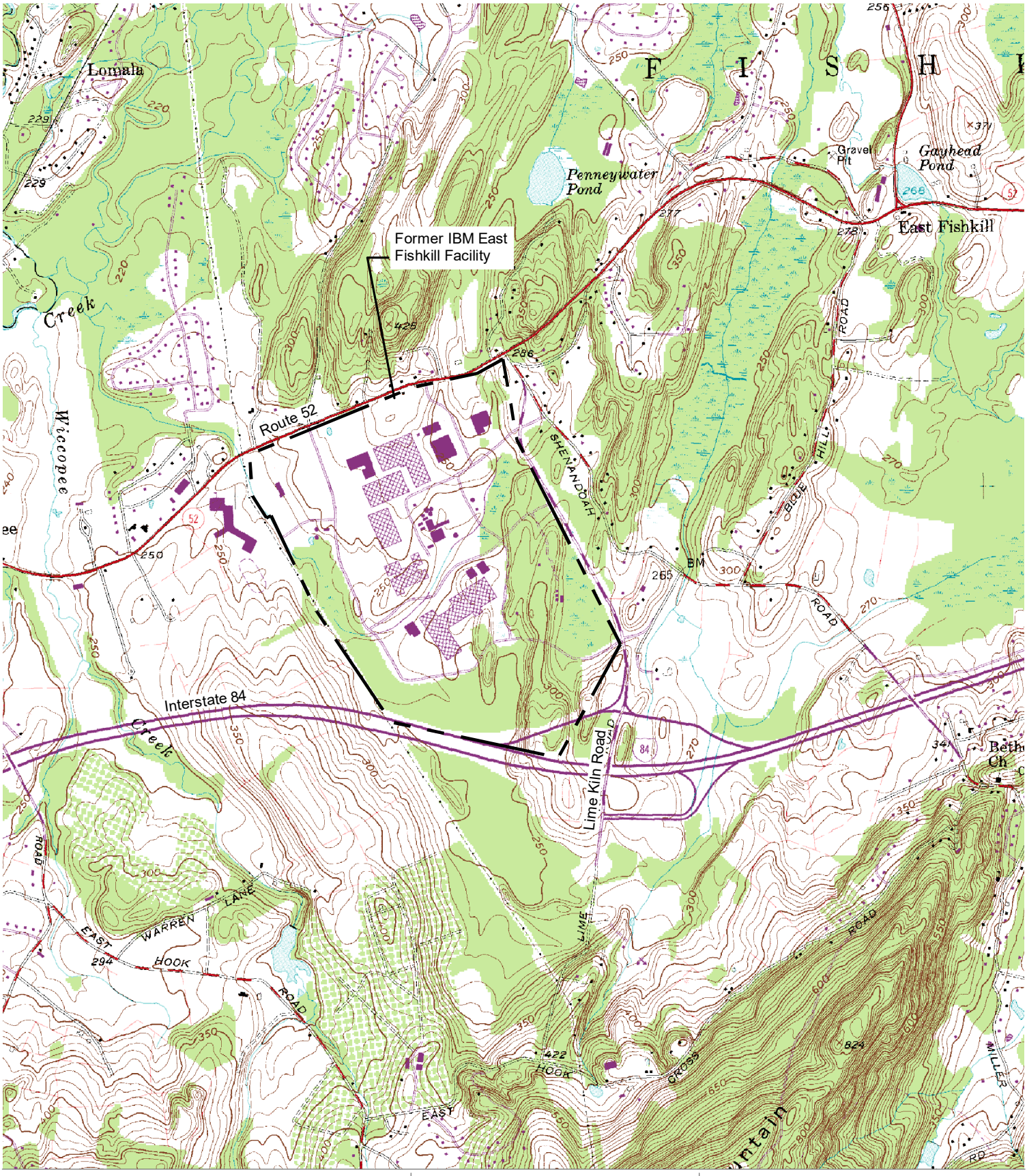
Sample Location	Building Floor	Sample Matrix	Canister Number	Sample Height (ft above floor)	Start Time (hours)	Start Pressure (mm Hg)	Stop Time (hours)	Stop Pressure (mm Hg)	Temperature (°F)	Location Description	Chemicals Observed Near Sample Location
Collection Date: August 14, 2020											
AA-01	Roof	Ambient Air	0983	0	6:43	-26	14:43	-5.5	75	AC-21 Intake	None observed
EB-01	Roof	Nitrogen	1233	-	6:09	-26.5	14:09	-10	75	AC-21 Intake	None observed
FD-01	Ground	Indoor Air	2643	4	6:43	-29.5	14:17	-5.5	70	Model Shop	None observed
IA2013	Ground	Indoor Air	0875	3	6:24	-28.5	14:28	-3	75	Vacant	None observed
IA2014	Ground	Indoor Air	0243	3	6:26	-28	14:31	-5	75	Vacant	None observed
IA2015	Ground	Indoor Air	0239	3	6:34	-28	14:34	-6	75	Vacant	None observed
IA2016	Ground	Indoor Air	0234	3	6:30	-29.5	14:33	-4.5	75	Vacant	None observed
IA2017	Ground	Indoor Air	1312	4	6:43	-30	14:17	-3	70	Model Shop	None observed
IA2081	Ground	Indoor Air	0825	4	6:16	-30	14:19	-4.5	70	Break Room	None observed
IA2084	Ground	Indoor Air	0483	4	6:44	-29	14:44	-6	70	Model Shop	None observed

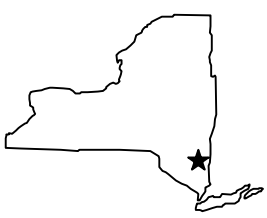
Notes:

1. Samples were collected by Sanborn, Head Engineering, PC on August 14, 2020.

2. Samples were collected into 6-liter, stainless steel, pre-evacuated SUMMA® canisters using 8-hour metering regulators. Each canister and regulator was laboratory-certified clean (100% certification). The samples were submitted to Eurofins/Air Toxics of Folsom, California for analysis of 22 project-specific analytes using modified USEPA Method TO-15 and Method TO-15 in selective ion monitoring (SIM) mode.

FIGURES





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

Drawn By: E. Wright
Designed By: C. Murphy
Reviewed By: D. Shea
Project No: 2999.16
Date: October 2020

1,000' 0 2,000' Feet

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Figure 1

Site Location Plan

Subslab Depressurization Completion and Startup Report - Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Figure 2

B310 Location Plan

Subslab Depressurization Completion and Startup Report - Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By: E. Wright
Designed By: C. Murphy
Reviewed By: D. Shea
Project No: 2999.16
Date: October 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

Figure 3

Building 310 Layout

Subslab Depressurization Completion and Startup Report - Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	J. Corsello
Reviewed By:	D. Shea
Project No:	2999.16
Date:	October 2020

Figure Narrative

This figure shows the subslab depressurization (SSD) systems installed by IBM. Note that most of the interior walls and rooms in Building 310 have been demolished and the building cleared. The building layout reflects the pre-demolition conditions.

This figure also shows the location of the currently occupied Model Shop area to the south, and the approximate area of subslab vapor vacuum influence from System VE-2. The presumed area of vacuum influence represents the inferred apparent vacuum conditions based on subslab differential pressure readings collected on September 17, 2019.

Legend

- Subslab vapor extraction port (System VE-2)
- Subslab vapor extraction port (System VE-9)
- Subslab vapor extraction port (inactive)
- Occupied areas
- System VE-2 overhead vacuum piping
- Inferred area of vacuum influence for System VE-2
- System VE-9 overhead vacuum piping
- Basement

Feet
40 20 0 40 80

SANBORN HEAD ENGINEERING

System VE-2 Equipment Room
System VE-9 Equipment Enclosure
Warehouse
Approximate Location of New Partitioning Wall (Floor to Roof) Separating Model Shop Area
Model Shop Area
B310
B3
EP-205
EP-207
EP-208
EP-204
EP-203
EP-209
EP-210
EP-221
EP-218
EP-211
EP-212
EP-213
EP-220
EP-214
EP-217
EP-222
EP-215
EP-216
EP-223
EP-219
-0.004

Last Edited By: ewright
Path: P:\2900\s2999.00\Graphics Files\GIS\Figures\B310\Startup Report\B310_BldLayout.mxd

Figure 4

Subslab Pressure Response to Vapor Extraction

Subslab Depressurization Completion and Startup Report - 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:	2999.16
Date:	October 2020

Figure Narrative

This figure shows the inferred subslab pressure response from the subslab depressurization (SSD) system extracting vapor from EP212, EP215, EP216, EP218, EP220, and EP-222, and the measurements recorded at those extraction ports upon startup. The subslab pressure response footprint represents the outer limit of the -0.004 inches of water column differential pressure based on measurements recorded on August 14,2020. Other interpretations are possible.

The differential pressure contours overlay the inferred subslab vapor tetrachloroethene (PCE) concentration isopleths based on subslab vapor samples collected in May and September of 2019 into 1-L Summa canisters equipped with 1-hour flow controllers.

Legend

- Subslab vapor monitoring port
- Subslab vapor extraction port
- Subslab vapor extraction port (inactive)
- Approximate location of subslab acid waste drains and cleanouts
- Basement
- -0.004 — Differential pressure contour (inches of water column)
- -0.004 — Approximate extent of subslab vacuum influence from System VE-2 (inches of water column)
- 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 — µg/m³ total VOC concentration (micrograms per cubic meter)
- -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.

Feet: 20 10 0 20 40

SANBORN HEAD ENGINEERING

IA2013
PCE = 3.1
TCE = <0.16

IA2015
PCE = 2.4
TCE = <0.17

IA2081
PCE = <1.0
TCE = <0.16

B310

IA2017
PCE = <1.0 (<1.1)
TCE = <0.16 (<0.17)

IA2084
PCE = <1.1
TCE = <0.18

IA2014
PCE = 2.4
TCE = <0.17

IA2016
PCE = 2.4
TCE = <0.17

Warehouse

Approximate Location of New Partitioning Wall (Floor to Roof) Separating Model Shop Area

Model Shop Area

Figure 5

Summary of PCE and TCE Concentrations for 8-Hour Indoor Air Samples

Subslab Depressurization Completion and Startup Report - Building 310

Former IBM East Fishkill Facility
Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	C. Murphy
Reviewed By:	D. Shea
Project No:	2999.16
Date:	October 2020

Figure Narrative

This figure shows tetrachloroethene (PCE) and trichloroethene (TCE) results for indoor air confirmatory laboratory analytical samples collected in Building 310 on August 14, 2020 while the SSD system was operating. The samples were collected as approximately 8-hour time-weighted average samples using 6-L SUMMA canisters. Results are shown in micrograms per cubic meter (ug/m3). Refer to Appendix C of this report for the full list of sampling results.

Legend

- Indoor Air Location
- Approximate Location of Subslab Acid Waste Drains and Cleanouts
- Basement
- PCE = 2.4 / TCE = <0.17 — Tetrachlorethene (PCE) sample result (ug/m3); Trichloroethene (TCE) sample result (ug/m3)
- ( ) Indicate field duplicate

N W E S

20 10 0 20 40 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

SUMMARY OF HVAC OPERATING CONDITIONS

Table B.1
Summary of HVAC Settings - B310
Former IBM East Fishkill Facility
Hopewell Junction, NY

HVAC Unit	Area Served	Operating Conditions	
		ON/OFF	OA Damper Position (% Open)
HVAC-1	Mechanical room/Basement	ON	25%
AC-21	Model Shop	ON	30%
AC-23	Warehouse	OFF	NA
AC-26	Warehouse	OFF	NA
AC-29	Warehouse	OFF	NA
AC-30	Warehouse	OFF	NA
AC-31	Warehouse	OFF	NA
AC-38	Warehouse	OFF	NA

Notes:
1. HVAC operating conditions were observed by Sanborn Head on August 14, 2020. Damper positions should be considered approximate.
2. Abbreviations
OA = Outside air
NA = Not applicable
3. Refer to Figure B.1 for HVAC zone locations.

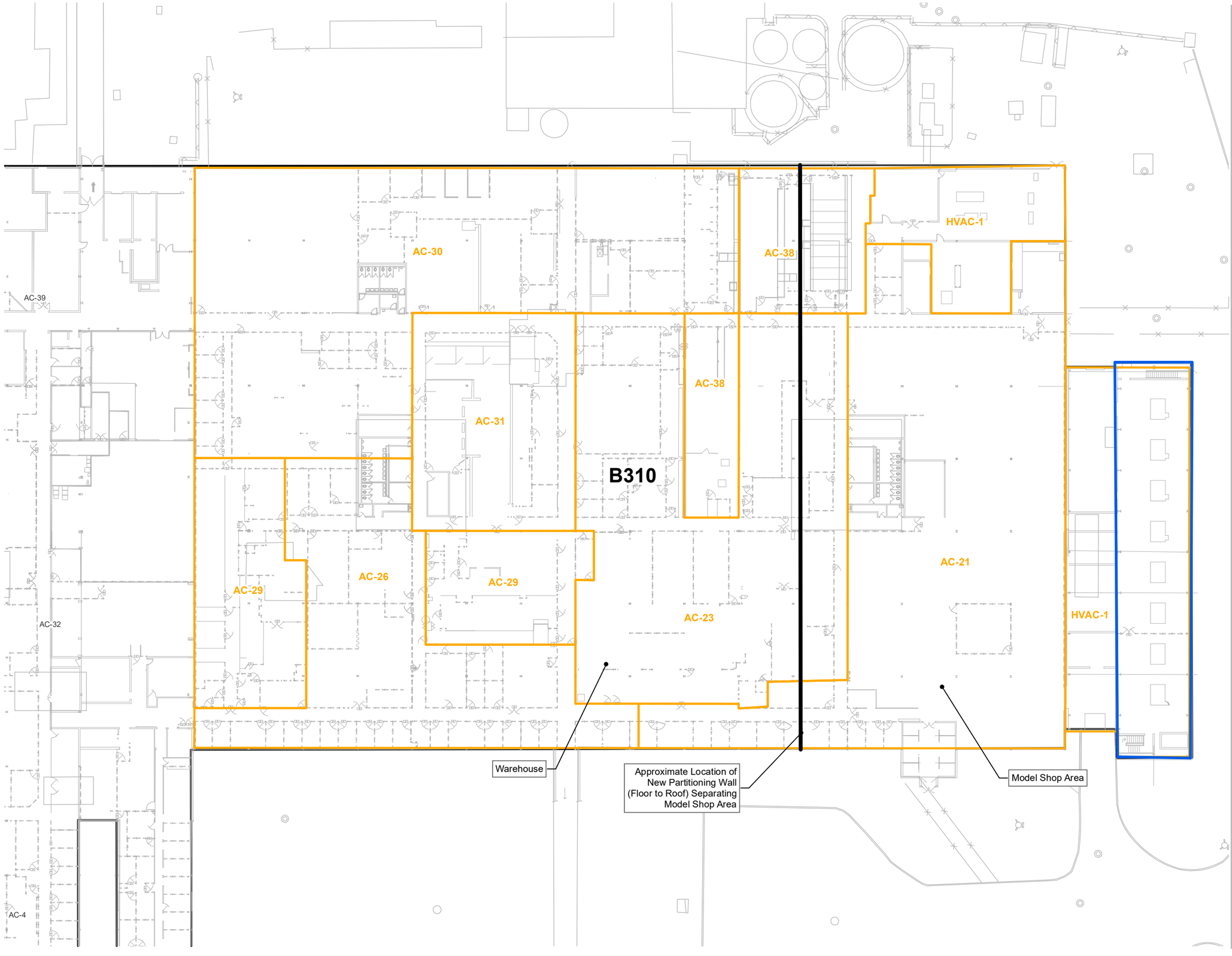

Figure B.1

HVAC Zones

Subslab Depressurization Completion and Startup Report - Building 310

Former IBM East Fishkill Facility

Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	C. Murphy
Reviewed By:	D. Shea
Project No:	2999.16
Date:	October 2020

Figure Narrative

This figure shows the approximate layout of the heating, ventilation, and air conditioning (HVAC) zones.

Legend

- HVAC Zone
- Basement

N E S W

20 10 0 20 40 Feet

SANBORN HEAD ENGINEERING

APPENDIX C

ANALYTICAL LABORATORY REPORT

eurofins | Air Toxics

8/31/2020
Ms. Jennifer Sanborn
Sanborn, Head & Associates
20 Foundry Street

Concord NH 03301

Project Name: EFK
Project #: 2999.16
Workorder #: 2008455

Dear Ms. Jennifer Sanborn

The following report includes the data for the above referenced project for sample(s) received on 8/18/2020 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: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Alexandra Winslow

Project Manager

eurofins | Air Toxics

WORK ORDER #: 2008455

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 #**	2999.16 EFK
DATE RECEIVED:	08/18/2020	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	08/31/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AA-01_20200814	Modified TO-15	6.7 "Hg	5 psi
01B	AA-01_20200814	Modified TO-15	6.7 "Hg	5 psi
02A	EB-01_20200814	Modified TO-15	10 "Hg	5.2 psi
02B	EB-01_20200814	Modified TO-15	10 "Hg	5.2 psi
03A	FD-01_20200814	Modified TO-15	5.1 "Hg	4.9 psi
03B	FD-01_20200814	Modified TO-15	5.1 "Hg	4.9 psi
04A	IA2013_20200814	Modified TO-15	3.7 "Hg	4.8 psi
04B	IA2013_20200814	Modified TO-15	3.7 "Hg	4.8 psi
05A	IA2014_20200814	Modified TO-15	5.1 "Hg	5 psi
05B	IA2014_20200814	Modified TO-15	5.1 "Hg	5 psi
06A	IA2015_20200814	Modified TO-15	5.1 "Hg	4.9 psi
06B	IA2015_20200814	Modified TO-15	5.1 "Hg	4.9 psi
07A	IA2016_20200814	Modified TO-15	4.5 "Hg	4.9 psi
07B	IA2016_20200814	Modified TO-15	4.5 "Hg	4.9 psi
08A	IA2017_20200814	Modified TO-15	3.1 "Hg	5 psi
08B	IA2017_20200814	Modified TO-15	3.1 "Hg	5 psi
09A	IA2081_20200814	Modified TO-15	4.1 "Hg	4.7 psi
09B	IA2081_20200814	Modified TO-15	4.1 "Hg	4.7 psi
10A	IA2084_20200814	Modified TO-15	6.1 "Hg	4.9 psi
10B	IA2084_20200814	Modified TO-15	6.1 "Hg	4.9 psi
11A	Lab Blank	Modified TO-15	NA	NA
11B	Lab Blank	Modified TO-15	NA	NA
11C	Lab Blank	Modified TO-15	NA	NA

Continued on next page

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WORK ORDER #: 2008455

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 #**	2999.16 EFK
DATE RECEIVED:	08/18/2020	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	08/31/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
11D	Lab Blank	Modified TO-15	NA	NA
12A	CCV	Modified TO-15	NA	NA
12B	CCV	Modified TO-15	NA	NA
12C	CCV	Modified TO-15	NA	NA
12D	CCV	Modified TO-15	NA	NA
13A	LCS	Modified TO-15	NA	NA
13AA	LCSD	Modified TO-15	NA	NA
13B	LCS	Modified TO-15	NA	NA
13BB	LCSD	Modified TO-15	NA	NA
13C	LCS	Modified TO-15	NA	NA
13CC	LCSD	Modified TO-15	NA	NA
13D	LCS	Modified TO-15	NA	NA
13DD	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 08/31/20

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209219, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-19-14, UT NELAP – CA009332019-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-013, 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# 2008455

Ten 6 Liter Summa Canister (SIM Certified) samples were received on August 18, 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.

The reporting limit for 1,2,4-Trichlorobenzene was raised from 0.5ppbv to 1.0ppbv due to anomalous linearity in the Initial Calibration.

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: AA-01_20200814

Lab ID#: 2008455-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	0.17	0.29	0.97	1.6
Acetone	1.7	5.9	4.1	14
Methylene Chloride	0.34	0.45	1.2	1.6
Toluene	0.17	0.18	0.65	0.66

Client Sample ID: AA-01_20200814

Lab ID#: 2008455-01B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.034	0.072	0.22	0.46

Client Sample ID: EB-01_20200814

Lab ID#: 2008455-02A

No Detections Were Found.

Client Sample ID: EB-01_20200814

Lab ID#: 2008455-02B

No Detections Were Found.

Client Sample ID: FD-01_20200814

Lab ID#: 2008455-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	0.16	0.35	0.90	2.0
Acetone	1.6	8.6	3.8	20
Benzene	0.16	0.30	0.51	0.97
Toluene	0.16	0.85	0.61	3.2
m,p-Xylene	0.16	0.22	0.70	0.93

Client Sample ID: FD-01_20200814

Lab ID#: 2008455-03B

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

Client Sample ID: FD-01_20200814

Lab ID#: 2008455-03B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.032	0.073	0.20	0.46

Client Sample ID: IA2013_20200814

Lab ID#: 2008455-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	0.15	4.3	0.85	24
Acetone	1.5	7.3	3.6	17
Benzene	0.15	0.29	0.48	0.94
Toluene	0.15	0.52	0.57	1.9
Tetrachloroethene	0.15	0.46	1.0	3.1
m,p-Xylene	0.15	0.24	0.66	1.0

Client Sample ID: IA2013_20200814

Lab ID#: 2008455-04B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.030	0.074	0.19	0.46

Client Sample ID: IA2014_20200814

Lab ID#: 2008455-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	0.16	5.1	0.90	28
Acetone	1.6	6.8	3.8	16
Methylene Chloride	0.32	0.65	1.1	2.3
Benzene	0.16	0.25	0.51	0.80
Toluene	0.16	0.52	0.61	2.0
Tetrachloroethene	0.16	0.36	1.1	2.4
m,p-Xylene	0.16	0.26	0.70	1.1

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

Client Sample ID: IA2014_20200814

Lab ID#: 2008455-05B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.032	0.074	0.20	0.46

Client Sample ID: IA2015_20200814

Lab ID#: 2008455-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	0.16	2.6	0.90	15
Acetone	1.6	8.4	3.8	20
Benzene	0.16	0.28	0.51	0.88
Toluene	0.16	0.59	0.61	2.2
Tetrachloroethene	0.16	0.35	1.1	2.4
m,p-Xylene	0.16	0.19	0.70	0.81

Client Sample ID: IA2015_20200814

Lab ID#: 2008455-06B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.032	0.074	0.20	0.47

Client Sample ID: IA2016_20200814

Lab ID#: 2008455-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	0.16	4.6	0.88	26
Acetone	1.6	8.0	3.7	19
Benzene	0.16	0.27	0.50	0.87
Toluene	0.16	0.53	0.59	2.0
Tetrachloroethene	0.16	0.35	1.1	2.4
m,p-Xylene	0.16	0.26	0.68	1.1

Client Sample ID: IA2016_20200814

Lab ID#: 2008455-07B

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

Client Sample ID: IA2016_20200814

Lab ID#: 2008455-07B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.031	0.075	0.20	0.47

Client Sample ID: IA2017_20200814

Lab ID#: 2008455-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.74	0.78	3.7	3.9
Freon 11	0.15	0.35	0.84	2.0
Acetone	1.5	6.3	3.5	15
Benzene	0.15	0.22	0.48	0.69
Toluene	0.15	0.80	0.56	3.0
m,p-Xylene	0.15	0.28	0.65	1.2

Client Sample ID: IA2017_20200814

Lab ID#: 2008455-08B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.030	0.073	0.19	0.46

Client Sample ID: IA2081_20200814

Lab ID#: 2008455-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	0.15	0.37	0.86	2.1
Acetone	1.5	6.1	3.6	14
Benzene	0.15	0.21	0.49	0.68
Toluene	0.15	0.48	0.58	1.8

Client Sample ID: IA2081_20200814

Lab ID#: 2008455-09B

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: IA2081_20200814

Lab ID#: 2008455-09B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.031	0.076	0.19	0.48

Client Sample ID: IA2084_20200814

Lab ID#: 2008455-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	0.17	0.32	0.94	1.8
Acetone	1.7	5.7	4.0	14
Benzene	0.17	0.24	0.53	0.78
Toluene	0.17	0.81	0.63	3.0
m,p-Xylene	0.17	0.24	0.72	1.0

Client Sample ID: IA2084_20200814

Lab ID#: 2008455-10B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.033	0.073	0.21	0.46

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Client Sample ID: AA-01_20200814

Lab ID#: 2008455-01A

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

File Name:	**17082508**	**Date of Collection:**	**8/14/20 14:43:00**
Dil. Factor:	**1.72**	**Date of Analysis:**	**8/25/20 03:35 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.86	Not Detected	4.2	Not Detected
Freon 11	0.17	0.29	0.97	1.6
Freon 113	0.17	Not Detected	1.3	Not Detected
Acetone	1.7	5.9	4.1	14
Methylene Chloride	0.34	0.45	1.2	1.6
1,1,1-Trichloroethane	0.17	Not Detected	0.94	Not Detected
Benzene	0.17	Not Detected	0.55	Not Detected
Toluene	0.17	0.18	0.65	0.66
Tetrachloroethene	0.17	Not Detected	1.2	Not Detected
Chlorobenzene	0.17	Not Detected	0.79	Not Detected
Ethyl Benzene	0.17	Not Detected	0.75	Not Detected
m,p-Xylene	0.17	Not Detected	0.75	Not Detected
o-Xylene	0.17	Not Detected	0.75	Not Detected
1,3-Dichlorobenzene	0.17	Not Detected	1.0	Not Detected
1,4-Dichlorobenzene	0.17	Not Detected	1.0	Not Detected
1,2-Dichlorobenzene	0.17	Not Detected	1.0	Not Detected
1,2,4-Trichlorobenzene	1.7	Not Detected	13	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: AA-01_20200814

Lab ID#: 2008455-01B

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

File Name:	**17082508sim**	**Date of Collection:**	**8/14/20 14:43:00**
Dil. Factor:	**1.72**	**Date of Analysis:**	**8/25/20 03:35 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.017	Not Detected	0.044	Not Detected
1,1-Dichloroethene	0.017	Not Detected	0.068	Not Detected
cis-1,2-Dichloroethene	0.034	Not Detected	0.14	Not Detected
Carbon Tetrachloride	0.034	0.072	0.22	0.46
Trichloroethene	0.034	Not Detected	0.18	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: EB-01_20200814

Lab ID#: 2008455-02A

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

File Name:	**17082410**	**Date of Collection:**	**8/14/20 14:09:00**
Dil. Factor:	**2.03**	**Date of Analysis:**	**8/24/20 02:27 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.0	Not Detected	5.0	Not Detected
Freon 11	0.20	Not Detected	1.1	Not Detected
Freon 113	0.20	Not Detected	1.6	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
Methylene Chloride	0.41	Not Detected	1.4	Not Detected
1,1,1-Trichloroethane	0.20	Not Detected	1.1	Not Detected
Benzene	0.20	Not Detected	0.65	Not Detected
Toluene	0.20	Not Detected	0.76	Not Detected
Tetrachloroethene	0.20	Not Detected	1.4	Not Detected
Chlorobenzene	0.20	Not Detected	0.93	Not Detected
Ethyl Benzene	0.20	Not Detected	0.88	Not Detected
m,p-Xylene	0.20	Not Detected	0.88	Not Detected
o-Xylene	0.20	Not Detected	0.88	Not Detected
1,3-Dichlorobenzene	0.20	Not Detected	1.2	Not Detected
1,4-Dichlorobenzene	0.20	Not Detected	1.2	Not Detected
1,2-Dichlorobenzene	0.20	Not Detected	1.2	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: EB-01_20200814

Lab ID#: 2008455-02B

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

File Name:	**17082410sim**	**Date of Collection:**	**8/14/20 14:09:00**
Dil. Factor:	**2.03**	**Date of Analysis:**	**8/24/20 02:27 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.020	Not Detected	0.052	Not Detected
1,1-Dichloroethene	0.020	Not Detected	0.080	Not Detected
cis-1,2-Dichloroethene	0.041	Not Detected	0.16	Not Detected
Carbon Tetrachloride	0.041	Not Detected	0.26	Not Detected
Trichloroethene	0.041	Not Detected	0.22	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	107	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: FD-01_20200814

Lab ID#: 2008455-03A

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

File Name:	**17082509**	**Date of Collection:**	**8/14/20 14:17:00**
Dil. Factor:	**1.61**	**Date of Analysis:**	**8/25/20 04:15 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.80	Not Detected	4.0	Not Detected
Freon 11	0.16	0.35	0.90	2.0
Freon 113	0.16	Not Detected	1.2	Not Detected
Acetone	1.6	8.6	3.8	20
Methylene Chloride	0.32	Not Detected	1.1	Not Detected
1,1,1-Trichloroethane	0.16	Not Detected	0.88	Not Detected
Benzene	0.16	0.30	0.51	0.97
Toluene	0.16	0.85	0.61	3.2
Tetrachloroethene	0.16	Not Detected	1.1	Not Detected
Chlorobenzene	0.16	Not Detected	0.74	Not Detected
Ethyl Benzene	0.16	Not Detected	0.70	Not Detected
m,p-Xylene	0.16	0.22	0.70	0.93
o-Xylene	0.16	Not Detected	0.70	Not Detected
1,3-Dichlorobenzene	0.16	Not Detected	0.97	Not Detected
1,4-Dichlorobenzene	0.16	Not Detected	0.97	Not Detected
1,2-Dichlorobenzene	0.16	Not Detected	0.97	Not Detected
1,2,4-Trichlorobenzene	1.6	Not Detected	12	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: FD-01_20200814

Lab ID#: 2008455-03B

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

File Name:	**17082509sim**	**Date of Collection:**	**8/14/20 14:17:00**
Dil. Factor:	**1.61**	**Date of Analysis:**	**8/25/20 04:15 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.016	Not Detected	0.041	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.064	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.13	Not Detected
Carbon Tetrachloride	0.032	0.073	0.20	0.46
Trichloroethene	0.032	Not Detected	0.17	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: IA2013_20200814

Lab ID#: 2008455-04A

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

File Name:	**17082510**	**Date of Collection:**	**8/14/20 14:28:00**
Dil. Factor:	**1.51**	**Date of Analysis:**	**8/25/20 04:54 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.76	Not Detected	3.7	Not Detected
Freon 11	0.15	4.3	0.85	24
Freon 113	0.15	Not Detected	1.2	Not Detected
Acetone	1.5	7.3	3.6	17
Methylene Chloride	0.30	Not Detected	1.0	Not Detected
1,1,1-Trichloroethane	0.15	Not Detected	0.82	Not Detected
Benzene	0.15	0.29	0.48	0.94
Toluene	0.15	0.52	0.57	1.9
Tetrachloroethene	0.15	0.46	1.0	3.1
Chlorobenzene	0.15	Not Detected	0.70	Not Detected
Ethyl Benzene	0.15	Not Detected	0.66	Not Detected
m,p-Xylene	0.15	0.24	0.66	1.0
o-Xylene	0.15	Not Detected	0.66	Not Detected
1,3-Dichlorobenzene	0.15	Not Detected	0.91	Not Detected
1,4-Dichlorobenzene	0.15	Not Detected	0.91	Not Detected
1,2-Dichlorobenzene	0.15	Not Detected	0.91	Not Detected
1,2,4-Trichlorobenzene	1.5	Not Detected	11	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: IA2013_20200814

Lab ID#: 2008455-04B

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

File Name:	**17082510sim**	**Date of Collection:**	**8/14/20 14:28:00**
Dil. Factor:	**1.51**	**Date of Analysis:**	**8/25/20 04:54 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.015	Not Detected	0.038	Not Detected
1,1-Dichloroethene	0.015	Not Detected	0.060	Not Detected
cis-1,2-Dichloroethene	0.030	Not Detected	0.12	Not Detected
Carbon Tetrachloride	0.030	0.074	0.19	0.46
Trichloroethene	0.030	Not Detected	0.16	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: IA2014_20200814

Lab ID#: 2008455-05A

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

File Name:	**17082409**	**Date of Collection:**	**8/14/20 14:31:00**
Dil. Factor:	**1.61**	**Date of Analysis:**	**8/24/20 01:48 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.80	Not Detected	4.0	Not Detected
Freon 11	0.16	5.1	0.90	28
Freon 113	0.16	Not Detected	1.2	Not Detected
Acetone	1.6	6.8	3.8	16
Methylene Chloride	0.32	0.65	1.1	2.3
1,1,1-Trichloroethane	0.16	Not Detected	0.88	Not Detected
Benzene	0.16	0.25	0.51	0.80
Toluene	0.16	0.52	0.61	2.0
Tetrachloroethene	0.16	0.36	1.1	2.4
Chlorobenzene	0.16	Not Detected	0.74	Not Detected
Ethyl Benzene	0.16	Not Detected	0.70	Not Detected
m,p-Xylene	0.16	0.26	0.70	1.1
o-Xylene	0.16	Not Detected	0.70	Not Detected
1,3-Dichlorobenzene	0.16	Not Detected	0.97	Not Detected
1,4-Dichlorobenzene	0.16	Not Detected	0.97	Not Detected
1,2-Dichlorobenzene	0.16	Not Detected	0.97	Not Detected
1,2,4-Trichlorobenzene	1.6	Not Detected	12	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: IA2014_20200814

Lab ID#: 2008455-05B

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

File Name:	**17082409sim**	**Date of Collection: 8/14/20 14:31:00**	
Dil. Factor:	**1.61**	**Date of Analysis: 8/24/20 01:48 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.016	Not Detected	0.041	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.064	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.13	Not Detected
Carbon Tetrachloride	0.032	0.074	0.20	0.46
Trichloroethene	0.032	Not Detected	0.17	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: IA2015_20200814

Lab ID#: 2008455-06A

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

File Name:	**17082511**	**Date of Collection:**	**8/14/20 14:34:00**
Dil. Factor:	**1.61**	**Date of Analysis:**	**8/25/20 05:34 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.80	Not Detected	4.0	Not Detected
Freon 11	0.16	2.6	0.90	15
Freon 113	0.16	Not Detected	1.2	Not Detected
Acetone	1.6	8.4	3.8	20
Methylene Chloride	0.32	Not Detected	1.1	Not Detected
1,1,1-Trichloroethane	0.16	Not Detected	0.88	Not Detected
Benzene	0.16	0.28	0.51	0.88
Toluene	0.16	0.59	0.61	2.2
Tetrachloroethene	0.16	0.35	1.1	2.4
Chlorobenzene	0.16	Not Detected	0.74	Not Detected
Ethyl Benzene	0.16	Not Detected	0.70	Not Detected
m,p-Xylene	0.16	0.19	0.70	0.81
o-Xylene	0.16	Not Detected	0.70	Not Detected
1,3-Dichlorobenzene	0.16	Not Detected	0.97	Not Detected
1,4-Dichlorobenzene	0.16	Not Detected	0.97	Not Detected
1,2-Dichlorobenzene	0.16	Not Detected	0.97	Not Detected
1,2,4-Trichlorobenzene	1.6	Not Detected	12	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: IA2015_20200814

Lab ID#: 2008455-06B

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

File Name:	**17082511sim**	**Date of Collection: 8/14/20 14:34:00**	
Dil. Factor:	**1.61**	**Date of Analysis: 8/25/20 05:34 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.016	Not Detected	0.041	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.064	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.13	Not Detected
Carbon Tetrachloride	0.032	0.074	0.20	0.47
Trichloroethene	0.032	Not Detected	0.17	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: IA2016_20200814

Lab ID#: 2008455-07A

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

File Name:	**17082512**	**Date of Collection:**	**8/14/20 14:33:00**
Dil. Factor:	**1.57**	**Date of Analysis:**	**8/25/20 06:14 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.78	Not Detected	3.9	Not Detected
Freon 11	0.16	4.6	0.88	26
Freon 113	0.16	Not Detected	1.2	Not Detected
Acetone	1.6	8.0	3.7	19
Methylene Chloride	0.31	Not Detected	1.1	Not Detected
1,1,1-Trichloroethane	0.16	Not Detected	0.86	Not Detected
Benzene	0.16	0.27	0.50	0.87
Toluene	0.16	0.53	0.59	2.0
Tetrachloroethene	0.16	0.35	1.1	2.4
Chlorobenzene	0.16	Not Detected	0.72	Not Detected
Ethyl Benzene	0.16	Not Detected	0.68	Not Detected
m,p-Xylene	0.16	0.26	0.68	1.1
o-Xylene	0.16	Not Detected	0.68	Not Detected
1,3-Dichlorobenzene	0.16	Not Detected	0.94	Not Detected
1,4-Dichlorobenzene	0.16	Not Detected	0.94	Not Detected
1,2-Dichlorobenzene	0.16	Not Detected	0.94	Not Detected
1,2,4-Trichlorobenzene	1.6	Not Detected	12	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: IA2016_20200814

Lab ID#: 2008455-07B

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

File Name:	**17082512sim**	**Date of Collection:**	**8/14/20 14:33:00**
Dil. Factor:	**1.57**	**Date of Analysis:**	**8/25/20 06:14 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.016	Not Detected	0.040	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.062	Not Detected
cis-1,2-Dichloroethene	0.031	Not Detected	0.12	Not Detected
Carbon Tetrachloride	0.031	0.075	0.20	0.47
Trichloroethene	0.031	Not Detected	0.17	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: IA2017_20200814

Lab ID#: 2008455-08A

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

File Name:	**17082513**	**Date of Collection:**	**8/14/20 14:17:00**
Dil. Factor:	**1.49**	**Date of Analysis:**	**8/25/20 06:53 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.74	0.78	3.7	3.9
Freon 11	0.15	0.35	0.84	2.0
Freon 113	0.15	Not Detected	1.1	Not Detected
Acetone	1.5	6.3	3.5	15
Methylene Chloride	0.30	Not Detected	1.0	Not Detected
1,1,1-Trichloroethane	0.15	Not Detected	0.81	Not Detected
Benzene	0.15	0.22	0.48	0.69
Toluene	0.15	0.80	0.56	3.0
Tetrachloroethene	0.15	Not Detected	1.0	Not Detected
Chlorobenzene	0.15	Not Detected	0.68	Not Detected
Ethyl Benzene	0.15	Not Detected	0.65	Not Detected
m,p-Xylene	0.15	0.28	0.65	1.2
o-Xylene	0.15	Not Detected	0.65	Not Detected
1,3-Dichlorobenzene	0.15	Not Detected	0.90	Not Detected
1,4-Dichlorobenzene	0.15	Not Detected	0.90	Not Detected
1,2-Dichlorobenzene	0.15	Not Detected	0.90	Not Detected
1,2,4-Trichlorobenzene	1.5	Not Detected	11	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	91	70-130

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Client Sample ID: IA2017_20200814

Lab ID#: 2008455-08B

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

File Name:	**17082513sim**	**Date of Collection:**	**8/14/20 14:17:00**
Dil. Factor:	**1.49**	**Date of Analysis:**	**8/25/20 06:53 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.015	Not Detected	0.038	Not Detected
1,1-Dichloroethene	0.015	Not Detected	0.059	Not Detected
cis-1,2-Dichloroethene	0.030	Not Detected	0.12	Not Detected
Carbon Tetrachloride	0.030	0.073	0.19	0.46
Trichloroethene	0.030	Not Detected	0.16	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	92	70-130

eurofins | Air Toxics

Client Sample ID: IA2081_20200814

Lab ID#: 2008455-09A

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

File Name:	**17082514**	**Date of Collection:**	**8/14/20 14:19:00**
Dil. Factor:	**1.53**	**Date of Analysis:**	**8/25/20 07:33 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.76	Not Detected	3.8	Not Detected
Freon 11	0.15	0.37	0.86	2.1
Freon 113	0.15	Not Detected	1.2	Not Detected
Acetone	1.5	6.1	3.6	14
Methylene Chloride	0.31	Not Detected	1.1	Not Detected
1,1,1-Trichloroethane	0.15	Not Detected	0.83	Not Detected
Benzene	0.15	0.21	0.49	0.68
Toluene	0.15	0.48	0.58	1.8
Tetrachloroethene	0.15	Not Detected	1.0	Not Detected
Chlorobenzene	0.15	Not Detected	0.70	Not Detected
Ethyl Benzene	0.15	Not Detected	0.66	Not Detected
m,p-Xylene	0.15	Not Detected	0.66	Not Detected
o-Xylene	0.15	Not Detected	0.66	Not Detected
1,3-Dichlorobenzene	0.15	Not Detected	0.92	Not Detected
1,4-Dichlorobenzene	0.15	Not Detected	0.92	Not Detected
1,2-Dichlorobenzene	0.15	Not Detected	0.92	Not Detected
1,2,4-Trichlorobenzene	1.5	Not Detected	11	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: IA2081_20200814

Lab ID#: 2008455-09B

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

File Name:	**17082514sim**	**Date of Collection:**	**8/14/20 14:19:00**
Dil. Factor:	**1.53**	**Date of Analysis:**	**8/25/20 07:33 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.015	Not Detected	0.039	Not Detected
1,1-Dichloroethene	0.015	Not Detected	0.061	Not Detected
cis-1,2-Dichloroethene	0.031	Not Detected	0.12	Not Detected
Carbon Tetrachloride	0.031	0.076	0.19	0.48
Trichloroethene	0.031	Not Detected	0.16	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: IA2084_20200814

Lab ID#: 2008455-10A

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

File Name:	**17082408**	**Date of Collection:**	**8/14/20 14:44:00**
Dil. Factor:	**1.67**	**Date of Analysis:**	**8/24/20 01:09 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.84	Not Detected	4.1	Not Detected
Freon 11	0.17	0.32	0.94	1.8
Freon 113	0.17	Not Detected	1.3	Not Detected
Acetone	1.7	5.7	4.0	14
Methylene Chloride	0.33	Not Detected	1.2	Not Detected
1,1,1-Trichloroethane	0.17	Not Detected	0.91	Not Detected
Benzene	0.17	0.24	0.53	0.78
Toluene	0.17	0.81	0.63	3.0
Tetrachloroethene	0.17	Not Detected	1.1	Not Detected
Chlorobenzene	0.17	Not Detected	0.77	Not Detected
Ethyl Benzene	0.17	Not Detected	0.72	Not Detected
m,p-Xylene	0.17	0.24	0.72	1.0
o-Xylene	0.17	Not Detected	0.72	Not Detected
1,3-Dichlorobenzene	0.17	Not Detected	1.0	Not Detected
1,4-Dichlorobenzene	0.17	Not Detected	1.0	Not Detected
1,2-Dichlorobenzene	0.17	Not Detected	1.0	Not Detected
1,2,4-Trichlorobenzene	1.7	Not Detected	12	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: IA2084_20200814

Lab ID#: 2008455-10B

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

File Name:	**17082408sim**	**Date of Collection:**	**8/14/20 14:44:00**
Dil. Factor:	**1.67**	**Date of Analysis:**	**8/24/20 01:09 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.017	Not Detected	0.043	Not Detected
1,1-Dichloroethene	0.017	Not Detected	0.066	Not Detected
cis-1,2-Dichloroethene	0.033	Not Detected	0.13	Not Detected
Carbon Tetrachloride	0.033	0.073	0.21	0.46
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	103	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2008455-11A

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

File Name:	**17082407a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/24/20 12:04 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	1.0	Not Detected	7.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2008455-11B

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

File Name:	**17082407sima**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/24/20 12:04 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	104	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2008455-11C

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

File Name:	**17082507a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/25/20 01:53 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	1.0	Not Detected	7.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2008455-11D

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

File Name:	**17082507sima**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/25/20 01:53 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	104	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: CCV

Lab ID#: 2008455-12A

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

File Name:	**17082402**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/24/20 08:39 AM**	

Compound	%Recovery
Freon 12	105
Freon 11	102
Freon 113	100
Acetone	94
Methylene Chloride	100
1,1,1-Trichloroethane	100
Benzene	120
Toluene	109
Tetrachloroethene	105
Chlorobenzene	106
Ethyl Benzene	101
m,p-Xylene	102
o-Xylene	94
1,3-Dichlorobenzene	102
1,4-Dichlorobenzene	101
1,2-Dichlorobenzene	105
1,2,4-Trichlorobenzene	90

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	109	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: CCV

Lab ID#: 2008455-12B

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

File Name:	**17082402sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/24/20 08:39 AM**	

Compound	%Recovery
Vinyl Chloride	102
1,1-Dichloroethene	82
cis-1,2-Dichloroethene	90
Carbon Tetrachloride	79
Trichloroethene	98

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	111	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: CCV

Lab ID#: 2008455-12C

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

File Name:	**17082502**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/25/20 10:37 AM**	

Compound	%Recovery
Freon 12	106
Freon 11	105
Freon 113	101
Acetone	96
Methylene Chloride	104
1,1,1-Trichloroethane	103
Benzene	118
Toluene	108
Tetrachloroethene	104
Chlorobenzene	107
Ethyl Benzene	100
m,p-Xylene	100
o-Xylene	93
1,3-Dichlorobenzene	102
1,4-Dichlorobenzene	100
1,2-Dichlorobenzene	105
1,2,4-Trichlorobenzene	89

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	107	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: CCV

Lab ID#: 2008455-12D

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

File Name:	**17082502sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/25/20 10:37 AM**	

Compound	%Recovery
Vinyl Chloride	101
1,1-Dichloroethene	82
cis-1,2-Dichloroethene	90
Carbon Tetrachloride	78
Trichloroethene	98

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	110	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCS

Lab ID#: 2008455-13A

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

File Name:	**17082404**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/24/20 09:56 AM**	

Compound	%Recovery	Method Limits
Freon 12	103	70-130
Freon 11	104	70-130
Freon 113	98	70-130
Acetone	91	70-130
Methylene Chloride	101	70-130
1,1,1-Trichloroethane	102	70-130
Benzene	121	70-130
Toluene	110	70-130
Tetrachloroethene	107	70-130
Chlorobenzene	106	70-130
Ethyl Benzene	105	70-130
m,p-Xylene	104	70-130
o-Xylene	98	70-130
1,3-Dichlorobenzene	95	70-130
1,4-Dichlorobenzene	92	70-130
1,2-Dichlorobenzene	93	70-130
1,2,4-Trichlorobenzene	88	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	107	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCSD

Lab ID#: 2008455-13AA

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

File Name:	**17082405**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/24/20 10:47 AM**	

Compound	%Recovery	Method Limits
Freon 12	108	70-130
Freon 11	106	70-130
Freon 113	100	70-130
Acetone	96	70-130
Methylene Chloride	104	70-130
1,1,1-Trichloroethane	102	70-130
Benzene	119	70-130
Toluene	110	70-130
Tetrachloroethene	108	70-130
Chlorobenzene	108	70-130
Ethyl Benzene	106	70-130
m,p-Xylene	103	70-130
o-Xylene	99	70-130
1,3-Dichlorobenzene	108	70-130
1,4-Dichlorobenzene	105	70-130
1,2-Dichlorobenzene	106	70-130
1,2,4-Trichlorobenzene	90	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCS

Lab ID#: 2008455-13B

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

File Name:	**17082404sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/24/20 09:56 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	106	70-130
1,1-Dichloroethene	84	70-130
cis-1,2-Dichloroethene	83	70-130
Carbon Tetrachloride	101	60-140
Trichloroethene	101	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	108	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCSD

Lab ID#: 2008455-13BB

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

File Name:	**17082405sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/24/20 10:47 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	107	70-130
1,1-Dichloroethene	84	70-130
cis-1,2-Dichloroethene	83	70-130
Carbon Tetrachloride	101	60-140
Trichloroethene	100	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	107	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCS

Lab ID#: 2008455-13C

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

File Name:	**17082504**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/25/20 11:55 AM**	

Compound	%Recovery	Method Limits
Freon 12	108	70-130
Freon 11	108	70-130
Freon 113	101	70-130
Acetone	94	70-130
Methylene Chloride	104	70-130
1,1,1-Trichloroethane	105	70-130
Benzene	117	70-130
Toluene	109	70-130
Tetrachloroethene	108	70-130
Chlorobenzene	110	70-130
Ethyl Benzene	105	70-130
m,p-Xylene	102	70-130
o-Xylene	97	70-130
1,3-Dichlorobenzene	106	70-130
1,4-Dichlorobenzene	104	70-130
1,2-Dichlorobenzene	103	70-130
1,2,4-Trichlorobenzene	85	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	107	70-130
4-Bromofluorobenzene	96	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 2008455-13CC

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

File Name:	**17082505**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/25/20 12:34 PM**	

Compound	%Recovery	Method Limits
Freon 12	105	70-130
Freon 11	104	70-130
Freon 113	99	70-130
Acetone	94	70-130
Methylene Chloride	102	70-130
1,1,1-Trichloroethane	102	70-130
Benzene	119	70-130
Toluene	108	70-130
Tetrachloroethene	107	70-130
Chlorobenzene	109	70-130
Ethyl Benzene	105	70-130
m,p-Xylene	104	70-130
o-Xylene	99	70-130
1,3-Dichlorobenzene	105	70-130
1,4-Dichlorobenzene	106	70-130
1,2-Dichlorobenzene	104	70-130
1,2,4-Trichlorobenzene	89	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	96	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 2008455-13D

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

File Name:	**17082504sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/25/20 11:55 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	106	70-130
1,1-Dichloroethene	84	70-130
cis-1,2-Dichloroethene	83	70-130
Carbon Tetrachloride	101	60-140
Trichloroethene	100	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	108	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: LCSD

Lab ID#: 2008455-13DD

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

File Name:	**17082505sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/25/20 12:34 PM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	106	70-130
1,1-Dichloroethene	85	70-130
cis-1,2-Dichloroethene	84	70-130
Carbon Tetrachloride	101	60-140
Trichloroethene	100	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	108	70-130
4-Bromofluorobenzene	96	70-130

APPENDIX D

DATA USABILITY SUMMARY REPORT

Data Usability Summary Report (DUSR)

Client:	Sanborn, Head & Associates, Inc., Concord, New Hampshire (SHA)
Site:	Former IBM East Fishkills Facility, Hopewell Junction, New York Building 310
Laboratory:	Eurofins Air Toxics, Inc. (EATL), Folsom, California
Lab SDG / Work Order:	2008455
Date(s) of Collection:	August 14, 2020
Number and type Samples & analyses:	8 Indoor Air, 1 Ambient Air, and 1 Field Blank sample for twenty-two project-specific VOCs by Method TO-15 Hi/Lo
Senior Data Reviewers:	Dr. Nancy C. Rothman, New Environmental Horizons, Inc. Susan D. Chapnick, New Environmental Horizons, Inc.
Date Completed:	September 22, 2020

This Data Usability Summary Report (DUSR) is based on guidance developed by the New York State Department of Conservation (NYSDEC), June 1999, for technical review of analytical data and consistent with the requirements set forth in NYSDEC Technical Guidance for Site Investigation and Remediation, DER-10, Appendix 2B (May 2010). The objective of the DUSR is to determine whether or not the data as presented meet the Work Plan or EPA method QC acceptance criteria.

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I. Required DUSR Questions

1. ***Is the data package complete as defined under the requirements for the most current NYSDEC ASP Category B or USEPA CLP deliverables?***

   Yes.

2. ***Have all holding times been met?***

   Yes.

3. ***Do all the QC data: blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?***

   Yes, in general except some QC exceptions resulted in qualification of data as noted in the Data Validation Checklist (DV Checklist).

4. ***Have all of the data been generated using established and agreed upon analytical protocols?***

   Yes. Analytical data were generated using established EPA Methods (see analytical references in Section II below). Deviations from EPA and NYSDEC ASP 2005 QC protocols are discussed in the DV Checklist of this DUSR.

5. ***Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?***

   Yes. The raw data were checked to verify that detected results met retention time and mass spectral criteria, where applicable, for qualitative identification. A spot check was performed to verify quantitative accuracy for reporting of all results (see the DV Checklist).

6. ***Have the correct data qualifiers been used and are they consistent with the most current NYSDEC ASP?***

   Yes. The laboratory used the correct data qualifiers in reporting of results.

7. ***Have any quality control (QC) exceedances been specifically noted in the DUSR and have the corresponding QC summary sheets from the data package been attached to the DUSR?***

   Yes. QC exceedances are specified in the DV Checklist. QC summary sheets from the data package have not been attached; however, all QC exceedances that required data qualification are summarized in Table 2 of the DUSR and flagged in the validated electronic data deliverable (EDD).

II. Sample Descriptions and Analytical Parameters

The sample IDs, date of sampling, identification of quality control (QC) samples, if applicable, and the analytical parameters reviewed in this DUSR are listed in Table 1. Any deviations noted for sample collection or receipt (*e.g.*, temperature or preservation issues) are included in Section III, below.

Table 1. Sample Descriptions and Analytical Parameters

Sample ID	Sample ID	Collection Date	Matrix	Analytical Parameters	Sample Type
AA-01_20200814	2008455-01	8/14/2020	Ambient Air	VOCs	Field Sample
EB-01_20200814	2008455-02	8/14/2020	Air	VOCs	Field Blank
FD-01_20200814	2008455-03	8/14/2020	Indoor Air	VOCs	Field Duplicate of IA2017_20200814
IA2013_20200814	2008455-04	8/14/2020	Indoor Air	VOCs	Field Sample
IA2014_20200814	2008455-05	8/14/2020	Indoor Air	VOCs	Field Sample
IA2015_20200814	2008455-06	8/14/2020	Indoor Air	VOCs	Field Sample
IA2016_20200814	2008455-07	8/14/2020	Indoor Air	VOCs	Field Sample
IA2017_20200814	2008455-08	8/14/2020	Indoor Air	VOCs	Field Sample
IA2081_20200814	2008455-09	8/14/2020	Indoor Air	VOCs	Field Sample
IA2084_20200814	2008455-10	8/14/2020	Indoor Air	VOCs	Field Blank

Analytical method reference:

VOC: TO-15 Hi/Lo – Method TO-15 with simultaneous Full Scan and Selected Ion Monitoring (SIM) analysis for twenty-two project-specific VOCs (see Table in the DV Checklist for complete list of VOCs).

III. Data Deficiencies, Analytical Protocol Deviations, and Quality Control Problems

The following QC elements, as applicable to the analytical methods, were reviewed during this validation:

- Data package completeness and reporting protocols
- Sample receipt, holding times, and canister condition
- Calibration criteria (instrument tuning, initial and continuing calibration verifications)
- Method and field blank results
- Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) and Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Recoveries and Precision
- Internal Standard (IS) and Surrogate Recoveries
- Sample/Laboratory Duplicate (LD) or sample/Field Duplicate (FD) Relative Percent Differences (RPDs)
- Sample result reporting (including reporting limits and units)
- Other method-specific QC if applicable and reported
- Deficiencies or protocol deviations as noted in the Laboratory Narrative

During this review of VOCs several results were estimated (J or UJ) due to QC issues. Table 2 summarizes the actions taken during this review. NEH generated validated data spreadsheets based on the electronic project database files received from SHA for these Work Orders. All results were considered acceptable compared to QAPP and method criteria and usable for project decisions with the understanding of the potential uncertainty (bias) in the qualified results.

The attached Data Review Checklist documents the method and matrix-specific QC reviewed and the issues that required action (as listed in Table 2) or affected the data certainty in terms of data quality objectives (DQO) of accuracy, precision, and sensitivity.

The laboratory reported results for 22 project-specific VOCs from a single analysis with two mass spectrometer (MS) detectors, each operated in a different detection mode: one operated in the full scan electron impact mode and the other operated in the Selected Ion Monitoring (SIM) mode. This analysis, called TO-15 Hi/Lo by ATL, allowed the sensitivity requirements of the project, unless otherwise discussed in this report, to be met for all of the compounds. The Data Review Checklist indicates the compounds reported from each of the two modes of MS operation. The full scan analysis was reported with an “A” suffix and the SIM analysis with a “B” suffix appended to the laboratory sample ID.

All non-detects were reported at levels below the Project required RLs (as shown in Table B.1 of the QAPP) except for Freon 12 and 1,2,4-trichloreobenzene in all samples due to calibration issues causing project sensitivity requirements to not be met for these compounds. The data users will need to evaluate the Freon 12 and 1,2,4-trichlorobenzene non-detects above project sensitivity criteria for project uses.

All other quality control information associated with accuracy, precision, and sensitivity for the VOCs reported met method and QAPP criteria for the samples in these Work Orders with the exceptions included in Table 2.

Table 2. Summary of Data Validation Actions

Field Sample ID	Analyte	Qualifier	Bias	Validation Comments
AA-01_20200814 EB-01_20200814 IA2013_20200814 IA2014_20200814 IA2015_20200814 IA2016_20200814 IA2081_20200814 IA2084_20200814	Acetone	J or UJ	I	Initial Calibration outside criteria
FD-01_20200814 IA2017_20200814	Acetone	J	I	Initial Calibration outside criteria + FD imprecision

Qualifiers: *U = analyte is non-detect at the sample-specific Reporting Limit (usable); UJ = non-detect is usable as an estimated value; J = result is usable as an estimated value with indeterminate bias; J+ = result is usable as an estimated value with possible high bias; J- = result is usable as an estimated value with possible low bias; JN = the analyte has been "tentatively identified" and the result is usable as an estimated value with indeterminate bias; R = result is rejected due to severe QC exceedance and unusable for project decisions.*

Bias: *L = Low; H = High; I = Indeterminate*

Abbreviations used in Table 2:
FD = Field Duplicate

Former IBM B310 - East Fishkill Facility, Hopewell Junction, New York

Date Sampled: 8/14/2020

No. Samples 7IA + 1FD + 1AA + 1FB

Method of Analysis: TO-15 SIM

Data Element Acceptable	Canister Receipt	HT	GC/MS Tunes + Calibrations	Internal Stds + Surrogates	LCS	Lab Dup (LCS and LD)	Field Duplicates	RL & Quant.
Yes	√	√		√	√	√		
No			Estimate (J or UJ) 10 results				Estimate (J) 2 results	Freon 12 & 1,2,4-Trichloro-benzene RLs > Proj. Req. RLs

Other Issues :

Blank Action: none

A combined Full Scan and SIM Analysis was performed for each sample for 22 Project-specific VOCs listed in Table B.1 of the Work Plan, as shown on the second to last page of this checklist. The full scan analysis was reported with an "A" suffix and the SIM analysis with a "B" suffix appended to the laboratory sample ID.

Data usability review was performed on Quality Control forms associated with this data package, which involved evaluation of the following (where applicable): agreement of analyses conducted with COC requests; Holding times and sample preservation; Laboratory blanks/equipment blanks/ field blanks results compared to field sample results; Field duplicate results; Quantitation limits and sample results; Surrogate and Internal Standard recoveries; LCS/LCSD results; Laboratory duplicate results; instrument tuning and calibration information; sample chromatograms; and laboratory qualifiers applied to the dataset. The project narrative was also reviewed to determine whether additional issues were found that were not reported in the QC previously evaluated. This review is consistent with the requirements set forth in NYSDEC Technical Guidance for Site Investigation and Remediation, DER-10, Appendix 2B (May 2010).

Data Package Completeness: All required forms (results, summary QC, COC), as needed to validate the data in accordance with NYSDEC ASP and the Work Plan were present in the data package. The laboratory provided the equivalent of the Category B deliverable.

Sample receipt: The 10 6-L canisters were received intact and in good condition on 8/18/2020. The sample IDs in the EDD were amended by SHA to add the date of sample collection to the IDs (e.g., FD-01 reported on the COC and canister label was reported in the EDD as FD-01_20200814). There were no issues noted with sample receiving.

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Associated Blanks: Method Blanks: 17082407a/17082407sima & 17082507a/17082507sima

FB = EB-01_20200814

Blank ID	Contaminant / Level (µg/m^3)		Action Level DF=		Sample and reported result (µg/m3)	Corrected Database Result
17082407a	None				No Blank Action Required	
17082407sima	None				No Blank Action Required	
17082507a	None				No Blank Action Required	
17082507sima	None				No Blank Action Required	
EB-01_20200814	None				No Blank Action Required	

Additional Notes:

Certification: Canisters were each Certified pre-cleaned on 8/8/2020 prior to shipment to the field indicating all 22 target VOCs were non-detect prior to use.

Sample Integrity: All samples were collected for about 8 hours on 8/14/2020 except for FD-01, which was collected for 7.5 hours. The field receipt vacuums (26 - 30 "Hg), field final vacuums (3.0-10 "Hg) and lab receipt vacuums (3.1-10 "Hg) were acceptable. All canisters were over-pressurized prior to analysis (final pressures ranged from 4.7 to 5 psi). No Action required.

Holding Time (HT): Samples were analyzed on 8/25/2020; therefore HT was met. No Action required.

BFB Tunes: Instrument MSD-17 tunes (1 ICAL + 2 CCV). Method TO-15 tune criteria used and tunes were acquired properly (average of 3 scans across BFB peak with background subtraction). All criteria in all tunes were met and all samples were analyzed within 12 hours of tune; therefore, No Action Required.

ICALs : Instrument MSD-17 Full Scan and SIM performed on 7/23/2020. Full Scan = 5- to 7-level calibration from 0.1, 0.5, or 1.0 to 40 ppbV for all 22 Target compounds plus several non-target compounds. SIM = 9- to 10-level calibration from 0.005 or 0.01 to 20 ppbV for 3 Targets shown in the Table on page 5 plus 1,1-dichloroethene and cis-1,2-dichloroethene plus several other compounds not reported by SIM. %RSD ≤ 30% for all 22 Target Compounds except for Acetone with %RSD = 32%.
****ACTION: Acetone estimated (J or UJ) in all samples with indeterminate bias due to the Initial Calibration being outside criteria.***

CCVs: 17082402/17082402sim & 170824502/17082502sim - % Recovery 70-130% for all 22 Target compounds - No Action required.

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Additional Notes:

Surrogates & Internal Standards **:** Surrogates (1,2-Dichloroethane-d4, Toluene-d8, and 4-Bromofluorobenzene) had %Recovery within criteria and all 3 IS' (Chlorobenzene-d5, 1,4-Difluorobenzene, and Bromochloromethane) had areas and RTs within criteria in all analyses; therefore, No Action Required.

LCS/LCSD : 17082404/17082405 & 17082404sim/17082405sim and 17082504/17082505 & 17082504sim/17082505sim - %Recovery acceptable for all 22 Targets in both LCS and LCSD and LCS/LCSD RPDs all OK; therefore, acceptable accuracy and precision demonstrated for analysis of the 22 VOCs by full scan and SIM analysis. No Action required.

LD: Not performed for these samples since LCS/LCSD and FD performed allowing precision evaluation.

Compound Reporting: The lab reported results for 22 Target VOCs, as requested in Table B.1 of the Work Plan. 17 compounds were reported from the Full Scan analysis and 5 from the SIM analysis as shown on the second to last page of this DV Checklist.

Qualifier Action: All data were either detect or qualified "U" to indicate the result was non-detect at the sample-specific RL. No additional lab-qualifier action required.

Compound Reporting & Sensitivity: All non-detects were at or below the Project required RL (as shown in Table B.1, which is reproduced on the second to last page of this Checklist) except: Freon 12 and 1,2,4-trichlorobenzene in all samples due to a calibration issues causing project sensitivity requirements to not be met. The data users will need to evaluate these non-detects above project sensitivity criteria for project uses.

Narrative: The narrative did not raise any issues not already addressed or that would affect data quality.

Calculation Verification Checks:

Initial Calibration : Verification MSD-17 SIM ICAL on 7/23/20 for Carbon Tetrachloride with IS Bromochloromethane

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
Std Conc.	0.01	0.02	0.05	0.1	0.5	1	5
Cpd Resp	562	1033	2857	4718	25273	49530	259292
IS Conc.	5	5	5	5	5	5	5
IS Resp	267048	242739	272334	232704	252001	248266	241051
RRF	1.0522	1.0639	1.0491	1.0137	1.0029	0.9975	1.0757

	Level 8	Level 9	Avg. RRF	%RSD
Std Conc.	10	20		
Cpd Resp	516774	1029237		
IS Conc.	5	5		
IS Resp	239841	241986		
RRF	1.0773	1.0633	1.0440	2.98%

√

ICAL verified, no action required

CCV : Verification MSD-17 8/24/20 for 10 ppbV Standard of Freon 11: Response for Compound = 1128298; IS (Bromochloromethane) Response = 168484@5 ppbV; RRF from ICAL = 1.18188

$$\text{Concentration} = \frac{406631 \times 5}{168484 \times 1.18188} = 10.2\text{ppb}$$ √

$$\%\text{Recovery} = \frac{100 \times 10.2}{10} = 102\%$$

QL & Result Verification: IA2016_20200814; Freon 11

Normal 250 mL analyzed (same as for Method Blank) but since canister was over-pressurize, effective DF = 1.57; MWt = 137.38

Sample Response = 119800; IS Response = 171104@ 5; RRF ICAL = 1.18188 Lowest-level ICAL Std = 0.100 ppbV

$$\text{Conc.} = \frac{119800 \times 5 \times 1.57}{171104 \times 1.18188} = 4.65\text{ ppbV}$$

QL = 0.100 x 1.57 = 0.157 ppbV or 0.88 µg/m3 √

$\mu g/m^3$ = (ppbv x Mwt x DF) / 24.45 = (4.65 x 137.38 x 1)/24.45 = 26 $\mu g/m^3$ √

The sample chromatograms, mass spectra of detects and quantitation reports were scanned and data appeared to have been reported correctly. Although TICs were not requested, some samples contained peaks that are not target compounds.

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FD : IA2017_20200814 /FD-01_20200814. A comparison of results for the 22 target compounds is shown below

Field Duplicate Evaluation_ Sample IDs: Sample = IA2017_20200814 FD = FD-01_20200814

Analyte Name	DF= 1.49* RL (µg/m^3)	Sample µg/m^3	Q	Sample Result Level	FD µg/m^3	Q	FD Result Level	RPD	Action **
Freon 12	3.7	3.9		< 5 x RL	4.0	U	RL	NC	None
Freon 11	0.84	2		< 5 x RL	2		< 5 x RL	0.0%	None
Freon 113	1.1	1.1	U	RL	1.2	U	RL	NC	None
Acetone	3.5	15		< 5 x RL	20		> 5 x RL	28.6%	**J Both**
Methylene Chloride	1	1	U	RL	1.1	U	RL	7.7%	None
1,1,1-Trichloroethane	0.81	0.81	U	RL	0.88	U	RL	NC	None
Benzene	0.48	0.69		< 5 x RL	0.97		< 5 x RL	33.7%	None **
Toluene	0.56	3		> 5 x RL	3.2		> 5 x RL	6.5%	None
Tetrachloroethene	1	1	U	RL	1.1	U	RL	NC	None
Chlorobenzene	0.68	0.68	U	RL	0.74	U	RL	NC	None
Ethyl Benzene	0.65	0.65	U	RL	0.70	U	RL	NC	None
m,p-Xylene	0.65	1.2		< 5 x RL	0.93		< 5 x RL	25.4%	None
o-Xylene	0.65	0.65	U	RL	0.70	U	RL	NC	None
1,3-Dichlorobenzene	0.9	0.9	U	RL	0.97	U	RL	NC	None
1,4-Dichlorobenzene	0.9	0.9	U	RL	0.97	U	RL	NC	None
1,2-Dichlorobenzene	0.9	0.9	U	RL	0.97	U	RL	NC	None
1,2,4-Trichlorobenzene	11	11	U	RL	12	U	RL	NC	None
Vinyl Chloride	0.038	0.038	U	RL	0.04	U	RL	NC	None
1,1-Dichloroethene	0.059	0.059	U	RL	0.06	U	RL	NC	None
cis-1,2-Dichloroethene	0.12	0.12	U	RL	0.13	U	RL	NC	None
Carbon Tetrachloride	0.19	0.46		< 5 x RL	0.46		< 5 x RL	0.0%	None
Trichloroethene	0.16	0.16	U	RL	0.17	U	RL	NC	None

* FD DF was 1.61 so RLs for FD are the Sample RLs x 1.61/1.49

**Action only taken if RPD > 20% and one or both samples report values > 5 x RL; Q = Validator Qualifier; NC = Not Calculated

FD precision was acceptable for all 22 project-specific VOCs except for acetone in the FD pair IA20175_20200814 and FD-01_20200814 indicating acceptable precision and representativeness of the samples to the site location for all compounds except acetone.

ACTION: Acetone estimated (J) with indeterminate bias in samples IA2017_20200814 and FD-01_20200814 due to FD imprecision.

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Data Reviewer: ***Nancy C. Rothman, Ph.D.***

Method of Analysis: TO-15 Hi/Lo

Compound List and Project-required Reporting Limits (RL): Table B-1 of Work Plan

Target Analyte Name		Full Scan (Full) or SIM		RL (µg/m^3)	
Tetrachloroethene (PCE)		Full		1.4	
Trichloroethene (TCE)		SIM		0.22	
cis-1,2-Dichloroethene (cDCE)		Full		0.8	*Reported by SIM for this Work Order*
1,1-Dichloroethene (DCE)		Full		0.8	*Reported by SIM for this Work Order*
Vinyl chloride (VC)		SIM		0.06	
1,1,1-Trichloroethane (TCA)		Full		1.1	
Carbon Tetrachloride		SIM		0.2	
Methylene chloride (MeCl)		Full		1.4	
Chlorobenzene		Full		0.92	
1,2,4-Trichlorobenzene		Full		7.4	
1,2-Dichlorobenzene		Full		1.2	
1,3-Dichlorobenzene		Full		1.2	
1,4-Dichlorobenzene		Full		1.2	
Acetone		Full		2.4	
Benzene		Full		0.64	
Ethylbenzene		Full		0.86	
m, p-Xylene		Full		0.86	
o-Xylene		Full		0.86	
Toluene		Full		0.77	
Trichlorofluoromethane (Freon 11)		Full		1.1	
Dichlorodifluoromethane (Freon 12)		Full		1	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)		Full		1.5	

Actions continued (see references below):

Canister Integrity:	If certification forms indicate issues, J/U or UJ results in samples; if Flow controller RPD > 20% for pre- and post-flow calibrations, J detect/UJ non-detects
Canister Vacuum (Vac):	Initial Field Vac < 25" Hg, J/UJ all results; Lab Receipt Vac > 15" Hg, J/UJ results; Lab Receipt Vac > ± 5" Hg of Final Field Vac, J/UJ results
Hold Time (HT):	HT > 30 days, J detects/ UJ non-detects
Blank Actions:	Sample-specific Blank Action Level = Blank Level x (Sample DF/Blank DF)
	Method Blank (MB): ***If MB < RL*** : and sample < RL, negate (U) result in sample RL; if sample is > RL but < 2 x RL (or 4 x RL for acetone, 2-butanone, and methylene chloride), negate (U) result at level found in sample. ***If MB > RL*** : and sample < RL, negate (U) result in sample RL; if sample is > RL but < Sample-Specific Blank Action Level, negate (U) the sample at the Sample-Specific Blank Action Level.
	Equipment Blank (EB): Result<Blank Action, EB result at level reported in sample
BFB Tune:	SW-846 method 8260B or TO-15 tune criteria not met, professional judgment on R of all data; samples analyzed > 12-hours after tune; professional judgment on J/UJ or R of results
LCS and CCV:	Percent Recovery (%Rec) <10%, J detects, R non-detects; 10% < %Rec <70%; J/UJ all associated data; %Rec >130%, J detects - no action for non-detects
Initial Calibration (ICAL):	%RSD > 30%, J/UJ associated results
Internal Standard (IS):	RT > ±0.33 min of IS RT in daily CCV, J/UJ associated results;
	Area < 25% Area in CCV, J detects, R non-detects (or professional judgment); 25%< Area < 60% of CCV Area, J/UJ associated results; Area > 140% of CCV Area, J detects, no action for non-detects
Surrogates:	%Rec <10%, J detects, R non-detects; 10% < %Rec <70%; J/UJ all associated data; %Rec >130%, J detects - no action for non-detects
Laboratory Duplicates:	LCS/LCSD RPD or Sample/LD RPD > 20% for detects > 5x RL, J associated data; professional judgment for results < 5 x RL
Field Duplicates:	RPD > 20% for detects > 5x RL, J associated data; professional judgment for results < 5 x RL
RLs + Quant:	Compound reported outside calibration range (< RL or at ppbV level > sample-specific highest ICAL standard for compound), J data. Note if RL > expected RL from Table B.1 of Work Plan (see above)
DV Qualifier Definitions:	U = analyte is non-detect at the sample-specific Quantitation Limit (usable); UJ = non-detect is usable as an estimated value; J = result is usable as an estimated value with indeterminate bias; J+ = result is usable as an estimated value with possible high bias; J- = result is usable as an estimated value with possible low bias; NJ = the analyte has been "tentatively identified" and the result is usable as an estimated value with indeterminate bias; and R = result is rejected due to severe QC exceedance and unusable for project objectives. Bias: L = Low; H = High; I = Indeterminate.
References:	*Work Plan, RCRA Facility Investigation (RFI), VOC Source Assessment IBM East Fishkill Facility, Hopewell Junction, New York,* prepared by Sanborn, Head & Associates, June 2009; *NYSDEC Analytical Services Protocol,* June 2005 *with NYSDEC Modifications to the EPA Region 9 TO-15 QA/QC Criteria,* February 2008*; USEPA Region II SOP HW-31, Validating Air Samples, Volatile Organic Analysis of Ambient Air in Canisters by Method TO-15,* Rev. 6, June 2014; *and Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS),* Publication EPA/625/R-96/010b, January 1999

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