8976 Wellington Road
Manassas, VA 20109

November 16, 2018

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: Indoor Air Quality Testing Report - Final
B330C Cozzini Brothers Tenant Space
Former IBM East Fishkill Facility
Hopewell Junction, New York
EPA ID No. NYD00707901

Dear Ms. LaClair:

The enclosed report presents the results of the September 2018 indoor air quality (IAQ) testing that was conducted in Buildings 330C (Cozzini Brothers tenant space) at the Former IBM East Fishkill Facility in Hopewell Junction, New York. B330C is owned by iPark East Fishkill LLC. IAQ testing was conducted in accordance with IBM's Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan dated June 15, 2009.

If you have any questions or need additional information. please contact me at (703) 257-2583.

Sincerely yours,

Dean W Chartrand

Dean W. Chartrand
Program Manager
Corporate Environmental Affairs

Enclosure *Indoor Air Quality Testing Report - Final*
B330C Cozzini Brothers Tenant Space

Cc:	Julia Kenney	NYSDOH	(w/ enclosure via email)
	Mike Buckley	National Resources	(w/ enclosure via email)
	Gary Marone	Global Foundries	(w/ enclosure via email)
	David Shea	Sanborn Head and Associates	(w/ enclosure via email)

SANBORN HEAD ENGINEERING
Building Trust. Engineering Success.

20 Foundry Street
Concord, NH 03301

Dean Chartrand
IBM Corporation
8976 Wellington Road
Manassas, VA 20109

November 14, 2018
File No. 2999.06

Re: Indoor Air Quality Testing Results – FINAL REPORT
Building 330C, Former IBM East Fishkill Facility
Hopewell Junction, NY
EPA ID No. NYD000797901, NYSDEC Site No. 314054

Dear Mr. Chartrand:

This letter transmits the results of indoor air quality (IAQ) testing that was conducted in a portion of Building 330C (B330C) on September 5, 2018 at the former IBM East Fishkill facility. These testing results were originally transmitted to you in a September 27, 2018 letter; this transmittal provides additional information related to the sampling event, including a summary of HVAC operating conditions, data usability review, and photograph log.

B330C is currently owned by iPark East Fishkill LLC, also referred to as National Resources (NR). IAQ testing was conducted in the Cozzini Brothers tenant space, a commercial knife sharpening business, which is housed in IBM's former sintering furnace rooms on the south side of B330C. The purpose of the testing was to assess whether the building modifications made prior to the tenant's occupancy and the tenant's operations have affected the potential for soil vapor intrusion and resulting IAQ. The testing was commissioned by IBM Corporation and conducted by Sanborn, Head Engineering P.C. (SHPC).

The services conducted, and this letter report, are subject to the standard limitations for this type of work described in Attachment 1.

Summary of HVAC Operating Conditions

The Cozzini space is served by 10 rooftop air handling units (RTUs) that were installed as part of the renovation of this tenant space. The table below provides a summary of the areas served, maximum outside air (OA) flow rate (according to mechanical design plans provided by NR dated January 20, 2018), and observed OA and return air (RA) damper position on the day of sampling on September 5, 2018.

Rooftop Air Handling Unit (RTU)[1]	Area Served	Maximum Outside Air (OA) Flow Rating (CFM)[1]	OA Damper Position Observed on 9/5/2018	Return Air (RA) Damper Position Observed on 9/5/2018
1	Production Area - West	500	Closed	Open
2	Production Area - West	500	Closed	Open
3	Production Area - West	500	Closed	Open
4	Production Area - West	500	Closed	Open
5	Production Area - East	500	Closed	Open
6	Production Area - East	500	NR representative unable to locate RTU on sampling date	
7	Production Area - East	500	Closed	Open
8	Storage/Stockroom	0 (heat pump)	NR representative unable to locate RTU on sampling date	
9	Break Room/Restrooms	100	Closed	Open
10	Offices/ Conference Room	500	Closed	Open

Note:
1. RTU numbers and outside air flow rating were obtained from mechanical design plans dated January 20, 2018 provided to IBM by National Resources via e-mail on June 18, 2018.

The RTUs were found to be running on the day of sampling, when the outside air temperature reached a high of 90°F; however, the RTUs are thermostat controlled, and switch on and off depending on the temperature in the building. RTUs #1 and #10 were observed to be switching off and on during the sampling day based on our observations of the RTUs when on the roof to check on the outdoor air sample collection (see below).

Summary of Indoor Air Quality Testing

IAQ testing was conducted in conformance with the procedures described in IBM's RCRA Facility Investigation (RFI) Work Plan, which was approved by the New York State Department of Environmental Conservation and Department of Health. IAQ samples were collected using 6-liter, pre-evacuated, stainless-steel canisters (Summa® canisters) equipped with flow controllers to obtain 8-hour time-averaged samples. Indoor air samples were collected from breathing zone height of 3 to 5 feet above the floor at the four locations shown on attached Figure 1. These locations are identified as follows:

IA0416: storage/loading area
IA0438: production area
IA0486: break room
IA0487: conference room

In addition, an outdoor air sample was collected on the roof of the tenant space proximate to the air intake of air handler RTU-7, which serves the storage/loading area in the eastern production area. A field duplicate sample was collected in the break room (location IA0486).

A photographic log of sampling locations is provided as Attachment 2, and a summary of field sampling information is provided in Table 1.

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 sample results are presented in attached Table 2, and the laboratory report is included as Attachment 3.

Tetrachloroethene (PCE) was detected in each indoor air sample at concentrations ranging from 2.4 to 3.5 µg/m^3. Trichloroethene (TCE) was not detected above the laboratory reporting limit in 3 of the 4 indoor air samples, and was detected in the fourth sample at a concentration of 0.99 µg/m^3. The sample location where TCE was detected (IA0487) was collected in the area served by RTU-10, which was observed to be turning off and on throughout the day.

Quality Assurance/Quality Control

The analytical data were provided to New Environmental Horizons, Inc. (NEH) of Skillman, NJ for an independent, third-party data usability review (i.e., data validation) in accordance with the RFI Work Plan. The data validation report is provided in Attachment 4. The review found that all results were considered usable for project objectives/decisions, with the following qualifications:

- Two results were flagged as estimated (EB) because the Field Blank also reported a result for the same compounds at comparable levels. The affected results have a potential high bias, and are as follows:
  - Acetone – detected at 17 µg/m^3 in AA0402; and
  - Toluene – detected at 1.2 µg/m^3 in IA0487

  This is not considered a significant issue since acetone and toluene are not primary contaminants of concern at the site, AA0402 is an outside air blank, and the results have a high bias, which is a conservative bias.

- Freon 12 was non-detect in ambient air sample AA0402 with a reporting limit (RL) that exceeded the project-specific requirements. This is not considered a significant issue since Freon 12 is not a primary contaminant of concern at the site, and the sample is an outside air blank.

Tenant Notifications

We understand that the property owner, NR, may be 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.

Please contact us if you have any questions.

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

David Shea, P.E.
President

Jennifer H. Sanborn
Sanborn, Head & Associates, Inc.

Encl. Figure 1 – Indoor Air Sample Locations of September 5, 2018
Table 1 – Summary of Confirmatory Indoor Air Sample Information
Table 2 – Summary of 8-Hour Indoor Air Sampling Results
Attachment 1 – Limitations
Attachment 2 – Photograph Log
Attachment 3 – Analytical Laboratory Report
Attachment 4 – Data Validation Report

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N
W E
S

B330C

B338

RTU-10
IA0487 (Conference Room)
IA0416
Production Area East
(Storage/Loading Area)
RTU-5,6,7
RTU-9
RTU-1,2,3,4
Production
Area West
IA0486 (Break Room)
Storage
Room
RTU-8
IA0438

Cozzini Bros.
Tenant Space

Figure 1

Indoor Air Sample Locations of September 5, 2018

Building 330C

Former IBM East Fishkill Facility

Hopewell Junction, New York

Drawn By:	E. Wright
Designed By:	J. Sanborn
Reviewed By:	D. Shea
Project No:	2999.06
Date:	November 2018

Figure Narrative

This figure shows the locations of indoor air samples collected on September 5, 2018 by Sanborn Head Engineeering P.C. on behalf of IBM Corporation. The samples were collected into 6-L SUMMA canisters over a period of approximately 8 hours.

In addition to the indoor air locations shown on the figure, one outdoor air sample was collected on the roof at the outside air intake for air handler RTU-7.

Legend

- Indoor air sample location and designation
- HVAC zone (approximate)
- Occupied area
- Proposed/new tenant spaces

40 20 0 40 80 Feet

SANBORN HEAD ENGINEERING

Table 1
Summary of Indoor Air Sample Information
Building 330C - Cozzini Space
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: September 5, 2018											
Ambient Air	Roof	Ambient Air	N1725	1	7:26	-28	14:59	-4	75	RTU-7-C intake	None observed
Nitrogen Blank	Roof	Nitrogen	N2755	1	7:26	-30	15:00	-10.5	75	RTU-7-C intake	None observed
IA0416	Ground	Indoor Air	O0982	3.5	7:11	-28.5	15:20	-5	70	Production Floor	None observed
IA0438	Ground	Indoor Air	N3480	3	7:18	-30	15:18	-7	70	Production Floor	None observed
IA0486	Ground	Indoor Air	N110	3	7:12	-29.5	15:14	-6	70	Breakroom	None observed
FD0486	Ground	Indoor Air	N3528	3	7:12	-27.5	14:55	-3	70	Breakroom	None observed
IA0487	Ground	Indoor Air	N1593	3	7:09	-29.5	15:12	-5	65	Conference Room	None observed

Notes:

1. Samples were collected by Sanborn, Head Engineering, PC on September 5, 2018.

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.

Table 2
Summary of 8-Hour Indoor Air Sampling Results
Building 330C
Former IBM East Fishkill Facility
Hopewell Junction, New York

Analyte	Field Sample Name	AA0402			IA0416			IA0438			IA0486			IA0486 (Dup)			IA0487			FB0402		
	Collection Date	9/5/2018			9/5/2018			9/5/2018			9/5/2018			9/5/2018			9/5/2018			9/5/2018		
	Units	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias	Result	Qual.	Bias
Acetone	µg/m3	17	EB	H	20			26			22			27			20			20		
Benzene	µg/m3	<0.57	U		0.50			<0.53	U		<0.51	U		<0.55	U		<0.52	U		<0.64	U	
Carbon tetrachloride	µg/m3	0.43			0.43			0.50			0.44			0.44			0.45			<0.25	U	
Chlorobenzene (Monochlorobenzene)	µg/m3	<0.82	U		<0.72	U		<0.76	U		<0.74	U		<0.79	U		<0.74	U		<0.92	U	
Dichlorobenzene (1,2-)	µg/m3	<1.1	U		<0.94	U		<1.0	U		<0.97	U		<1.0	U		<0.97	U		<1.2	U	
Dichlorobenzene (1,3-)	µg/m3	<1.1	U		<0.94	U		<1.0	U		<0.97	U		<1.0	U		<0.97	U		<1.2	U	
Dichlorobenzene (1,4-)	µg/m3	<1.1	U		<0.94	U		<1.0	U		<0.97	U		<1.0	U		<0.97	U		<1.2	U	
Dichlorodifluoromethane (CFC12)	µg/m3	<4.4	U		4.2			4.1			4.4			4.7			5.6			<4.9	U	
Dichloroethene (1,1-)	µg/m3	<0.071	U		<0.062	U		<0.066	U		<0.064	U		<0.068	U		<0.064	U		<0.079	U	
Dichloroethene (cis-1,2-)	µg/m3	<0.14	U		<0.12	U		<0.13	U		<0.13	U		<0.14	U		<0.13	U		<0.16	U	
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	µg/m3	<1.4	U		<1.2	U		<1.3	U		<1.2	U		<1.3	U		<1.2	U		<1.5	U	
Ethylbenzene	µg/m3	<0.78	U		0.98			<0.72	U		0.96			0.93			<0.70	U		<0.86	U	
Methylene Chloride (Dichloromethane)	µg/m3	2.8			1.9			<1.2	U		9.0			9.4			<1.1	U		<1.4	U	
Tetrachloroethene (PCE)	µg/m3	<1.2	U		2.8			3.5			3.1			2.8			2.4			<1.3	U	
Toluene	µg/m3	<0.67	U		3.4			2.2			2.5			2.2			1.2	EB	H	2.2		
Trichlorobenzene (1,2,4-)	µg/m3	<6.6	U		<5.8	U		<6.2	U		<6.0	U		<6.4	U		<6.0	U		<7.4	U	
Trichloroethane (1,1,1-)	µg/m3	<0.98	U		<0.86	U		<0.90	U		<0.88	U		<0.94	U		<0.88	U		<1.1	U	
Trichloroethene (TCE)	µg/m3	<0.19	U		<0.17	U		<0.18	U		<0.17	U		<0.18	U		0.99			<0.21	U	
Trichlorofluoromethane (CFC11)	µg/m3	1.7			45			48			49			52			24			<1.1	U	
Vinyl chloride	µg/m3	<0.046	U		<0.040	U		<0.042	U		<0.041	U		<0.044	U		<0.041	U		<0.051	U	
Xylene (m,p-)	µg/m3	<0.78	U		2.9			1.6			2.2			2.3			1.1			0.91		
Xylene (o-)	µg/m3	<0.78	U		1.1			<0.72	U		0.88			0.80			<0.70	U		<0.86	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. 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. Results are presented in micrograms per cubic meter ($\mu g/m^3$).

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

4. Results are displayed with two significant figures.

5. A data usability review (DUR) 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 DUR report for further details.
"U" indicates the analyte is non-detect at or above the indicated sample specific practical quantification limit (PQL).
"EB" indicates the analyte was also present in a Field Equipment Blank.
"H" indicates high bias due to equipment blank action.

ATTACHMENT 1
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. Quantitative laboratory testing was performed by others as part of the investigation as noted within the report. It must be noted that additional compounds not searched for during the current study may be present in 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 indoor air may occur due to the passage of time, seasonal fluctuations, and other factors.

3. 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.

4. 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.

P:\2900s\2999.06\Source Files\201811 B330C Cozzini Sample Letter Validated\Attachment 1 - Limitations\Attachment 1 - Limitations.doc

Attachment 2
B330C Cozzini Space 8-Hour Confirmatory Sampling Photograph Log

Photo 1: Samples AA0402 and FB0402 on roof of 330C at the intake for RTU-7

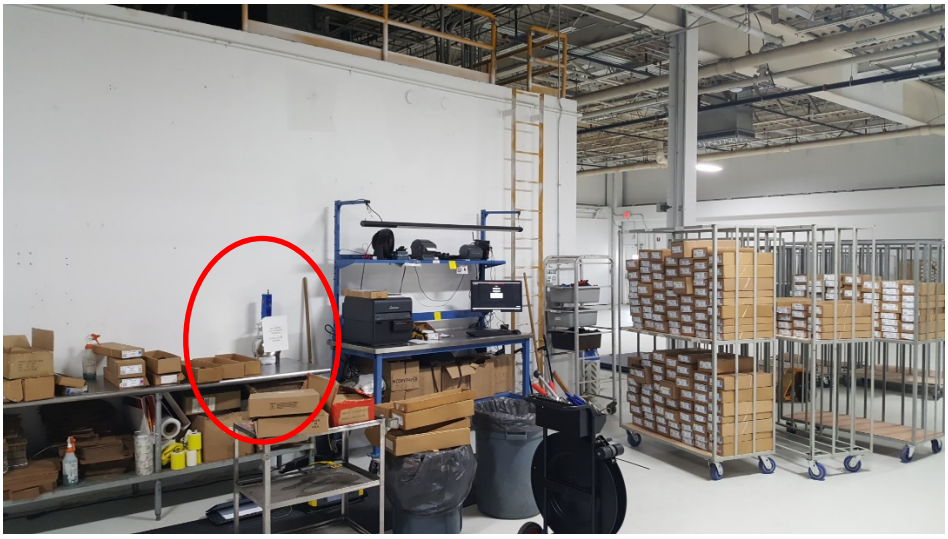

Photo 2: Sample IA0416, located in storage/loading area of production floor east

Photo 3: Sample IA0438, located on production floor west

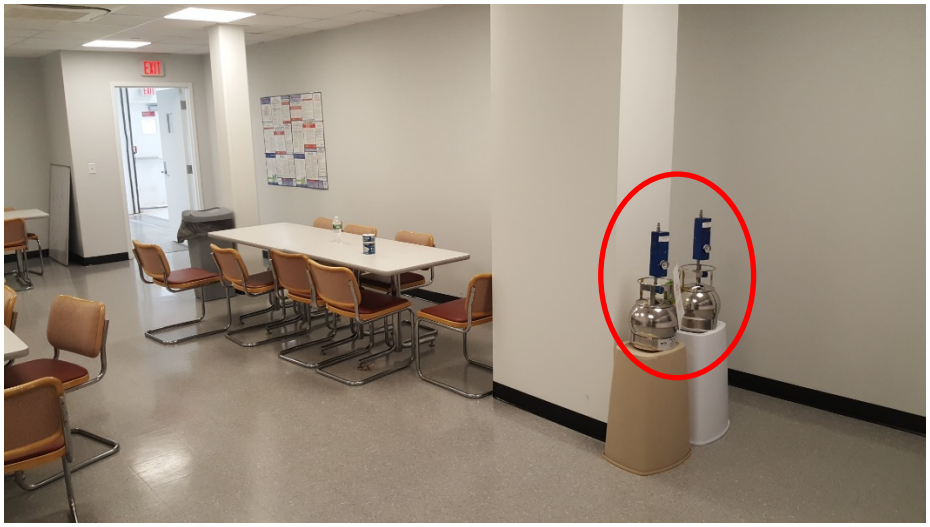

Photo 4: Sample IA0486 and FD0486, located in breakroom

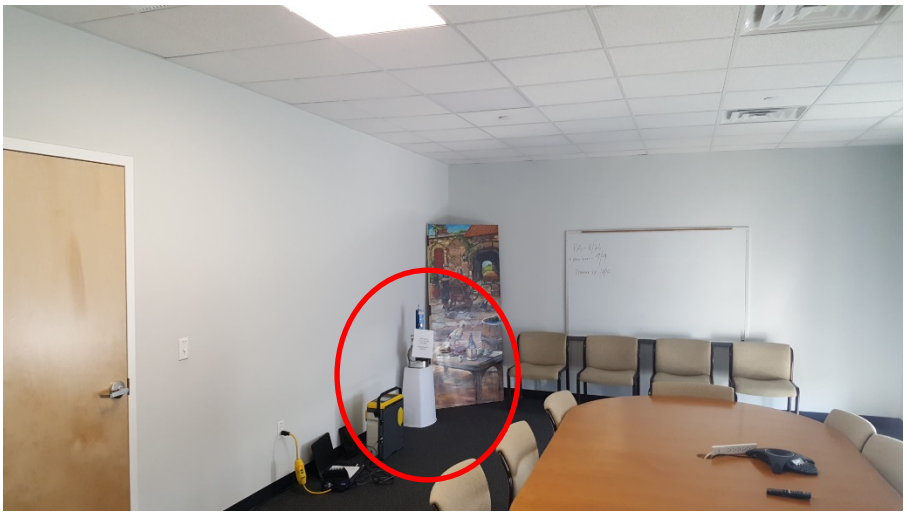

Photo 5: Sample IA0487, located in conference room

ATTACHMENT 3

Analytical Laboratory Report

eurofins | Air Toxics

9/20/2018
Ms. Erica Bosse
Sanborn, Head & Associates
24 Wade Road

Latham NY

Project Name: EFK
Project #: 2999.06
Workorder #: 1809112

Dear Ms. Erica Bosse

The following report includes the data for the above referenced project for sample(s) received on 9/10/2018 at Air Toxics Ltd.

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

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

Regards,

Ausha Scott

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1809112

Work Order Summary

CLIENT:	Ms. Erica Bosse Sanborn, Head & Associates 24 Wade Road Latham, NY	**BILL TO:**	Accounts Payable Sanborn, Head & Associates 20 Foundry Street Concord, NH 03301
PHONE:	518-207-0769	**P.O. #**	
FAX:		**PROJECT #**	2999.06 EFK
DATE RECEIVED:	09/10/2018	**CONTACT:**	Ausha Scott
DATE COMPLETED:	09/20/2018		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AA0402_20180905	Modified TO-15	7.3 "Hg	5.2 psi
01B	AA0402_20180905	Modified TO-15	7.3 "Hg	5.2 psi
02A	FB0402_20180905	Modified TO-15	9.8 "Hg	5 psi
02B	FB0402_20180905	Modified TO-15	9.8 "Hg	5 psi
03A	FD04_20180905	Modified TO-15	6.5 "Hg	5.1 psi
03B	FD04_20180905	Modified TO-15	6.5 "Hg	5.1 psi
04A	IA0416_20180905	Modified TO-15	4.1 "Hg	5.3 psi
04B	IA0416_20180905	Modified TO-15	4.1 "Hg	5.3 psi
05A	IA0438_20180905	Modified TO-15	5.7 "Hg	5.1 psi
05B	IA0438_20180905	Modified TO-15	5.7 "Hg	5.1 psi
06A	IA0487_20180905	Modified TO-15	5.1 "Hg	5.1 psi
06B	IA0487_20180905	Modified TO-15	5.1 "Hg	5.1 psi
07A	IA0486_20180905	Modified TO-15	5.1 "Hg	5 psi
07B	IA0486_20180905	Modified TO-15	5.1 "Hg	5 psi
08A	Lab Blank	Modified TO-15	NA	NA
08B	Lab Blank	Modified TO-15	NA	NA
09A	CCV	Modified TO-15	NA	NA
09B	CCV	Modified TO-15	NA	NA
10A	LCS	Modified TO-15	NA	NA
10AA	LCSD	Modified TO-15	NA	NA
10B	LCS	Modified TO-15	NA	NA
10BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY:  DATE: 09/20/18

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-16-11, UT NELAP CA0093332016-7, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2016, Expiration date: 10/17/2017.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
Modified TO-15 Full Scan/SIM
Sanborn, Head & Associates
Workorder# 1809112

Seven 6 Liter Summa Canister (SIM Certified) samples were received on September 10, 2018. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the Full Scan and SIM acquisition modes. The method involves concentrating up to 1.0 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

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

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

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

Receiving Notes

The Chain of Custody (COC) information for samples AA0402_20180905, FB0402_20180905, FD04_20180905, IA0416_20180905, IA0438_20180905, IA0487_20180905, and IA0486_20180905 did not match the entries on the sample tags with regard to sample identification. Therefore the information on the COC was used to process and report the samples.

Analytical Notes

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

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

CN - See case narrative explanation

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

eurofins | Air Toxics

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

Client Sample ID: AA0402_20180905

Lab ID#: 1809112-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	0.18	0.30	1.0	1.7
Acetone	0.90	7.3	2.1	17
Methylene Chloride	0.36	0.80	1.2	2.8

Client Sample ID: AA0402_20180905

Lab ID#: 1809112-01B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.036	0.069	0.22	0.43

Client Sample ID: FB0402_20180905

Lab ID#: 1809112-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	1.0	8.5	2.4	20
Toluene	0.20	0.59	0.75	2.2
m,p-Xylene	0.20	0.21	0.86	0.91

Client Sample ID: FB0402_20180905

Lab ID#: 1809112-02B

No Detections Were Found.

Client Sample ID: FD04_20180905

Lab ID#: 1809112-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.86	0.95	4.2	4.7
Freon 11	0.17	9.2	0.97	52
Acetone	0.86	12	2.0	27
Methylene Chloride	0.34	2.7	1.2	9.4
Toluene	0.17	0.57	0.65	2.2
Tetrachloroethene	0.17	0.41	1.2	2.8

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

Client Sample ID: FD04_20180905

Lab ID#: 1809112-03A

Ethyl Benzene	0.17	0.21	0.75	0.93
m,p-Xylene	0.17	0.52	0.75	2.3
o-Xylene	0.17	0.18	0.75	0.80

Client Sample ID: FD04_20180905

Lab ID#: 1809112-03B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.034	0.070	0.22	0.44

Client Sample ID: IA0416_20180905

Lab ID#: 1809112-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.78	0.85	3.9	4.2
Freon 11	0.16	8.0	0.88	45
Acetone	0.78	8.3	1.9	20
Methylene Chloride	0.31	0.54	1.1	1.9
Benzene	0.16	0.16	0.50	0.50
Toluene	0.16	0.91	0.59	3.4
Tetrachloroethene	0.16	0.41	1.1	2.8
Ethyl Benzene	0.16	0.22	0.68	0.98
m,p-Xylene	0.16	0.66	0.68	2.9
o-Xylene	0.16	0.25	0.68	1.1

Client Sample ID: IA0416_20180905

Lab ID#: 1809112-04B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.031	0.068	0.20	0.43

Client Sample ID: IA0438_20180905

Lab ID#: 1809112-05A

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

Client Sample ID: IA0438_20180905

Lab ID#: 1809112-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.83	0.84	4.1	4.1
Freon 11	0.17	8.5	0.93	48
Acetone	0.83	11	2.0	26
Toluene	0.17	0.60	0.62	2.2
Tetrachloroethene	0.17	0.51	1.1	3.5
m,p-Xylene	0.17	0.38	0.72	1.6

Client Sample ID: IA0438_20180905

Lab ID#: 1809112-05B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.033	0.079	0.21	0.50

Client Sample ID: IA0487_20180905

Lab ID#: 1809112-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.81	1.1	4.0	5.6
Freon 11	0.16	4.2	0.91	24
Acetone	0.81	8.6	1.9	20
Toluene	0.16	0.31	0.61	1.2
Tetrachloroethene	0.16	0.36	1.1	2.4
m,p-Xylene	0.16	0.26	0.70	1.1

Client Sample ID: IA0487_20180905

Lab ID#: 1809112-06B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.032	0.071	0.20	0.45
Trichloroethene	0.032	0.18	0.17	0.99

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

Client Sample ID: IA0486_20180905

Lab ID#: 1809112-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.80	0.90	4.0	4.4
Freon 11	0.16	8.8	0.90	49
Acetone	0.80	9.2	1.9	22
Methylene Chloride	0.32	2.6	1.1	9.0
Toluene	0.16	0.65	0.61	2.5
Tetrachloroethene	0.16	0.45	1.1	3.1
Ethyl Benzene	0.16	0.22	0.70	0.96
m,p-Xylene	0.16	0.51	0.70	2.2
o-Xylene	0.16	0.20	0.70	0.88

Client Sample ID: IA0486_20180905

Lab ID#: 1809112-07B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Carbon Tetrachloride	0.032	0.070	0.20	0.44

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Client Sample ID: AA0402_20180905

Lab ID#: 1809112-01A

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

File Name:	**20091407**	**Date of Collection: 9/5/18 2:59:00 PM**	
Dil. Factor:	**1.79**	**Date of Analysis: 9/14/18 01:06 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.90	Not Detected	4.4	Not Detected
Freon 11	0.18	0.30	1.0	1.7
Freon 113	0.18	Not Detected	1.4	Not Detected
Acetone	0.90	7.3	2.1	17
Methylene Chloride	0.36	0.80	1.2	2.8
1,1,1-Trichloroethane	0.18	Not Detected	0.98	Not Detected
Benzene	0.18	Not Detected	0.57	Not Detected
Toluene	0.18	Not Detected	0.67	Not Detected
Tetrachloroethene	0.18	Not Detected	1.2	Not Detected
Chlorobenzene	0.18	Not Detected	0.82	Not Detected
Ethyl Benzene	0.18	Not Detected	0.78	Not Detected
m,p-Xylene	0.18	Not Detected	0.78	Not Detected
o-Xylene	0.18	Not Detected	0.78	Not Detected
1,3-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
1,4-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
1,2-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
1,2,4-Trichlorobenzene	0.90	Not Detected	6.6	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	120	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: AA0402_20180905

Lab ID#: 1809112-01B

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

File Name:	**20091407sim**	**Date of Collection: 9/5/18 2:59:00 PM**	
Dil. Factor:	**1.79**	**Date of Analysis: 9/14/18 01:06 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.018	Not Detected	0.046	Not Detected
1,1-Dichloroethene	0.018	Not Detected	0.071	Not Detected
cis-1,2-Dichloroethene	0.036	Not Detected	0.14	Not Detected
Carbon Tetrachloride	0.036	0.069	0.22	0.43
Trichloroethene	0.036	Not Detected	0.19	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	117	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: FB0402_20180905

Lab ID#: 1809112-02A

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

File Name:	**20091408**	**Date of Collection: 9/5/18 3:00:00 PM**	
Dil. Factor:	**1.99**	**Date of Analysis: 9/14/18 01:54 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.0	Not Detected	4.9	Not Detected
Freon 11	0.20	Not Detected	1.1	Not Detected
Freon 113	0.20	Not Detected	1.5	Not Detected
Acetone	1.0	8.5	2.4	20
Methylene Chloride	0.40	Not Detected	1.4	Not Detected
1,1,1-Trichloroethane	0.20	Not Detected	1.1	Not Detected
Benzene	0.20	Not Detected	0.64	Not Detected
Toluene	0.20	0.59	0.75	2.2
Tetrachloroethene	0.20	Not Detected	1.3	Not Detected
Chlorobenzene	0.20	Not Detected	0.92	Not Detected
Ethyl Benzene	0.20	Not Detected	0.86	Not Detected
m,p-Xylene	0.20	0.21	0.86	0.91
o-Xylene	0.20	Not Detected	0.86	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	1.0	Not Detected	7.4	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: FB0402_20180905

Lab ID#: 1809112-02B

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

File Name:	**20091408sim**	**Date of Collection:**	**9/5/18 3:00:00 PM**
Dil. Factor:	**1.99**	**Date of Analysis:**	**9/14/18 01:54 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.020	Not Detected	0.051	Not Detected
1,1-Dichloroethene	0.020	Not Detected	0.079	Not Detected
cis-1,2-Dichloroethene	0.040	Not Detected	0.16	Not Detected
Carbon Tetrachloride	0.040	Not Detected	0.25	Not Detected
Trichloroethene	0.040	Not Detected	0.21	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: FD04_20180905

Lab ID#: 1809112-03A

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

File Name:	**20091409**	**Date of Collection: 9/5/18 2:55:00 PM**	
Dil. Factor:	**1.72**	**Date of Analysis: 9/14/18 02:34 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.86	0.95	4.2	4.7
Freon 11	0.17	9.2	0.97	52
Freon 113	0.17	Not Detected	1.3	Not Detected
Acetone	0.86	12	2.0	27
Methylene Chloride	0.34	2.7	1.2	9.4
1,1,1-Trichloroethane	0.17	Not Detected	0.94	Not Detected
Benzene	0.17	Not Detected	0.55	Not Detected
Toluene	0.17	0.57	0.65	2.2
Tetrachloroethene	0.17	0.41	1.2	2.8
Chlorobenzene	0.17	Not Detected	0.79	Not Detected
Ethyl Benzene	0.17	0.21	0.75	0.93
m,p-Xylene	0.17	0.52	0.75	2.3
o-Xylene	0.17	0.18	0.75	0.80
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	0.86	Not Detected	6.4	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	115	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: FD04_20180905

Lab ID#: 1809112-03B

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

File Name:	**20091409sim**	**Date of Collection: 9/5/18 2:55:00 PM**	
Dil. Factor:	**1.72**	**Date of Analysis: 9/14/18 02:34 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	0.070	0.22	0.44
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	111	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: IA0416_20180905

Lab ID#: 1809112-04A

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

File Name:	**20091410**	**Date of Collection: 9/5/18 3:20:00 PM**	
Dil. Factor:	**1.57**	**Date of Analysis: 9/14/18 03:14 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.78	0.85	3.9	4.2
Freon 11	0.16	8.0	0.88	45
Freon 113	0.16	Not Detected	1.2	Not Detected
Acetone	0.78	8.3	1.9	20
Methylene Chloride	0.31	0.54	1.1	1.9
1,1,1-Trichloroethane	0.16	Not Detected	0.86	Not Detected
Benzene	0.16	0.16	0.50	0.50
Toluene	0.16	0.91	0.59	3.4
Tetrachloroethene	0.16	0.41	1.1	2.8
Chlorobenzene	0.16	Not Detected	0.72	Not Detected
Ethyl Benzene	0.16	0.22	0.68	0.98
m,p-Xylene	0.16	0.66	0.68	2.9
o-Xylene	0.16	0.25	0.68	1.1
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	0.78	Not Detected	5.8	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	110	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: IA0416_20180905

Lab ID#: 1809112-04B

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

File Name:	**20091410sim**	**Date of Collection:**	**9/5/18 3:20:00 PM**
Dil. Factor:	**1.57**	**Date of Analysis:**	**9/14/18 03:14 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	0.068	0.20	0.43
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	112	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: IA0438_20180905

Lab ID#: 1809112-05A

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

File Name:	**20091411**	**Date of Collection: 9/5/18 3:18:00 PM**	
Dil. Factor:	**1.66**	**Date of Analysis: 9/14/18 03:54 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.83	0.84	4.1	4.1
Freon 11	0.17	8.5	0.93	48
Freon 113	0.17	Not Detected	1.3	Not Detected
Acetone	0.83	11	2.0	26
Methylene Chloride	0.33	Not Detected	1.2	Not Detected
1,1,1-Trichloroethane	0.17	Not Detected	0.90	Not Detected
Benzene	0.17	Not Detected	0.53	Not Detected
Toluene	0.17	0.60	0.62	2.2
Tetrachloroethene	0.17	0.51	1.1	3.5
Chlorobenzene	0.17	Not Detected	0.76	Not Detected
Ethyl Benzene	0.17	Not Detected	0.72	Not Detected
m,p-Xylene	0.17	0.38	0.72	1.6
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	0.83	Not Detected	6.2	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	113	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: IA0438_20180905

Lab ID#: 1809112-05B

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

File Name:	**20091411sim**	**Date of Collection:**	**9/5/18 3:18:00 PM**
Dil. Factor:	**1.66**	**Date of Analysis:**	**9/14/18 03:54 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.017	Not Detected	0.042	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	0.079	0.21	0.50
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	112	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: IA0487_20180905

Lab ID#: 1809112-06A

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

File Name:	**20091412**	**Date of Collection: 9/5/18 3:12:00 PM**	
Dil. Factor:	**1.62**	**Date of Analysis: 9/14/18 04:36 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.81	1.1	4.0	5.6
Freon 11	0.16	4.2	0.91	24
Freon 113	0.16	Not Detected	1.2	Not Detected
Acetone	0.81	8.6	1.9	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	Not Detected	0.52	Not Detected
Toluene	0.16	0.31	0.61	1.2
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	0.81	Not Detected	6.0	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	117	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: IA0487_20180905

Lab ID#: 1809112-06B

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

File Name:	**20091412sim**	**Date of Collection:**	**9/5/18 3:12:00 PM**
Dil. Factor:	**1.62**	**Date of Analysis:**	**9/14/18 04:36 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	0.071	0.20	0.45
Trichloroethene	0.032	0.18	0.17	0.99

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	112	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: IA0486_20180905

Lab ID#: 1809112-07A

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

File Name:	**20091413**	**Date of Collection: 9/5/18 3:14:00 PM**	
Dil. Factor:	**1.61**	**Date of Analysis: 9/14/18 05:16 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.80	0.90	4.0	4.4
Freon 11	0.16	8.8	0.90	49
Freon 113	0.16	Not Detected	1.2	Not Detected
Acetone	0.80	9.2	1.9	22
Methylene Chloride	0.32	2.6	1.1	9.0
1,1,1-Trichloroethane	0.16	Not Detected	0.88	Not Detected
Benzene	0.16	Not Detected	0.51	Not Detected
Toluene	0.16	0.65	0.61	2.5
Tetrachloroethene	0.16	0.45	1.1	3.1
Chlorobenzene	0.16	Not Detected	0.74	Not Detected
Ethyl Benzene	0.16	0.22	0.70	0.96
m,p-Xylene	0.16	0.51	0.70	2.2
o-Xylene	0.16	0.20	0.70	0.88
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	0.80	Not Detected	6.0	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	112	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	94	70-130

eurofins | Air Toxics

Client Sample ID: IA0486_20180905

Lab ID#: 1809112-07B

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

File Name:	**20091413sim**	**Date of Collection: 9/5/18 3:14:00 PM**	
Dil. Factor:	**1.61**	**Date of Analysis: 9/14/18 05:16 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	0.070	0.20	0.44
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	112	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	95	70-130

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1809112-08A

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

File Name:	**20091406**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/14/18 12:13 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	0.50	Not Detected	1.2	Not Detected
Methylene Chloride	0.20	Not Detected	0.69	Not Detected
1,1,1-Trichloroethane	0.10	Not Detected	0.54	Not Detected
Benzene	0.10	Not Detected	0.32	Not Detected
Toluene	0.10	Not Detected	0.38	Not Detected
Tetrachloroethene	0.10	Not Detected	0.68	Not Detected
Chlorobenzene	0.10	Not Detected	0.46	Not Detected
Ethyl Benzene	0.10	Not Detected	0.43	Not Detected
m,p-Xylene	0.10	Not Detected	0.43	Not Detected
o-Xylene	0.10	Not Detected	0.43	Not Detected
1,3-Dichlorobenzene	0.10	Not Detected	0.60	Not Detected
1,4-Dichlorobenzene	0.10	Not Detected	0.60	Not Detected
1,2-Dichlorobenzene	0.10	Not Detected	0.60	Not Detected
1,2,4-Trichlorobenzene	0.50	Not Detected	3.7	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	111	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	95	70-130

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1809112-08B

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

File Name:	**20091406sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/14/18 12:13 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	113	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	96	70-130

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 1809112-09A

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

File Name:	**20091402**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/14/18 09:33 AM**	

Compound	%Recovery
Freon 12	105
Freon 11	102
Freon 113	90
Acetone	99
Methylene Chloride	101
1,1,1-Trichloroethane	94
Benzene	100
Toluene	101
Tetrachloroethene	96
Chlorobenzene	97
Ethyl Benzene	97
m,p-Xylene	96
o-Xylene	95
1,3-Dichlorobenzene	87
1,4-Dichlorobenzene	84
1,2-Dichlorobenzene	86
1,2,4-Trichlorobenzene	92

Container Type: NA - Not Applicable

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

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 1809112-09B

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

File Name:	**20091402sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/14/18 09:33 AM**	

Compound	%Recovery
Vinyl Chloride	99
1,1-Dichloroethene	92
cis-1,2-Dichloroethene	93
Carbon Tetrachloride	114
Trichloroethene	94

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	96	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 1809112-10A

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

File Name:	**20091403**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/14/18 10:13 AM**	

Compound	%Recovery	Method Limits
Freon 12	102	70-130
Freon 11	100	70-130
Freon 113	86	70-130
Acetone	95	70-130
Methylene Chloride	95	70-130
1,1,1-Trichloroethane	90	70-130
Benzene	97	70-130
Toluene	98	70-130
Tetrachloroethene	96	70-130
Chlorobenzene	99	70-130
Ethyl Benzene	99	70-130
m,p-Xylene	98	70-130
o-Xylene	96	70-130
1,3-Dichlorobenzene	92	70-130
1,4-Dichlorobenzene	91	70-130
1,2-Dichlorobenzene	92	70-130
1,2,4-Trichlorobenzene	93	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	93	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	95	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1809112-10AA

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

File Name:	**20091404**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/14/18 10:53 AM**	

Compound	%Recovery	Method Limits
Freon 12	103	70-130
Freon 11	101	70-130
Freon 113	86	70-130
Acetone	96	70-130
Methylene Chloride	97	70-130
1,1,1-Trichloroethane	90	70-130
Benzene	97	70-130
Toluene	98	70-130
Tetrachloroethene	93	70-130
Chlorobenzene	98	70-130
Ethyl Benzene	97	70-130
m,p-Xylene	96	70-130
o-Xylene	93	70-130
1,3-Dichlorobenzene	90	70-130
1,4-Dichlorobenzene	88	70-130
1,2-Dichlorobenzene	89	70-130
1,2,4-Trichlorobenzene	90	70-130

Container Type: NA - Not Applicable

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

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 1809112-10B

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

File Name:	**20091403sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/14/18 10:13 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	99	70-130
1,1-Dichloroethene	89	70-130
cis-1,2-Dichloroethene	84	70-130
Carbon Tetrachloride	102	60-140
Trichloroethene	95	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	96	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1809112-10BB

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

File Name:	**20091404sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/14/18 10:53 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	98	70-130
1,1-Dichloroethene	88	70-130
cis-1,2-Dichloroethene	84	70-130
Carbon Tetrachloride	100	60-140
Trichloroethene	94	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	96	70-130

ATTACHMENT 4

Data Usability Review

Data Usability Review
Method TO-15 Hi/Lo Analysis

Client:	Sanborn, Head & Associates, Inc., Concord, New Hampshire (SHA)
Site:	IBM East Fishkills Facility, Hopewell Junction, New York Building 330C
Laboratory:	Eurofins Air Toxics, Inc. (EATL), Folsom, California
SDG / Work Order:	1809112
Date(s) of Collection:	September 5, 2018
Number and type Samples & analyses:	5 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:	October 26, 2018

This Data Usability Report was performed on the Work Order identified with the following intentions: 1) to determine if the data were generated and reported in accordance with the *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 9, *Volatile Organic Compounds (VOCs) in Air (Ambient Air/Soil Vapor/Stack Gas) Samples Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/ Mass Spectrometry (GC/MS), EPA Method TO-15* (January 1999), 01/21/2000 revision; 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; 2) to determine if the data met project data quality objectives for acceptable accuracy, precision, sensitivity; and technical usability; and 3) to update the project database with appropriate data quality qualifiers.

I. 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 In-Depth data usability review are listed in Table 1. Any deviations noted for sample collection and receipt (*e.g.*, temperature or preservation issues) are included in Section III, below.

Table 1. Sample Descriptions and Analytical Parameters

Sample ID	Lab Sample ID	Collection Date	Matrix	Analytical Parameters	Sample Type
AA0402_20180905	1809112-01A	9/5/2018	Ambient Air	VOCs	Field Sample
FB0402_20180905	1809112-02A	9/5/2018	Air	VOCs	Field Blank
FD04_20180905	1809112-03A	9/5/2018	Indoor Air	VOCs	Field Duplicate of IA0486_20180905
IA0416_20180905	1809112-04A	9/5/2018	Indoor Air	VOCs	Field Sample
IA0438_20180905	1809112-05A	9/5/2018	Indoor Air	VOCs	Field Sample
IA0487_20180905	1809112-06A	9/5/2018	Indoor Air	VOCs	Field Sample
IA0486_20180905	1809112-07A	9/5/2018	Indoor Air	VOCs	Field Sample

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

II. 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) recoveries
- Internal Standard (IS) 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 two results were estimated (EB) 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 this Work Order. 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.

The canister number identified on the Chain-of-Custody for sample IA0486_20180905 was incorrectly identified as N0110; however, the actual canister number, which was verified in the logbooks and certification records, was N1253.

Two results were estimated (EB) to indicate the Field Blank also reported a result for the same compounds at comparable levels. The affected results have a potential high bias and are shown in Table 2.

Precision was acceptable for all VOCs in the Field Duplicate pair of IA0486_20180905 and FD04_20180905. These results are an indication of acceptable precision and representativeness of the samples for this site location for the project-specific VOCs.

All reporting limits were at a level below the Project required RL (as shown in Table B.1 of the QAPP) except for carbon tetrachloride in samples AA0402_20180905, FD04_20180905, and IA0438_20180905 and Freon 12 in all samples due to calibration issues; however, carbon tetrachloride and Freon 12 were detected in all samples with one exception. Freon 12 was non-detect in sample AA0402_20180905 with an RL that exceeded QAPP requirements. The data user will need to evaluate the usability of this result for project decisions.

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

Table 2. Summary of Data Validation Actions

Field Sample ID	Analyte	Qualifier	Bias	Validation Comments
AA0402_20180905	Acetone	EB	H	Equipment Blank Action
IA0487_20180905	Toluene	EB	H	Equipment Blank Action

Qualifiers: U = Analyte is non-detect at or above the sample-specific reporting limit (RL); UJ = Non-detect is estimated at the RL; J = Result is estimated; EB = Analyte was also present in a Field Equipment Blank; R = Result is rejected and is unusable for project decisions.

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

Date Sampled: 9/5/18 No. Samples 4 IA + 1 FD + 1 AA + 1FB
Method of Analysis: TO-15 Hi/Lo

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								Sensitivity not met for 1 result

Other Issues : ***Blank Action:*** Estimate (EB) 2 results

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 page 6 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.

DV Summary: All quality control information associated with accuracy, precision, and sensitivity for the project-specific list of 8 VOCs reported met project criteria for the samples in this SDG except for Freon 12 in AA0402_20180905, which was reported as a non-detect above the project-required RL. Two results were estimated (EB) indicating that the Field Blank reported results at levels comparable to the levels found in the samples. All data are considered usable for project decisions.

A limited data checklist review (Tier 2) 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 summaries; and evaluation of laboratory qualifiers applied to the dataset. The project narrative was also reviewed to determine whether additional issues were found that weren't reported in the QC previously evaluated. No raw data was reviewed nor were any re-calculations of data performed.

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.

Date: ***10/25/18***
Data Reviewer: ***Nancy C. Rothman, Ph.D.***

Associated Blanks: Method Blank: 20091406 /20091406sim
FB: FB0402_20180905

Blank ID	Contaminant / Level (µg/m^3)	Action Level FB DF = 1.99	Sample and reported result (µg/m^3)		Corrected Database Result
20091406	None		No Blank Action Required		
20091406sim	None		No Blank Action Required		
FB0402_20180905	Acetone 20	18	AA0402_20180905	17	17 EB
		17	FD04_20180905	27	No Action
		16	IA0416_20180905	20	No Action
		17	IA0438_20180905	26	No Action
		16	IA0487_20180905	20	No Action
		16	IA0486_20180905	22	No Action
FB0402_20180905	Toluene 2.2	1.9	FD04_20180905	2.2	No Action
		1.9	IA0416_20180905	3.4	No Action
		1.7	IA0438_20180905	2.2	No Action
		1.8	IA0487_20180905	1.2	1.2 EB
		1.8	IA0486_20180905	2.5	No Action
			The other sample was ND - no additional action		
FB0402_20180905	m,p-Xylene 0.91	0.79	FD04_20180905	2.3	No Action
		0.72	IA0416_20180905	2.9	No Action
		0.76	IA0438_20180905	1.6	No Action
		0.74	IA0487_20180905	1.1	No Action
		0.74	IA0486_20180905	2.2	No Action
			The other sample was ND - no additional action		

Date: ***10/25/18***
Data Reviewer: ***Nancy C. Rothman, Ph.D.***

Additional Notes:

Sample Receipt: Samples were collected in 6 L Summa Canisters. Samples were all collected for about 8 hours (the "Time of Collection" listed on the COC shows 2 times such as 7:18 - 15:18). The vacuum for all samples was > 25" Hg in field prior to sample collection. The samples were received intact at Eurofins - Air Toxics on 9/10/18. The canister number identified on the Chain-of-Custody for sample IA0486_20180905 was incorrectly identified as N0110; however, the actual canister number, which was verified in the logbooks and certification records, was N1253.

Canister Certification: Canisters were Certified pre-cleaned - certificates of analysis were reported and indicate that all Target compounds were non-detect in the canisters prior to being sent to the field.

Sample Integrity: The canister vacuums (field initial, field final and lab receipt) were acceptable for all samples. All canisters were over-pressurized to 5 - 5.2 psi prior to analysis. No Action required.

Holding Time (HT): Samples were analyzed on 9/14/18; therefore HT was met. No Action required.

BFB Tunes: Instrument 20 Tunes (2 for ICAL + 1 for CCAL) - all criteria in all tunes were met and all samples were analyzed within 12 hours of tune; therefore, No Action Required.

ICALs : Instrument 20 Full Scan and SIM performed on 9/10/18-9/11/18. Full Scan = 7- to 9-level calibration from 0.05, 0.1, or 0.5 to 40 ppbV for all 22 Target compounds plus several non-target compounds. SIM = 9- to 10-level calibration from 0.01 or 0.02 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 non-target compounds. %RSD ≤ 30% for all 22 Target Compounds. RLs reported (as indicated in the table at the end of this checklist for DF=2 analysis) were supported by the ICALs. NOTE: 1,1-dichloroethene and cis-1,2-dichloroethene were reported by SIM analysis even though RLs by full scan met project sensitivity requirements. No Action required

CCALs: 20091402/20091402sim - % Recovery 70-130% for all 22 Target compounds - No Action required.

Surrogates & Internal Standards **:** All 3 Surrogates had %Recovery within criteria and all IS' had Areas and RTs within criteria in all analyses; therefore, No Action Required.

LCS/LCSD : 20091403/20091404 & 20091403sim/20091404sim - %Recovery acceptable for all 22 Targets in LCS and LCSD and LCS/LCSD RPDs all OK; therefore, acceptable accuracy and precision demonstrated for analysis of the 22 VOCs by Full Scan + SIM analysis.

LD: LD analysis not performed for the samples in this Work Order. LCS/LCSD reported instead, which reported acceptable precision except as listed above.

Date: ***10/25/18***
Data Reviewer: ***Nancy C. Rothman, Ph.D.***

Additional Notes:

Qualifier Action: There were no qualifiers other than "U" placed on the data (i.e., no "J" results reported). All data were reported within the instrument calibration range.

Compound Reporting & Sensitivity: All reporting limits were at a level below the Project required RL (as shown in Table B.1, which is reproduced on page 6 of this Checklist) except for Carbon Tetrachloride in samples AA0402_20180905, FD04_20180905, and IA0438_20180905, which had RLs exceeding the expected RL; however, as carbon tetrachloride was detected in all of these samples, sensitivity for these data are considered acceptable. Freon 12 RLs were all higher than required due to calibration issues; however, Freon 12 was detected in all samples except AA0402_20180905 , so sensitivity was not acceptable for Freon 12 in AA0402_20180905. The data users will need to evaluate this one Freon 12 non-detect above project sensitivity criteria for project uses.

Narrative: The narrative did not raise any additional issues that would affect data quality.

Field Duplicate Evaluation_ Sample IDs: Sample = IA0486_20180905 FD = FD04_20180905

Analyte Name	CAS No.	DF = 1.61* RL (µg/m³)	Sample Result µg/m3	Q	Result Level	FD Result µg/m3	Q	FD Level	RPD	Action
Freon 12	75-71-8	4.2	4.7		< 5xRL	4.4		< 5xRL	6.6	None
Freon 11	75-69-4	0.97	52		< 5xRL	49		< 5xRL	5.9	None
Freon 113	76-13-1	1.3	1.3	U	RL	1.2	U	RL	NA	None
Acetone	67-64-1	2	27		> 5xRL	22		> 5xRL	20.4	None
Methylene Chloride	75-09-2	1.2	9.4		> 5xRL	9		> 5xRL	4.3	None
1,1,1-Trichloroethane	71-55-6	0.94	0.94	U	RL	0.88	U	RL	NA	None
Benzene	71-43-2	0.55	0.55	U	RL	0.51	U	RL	NA	None
Toluene	108-88-3	0.65	2.2		< 5xRL	2.5		< 5xRL	12.8	None
Tetrachloroethene	127-18-4	1.2	2.8		< 5xRL	3.1		< 5xRL	10.2	None
Chlorobenzene	108-90-7	0.79	0.79	U	RL	0.74	U	RL	NA	None
Ethyl Benzene	100-41-4	0.75	0.93		< 5xRL	0.96		< 5xRL	3.2	None
m,p-Xylene	108-38-3/ 106-42-3	0.75	2.3		< 5xRL	2.2		< 5xRL	4.4	None
o-Xylene	95-47-6	0.75	0.8		< 5xRL	0.88		< 5xRL	9.5	None
1,3-Dichlorobenzene	541-73-1	1	1	U	RL	0.97	U	RL	NA	None
1,4-Dichlorobenzene	106-46-7	1	1	U	RL	0.97	U	RL	NA	None
1,2-Dichlorobenzene	95-50-1	1	1	U	RL	0.97	U	RL	NA	None
1,2,4-Trichlorobenzene	120-82-1	6.4	6.4	U	RL	6	U	RL	NA	None
Vinyl Chloride	75-01-4	0.044	0.044	U	RL	0.041	U	RL	NA	None
1,1-Dichloroethene	75-35-4	0.068	0.068	U	RL	0.064	U	RL	NA	None
cis-1,2-Dichloroethene	156-59-2	0.14	0.14	U	RL	0.13	U	RL	NA	None
Carbon Tetrachloride	56-23-5	0.22	0.44		< 5xRL	0.44		< 5xRL	0.0	None
Trichloroethene	79-01-6	0.18	0.18	U	RL	0.17	U	RL	NA	None

*The FD DF was 1.72

** Action only taken for RPD > 20% if one or both results are > 5 x RL or if one result ND and other results > 5 x RL

Q = Data Qualifier as reported by EATL and/or NEH; U = non-detect, J = estimated result; UJ = non-detect is estimated; EB =Equipment Blank Action

NA = Not Applicable. RPD not calculated since one or both results were non-detect.

FD precision was acceptable for all Target VOCs in the FD pair of IA0486_20180905 and FD04_20180905 - No Action required.

Date: ***10/25/18***

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

Method of Analysis: TO-15 Hi/Lo

Compound List and Project-required Reporting Limits (RL)

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 (see References below):

Canister Integrity:	If certification forms indicate issues, J/U or UJ results in samples
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 = Level in the Blank x (Sample DF/Blank DF) Method Blank (MB): Result < RL, U result at RL; RL<Result<Blank Action, U result at level reported Equipment Blank (EB): Result<Blank Action, EB result at level reported
BFB Tune:	SW-846 method 8260B 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)

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