Checked by TT
3/7/2016

MEMORANDUM

TO: Mr. Addison Rice
Anderson, Mulholland and Associates

DATE: February 27, 2016

FROM: R. Infante

FILE: 1602064A

RE: Data Validation
Air samples
SDG: 1602064A

SUMMARY

Full validation was performed on the data for several gas samples analyzed for volatile organic compounds (full suite) by method Compendium 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), January, 1999. The samples were collected at the Bristol Myer Squib, Humacao, PR site on January 31, 2016 and submitted to Eurofins Air Toxics, Inc. of Folson, California that analyzed and reported the results under delivery groups (SDG) 1602064A.

The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: Compendium Method TO-15. Determination Of Volatile Organic Compounds (VOCas) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS), January, 1999; Validating Air Samples. Volatile Organic Analysis of Ambient Air in Canisters by Method TO-15, (SOP # HW-31. Revision #4. October, 2006. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

In general the data is valid as reported and may be used for decision making purposes. The data results are acceptable for use. Results for Freon and hexachlorobutadiene were qualified as estimated (J) in sample 1602064A-01A; -02A; -03A; -06A due to continuing calibration check outside method performance limit. Ethanol were qualified as estimated (J) in samples 1602064A-04A; 05A; 05AA; 07A; 08A; 09A; and -10A due to continuing calibration check outside method performance limit. Results for acetone and 2-butanone qualified as estimated in samples 1602064-04A and 1602064A-05A due to RPD over laboratory and generally acceptable control limits for field duplicates.

SAMPLES

The samples included in the review are listed below

Client Sample ID	Lab. Sample ID	Collected Date	Matrix	Analysis
B30-1IA013016	1602064A-01A	01/31/2016	Air	VOCs
B30-2IA013016	1602064A-02A	01/31/2016	Air	VOCs
B30-3IA013016	1602064A-03A	01/31/2016	Air	VOCs
B30-4IA013016	1602064A-04A	01/31/2016	Air	VOCs
B30-4DIA013016	1602064A-05A	01/31/2016	Air	VOCs

Client Sample ID	Lab. Sample ID	Collected Date	Matrix	Analysis
B30-4DIA013016 (LAB DUP)	1602064A-05AA	01/31/2016	Air	VOCs
B30-5IA013016	1602064A-06A	01/31/2016	Air	VOCs
B42-1IA013016	1602064A-07A	01/31/2016	Air	VOCs
B42-2IA013016	1602064A-08A	01/31/2016	Air	VOCs
B42-3IA013016	1602064A-09A	01/31/2016	Air	VOCs
B3042AA013016	1602064A-10A	01/31/2016	Air	VOCs

REVIEW ELEMENTS

Sample data were reviewed for the following parameters, where applicable to the method

- Agreement of analysis conducted with chain of custody (COC) form
- Holding time and sample preservation
- Gas chromatography/mass spectrometry (GC/MS) tunes
- Initial and continuing calibrations
- Method blanks/trip blanks/field blank
- Canister cleaning certification criteria
- Surrogate spike recovery
- Internal standard performance and retention times
- Field duplicate results
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analysis Conducted with COC Request

Sample reports corresponded to the analytical request designated on the chain-of-custody form.

Holding Times and Sample Preservation

Sample preservation was acceptable.

Samples analyzed within method recommended holding time.

GC/MS Tunes

The frequency and abundance of bromofluorobenzene (BFB) tunes were within the QC acceptance criteria. All samples were analyzed within the tuning criteria associated with the method.

Initial and Continuing Calibrations

VOCs – (Method TO-15)
Initial calibration meets method performance criteria. Ongoing accuracy of the instrument was determined by the analysis of a continuing calibration standard, continuing calibration meet the method performance criteria except for the following analytes:

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
02/08/2016	1602064A-12A	32 %	Freon	1602064A-01A to -03; 1602064A-06A
		38 %	Hexachlorobutadiene	
02/09/2016	1602064A-12B	34 %	Ethanol	1602064A-04A; -05; -05AA; -07A; -08A; -09A; -10A

Results qualified estimated (J) in affected samples.

Method Blank/Trip Blank/Field Blank

Target analytes were not detected in laboratory method blanks above the reporting concentration/action level.

Summa canister met cleaning certification criteria.

No trip/field blank analyzed with this data package.

Surrogate Spike Recovery

The surrogate recoveries as per method TO-15 were within the laboratory QC acceptance limits in all samples analyzed.

Internal Standard Performance

VOCs -
Samples were spiked with the method specified internal standard. Internal standard are performance and retention times met the QC acceptance criteria in all sample analyses and calibration standards.

Laboratory/Field Duplicate Results

Field/laboratory duplicates were analyzed as part of this data set. Target analytes meet the RPD performance criteria of + 25 % for analytes 5 x SQL except for the followings:

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Ethanol	0.73	4.7	7.9	49.6 %	Qualify results (J) in affected samples.
2-Butanone	0.73	0.41	1.3	104 %	Qualify results (J) in affected samples.

LCS/LCSD Results

LCS/LCSD (blank spike) analyzed by the laboratory associated with this data package; % recoveries and RPD within laboratory and generally acceptable control limits.

Quantitation Limits and Sample Results

Dilutions were not performed on TO-15 samples (see worksheet).

Calculations were spot checked.

Certification

The following samples 1602064A-01A; 1602064A-02A; 1602064A-03A; 1602064A-04A; 1602064A-05A; 1602064A-05AA; 1602064A-06A; 1602064A-07A; 1602064A-08A; 1602064A-09A; and 1602064A-10A were analyzed following standard procedures accepted by regulatory agencies. The quality control requirements met the methods criteria except in the occasions described in this document. The results are valid some of the results were qualified.

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Client Sample ID: B30-1IA013016

Lab ID#: 1602064A-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**e020818**	**Date of Collection: 1/31/16 10:32:00 AM**
Dil. Factor:	**1.83**	**Date of Analysis: 2/8/16 10:03 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.18	0.42	0.90	2.1
Freon 114	0.18	Not Detected	1.3	Not Detected
Chloromethane	0.92	0.64 J	1.9	1.3 J
Vinyl Chloride	0.18	Not Detected	0.47	Not Detected
1,3-Butadiene	0.18	0.074 J	0.40	0.16 J
Bromomethane	0.92	Not Detected	3.6	Not Detected
Chloroethane	0.92	Not Detected	2.4	Not Detected
Freon 11	0.18	0.23	1.0	1.3
Ethanol	0.92	13	1.7	24
Freon 113	0.18	0.060 J J	1.4	0.46 J
1,1-Dichloroethene	0.18	Not Detected	0.72	Not Detected
Acetone	0.92	5.2	2.2	12
2-Propanol	0.92	11	2.2	26
Carbon Disulfide	0.92	0.42 J	2.8	1.3 J
3-Chloropropene	0.92	Not Detected	2.9	Not Detected
Methylene Chloride	0.37	0.084 J	1.3	0.29 J
Methyl tert-butyl ether	0.18	Not Detected	0.66	Not Detected
trans-1,2-Dichloroethene	0.18	Not Detected	0.72	Not Detected
Hexane	0.18	0.12 J	0.64	0.43 J
1,1-Dichloroethane	0.18	Not Detected	0.74	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.92	0.79 J	2.7	2.3 J
cis-1,2-Dichloroethene	0.18	Not Detected	0.72	Not Detected
Tetrahydrofuran	0.92	Not Detected	2.7	Not Detected
Chloroform	0.18	Not Detected	0.89	Not Detected
1,1,1-Trichloroethane	0.18	Not Detected	1.0	Not Detected
Cyclohexane	0.18	Not Detected	0.63	Not Detected
Carbon Tetrachloride	0.18	0.073 J	1.2	0.46 J
2,2,4-Trimethylpentane	0.92	Not Detected	4.3	Not Detected
Benzene	0.18	0.22	0.58	0.70
1,2-Dichloroethane	0.18	Not Detected	0.74	Not Detected
Heptane	0.18	0.11 J	0.75	0.47 J
Trichloroethene	0.18	Not Detected	0.98	Not Detected
1,2-Dichloropropane	0.18	Not Detected	0.84	Not Detected
1,4-Dioxane	0.18	Not Detected	0.66	Not Detected
Bromodichloromethane	0.18	Not Detected	1.2	Not Detected
cis-1,3-Dichloropropene	0.18	Not Detected	0.83	Not Detected
4-Methyl-2-pentanone	0.18	Not Detected	0.75	Not Detected
Toluene	0.18	0.30	0.69	1.1
trans-1,3-Dichloropropene	0.18	Not Detected	0.83	Not Detected
1,1,2-Trichloroethane	0.18	Not Detected	1.0	Not Detected
Tetrachloroethene	0.18	Not Detected	1.2	Not Detected
2-Hexanone	0.92	Not Detected	3.7	Not Detected

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Client Sample ID: B30-1IA013016

Lab ID#: 1602064A-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**e020818**	**Date of Collection:**	**1/31/16 10:32:00 AM**
Dil. Factor:	**1.83**	**Date of Analysis:**	**2/8/16 10:03 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.18	Not Detected	1.6	Not Detected
1,2-Dibromoethane (EDB)	0.18	Not Detected	1.4	Not Detected
Chlorobenzene	0.18	Not Detected	0.84	Not Detected
Ethyl Benzene	0.18	Not Detected	0.79	Not Detected
m,p-Xylene	0.18	0.086 J	0.79	0.37 J
o-Xylene	0.18	Not Detected	0.79	Not Detected
Styrene	0.18	0.038 J	0.78	0.16 J
Bromoform	0.18	Not Detected	1.9	Not Detected
Cumene	0.18	Not Detected	0.90	Not Detected
1,1,2,2-Tetrachloroethane	0.18	Not Detected	1.2	Not Detected
Propylbenzene	0.18	Not Detected	0.90	Not Detected
4-Ethyltoluene	0.18	0.023 J	0.90	0.11 J
1,3,5-Trimethylbenzene	0.18	Not Detected	0.90	Not Detected
1,2,4-Trimethylbenzene	0.18	Not Detected	0.90	Not Detected
1,3-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
1,4-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
alpha-Chlorotoluene	0.18	0.021 J	0.95	0.11 J
1,2-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
1,2,4-Trichlorobenzene	0.92	Not Detected	6.8	Not Detected
Hexachlorobutadiene	0.92	Not Detected	9.8	Not Detected
Naphthalene	0.92	Not Detected	4.8	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

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

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Client Sample ID: B30-2IA013016

Lab ID#: 1602064A-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**e020821**	**Date of Collection: 1/31/16 10:33:00 AM**
Dil. Factor:	**1.71**	**Date of Analysis: 2/9/16 08:01 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.17	0.38	0.84	1.9
Freon 114	0.17	Not Detected	1.2	Not Detected
Chloromethane	0.86	0.60 J	1.8	1.2 J
Vinyl Chloride	0.17	Not Detected	0.44	Not Detected
1,3-Butadiene	0.17	Not Detected	0.38	Not Detected
Bromomethane	0.86	Not Detected	3.3	Not Detected
Chloroethane	0.86	Not Detected	2.2	Not Detected
Freon 11	0.17	0.23	0.96	1.3
Ethanol	0.86	11	1.6	21
Freon 113	0.17	0.049 J	1.3	0.37 J
1,1-Dichloroethene	0.17	Not Detected	0.68	Not Detected
Acetone	0.86	3.6	2.0	8.5
2-Propanol	0.86	10	2.1	25
Carbon Disulfide	0.86	1.4	2.7	4.4
3-Chloropropene	0.86	Not Detected	2.7	Not Detected
Methylene Chloride	0.34	0.12 J	1.2	0.42 J
Methyl tert-butyl ether	0.17	Not Detected	0.62	Not Detected
trans-1,2-Dichloroethene	0.17	Not Detected	0.68	Not Detected
Hexane	0.17	Not Detected	0.60	Not Detected
1,1-Dichloroethane	0.17	Not Detected	0.69	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.86	0.41 J	2.5	1.2 J
cis-1,2-Dichloroethene	0.17	Not Detected	0.68	Not Detected
Tetrahydrofuran	0.86	Not Detected	2.5	Not Detected
Chloroform	0.17	Not Detected	0.83	Not Detected
1,1,1-Trichloroethane	0.17	Not Detected	0.93	Not Detected
Cyclohexane	0.17	Not Detected	0.59	Not Detected
Carbon Tetrachloride	0.17	0.066 J	1.1	0.41 J
2,2,4-Trimethylpentane	0.86	Not Detected	4.0	Not Detected
Benzene	0.17	0.10 J	0.55	0.33 J
1,2-Dichloroethane	0.17	Not Detected	0.69	Not Detected
Heptane	0.17	Not Detected	0.70	Not Detected
Trichloroethene	0.17	Not Detected	0.92	Not Detected
1,2-Dichloropropane	0.17	Not Detected	0.79	Not Detected
1,4-Dioxane	0.17	Not Detected	0.62	Not Detected
Bromodichloromethane	0.17	Not Detected	1.1	Not Detected
cis-1,3-Dichloropropene	0.17	Not Detected	0.78	Not Detected
4-Methyl-2-pentanone	0.17	Not Detected	0.70	Not Detected
Toluene	0.17	0.[illegible]	0.64	1.1
trans-1,3-Dichloropropene	0.17	Not Detected	[illegible]78	Not Detected
1,1,2-Trichloroethane	0.17	Not Detected	[illegible]93	Not Detected
Tetrachloroethene	0.17	Not Detected	[illegible]2	Not Detected
2-Hexanone	0.86	Not Detected	3.5	Not Detected

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Client Sample ID: B30-2IA013016

Lab ID#: 1602064A-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	e020821	**Date of Collection:**	1/31/16 10:33:00 AM
Dil. Factor:	1.71	**Date of Analysis:**	2/9/16 08:01 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.17	Not Detected	1.4	Not Detected
1,2-Dibromoethane (EDB)	0.17	Not Detected	1.3	Not Detected
Chlorobenzene	0.17	Not Detected	0.79	Not Detected
Ethyl Benzene	0.17	Not Detected	0.74	Not Detected
m,p-Xylene	0.17	0.088 J	0.74	0.38 J
o-Xylene	0.17	Not Detected	0.74	Not Detected
Styrene	0.17	0.047 J	0.73	0.20 J
Bromoform	0.17	Not Detected	1.8	Not Detected
Cumene	0.17	Not Detected	0.84	Not Detected
1,1,2,2-Tetrachloroethane	0.17	Not Detected	1.2	Not Detected
Propylbenzene	0.17	Not Detected	0.84	Not Detected
4-Ethyltoluene	0.17	0.030 J	0.84	0.15 J
1,3,5-Trimethylbenzene	0.17	Not Detected	0.84	Not Detected
1,2,4-Trimethylbenzene	0.17	0.045 J	0.84	0.22 J
1,3-Dichlorobenzene	0.17	Not Detected	1.0	Not Detected
1,4-Dichlorobenzene	0.17	0.035 J	1.0	0.21 J
alpha-Chlorotoluene	0.17	Not Detected	0.88	Not Detected
1,2-Dichlorobenzene	0.17	Not Detected	1.0	Not Detected
1,2,4-Trichlorobenzene	0.86	Not Detected	6.3	Not Detected
Hexachlorobutadiene	0.86	Not Detected	9.1	Not Detected
Naphthalene	0.86	0.063 J	4.5	0.33 J

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: B30-3IA013016

Lab ID#: 1602064A-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**e020820**	**Date of Collection:**	**1/31/16 10:42:00 AM**
Dil. Factor:	**1.79**	**Date of Analysis:**	**2/9/16 07:14 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.18	0.41	0.88	2.0
Freon 114	0.18	Not Detected	1.2	Not Detected
Chloromethane	0.90	0.68 J	1.8	1.4 J
Vinyl Chloride	0.18	Not Detected	0.46	Not Detected
1,3-Butadiene	0.18	Not Detected	0.40	Not Detected
Bromomethane	0.90	Not Detected	3.5	Not Detected
Chloroethane	0.90	Not Detected	2.4	Not Detected
Freon 11	0.18	0.23	1.0	1.3
Ethanol	0.90	15	1.7	28
Freon 113	0.18	0.055 J	1.4	0.42 J
1,1-Dichloroethene	0.18	Not Detected	0.71	Not Detected
Acetone	0.90	5.6	2.1	13
2-Propanol	0.90	7.7	2.2	19
Carbon Disulfide	0.90	0.49 J	2.8	1.5 J
3-Chloropropene	0.90	Not Detected	2.8	Not Detected
Methylene Chloride	0.36	0.071 J	1.2	0.24 J
Methyl tert-butyl ether	0.18	Not Detected	0.64	Not Detected
trans-1,2-Dichloroethene	0.18	Not Detected	0.71	Not Detected
Hexane	0.18	Not Detected	0.63	Not Detected
1,1-Dichloroethane	0.18	Not Detected	0.72	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.90	0.51 J	2.6	1.5 J
cis-1,2-Dichloroethene	0.18	Not Detected	0.71	Not Detected
Tetrahydrofuran	0.90	Not Detected	2.6	Not Detected
Chloroform	0.18	Not Detected	0.87	Not Detected
1,1,1-Trichloroethane	0.18	Not Detected	0.98	Not Detected
Cyclohexane	0.18	Not Detected	0.62	Not Detected
Carbon Tetrachloride	0.18	0.067 J	1.1	0.42 J
2,2,4-Trimethylpentane	0.90	Not Detected	4.2	Not Detected
Benzene	0.18	0.089 J	0.57	0.28 J
1,2-Dichloroethane	0.18	Not Detected	0.72	Not Detected
Heptane	0.18	Not Detected	0.73	Not Detected
Trichloroethene	0.18	Not Detected	0.96	Not Detected
1,2-Dichloropropane	0.18	Not Detected	0.83	Not Detected
1,4-Dioxane	0.18	Not Detected	0.64	Not Detected
Bromodichloromethane	0.18	Not Detected	1.2	Not Detected
cis-1,3-Dichloropropene	0.18	Not Detected	0.81	Not Detected
4-Methyl-2-pentanone	0.18	0.056 J	0.73	0.23 J
Toluene	0.18	0.23	0.67	0.86
trans-1,3-Dichloropropene	0.18	Not Detected	[illegible]	Not Detected
1,1,2-Trichloroethane	0.18	Not Detected	[illegible]	Not Detected
Tetrachloroethene	0.18	Not Detected	[illegible]	Not Detected
2-Hexanone	0.90	Not Detected	[illegible]	Not Detected

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Client Sample ID: B30-3IA013016

Lab ID#: 1602064A-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**e020820**	**Date of Collection:**	**1/31/16 10:42:00 AM**
Dil. Factor:	**1.79**	**Date of Analysis:**	**2/9/16 07:14 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.18	Not Detected	1.5	Not Detected
1,2-Dibromoethane (EDB)	0.18	Not Detected	1.4	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	0.076 J	0.78	0.33 J
o-Xylene	0.18	Not Detected	0.78	Not Detected
Styrene	0.18	0.052 J	0.76	0.22 J
Bromoform	0.18	Not Detected	1.8	Not Detected
Cumene	0.18	Not Detected	0.88	Not Detected
1,1,2,2-Tetrachloroethane	0.18	Not Detected	1.2	Not Detected
Propylbenzene	0.18	Not Detected	0.88	Not Detected
4-Ethyltoluene	0.18	0.024 J	0.88	0.12 J
1,3,5-Trimethylbenzene	0.18	Not Detected	0.88	Not Detected
1,2,4-Trimethylbenzene	0.18	Not Detected	0.88	Not Detected
1,3-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
1,4-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
alpha-Chlorotoluene	0.18	Not Detected	0.93	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
Hexachlorobutadiene	0.90	Not Detected 7	9.5	Not Detected
Naphthalene	0.90	Not Detected	4.7	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

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

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Client Sample ID: B30-4IA013016

Lab ID#: 1602064A-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**e020911**	**Date of Collection:**	**1/31/16 9:36:00 AM**
Dil. Factor:	**1.46**	**Date of Analysis:**	**2/9/16 06:33 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.15	0.42	0.72	2.1
Freon 114	0.15	Not Detected	1.0	Not Detected
Chloromethane	0.73	0.68 J	1.5	1.4 J
Vinyl Chloride	0.15	Not Detected	0.37	Not Detected
1,3-Butadiene	0.15	Not Detected	0.32	Not Detected
Bromomethane	0.73	Not Detected	2.8	Not Detected
Chloroethane	0.73	Not Detected	1.9	Not Detected
Freon 11	0.15	0.24	0.82	1.3
Ethanol	0.73	22 J0	1.4	41 J0
Freon 113	0.15	0.058 J	1.1	0.45 J
1,1-Dichloroethene	0.15	Not Detected	0.58	Not Detected
Acetone	0.73	4.7	1.7	11
2-Propanol	0.73	8.4	1.8	21
Carbon Disulfide	0.73	0.60 J	2.3	1.9 J
3-Chloropropene	0.73	Not Detected	2.3	Not Detected
Methylene Chloride	0.29	0.070 J	1.0	0.24 J
Methyl tert-butyl ether	0.15	Not Detected	0.53	Not Detected
trans-1,2-Dichloroethene	0.15	Not Detected	0.58	Not Detected
Hexane	0.15	Not Detected	0.51	Not Detected
1,1-Dichloroethane	0.15	Not Detected	0.59	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.73	0.41 J	2.2	1.2 J
cis-1,2-Dichloroethene	0.15	Not Detected	0.58	Not Detected
Tetrahydrofuran	0.73	Not Detected	2.2	Not Detected
Chloroform	0.15	Not Detected	0.71	Not Detected
1,1,1-Trichloroethane	0.15	Not Detected	0.80	Not Detected
Cyclohexane	0.15	Not Detected	0.50	Not Detected
Carbon Tetrachloride	0.15	0.065 J	0.92	0.41 J
2,2,4-Trimethylpentane	0.73	Not Detected	3.4	Not Detected
Benzene	0.15	0.090 J	0.47	0.29 J
1,2-Dichloroethane	0.15	0.037 J	0.59	0.15 J
Heptane	0.15	Not Detected	0.60	Not Detected
Trichloroethene	0.15	Not Detected	0.78	Not Detected
1,2-Dichloropropane	0.15	Not Detected	0.67	Not Detected
1,4-Dioxane	0.15	Not Detected	0.53	Not Detected
Bromodichloromethane	0.15	Not Detected	0.98	Not Detected
cis-1,3-Dichloropropene	0.15	Not Detected	0.66	Not Detected
4-Methyl-2-pentanone	0.15	Not Detected	0.6[illegible]	Not Detected
Toluene	0.15	0.21	0.55	0.79
trans-1,3-Dichloropropene	0.15	0.034 J	0.66	0.16 J
1,1,2-Trichloroethane	0.15	Not Detected	0.80	Not Detected
Tetrachloroethene	0.15	Not Detected	0.99	Not Detected
2-Hexanone	0.73	Not Detected	3.[illegible]	Not Detected

LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
1888
QUIMICO LICENCIADO

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Client Sample ID: B30-4IA013016

Lab ID#: 1602064A-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**e020911**	**Date of Collection:**	**1/31/16 9:36:00 AM**
Dil. Factor:	**1.46**	**Date of Analysis:**	**2/9/16 06:33 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.15	Not Detected	1.2	Not Detected
1,2-Dibromoethane (EDB)	0.15	Not Detected	1.1	Not Detected
Chlorobenzene	0.15	Not Detected	0.67	Not Detected
Ethyl Benzene	0.15	Not Detected	0.63	Not Detected
m,p-Xylene	0.15	0.078 J	0.63	0.34 J
o-Xylene	0.15	0.042 J	0.63	0.18 J
Styrene	0.15	0.061 J	0.62	0.26 J
Bromoform	0.15	Not Detected	1.5	Not Detected
Cumene	0.15	Not Detected	0.72	Not Detected
1,1,2,2-Tetrachloroethane	0.15	Not Detected	1.0	Not Detected
Propylbenzene	0.15	Not Detected	0.72	Not Detected
4-Ethyltoluene	0.15	0.030 J	0.72	0.15 J
1,3,5-Trimethylbenzene	0.15	Not Detected	0.72	Not Detected
1,2,4-Trimethylbenzene	0.15	0.039 J	0.72	0.19 J
1,3-Dichlorobenzene	0.15	0.024 J	0.88	0.14 J
1,4-Dichlorobenzene	0.15	0.042 J	0.88	0.25 J
alpha-Chlorotoluene	0.15	0.034 J	0.76	0.18 J
1,2-Dichlorobenzene	0.15	0.032 J	0.88	0.19 J
1,2,4-Trichlorobenzene	0.73	0.18 J	5.4	1.3 J
Hexachlorobutadiene	0.73	Not Detected	7.8	Not Detected
Naphthalene	0.73	0.042 J	3.8	0.22 J

J = Estimated value.
J0 = Estimated value due to bias in the CCV.
Container Type: 6 Liter Summa Canister (100% Certified)

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

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Client Sample ID: B30-4DIA013016

Lab ID#: 1602064A-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	e020912	Date of Collection:	1/31/16 9:36:00 AM
Dil. Factor:	2.01	Date of Analysis:	2/9/16 07:21 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.20	0.41	0.99	2.0
Freon 114	0.20	Not Detected	1.4	Not Detected
Chloromethane	1.0	0.66 J	2.1	1.4 J
Vinyl Chloride	0.20	Not Detected	0.51	Not Detected
1,3-Butadiene	0.20	Not Detected	0.44	Not Detected
Bromomethane	1.0	Not Detected	3.9	Not Detected
Chloroethane	1.0	Not Detected	2.6	Not Detected
Freon 11	0.20	0.24	1.1	1.4
Ethanol	1.0	24 J0 J	1.9	46 J0
Freon 113	0.20	0.049 J	1.5	0.37 J
1,1-Dichloroethene	0.20	Not Detected	0.80	Not Detected
Acetone	1.0	7.8 J	2.4	18
2-Propanol	1.0	8.9	2.5	22
Carbon Disulfide	1.0	0.47 J	3.1	1.5 J
3-Chloropropene	1.0	Not Detected	3.1	Not Detected
Methylene Chloride	0.40	Not Detected	1.4	Not Detected
Methyl tert-butyl ether	0.20	Not Detected	0.72	Not Detected
trans-1,2-Dichloroethene	0.20	Not Detected	0.80	Not Detected
Hexane	0.20	0.14 J	0.71	0.48 J
1,1-Dichloroethane	0.20	Not Detected	0.81	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.0	1.3 J	3.0	4.0
cis-1,2-Dichloroethene	0.20	Not Detected	0.80	Not Detected
Tetrahydrofuran	1.0	Not Detected	3.0	Not Detected
Chloroform	0.20	Not Detected	0.98	Not Detected
1,1,1-Trichloroethane	0.20	Not Detected	1.1	Not Detected
Cyclohexane	0.20	Not Detected	0.69	Not Detected
Carbon Tetrachloride	0.20	0.075 J	1.3	0.47 J
2,2,4-Trimethylpentane	1.0	Not Detected	4.7	Not Detected
Benzene	0.20	0.11 J	0.64	0.34 J
1,2-Dichloroethane	0.20	Not Detected	0.81	Not Detected
Heptane	0.20	0.11 J	0.82	0.44 J
Trichloroethene	0.20	Not Detected	1.1	Not Detected
1,2-Dichloropropane	0.20	Not Detected	0.93	Not Detected
1,4-Dioxane	0.20	Not Detected	0.72	Not Detected
Bromodichloromethane	0.20	Not Detected	1.3	Not Detected
cis-1,3-Dichloropropene	0.20	Not Detected	0.91	Not Detected
4-Methyl-2-pentanone	0.20	0.10 J	0.82	0.43 J
Toluene	0.20	0.24	[illegible]	0.91
trans-1,3-Dichloropropene	0.20	Not Detected	[illegible]	Not Detected
1,1,2-Trichloroethane	0.20	Not Detected	[illegible]	Not Detected
Tetrachloroethene	0.20	Not Detected	1.4	Not Detected
2-Hexanone	1.0	0.27 J	4.1	1.1 J

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Client Sample ID: B30-4DIA013016

Lab ID#: 1602064A-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**e020912**	**Date of Collection:**	**1/31/16 9:36:00 AM**
Dil. Factor:	**2.01**	**Date of Analysis:**	**2/9/16 07:21 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.20	Not Detected	1.7	Not Detected
1,2-Dibromoethane (EDB)	0.20	Not Detected	1.5	Not Detected
Chlorobenzene	0.20	Not Detected	0.92	Not Detected
Ethyl Benzene	0.20	Not Detected	0.87	Not Detected
m,p-Xylene	0.20	0.094 J	0.87	0.41 J
o-Xylene	0.20	Not Detected	0.87	Not Detected
Styrene	0.20	0.062 J	0.86	0.26 J
Bromoform	0.20	Not Detected	2.1	Not Detected
Cumene	0.20	Not Detected	0.99	Not Detected
1,1,2,2-Tetrachloroethane	0.20	Not Detected	1.4	Not Detected
Propylbenzene	0.20	Not Detected	0.99	Not Detected
4-Ethyltoluene	0.20	0.040 J	0.99	0.20 J
1,3,5-Trimethylbenzene	0.20	Not Detected	0.99	Not Detected
1,2,4-Trimethylbenzene	0.20	0.068 J	0.99	0.34 J
1,3-Dichlorobenzene	0.20	Not Detected	1.2	Not Detected
1,4-Dichlorobenzene	0.20	0.042 J	1.2	0.25 J
alpha-Chlorotoluene	0.20	Not Detected	1.0	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
Hexachlorobutadiene	1.0	Not Detected	11	Not Detected
Naphthalene	1.0	Not Detected	5.3	Not Detected

J = Estimated value.
J0 = Estimated value due to bias in the CCV.
Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	101	70-130

LIBRE ASOCIADO DE PUERTO RICO
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Client Sample ID: B30-4DIA013016 Lab Duplicate

Lab ID#: 1602064A-05AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	e020918	**Date of Collection: 1/31/16 9:36:00 AM**
Dil. Factor:	2.01	**Date of Analysis: 2/10/16 08:08 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.20	0.41	0.99	2.0
Freon 114	0.20	Not Detected	1.4	Not Detected
Chloromethane	1.0	0.61 J	2.1	1.3 J
Vinyl Chloride	0.20	Not Detected	0.51	Not Detected
1,3-Butadiene	0.20	Not Detected	0.44	Not Detected
Bromomethane	1.0	Not Detected	3.9	Not Detected
Chloroethane	1.0	Not Detected	2.6	Not Detected
Freon 11	0.20	0.22	1.1	1.3
Ethanol	1.0	23 J0	1.9	44 J0
Freon 113	0.20	0.050 J	1.5	0.38 J
1,1-Dichloroethene	0.20	Not Detected	0.80	Not Detected
Acetone	1.0	7.7	2.4	18
2-Propanol	1.0	8.8	2.5	22
Carbon Disulfide	1.0	0.75 J	3.1	2.3 J
3-Chloropropene	1.0	Not Detected	3.1	Not Detected
Methylene Chloride	0.40	Not Detected	1.4	Not Detected
Methyl tert-butyl ether	0.20	Not Detected	0.72	Not Detected
trans-1,2-Dichloroethene	0.20	Not Detected	0.80	Not Detected
Hexane	0.20	0.13 J	0.71	0.47 J
1,1-Dichloroethane	0.20	Not Detected	0.81	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.0	1.3	3.0	3.8
cis-1,2-Dichloroethene	0.20	Not Detected	0.80	Not Detected
Tetrahydrofuran	1.0	Not Detected	3.0	Not Detected
Chloroform	0.20	Not Detected	0.98	Not Detected
1,1,1-Trichloroethane	0.20	Not Detected	1.1	Not Detected
Cyclohexane	0.20	Not Detected	0.69	Not Detected
Carbon Tetrachloride	0.20	0.068 J	1.3	0.43 J
2,2,4-Trimethylpentane	1.0	Not Detected	4.7	Not Detected
Benzene	0.20	0.10 J	0.64	0.33 J
1,2-Dichloroethane	0.20	Not Detected	0.81	Not Detected
Heptane	0.20	0.13 J	0.82	0.54 J
Trichloroethene	0.20	Not Detected	1.1	Not Detected
1,2-Dichloropropane	0.20	Not Detected	0.93	Not Detected
1,4-Dioxane	0.20	Not Detected	0.72	Not Detected
Bromodichloromethane	0.20	Not Detected	1.3	Not Detected
cis-1,3-Dichloropropene	0.20	Not Detected	0.91	Not Detected
4-Methyl-2-pentanone	0.20	0.097 J	0.82	0.40 J
Toluene	0.20	0.24	0.76	0.92
trans-1,3-Dichloropropene	0.20	Not Detected	0.91	Not Detected
1,1,2-Trichloroethane	0.20	Not Detected	1.1	Not Detected
Tetrachloroethene	0.20	Not Detected	[illegible]	Not Detected
2-Hexanone	1.0	0.25 J	4.1	1.0 J

LIBRE ASOCIACIÓN DE PUERTO RICO
Rafael Infante Méndez
IC # 1888
QUÍMICO LICENCIADO

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Client Sample ID: B30-4DIA013016 Lab Duplicate

Lab ID#: 1602064A-05AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**e020918**	**Date of Collection:**	**1/31/16 9:36:00 AM**
Dil. Factor:	**2.01**	**Date of Analysis:**	**2/10/16 08:08 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.20	Not Detected	1.7	Not Detected
1,2-Dibromoethane (EDB)	0.20	Not Detected	1.5	Not Detected
Chlorobenzene	0.20	Not Detected	0.92	Not Detected
Ethyl Benzene	0.20	Not Detected	0.87	Not Detected
m,p-Xylene	0.20	0.10 J	0.87	0.44 J
o-Xylene	0.20	Not Detected	0.87	Not Detected
Styrene	0.20	0.061 J	0.86	0.26 J
Bromoform	0.20	Not Detected	2.1	Not Detected
Cumene	0.20	Not Detected	0.99	Not Detected
1,1,2,2-Tetrachloroethane	0.20	Not Detected	1.4	Not Detected
Propylbenzene	0.20	Not Detected	0.99	Not Detected
4-Ethyltoluene	0.20	0.039 J	0.99	0.19 J
1,3,5-Trimethylbenzene	0.20	Not Detected	0.99	Not Detected
1,2,4-Trimethylbenzene	0.20	0.051 J	0.99	0.25 J
1,3-Dichlorobenzene	0.20	Not Detected	1.2	Not Detected
1,4-Dichlorobenzene	0.20	Not Detected	1.2	Not Detected
alpha-Chlorotoluene	0.20	Not Detected	1.0	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
Hexachlorobutadiene	1.0	Not Detected	11	Not Detected
Naphthalene	1.0	Not Detected	5.3	Not Detected

J = Estimated value.
J0 = Estimated value due to bias in the CCV.
Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	100	70-130

ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
IC - 1888
QUIMICO LICENCIADO

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Client Sample ID: B30-5IA013016

Lab ID#: 1602064A-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	e020822	Date of Collection:	1/31/16 10:58:00 AM
Dil. Factor:	1.87	Date of Analysis:	2/9/16 08:56 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.19	0.40	0.92	2.0
Freon 114	0.19	Not Detected	1.3	Not Detected
Chloromethane	0.94	0.62 J	1.9	1.3 J
Vinyl Chloride	0.19	Not Detected	0.48	Not Detected
1,3-Butadiene	0.19	Not Detected	0.41	Not Detected
Bromomethane	0.94	Not Detected	3.6	Not Detected
Chloroethane	0.94	Not Detected	2.5	Not Detected
Freon 11	0.19	0.23	1.0	1.3
Ethanol	0.94	17	1.8	31
Freon 113	0.19	0.049 J	1.4	0.38 J
1,1-Dichloroethene	0.19	Not Detected	0.74	Not Detected
Acetone	0.94	4.2	2.2	10
2-Propanol	0.94	5.6	2.3	14
Carbon Disulfide	0.94	0.58 J	2.9	1.8 J
3-Chloropropene	0.94	Not Detected	2.9	Not Detected
Methylene Chloride	0.37	0.075 J	1.3	0.26 J
Methyl tert-butyl ether	0.19	Not Detected	0.67	Not Detected
trans-1,2-Dichloroethene	0.19	Not Detected	0.74	Not Detected
Hexane	0.19	Not Detected	0.66	Not Detected
1,1-Dichloroethane	0.19	Not Detected	0.76	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.94	0.56 J	2.8	1.6 J
cis-1,2-Dichloroethene	0.19	Not Detected	0.74	Not Detected
Tetrahydrofuran	0.94	Not Detected	2.8	Not Detected
Chloroform	0.19	Not Detected	0.91	Not Detected
1,1,1-Trichloroethane	0.19	Not Detected	1.0	Not Detected
Cyclohexane	0.19	Not Detected	0.64	Not Detected
Carbon Tetrachloride	0.19	0.068 J	1.2	0.43 J
2,2,4-Trimethylpentane	0.94	Not Detected	4.4	Not Detected
Benzene	0.19	0.095 J	0.60	0.30 J
1,2-Dichloroethane	0.19	Not Detected	0.76	Not Detected
Heptane	0.19	Not Detected	0.77	Not Detected
Trichloroethene	0.19	Not Detected	1.0	Not Detected
1,2-Dichloropropane	0.19	Not Detected	0.86	Not Detected
1,4-Dioxane	0.19	Not Detected	0.67	Not Detected
Bromodichloromethane	0.19	Not Detected	1.2	Not Detected
cis-1,3-Dichloropropene	0.19	Not Detected	0.85	Not Detected
4-Methyl-2-pentanone	0.19	Not Detected	0.77	Not Detected
Toluene	0.19	0.28	[illegible]	1.1
trans-1,3-Dichloropropene	0.19	Not Detected	0.85	Not Detected
1,1,2-Trichloroethane	0.19	Not Detected	1.0	Not Detected
Tetrachloroethene	0.19	Not Detected	1.3	Not Detected
2-Hexanone	0.94	Not Detected	3.8	Not Detected

Colegio de Químicos Asociados de Puerto Rico
Rafael Infante Méndez
1888
Químico Licenciado

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Client Sample ID: B30-5IA013016

Lab ID#: 1602064A-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**e020822**	**Date of Collection:**	**1/31/16 10:58:00 AM**
Dil. Factor:	**1.87**	**Date of Analysis:**	**2/9/16 08:56 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.19	Not Detected	1.6	Not Detected
1,2-Dibromoethane (EDB)	0.19	Not Detected	1.4	Not Detected
Chlorobenzene	0.19	Not Detected	0.86	Not Detected
Ethyl Benzene	0.19	Not Detected	0.81	Not Detected
m,p-Xylene	0.19	0.082 J	0.81	0.36 J
o-Xylene	0.19	Not Detected	0.81	Not Detected
Styrene	0.19	0.088 J	0.80	0.37 J
Bromoform	0.19	Not Detected	1.9	Not Detected
Cumene	0.19	Not Detected	0.92	Not Detected
1,1,2,2-Tetrachloroethane	0.19	Not Detected	1.3	Not Detected
Propylbenzene	0.19	Not Detected	0.92	Not Detected
4-Ethyltoluene	0.19	0.027 J	0.92	0.14 J
1,3,5-Trimethylbenzene	0.19	Not Detected	0.92	Not Detected
1,2,4-Trimethylbenzene	0.19	Not Detected	0.92	Not Detected
1,3-Dichlorobenzene	0.19	Not Detected	1.1	Not Detected
1,4-Dichlorobenzene	0.19	Not Detected	1.1	Not Detected
alpha-Chlorotoluene	0.19	Not Detected	0.97	Not Detected
1,2-Dichlorobenzene	0.19	Not Detected	1.1	Not Detected
1,2,4-Trichlorobenzene	0.94	Not Detected	6.9	Not Detected
Hexachlorobutadiene	0.94	Not Detected	10	Not Detected
Naphthalene	0.94	Not Detected	4.9	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	99	70-130

COLEGIO DE QUÍMICOS ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
1888
QUÍMICO LICENCIADO

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Client Sample ID: B42-1IA013016

Lab ID#: 1602064A-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	e020913	**Date of Collection:**	1/31/16 11:30:00 AM
Dil. Factor:	1.96	**Date of Analysis:**	2/9/16 08:08 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.20	0.40	0.97	2.0
Freon 114	0.20	Not Detected	1.4	Not Detected
Chloromethane	0.98	0.63 J	2.0	1.3 J
Vinyl Chloride	0.20	Not Detected	0.50	Not Detected
1,3-Butadiene	0.20	Not Detected	0.43	Not Detected
Bromomethane	0.98	Not Detected	3.8	Not Detected
Chloroethane	0.98	Not Detected	2.6	Not Detected
Freon 11	0.20	0.20	1.1	1.1
Ethanol	0.98	2.9 J0	1.8	5.5 J0
Freon 113	0.20	0.058 J	1.5	0.44 J
1,1-Dichloroethene	0.20	Not Detected	0.78	Not Detected
Acetone	0.98	4.1	2.3	9.8
2-Propanol	0.98	0.32 J	2.4	0.78 J
Carbon Disulfide	0.98	0.41 J	3.0	1.3 J
3-Chloropropene	0.98	Not Detected	3.1	Not Detected
Methylene Chloride	0.39	0.088 J	1.4	0.31 J
Methyl tert-butyl ether	0.20	Not Detected	0.71	Not Detected
trans-1,2-Dichloroethene	0.20	Not Detected	0.78	Not Detected
Hexane	0.20	0.14 J	0.69	0.51 J
1,1-Dichloroethane	0.20	Not Detected	0.79	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.98	0.71 J	2.9	2.1 J
cis-1,2-Dichloroethene	0.20	Not Detected	0.78	Not Detected
Tetrahydrofuran	0.98	0.42 J	2.9	1.2 J
Chloroform	0.20	Not Detected	0.96	Not Detected
1,1,1-Trichloroethane	0.20	Not Detected	1.1	Not Detected
Cyclohexane	0.20	Not Detected	0.67	Not Detected
Carbon Tetrachloride	0.20	0.073 J	1.2	0.46 J
2,2,4-Trimethylpentane	0.98	Not Detected	4.6	Not Detected
Benzene	0.20	0.12 J	0.63	0.39 J
1,2-Dichloroethane	0.20	Not Detected	0.79	Not Detected
Heptane	0.20	0.099 J	0.80	0.40 J
Trichloroethene	0.20	Not Detected	1.0	Not Detected
1,2-Dichloropropane	0.20	Not Detected	0.90	Not Detected
1,4-Dioxane	0.20	Not Detected	0.71	Not Detected
Bromodichloromethane	0.20	Not Detected	1.3	Not Detected
cis-1,3-Dichloropropene	0.20	Not Detected	0.89	Not Detected
4-Methyl-2-pentanone	0.20	0.074 J	0.80	0.30 J
Toluene	0.20	0.56	0.74	2.1
trans-1,3-Dichloropropene	0.20	Not Detected	[illegible]	Not Detected
1,1,2-Trichloroethane	0.20	Not Detected	[illegible]	Not Detected
Tetrachloroethene	0.20	Not Detected	[illegible]	Not Detected
2-Hexanone	0.98	Not Detected	[illegible]	Not Detected

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Client Sample ID: B42-1IA013016

Lab ID#: 1602064A-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	e020913	**Date of Collection:**	1/31/16 11:30:00 AM
Dil. Factor:	1.96	**Date of Analysis:**	2/9/16 08:08 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.20	Not Detected	1.7	Not Detected
1,2-Dibromoethane (EDB)	0.20	Not Detected	1.5	Not Detected
Chlorobenzene	0.20	Not Detected	0.90	Not Detected
Ethyl Benzene	0.20	0.062 J	0.85	0.27 J
m,p-Xylene	0.20	0.20	0.85	0.88
o-Xylene	0.20	0.074 J	0.85	0.32 J
Styrene	0.20	Not Detected	0.83	Not Detected
Bromoform	0.20	Not Detected	2.0	Not Detected
Cumene	0.20	Not Detected	0.96	Not Detected
1,1,2,2-Tetrachloroethane	0.20	Not Detected	1.3	Not Detected
Propylbenzene	0.20	Not Detected	0.96	Not Detected
4-Ethyltoluene	0.20	0.077 J	0.96	0.38 J
1,3,5-Trimethylbenzene	0.20	Not Detected	0.96	Not Detected
1,2,4-Trimethylbenzene	0.20	0.071 J	0.96	0.35 J
1,3-Dichlorobenzene	0.20	Not Detected	1.2	Not Detected
1,4-Dichlorobenzene	0.20	Not Detected	1.2	Not Detected
alpha-Chlorotoluene	0.20	Not Detected	1.0	Not Detected
1,2-Dichlorobenzene	0.20	Not Detected	1.2	Not Detected
1,2,4-Trichlorobenzene	0.98	Not Detected	7.3	Not Detected
Hexachlorobutadiene	0.98	Not Detected	10	Not Detected
Naphthalene	0.98	0.11 J	5.1	0.59 J

J = Estimated value.
J0 = Estimated value due to bias in the CCV.
Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: B42-2IA013016

Lab ID#: 1602064A-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	e020914	**Date of Collection:**	1/31/16 11:28:00 AM
Dil. Factor:	1.79	**Date of Analysis:**	2/9/16 09:04 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.18	0.40	0.88	2.0
Freon 114	0.18	Not Detected	1.2	Not Detected
Chloromethane	0.90	0.68 J	1.8	1.4 J
Vinyl Chloride	0.18	Not Detected	0.46	Not Detected
1,3-Butadiene	0.18	0.048 J	0.40	0.11 J
Bromomethane	0.90	Not Detected	3.5	Not Detected
Chloroethane	0.90	Not Detected	2.4	Not Detected
Freon 11	0.18	0.20	1.0	1.1
Ethanol	0.90	13 J0 J	1.7	25 J0
Freon 113	0.18	0.054 J	1.4	0.41 J
1,1-Dichloroethene	0.18	Not Detected	0.71	Not Detected
Acetone	0.90	8.4	2.1	20
2-Propanol	0.90	2.4	2.2	5.9
Carbon Disulfide	0.90	0.46 J	2.8	1.4 J
3-Chloropropene	0.90	Not Detected	2.8	Not Detected
Methylene Chloride	0.36	0.37	1.2	1.3
Methyl tert-butyl ether	0.18	Not Detected	0.64	Not Detected
trans-1,2-Dichloroethene	0.18	Not Detected	0.71	Not Detected
Hexane	0.18	0.54	0.63	1.9
1,1-Dichloroethane	0.18	Not Detected	0.72	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.90	1.4	2.6	4.1
cis-1,2-Dichloroethene	0.18	Not Detected	0.71	Not Detected
Tetrahydrofuran	0.90	4.0	2.6	12
Chloroform	0.18	Not Detected	0.87	Not Detected
1,1,1-Trichloroethane	0.18	Not Detected	0.98	Not Detected
Cyclohexane	0.18	0.11 J	0.62	0.38 J
Carbon Tetrachloride	0.18	0.059 J	1.1	0.37 J
2,2,4-Trimethylpentane	0.90	Not Detected	4.2	Not Detected
Benzene	0.18	0.18	0.57	0.59
1,2-Dichloroethane	0.18	Not Detected	0.72	Not Detected
Heptane	0.18	0.10 J	0.73	0.42 J
Trichloroethene	0.18	0.16 J	0.96	0.88 J
1,2-Dichloropropane	0.18	0.095 J	0.83	0.44 J
1,4-Dioxane	0.18	Not Detected	0.64	Not Detected
Bromodichloromethane	0.18	Not Detected	1.2	Not Detected
cis-1,3-Dichloropropene	0.18	Not Detected	0.81	Not Detected
4-Methyl-2-pentanone	0.18	0.068 J	0.73	0.28 J
Toluene	0.18	1.[illegible]	0.67	4.0
trans-1,3-Dichloropropene	0.18	Not Detected	[illegible]81	Not Detected
1,1,2-Trichloroethane	0.18	Not Detected	[illegible]	Not Detected
Tetrachloroethene	0.18	Not Detected	[illegible]	Not Detected
2-Hexanone	0.90	Not Detected	3.7	Not Detected

JOBE ASOCIADO DE PUERTO RICO
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Client Sample ID: B42-2IA013016

Lab ID#: 1602064A-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**e020914**	**Date of Collection:**	**1/31/16 11:28:00 AM**
Dil. Factor:	**1.79**	**Date of Analysis:**	**2/9/16 09:04 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.18	Not Detected	1.5	Not Detected
1,2-Dibromoethane (EDB)	0.18	Not Detected	1.4	Not Detected
Chlorobenzene	0.18	Not Detected	0.82	Not Detected
Ethyl Benzene	0.18	0.083 J	0.78	0.36 J
m,p-Xylene	0.18	0.23	0.78	1.0
o-Xylene	0.18	0.099 J	0.78	0.43 J
Styrene	0.18	0.062 J	0.76	0.27 J
Bromoform	0.18	Not Detected	1.8	Not Detected
Cumene	0.18	Not Detected	0.88	Not Detected
1,1,2,2-Tetrachloroethane	0.18	Not Detected	1.2	Not Detected
Propylbenzene	0.18	Not Detected	0.88	Not Detected
4-Ethyltoluene	0.18	0.068 J	0.88	0.34 J
1,3,5-Trimethylbenzene	0.18	Not Detected	0.88	Not Detected
1,2,4-Trimethylbenzene	0.18	0.069 J	0.88	0.34 J
1,3-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
1,4-Dichlorobenzene	0.18	Not Detected	1.1	Not Detected
alpha-Chlorotoluene	0.18	Not Detected	0.93	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
Hexachlorobutadiene	0.90	Not Detected	9.5	Not Detected
Naphthalene	0.90	0.036 J	4.7	0.19 J

J = Estimated value.
J0 = Estimated value due to bias in the CCV.
Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: B42-3IA013016

Lab ID#: 1602064A-09A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	e020915	Date of Collection:	1/31/16 11:29:00 AM
Dil. Factor:	1.71	Date of Analysis:	2/9/16 10:02 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.17	0.40	0.84	2.0
Freon 114	0.17	Not Detected	1.2	Not Detected
Chloromethane	0.86	0.64 J	1.8	1.3 J
Vinyl Chloride	0.17	Not Detected	0.44	Not Detected
1,3-Butadiene	0.17	Not Detected	0.38	Not Detected
Bromomethane	0.86	Not Detected	3.3	Not Detected
Chloroethane	0.86	Not Detected	2.2	Not Detected
Freon 11	0.17	0.17	0.96	0.98
Ethanol	0.86	9.3 J0	1.6	18 J0
Freon 113	0.17	0.057 J	1.3	0.44 J
1,1-Dichloroethene	0.17	Not Detected	0.68	Not Detected
Acetone	0.86	7.0	2.0	17
2-Propanol	0.86	1.0	2.1	2.6
Carbon Disulfide	0.86	0.37 J	2.7	1.2 J
3-Chloropropene	0.86	Not Detected	2.7	Not Detected
Methylene Chloride	0.34	0.59	1.2	2.0
Methyl tert-butyl ether	0.17	Not Detected	0.62	Not Detected
trans-1,2-Dichloroethene	0.17	Not Detected	0.68	Not Detected
Hexane	0.17	Not Detected	0.60	Not Detected
1,1-Dichloroethane	0.17	Not Detected	0.69	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.86	1.1	2.5	3.2
cis-1,2-Dichloroethene	0.17	Not Detected	0.68	Not Detected
Tetrahydrofuran	0.86	1.4	2.5	4.2
Chloroform	0.17	Not Detected	0.83	Not Detected
1,1,1-Trichloroethane	0.17	Not Detected	0.93	Not Detected
Cyclohexane	0.17	Not Detected	0.59	Not Detected
Carbon Tetrachloride	0.17	0.070 J	1.1	0.44 J
2,2,4-Trimethylpentane	0.86	0.21 J	4.0	0.96 J
Benzene	0.17	0.081 J	0.55	0.26 J
1,2-Dichloroethane	0.17	Not Detected	0.69	Not Detected
Heptane	0.17	0.094 J	0.70	0.39 J
Trichloroethene	0.17	0.069 J	0.92	0.37 J
1,2-Dichloropropane	0.17	Not Detected	0.79	Not Detected
1,4-Dioxane	0.17	Not Detected	0.62	Not Detected
Bromodichloromethane	0.17	Not Detected	1.1	Not Detected
cis-1,3-Dichloropropene	0.17	Not Detected	0.78	Not Detected
4-Methyl-2-pentanone	0.17	0.058 J	[illegible]	0.24 J
Toluene	0.17	0.31	0.64	1.2
trans-1,3-Dichloropropene	0.17	Not Detected	0.78	Not Detected
1,1,2-Trichloroethane	0.17	Not Detected	0.93	Not Detected
Tetrachloroethene	0.17	Not Detected	[illegible]	Not Detected
2-Hexanone	0.86	Not Detected	3.5	Not Detected

LIBRE ASOCIADO DE PUERTO RICO
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Client Sample ID: B42-3IA013016

Lab ID#: 1602064A-09A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	e020915	**Date of Collection:**	1/31/16 11:29:00 AM
Dil. Factor:	1.71	**Date of Analysis:**	2/9/16 10:02 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.17	Not Detected	1.4	Not Detected
1,2-Dibromoethane (EDB)	0.17	Not Detected	1.3	Not Detected
Chlorobenzene	0.17	Not Detected	0.79	Not Detected
Ethyl Benzene	0.17	Not Detected	0.74	Not Detected
m,p-Xylene	0.17	0.088 J	0.74	0.38 J
o-Xylene	0.17	Not Detected	0.74	Not Detected
Styrene	0.17	Not Detected	0.73	Not Detected
Bromoform	0.17	Not Detected	1.8	Not Detected
Cumene	0.17	Not Detected	0.84	Not Detected
1,1,2,2-Tetrachloroethane	0.17	Not Detected	1.2	Not Detected
Propylbenzene	0.17	Not Detected	0.84	Not Detected
4-Ethyltoluene	0.17	0.036 J	0.84	0.18 J
1,3,5-Trimethylbenzene	0.17	Not Detected	0.84	Not Detected
1,2,4-Trimethylbenzene	0.17	Not Detected	0.84	Not Detected
1,3-Dichlorobenzene	0.17	Not Detected	1.0	Not Detected
1,4-Dichlorobenzene	0.17	Not Detected	1.0	Not Detected
alpha-Chlorotoluene	0.17	Not Detected	0.88	Not Detected
1,2-Dichlorobenzene	0.17	Not Detected	1.0	Not Detected
1,2,4-Trichlorobenzene	0.86	Not Detected	6.3	Not Detected
Hexachlorobutadiene	0.86	Not Detected	9.1	Not Detected
Naphthalene	0.86	Not Detected	4.5	Not Detected

J = Estimated value.
J0 = Estimated value due to bias in the CCV.
Container Type: 6 Liter Summa Canister (100% Certified)

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

ABOGADO DE PUERTO RICO
Rafael Infante Méndez
1888
QUIMICO LICENCIADO

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Client Sample ID: B3042AA013016

Lab ID#: 1602064A-10A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	e020916	Date of Collection:	1/31/16 11:07:00 AM
Dil. Factor:	1.91	Date of Analysis:	2/9/16 10:55 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.19	0.40	0.94	2.0
Freon 114	0.19	Not Detected	1.3	Not Detected
Chloromethane	0.96	0.67 J	2.0	1.4 J
Vinyl Chloride	0.19	Not Detected	0.49	Not Detected
1,3-Butadiene	0.19	Not Detected	0.42	Not Detected
Bromomethane	0.96	Not Detected	3.7	Not Detected
Chloroethane	0.96	Not Detected	2.5	Not Detected
Freon 11	0.19	0.20	1.1	1.1
Ethanol	0.96	2.1 J0	1.8	4.0 J0
Freon 113	0.19	0.056 J	1.5	0.43 J
1,1-Dichloroethene	0.19	Not Detected	0.76	Not Detected
Acetone	0.96	3.4	2.3	8.1
2-Propanol	0.96	0.21 J	2.3	0.51 J
Carbon Disulfide	0.96	0.32 J	3.0	0.99 J
3-Chloropropene	0.96	Not Detected	3.0	Not Detected
Methylene Chloride	0.38	Not Detected	1.3	Not Detected
Methyl tert-butyl ether	0.19	Not Detected	0.69	Not Detected
trans-1,2-Dichloroethene	0.19	Not Detected	0.76	Not Detected
Hexane	0.19	Not Detected	0.67	Not Detected
1,1-Dichloroethane	0.19	Not Detected	0.77	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.96	0.38 J	2.8	1.1 J
cis-1,2-Dichloroethene	0.19	Not Detected	0.76	Not Detected
Tetrahydrofuran	0.96	Not Detected	2.8	Not Detected
Chloroform	0.19	Not Detected	0.93	Not Detected
1,1,1-Trichloroethane	0.19	Not Detected	1.0	Not Detected
Cyclohexane	0.19	Not Detected	0.66	Not Detected
Carbon Tetrachloride	0.19	0.076 J	1.2	0.48 J
2,2,4-Trimethylpentane	0.96	Not Detected	4.5	Not Detected
Benzene	0.19	0.076 J	0.61	0.24 J
1,2-Dichloroethane	0.19	Not Detected	0.77	Not Detected
Heptane	0.19	Not Detected	0.78	Not Detected
Trichloroethene	0.19	Not Detected	1.0	Not Detected
1,2-Dichloropropane	0.19	Not Detected	0.88	Not Detected
1,4-Dioxane	0.19	Not Detected	0.69	Not Detected
Bromodichloromethane	0.19	Not Detected	[illegible]	Not Detected
cis-1,3-Dichloropropene	0.19	Not Detected	0.87	Not Detected
4-Methyl-2-pentanone	0.19	Not Detected	0.78	Not Detected
Toluene	0.19	0.078 J	0.72	0.29 J
trans-1,3-Dichloropropene	0.19	Not Detected	0.87	Not Detected
1,1,2-Trichloroethane	0.19	Not Detected	1.0	Not Detected
Tetrachloroethene	0.19	Not Detected	1.3	Not Detected
2-Hexanone	0.96	Not Detected	3.9	Not Detected

Luis Infante Vélez 1888 Químico Licenciado Colegio de Químicos de Puerto Rico

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Client Sample ID: B3042AA013016

Lab ID#: 1602064A-10A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	e020916	**Date of Collection:**	1/31/16 11:07:00 AM
Dil. Factor:	1.91	**Date of Analysis:**	2/9/16 10:55 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.19	Not Detected	1.6	Not Detected
1,2-Dibromoethane (EDB)	0.19	Not Detected	1.5	Not Detected
Chlorobenzene	0.19	Not Detected	0.88	Not Detected
Ethyl Benzene	0.19	Not Detected	0.83	Not Detected
m,p-Xylene	0.19	Not Detected	0.83	Not Detected
o-Xylene	0.19	Not Detected	0.83	Not Detected
Styrene	0.19	Not Detected	0.81	Not Detected
Bromoform	0.19	Not Detected	2.0	Not Detected
Cumene	0.19	Not Detected	0.94	Not Detected
1,1,2,2-Tetrachloroethane	0.19	Not Detected	1.3	Not Detected
Propylbenzene	0.19	Not Detected	0.94	Not Detected
4-Ethyltoluene	0.19	Not Detected	0.94	Not Detected
1,3,5-Trimethylbenzene	0.19	Not Detected	0.94	Not Detected
1,2,4-Trimethylbenzene	0.19	Not Detected	0.94	Not Detected
1,3-Dichlorobenzene	0.19	Not Detected	1.1	Not Detected
1,4-Dichlorobenzene	0.19	0.037 J	1.1	0.22 J
alpha-Chlorotoluene	0.19	Not Detected	0.99	Not Detected
1,2-Dichlorobenzene	0.19	Not Detected	1.1	Not Detected
1,2,4-Trichlorobenzene	0.96	Not Detected	7.1	Not Detected
Hexachlorobutadiene	0.96	Not Detected	10	Not Detected
Naphthalene	0.96	Not Detected	5.0	Not Detected

J = Estimated value.
J0 = Estimated value due to bias in the CCV.
Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	98	70-130

LABORATORIO ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
RC - 1888
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Company: AMAI
Email:
Address: 2700 Westchester City: Purchase State: NY Zip: 10577
Phone: Fax:

Project Info:
P.O. #:
Project #:
Project Name: BMS VI

Turn Around Time:
☒ Normal
☐ Rush
specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial (" Hg)	Final (" Hg)	Receipt	Final (psi)
01A	B30-1IA013016	6L1261	1-31-16	10:32	Full TO-15, CH_4, MeOH	-30+	7.0		
02A	B30-2IA013016	14872	1-31-16	10:33		-30	7.0		
03A	B30-3IA013016	34354	1-31-16	10:42		-30	-7.0		
04A	B30-4IA013016	34212	1-31-16	09:36		-30	-1.5		
05A	B30-4DIA013016	N0620	1-31-16	09:36		-26	-10.0		
06A	B30-5IA013016	6L1296	1-31-16	10:58		-28	-8.0		
07A	B42-1IA013016	34259	1-31-16	11:30		-30+	-8.5		
08A	B42-2IA013016	96107	1-31-16	11:28		-28	-8.0		
09A	B42-3IA013016	N0645	1-31-16	11:29		-30+	-6.0		
10A	B3042AA013016	5672	1-31-16	11:07		-30	-8.0		

Relinquished by: (signature) Date/Time	Received by: (signature) Date/Time
1/31/16 1725	1/31/16 1725
2/1/16 1200	EATL 2/2/16 10:20

Notes: Report to MDL

Lab Use Only: Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
Fed Ex		N/A	Good	Yes No None	1602064

Form 1293 rev 11

Project Number:__1602064A_____
Date:_____01/31/2016_____

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: QC criteria from "Compendium 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), January, 1999"; USEPA Hazardous Waste Support Branch. Validating Air Samples. Volatile Organic Analysis of Ambient Air in Canisters by Method TO-15, (SOP # HW-31. Revision #4. October, 2006). The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Eurofins_-_Air_Toxics_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __1602064A_____ Sample matrix: ___Air_____
No. of Samples: _____11_____

Trip blank No.: ____-_____
Field blank No.: _____-_____
Equipment blank No.:___-_____
Field duplicate No.:_____ B30-4IA013016/B30-4DIA013016_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___N/A_ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_VOCs_by_method_TO-15_(full suite)_____
_____

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer: Rafael Infante
Date:__ 02/27/2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples analyzed within the recommended method holding time				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): N/A – summa canisters

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __X__
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__X___ The BFB performance results were reviewed and found to be within the specified criteria.

__X___ BFB tuning was performed for every 24 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

All criteria were met _____
Criteria were not met
and/or see below ___X___

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____01/12/16_____
Dates of continuing calibration:__02/08-09/16___
Instrument ID numbers:____MSD-E_____
Matrix/Level:_____Air/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and continuing calibration met the method performance criteria except for the following:				
02/08/2016	1602064A-12A	32 %	Freon	1602064A-01A to -03; 1602064A-06A
		38 %	Hexachlorobutadiene	
02/09/2016	1602064A-12B	34 %	Ethanol	1602064A-04A; -05; -05AA; -07A; -08A; -09A; -10A

Note: Samples results qualified as estimated (J) in affected samples.

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 30% regardless of method requirements for CCC.
Method TO-15 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 30%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 30%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r < 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met ___X___
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION/ UNITS
____None_of_the_analyte_detected_in_the_method/laboratory_blank_above_the_reporting_limit/_action_level_for_blanks.				

____Summa_canisters_met_cleaning_certification_criteria

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
No_field/trip/equipment_blanks_analyzed_with_this_data_package.				

All criteria were met ____
Criteria were not met
and/or see below __X__

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND			ACTION
	1,2-DICHLOROETHANE-d4	Toluene-d8	4-BFB	

_Surrogate_recoveries_within_laboratory_control_limits_____

QC Limits* (Air)

_____LL_to_UL___70__to_130__ _70__to_130_ _70__to_130__

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.

If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met _____
Criteria were not met
and/or see below __N/A____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.
Sample ID:_____ Matrix/Level:_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION

_____MS/MSD_are_not_required_as_part_of_Method_TO-15;_blank_spike_used_to_assess____
_____accuracy_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met ____
Criteria were not met
and/or see below __N/A__

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Method TO-15 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____ Matrix/Level/Unit:_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met __X___
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

___LCS/LCSD_%_recoveries_and_RPD_within_laboratory_control_limits_____

_____

_____

_____

_____

_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.

If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met __X___
Criteria were not met
and/or see below _____

IX. LABORATORY DUPLICATE PRECISION

Sample IDs: __1602064A-05A/05AA_(lab)__ Matrix:___Air____
Sample IDs: __LCS/LCSD_(02/08/2016)___ Matrix:___Air____
Sample IDs: __LCS/LCSD_(02/09/2016)___ Matrix:___Air____

Laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 25% for air samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
1602064A-05A/05AA					
1,2,4-Trimethylbenzene		0.06843	0.05066	30	No action taken; results < 5 x MDL.
1,4-Dichlorobenzene		0.04164	ND	200	
Carbon disulfide		0.4718	0.7531	46	

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met _____
Criteria were not met
and/or see below ___X_____

IX. FIELD DUPLICATE PRECISION

Sample IDs: _1602064A-04A/1602064A-05A_ Matrix:___Air____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.

Suggested criteria: RPD ± 25% for air samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Acetone	0.73	4.7	7.8	49.6 %	Qualify results (J) in affected samples.
2-Butanone	0.73	0.41	1.3	104 %	Qualify results (J) in affected samples.

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met _X__
Criteria were not met
and/or see below ____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +40% or -40% of the IS area in the associated calibration standard.
* Retention time (RT) within ± 0.06 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

_Internal_standard_area_and_retention_times_within_laboratory_control_limits_for_both_samples _and_calibration_standards_____

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -40%		IS AREA > +40%
Positive results	J		J
Nondetected results	R		ACCEPT

2. If a IS retention time varies more than 0.330 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X__
Criteria were not met
and/or see below ____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

1602064A-01A

Benzene RF = 1.11767

[ ] = (17100)(5.0)/(641741)(1.11767)

= 0.11925 ppbv OK

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASONS FOR DILUTION
All samples were diluted by a factor of < 2.01x.		

B. Percent Solids

List samples which have ≤ 50 % solids

_____
_____
_____
_____
_____
_____

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)