Derenzo and Associates, Inc.
Environmental Consultants

April 25, 2012

Ms. Trina Vielhauer, Bureau Chief
Bureau of Air Regulation
Department of Environmental Protection
STATE OF FLORIDA
2600 Blair Stone Road, MS 5505
Tallahassee, FL 32399-2400

Subject: Seminole Energy, LLC
DEP File No. 1170084-008-AC (PSD-FL-376A)
LFG Monitoring Sulfur and Chlorine Contents

Dear Ms. Vielhauer:

Condition 3.C. of Section III – Emission Unit(s) Specific Conditions of Air Construction Permit 1170084-008-AC (PSD-FL-376A) issued Seminole Energy, LLC (Seminole Energy) specifies that *The permittee shall comply with the following requirements to monitor the sulfur and chlorine content of the landfill gas:*

... the permittee shall sample and analyze the landfill gas for sulfur and chlorine content. The gas sample collected for the analyses shall be a composite sample and collected under normal operating conditions ... The gas sample collection and analyses for sulfur and chlorine content shall be done semi-annually ... Results shall be reported as SO_2 and HCl emission factors in terms of lb/MMscf of landfill gas.

The initial gas sample collection and analyses were completed in February 2007. Therefore, Derenzo and Associates, Inc. (Derenzo and Associates), on behalf of Seminole Energy, is submitting to the Florida Department of Environmental Protection, Division of Air Resource Management (FDEP-DARM) results of sulfur and chlorine analyses that were performed on a sample of landfill gas (LFG) obtained from the Osceola Road Solid Waste Management Facility in March 2012 (semi-annual collection and analyses). The required SO_2 and HCl emission factors (in terms of lb/MMscf of landfill gas) and supporting analytical data are provided in the attached documents.

The air permit application for Seminole Energy developed (based on USEPA AP-42 default LFG composition data) a:

1. SO_2 emission factor of 27.5 lb/MMscf of LFG; and

2. HCl emission factor of 11.95 lb/MMscf of LFG.

The SO_2 emission factor developed from analyses of the March 27, 2012 sample of LFG obtained from the Osceola Road Solid Waste Management Facility is 8.56 lb/MMscf of LFG (<11.28 lb/MMscf of LFG with the incorporation of all non-measured chemicals at its reporting limit).

The HCl emission factor developed from analyses of the March 22, 2012 sample of LFG obtained from the Osceola Road Solid Waste Management Facility is 0.22 lb/MMscf of LFG (<0.78 lb/MMscf of LFG with the incorporation of all non-measured chemicals at its reporting limit).

Please contact us if you have questions or require clarifications

Sincerely,

DERENZO AND ASSOCIATES, INC.

Charles Scamp
Environmental consultant

attachments
c: Mike Laframboise, Landfill Energy Systems
Garry Kuberski, FDEP Central District Office
Kimberly Russell, Seminole County Solid Waste Management Division

Seminole Energy, LLC (March 27, 2012 Sample)

Sulfur Dioxide Emission Factor for LFG Combustion

LFG Influent Sulfur Compound	Analytical Report Concentrations[A] (ppmv)	Molecular Formula	No. Sulfur Atoms	Sulfur Content[B] as H_2S (ppmv)	Resulting SO_2 Emission Rate (lb./MMcf)
Hydrogen sulfide	41.6	H_2S	1	41.6	6.89 *
Carbonyl sulfide	<0.80	CSO	1	<0.80	<0.13
Methyl mercaptan	4.9	CH_4S	1	4.93	0.8
Ethyl mercaptan	<0.80	C_2H_6S	1	<0.80	<0.13
Dimethyl sulfide	5.2	C_2H_6S	1	5.2	0.86
Carbon disulfide	<1.00	CS_2	2	<2.00	<0.33
Isopropyl mercaptan	<0.80	C_3H_6S	1	<0.80	<0.13
tert-Butyl mercaptan	<0.80	$C_4H_{10}S$	1	<0.80	<0.13
n-Propyl mercaptan	<0.80	C_3H_8S	1	<0.80	<0.13
Ethyl methyl sulfide	<0.80	C_3H_8S	1	<0.80	<0.13
Thiophene	<0.80	C_4H_4S	1	<0.80	<0.13
Isobutyl mercaptan	<0.80	$C_4H_{10}S$	1	<0.80	<0.13
Diethyl sulfide	<0.80	$CH_3CH_2SCH_2CH_3$	1	<0.80	<0.13
n-Butyl mercaptan	<0.80	$C_4H_{10}S$	1	<0.80	<0.13
3-Methyl Thiophene	<0.80	C_5H_6S	1	<0.80	<0.13
Dimethyl disulfide	<0.80	CH_3SSCH_3	2	<1.60	<0.26
Tetrahydrothiophene	<0.80	$C_4H_8O_2S$	1	<0.80	<0.13
2-Ethylthiophene	<0.80	C_6H_8S	1	<0.80	<0.13
2,5-Dimethylthiopene	<0.80	C_6H_8S	1	<0.80	<0.13
Diethyl disulfide	<0.80	CH_3SSCH_3	2	<1.60	<0.26
Total				**<68.1**	**<11.28** [C]

Notes

A. March 28, 2012 LFG sample laboratory analytical results (see Attachment) (average of 3 smaples)

B. Determined by multiplying concentration by number of sulfur atoms in the molecule.

C. Calculation of SO_2 emission factor from sulfur content, as H_2S:

(68.1 scf H_2S/MMcf LFG) (1 scf SO_2/scf H_2S) (64.06 lb.SO_2/mol) / (387 ft^3/mol)

= 11.3 lb SO_2/MMcf LFG

* Sample calculation: SO_2 generation from hydrogen sulfide (H_2S):

(41.6 scf H_2S/MMcf LFG) (1 scf SO_2/scf H_2S) (64.06 lb.SO_2/mol) / (387 ft^3/mol)

= 6.89 lb SO_2/MMcf LFG

Seminole Energy, LLC (March 27, 2012 Sample)

Sulfur Dioxide Emission Factor for LFG Combustion

LFG Influent Sulfur Compound	Measured Concentrations[A] (ppmv)	Molecular Formula	No. Sulfur Atoms	Sulfur Content[B] as H_2S (ppmv)	Resulting SO_2 Emission Rate (lb./MMcf)
Hydrogen sulfide	41.6	H_2S	1	41.6	6.89 *
Methyl mercaptan	4.9	CH_4S	1	4.93	0.8
Dimethyl sulfide	5.2	C_2H_6S	1	5.2	0.86
Total				**51.7**	**8.56**

Notes

A. March 28, 2012 LFG sample laboratory analytical results (see Attachment) (average of 3 smaples)

B. Determined by multiplying concentration by number of sulfur atoms in the molecule.

* Sample calculation: SO_2 generation from hydrogen sulfide (H_2S):

(41.6 scf H_2S/MMcf LFG) (1 scf SO_2/scf H_2S) (64.06 lb.SO_2/mol) / (387 ft^3/mol)

= 6.89 lb SO_2/MMcf LFG

Seminole Energy, LLC (March 22, 2012 Sample)

LFG Combustion Hydrogen Chloride Emission Factor

LFG Influent Chlorine Coumpounds	Analytical Report Concentration[1] (ppm)	Molecular Formula	No. Chlorine Atoms	HCl Emission Factor (lb./MMcf)
Freon 12 (Dichlorodifluoromethane)	0.220	CCl_2F_2	2	0.041 *
Freon 114 (Dichlorotetrafluroethane)	<0.050	$C_2Cl_2F_4$	2	<0.009
Chloromethane	<0.500	CH_3Cl	1	<0.047
Vinyl Chloride	<0.050	C_2HCl	1	<0.005
Chloroethane	<0.200	C_2H_5Cl	1	<0.019
Freon 11 (Fluorotrichloromethane)	<0.050	$CFCl_3$	3	<0.014
Freon 113 (1,1,2-trichloro-1,2,2-trifluoroethane)	<0.050	$C_2Cl_2F_3$	2	<0.009
3-Chloropropene	<0.200	C_3H_5Cl	1	<0.019
Methylene Chloride (Dichloromethane)	<0.500	CH_2Cl_2	2	<0.094
1,2-Dichloroethene (as cis-1,2-Dichloroethene)	0.220	$C_2H_2Cl_2$	2	0.041
1,2-Dichloroethene (as trans-1,2-Dichloroethene)	<0.050	$C_2H_2Cl_2$	2	<0.009
1,1-Dichloroethane	<0.050	$C_2H_4Cl_2$	2	<0.009
1,1-Dichloroethene	<0.050	$C_2H_2Cl_2$	2	<0.009
Chloroform	<0.050	$CHCl_3$	3	<0.014
1,1,1-Trichloroethane	<0.050	$C_2H_3Cl_3$	3	<0.014
Carbon Tetrachloride	<0.050	CCl_4	4	<0.019
1,2-Dichloroethane	0.066	$C_2H_4Cl_2$	2	0.012
Trichloroethene	0.087	C_2HCl_3	3	0.025
1,2-dichloropropane	<0.050	$C_3H_6Cl_2$	2	<0.009
Bromodichloromethane	<0.050	$CBrCl_2$	2	<0.009
1,3-Dichloropropene (as cis-1,3-Dichloropropene)	<0.050	$C_3H_4Cl_2$	2	<0.009
1,3-Dichloropropene (as trans-1,3-Dichloropropene)	<0.050	$C_3H_4Cl_2$	2	<0.009
1,1,2-Trichloroethane	<0.050	$C_2H_3Cl_3$	3	<0.014
Tetrachloroethene (Perchloroethene)	0.160	C_2Cl_4	4	0.060
Dibromochloromethane	<0.050	$CHBr_2Cl$	1	<0.005
Chlorobenzene	0.087	C_6H_5Cl	1	0.008
1,1,2,2-Tetrachloroethane	<0.050	$C_2H_2Cl_4$	4	<0.019
1,3-Dichlorobenzene	<0.050	$C_6H_4Cl_2$	2	<0.009
1,4-Dichlorobenzene	0.167	$C_6H_4Cl_2$	2	0.031
alpha-Chlorotoluene	<0.050	C_7H_7Cl	1	<0.005
1,2-Dichlorobenzene	<0.050	$C_6H_4Cl_2$	2	<0.009
1,2,4-Trichlorobenzene	<0.200	$C_6H_3Cl_3$	3	<0.057
Hexachlorobutadiene	<0.200	C_4Cl_6	6	<0.113
Total hydrogen chloride emission factor (lb./MMcf)				**<0.78**

Notes

1. March 24, 2012 LFG sample laboratory analytical results (average of 3 samples).

* Example calculation for Freon 12 that assumes complete conversion of chloride to HCl

(0.220 ft^3 Freon 12/MMcf LFG) (2 mol HCl/mol Freon 12) (36.46 lb. HCl/mol) / (387 ft^3/mol)

= 0.041 lb. HCl/MMcf LFG

Seminole Energy, LLC (March 22, 2012 Sample)

LFG Combustion Hydrogen Chloride Emission Factor

LFG Influent Chlorine Compounds[1]	Measured Concentration (ppm)	Molecular Formula	No. Chlorine Atoms	HCl Emission Factor (lb./MMcf)
Freon 12 (Dichlorodifluoromethane)	0.220	CCl_2F_2	2	0.041 *
1,2-Dichloroethene (as cis-1,2-Dichloroethene)	0.220	$C_2H_2Cl_2$	2	0.041
1,2-Dichloroethane	0.066	$C_2H_4Cl_2$	2	0.012
Trichloroethene	0.087	C_2HCl_3	3	0.025
Tetrachloroethene (Perchloroethene)	0.160	C_2Cl_4	4	0.060
Chlorobenzene	0.087	C_6H_5Cl	1	0.008
1,4-Dichlorobenzene	0.167	$C_6H_4Cl_2$	2	0.031
Total hydrogen chloride emission factor (lb./MMcf)				**0.22**

Notes

1. March 24, 2012 LFG sample laboratory analytical results (average of 3 samples).

* Example calculation for Freon 12 that assumes complete conversion of chloride to HCl

(0.220 ft^3 Freon 12/MMcf LFG) (2 mol HCl/mol Freon 12) (36.46 lb. HCl/mol) / (387 ft^3/mol)

= 0.041 lb. HCl/MMcf LFG

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LABORATORY NARRATIVE
ASTM D-5504
Derenzo & Associates
Workorder# 1203592

Three 1 Liter Tedlar Bag samples were received on March 28, 2012. The laboratory performed the analysis of sulfur compounds via ASTM D-5504 using GC/SCD. The method involves direct injection of the air sample into the GC via a fixed 2.0 mL sampling loop. See the data sheets for the reporting limits for each compound.

Receiving Notes

A collection date and time for sulfur samples SEB-1, SEB-2 and SEB-3 was not provided on the Chain of Custody. The client was contacted and a collection date of 3/27/2012 and times of 1530, 1600, and 1630 were provided.

Analytical Notes

Samples SEB-1, SEB-2 and SEB-3 were analyzed past the method specified 24 hour hold time.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
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 detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
SULFUR GASES BY ASTM D-5504 GC/SCD

Client Sample ID: SEB-1

Lab ID#: 1203592-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Hydrogen Sulfide	800	43000
Methyl Mercaptan	800	5100
Dimethyl Sulfide	800	5300

Client Sample ID: SEB-2

Lab ID#: 1203592-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Hydrogen Sulfide	800	40000
Methyl Mercaptan	800	4700
Dimethyl Sulfide	800	5200

Client Sample ID: SEB-3

Lab ID#: 1203592-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Hydrogen Sulfide	800	42000
Methyl Mercaptan	800	5000
Dimethyl Sulfide	800	5200

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Client Sample ID: SEB-1

Lab ID#: 1203592-01A

SULFUR GASES BY ASTM D-5504 GC/SCD

File Name:	**I032822**	**Date of Collection:**	**3/27/12 3:30:00 PM**
Dil. Factor:	**200**	**Date of Analysis:**	**3/28/12 02:33 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Hydrogen Sulfide	800	43000
Carbonyl Sulfide	800	Not Detected
Methyl Mercaptan	800	5100
Ethyl Mercaptan	800	Not Detected
Dimethyl Sulfide	800	5300
Carbon Disulfide	1000	Not Detected
Isopropyl Mercaptan	800	Not Detected
tert-Butyl Mercaptan	800	Not Detected
n-Propyl Mercaptan	800	Not Detected
Ethyl Methyl Sulfide	800	Not Detected
Thiophene	800	Not Detected
Isobutyl Mercaptan	800	Not Detected
Diethyl Sulfide	300	Not Detected
n-Butyl Mercaptan	800	Not Detected
Dimethyl Disulfide	800	Not Detected
3-Methylthiophene	800	Not Detected
Tetrahydrothiophene	800	Not Detected
2-Ethylthiophene	800	Not Detected
2,5-Dimethylthiophene	800	Not Detected
Diethyl Disulfide	800	Not Detected

Container Type: 1 Liter Tedlar Bag

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Client Sample ID: SEB-2

Lab ID#: 1203592-02A

SULFUR GASES BY ASTM D-5504 GC/SCD

File Name:	**I032823**	**Date of Collection: 3/27/12 4:00:00 PM**	
Dil. Factor:	**200**	**Date of Analysis: 3/28/12 02:56 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Hydrogen Sulfide	800	40000
Carbonyl Sulfide	800	Not Detected
Methyl Mercaptan	800	4700
Ethyl Mercaptan	800	Not Detected
Dimethyl Sulfide	800	5200
Carbon Disulfide	1000	Not Detected
Isopropyl Mercaptan	800	Not Detected
tert-Butyl Mercaptan	800	Not Detected
n-Propyl Mercaptan	800	Not Detected
Ethyl Methyl Sulfide	800	Not Detected
Thiophene	800	Not Detected
Isobutyl Mercaptan	800	Not Detected
Diethyl Sulfide	800	Not Detected
n-Butyl Mercaptan	800	Not Detected
Dimethyl Disulfide	800	Not Detected
3-Methylthiophene	800	Not Detected
Tetrahydrothiophene	800	Not Detected
2-Ethylthiophene	800	Not Detected
2,5-Dimethylthiophene	800	Not Detected
Diethyl Disulfide	800	Not Detected

Container Type: 1 Liter Tedlar Bag

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Client Sample ID: SEB-3

Lab ID#: 1203592-03A

SULFUR GASES BY ASTM D-5504 GC/SCD

File Name:	**I032824**	**Date of Collection: 3/27/12 4:30:00 PM**	
Dil. Factor:	**200**	**Date of Analysis: 3/28/12 03:21 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Hydrogen Sulfide	800	42000
Carbonyl Sulfide	800	Not Detected
Methyl Mercaptan	800	5000
Ethyl Mercaptan	800	Not Detected
Dimethyl Sulfide	800	5200
Carbon Disulfide	1000	Not Detected
Isopropyl Mercaptan	800	Not Detected
tert-Butyl Mercaptan	800	Not Detected
n-Propyl Mercaptan	800	Not Detected
Ethyl Methyl Sulfide	800	Not Detected
Thiophene	800	Not Detected
Isobutyl Mercaptan	800	Not Detected
Diethyl Sulfide	800	Not Detected
n-Butyl Mercaptan	800	Not Detected
Dimethyl Disulfide	800	Not Detected
3-Methylthiophene	800	Not Detected
Tetrahydrothiophene	800	Not Detected
2-Ethylthiophene	800	Not Detected
2,5-Dimethylthiophene	800	Not Detected
Diethyl Disulfide	800	Not Detected

Container Type: 1 Liter Tedlar Bag

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Client Sample ID: Lab Blank

Lab ID#: 1203592-04A

SULFUR GASES BY ASTM D-5504 GC/SCD

File Name:	**I032812**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/28/12 10:56 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Hydrogen Sulfide	4.0	Not Detected
Carbonyl Sulfide	4.0	Not Detected
Methyl Mercaptan	4.0	Not Detected
Ethyl Mercaptan	4.0	Not Detected
Dimethyl Sulfide	4.0	Not Detected
Carbon Disulfide	5.0	Not Detected
Isopropyl Mercaptan	4.0	Not Detected
tert-Butyl Mercaptan	4.0	Not Detected
n-Propyl Mercaptan	4.0	Not Detected
Ethyl Methyl Sulfide	4.0	Not Detected
Thiophene	4.0	Not Detected
Isobutyl Mercaptan	4.0	Not Detected
Diethyl Sulfide	4.0	Not Detected
n-Butyl Mercaptan	4.0	Not Detected
Dimethyl Disulfide	4.0	Not Detected
3-Methylthiophene	4.0	Not Detected
Tetrahydrothiophene	4.0	Not Detected
2-Ethylthiophene	4.0	Not Detected
2,5-Dimethylthiophene	4.0	Not Detected
Diethyl Disulfide	4.0	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: LCS

Lab ID#: 1203592-05A

SULFUR GASES BY ASTM D-5504 GC/SCD

File Name:	**I032810**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/28/12 10:14 AM**	

Compound	%Recovery
Hydrogen Sulfide	95
Carbonyl Sulfide	86
Methyl Mercaptan	93
Ethyl Mercaptan	87
Dimethyl Sulfide	94
Carbon Disulfide	95
Isopropyl Mercaptan	85
tert-Butyl Mercaptan	82
n-Propyl Mercaptan	83
Ethyl Methyl Sulfide	91
Thiophene	92
Isobutyl Mercaptan	88
Diethyl Sulfide	91
n-Butyl Mercaptan	91
Dimethyl Disulfide	91
3-Methylthiophene	93
Tetrahydrothiophene	98
2-Ethylthiophene	102
2,5-Dimethylthiophene	88
Diethyl Disulfide	101

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 1203592-05AA

SULFUR GASES BY ASTM D-5504 GC/SCD

File Name:	**I032828**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/28/12 06:46 PM**	

Compound	%Recovery
Hydrogen Sulfide	100
Carbonyl Sulfide	93
Methyl Mercaptan	105
Ethyl Mercaptan	97
Dimethyl Sulfide	105
Carbon Disulfide	106
Isopropyl Mercaptan	93
tert-Butyl Mercaptan	96
n-Propyl Mercaptan	94
Ethyl Methyl Sulfide	109
Thiophene	102
Isobutyl Mercaptan	97
Diethyl Sulfide	102
n-Butyl Mercaptan	100
Dimethyl Disulfide	104
3-Methylthiophene	103
Tetrahydrothiophene	110
2-Ethylthiophene	113
2,5-Dimethylthiophene	98
Diethyl Disulfide	109

Container Type: NA - Not Applicable

Air Toxics LTD.

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Project Manager Mike Brack

Collected by: (Print and Sign) Will Brown

Company Seminole Energy Email see below

Address 39395 Schoolcraft City Livonia State MI Zip 48150

Phone 734-464-3880 Fax mbrack@derenzo.com

Project Info:
P.O. # Derenzo FLD-15
Project # 120106
Project Name Seminole Sulfur

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	Final	Receipt	Final (psi)
01A	SEB-1	—			D-5504	—	—		
02A	SEB-2	—			1	—	—		
03A	SEB-3	—			1	—	—		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
	3/27/12 15:05	ATL	3/28/12 0900
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes:

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	FED EX		NA	Good	Yes No (None)	1203592

Form 1293 rev.11

LABORATORY NARRATIVE
EPA Method TO-15
Derenzo & Associates
Workorder# 1203521

Three 1 Liter Tedlar Bag samples were received on March 23, 2012. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

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

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

Method TO-15 is validated for samples collected in specially treated canisters. As such, the use of Tedlar™ bags for sample collection is outside the scope of the method and not recommended for ambient or indoor air samples. It is the responsibility of the data user to determine the usability of TO-15 results generated from Tedlar bags.

Definition of Data Qualifying Flags

Eight 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 and/or LCS.
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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

Client Sample ID: SEB-1

Lab ID#: 1203521-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	50	220	250	1100
Ethanol	200	36000 E	380	68000 E
Acetone	500	20000	1200	47000
2-Propanol	200	5300	490	13000
Hexane	50	270	180	960
2-Butanone (Methyl Ethyl Ketone)	200	16000	590	46000
cis-1,2-Dichloroethene	50	220	200	860
Tetrahydrofuran	50	1800	150	5200
Cyclohexane	50	260	170	910
2,2,4-Trimethylpentane	50	130	230	600
Benzene	50	1500	160	4800
1,2-Dichloroethane	50	74	200	300
Heptane	50	510	200	2100
Trichloroethene	50	96	270	510
4-Methyl-2-pentanone	50	1000	200	4200
Toluene	50	6800	190	26000
Tetrachloroethene	50	160	340	1100
Chlorobenzene	50	83	230	380
Ethyl Benzene	50	3300	220	14000
m,p-Xylene	50	5100	220	22000
o-Xylene	50	1600	220	6800
Styrene	50	340	210	1400
Cumene	50	410	240	2000
Propylbenzene	50	270	240	1300
4-Ethyltoluene	50	930	240	4600
1,3,5-Trimethylbenzene	50	410	240	2000
1,2,4-Trimethylbenzene	50	870	240	4300
1,4-Dichlorobenzene	50	150	300	890

Client Sample ID: SEB-2

Lab ID#: 1203521-02A

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

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

Client Sample ID: SEB-2

Lab ID#: 1203521-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	50	210	250	1000
Ethanol	200	38000 E	380	72000 E
Acetone	500	20000 E	1200	48000 E
2-Propanol	200	5500	490	13000
Hexane	50	280	180	1000
2-Butanone (Methyl Ethyl Ketone)	200	16000	590	47000
cis-1,2-Dichloroethene	50	230	200	900
Tetrahydrofuran	50	1800	150	5300
Cyclohexane	50	270	170	930
2,2,4-Trimethylpentane	50	130	230	610
Benzene	50	1500	160	4900
Heptane	50	490	200	2000
Trichloroethene	50	82	270	440
4-Methyl-2-pentanone	50	1100	200	4600
Toluene	50	7000	190	26000
Tetrachloroethene	50	160	340	1100
Chlorobenzene	50	90	230	420
Ethyl Benzene	50	3600	220	16000
m,p-Xylene	50	5600	220	24000
o-Xylene	50	1800	220	7700
Styrene	50	380	210	1600
Cumene	50	490	240	2400
Propylbenzene	50	310	240	1500
4-Ethyltoluene	50	1100	240	5400
1,3,5-Trimethylbenzene	50	490	240	2400
1,2,4-Trimethylbenzene	50	1000	240	5100
1,4-Dichlorobenzene	50	180	300	1100

Client Sample ID: SEB-3

Lab ID#: 1203521-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	50	200	250	990

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

Client Sample ID: SEB-3

Lab ID#: 1203521-03A

Ethanol	200	38000 E	380	72000 E
Acetone	500	20000	1200	46000
2-Propanol	200	5300	490	13000
Hexane	50	260	180	930
2-Butanone (Methyl Ethyl Ketone)	200	16000	590	46000
cis-1,2-Dichloroethene	50	210	200	850
Tetrahydrofuran	50	1800	150	5400
Cyclohexane	50	260	170	880
2,2,4-Trimethylpentane	50	120	230	570
Benzene	50	1400	160	4600
1,2-Dichloroethane	50	74	200	300
Heptane	50	500	200	2000
Trichloroethene	50	84	270	450
4-Methyl-2-pentanone	50	1100	200	4500
Toluene	50	6800	190	26000
Tetrachloroethene	50	160	340	1000
Chlorobenzene	50	89	230	410
Ethyl Benzene	50	3500	220	15000
m,p-Xylene	50	5500	220	24000
o-Xylene	50	1700	220	7400
Styrene	50	380	210	1600
Cumene	50	440	240	2200
Propylbenzene	50	320	240	1600
4-Ethyltoluene	50	1100	240	5400
1,3,5-Trimethylbenzene	50	480	240	2400
1,2,4-Trimethylbenzene	50	1000	240	5100
1,4-Dichlorobenzene	50	170	300	1000

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Client Sample ID: SEB-1

Lab ID#: 1203521-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032409**	**Date of Collection:**	**3/22/12 10:50:00 AM**
Dil. Factor:	**100**	**Date of Analysis:**	**3/24/12 11:47 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	50	220	250	1100
Freon 114	50	Not Detected	350	Not Detected
Chloromethane	500	Not Detected	1000	Not Detected
Vinyl Chloride	50	Not Detected	130	Not Detected
1,3-Butadiene	50	Not Detected	110	Not Detected
Bromomethane	500	Not Detected	1900	Not Detected
Chloroethane	200	Not Detected	530	Not Detected
Freon 11	50	Not Detected	280	Not Detected
Ethanol	200	36000 E	380	68000 E
Freon 113	50	Not Detected	380	Not Detected
1,1-Dichloroethene	50	Not Detected	200	Not Detected
Acetone	500	20000	1200	47000
2-Propanol	200	5300	490	13000
Carbon Disulfide	200	Not Detected	620	Not Detected
3-Chloropropene	200	Not Detected	630	Not Detected
Methylene Chloride	500	Not Detected	1700	Not Detected
Methyl tert-butyl ether	50	Not Detected	180	Not Detected
trans-1,2-Dichloroethene	50	Not Detected	200	Not Detected
Hexane	50	270	180	960
1,1-Dichloroethane	50	Not Detected	200	Not Detected
2-Butanone (Methyl Ethyl Ketone)	200	16000	590	46000
cis-1,2-Dichloroethene	50	220	200	860
Tetrahydrofuran	50	1800	150	5200
Chloroform	50	Not Detected	240	Not Detected
1,1,1-Trichloroethane	50	Not Detected	270	Not Detected
Cyclohexane	50	260	170	910
Carbon Tetrachloride	50	Not Detected	310	Not Detected
2,2,4-Trimethylpentane	50	130	230	600
Benzene	50	1500	160	4800
1,2-Dichloroethane	50	74	200	300
Heptane	50	510	200	2100
Trichloroethene	50	96	270	510
1,2-Dichloropropane	50	Not Detected	230	Not Detected
1,4-Dioxane	200	Not Detected	720	Not Detected
Bromodichloromethane	50	Not Detected	340	Not Detected
cis-1,3-Dichloropropene	50	Not Detected	230	Not Detected
4-Methyl-2-pentanone	50	1000	200	4200
Toluene	50	6800	190	26000
trans-1,3-Dichloropropene	50	Not Detected	230	Not Detected
1,1,2-Trichloroethane	50	Not Detected	270	Not Detected
Tetrachloroethene	50	160	340	1100
2-Hexanone	200	Not Detected	820	Not Detected

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Client Sample ID: SEB-1

Lab ID#: 1203521-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032409**	**Date of Collection: 3/22/12 10:50:00 AM**	
Dil. Factor:	**100**	**Date of Analysis: 3/24/12 11:47 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	50	Not Detected	420	Not Detected
1,2-Dibromoethane (EDB)	50	Not Detected	380	Not Detected
Chlorobenzene	50	83	230	380
Ethyl Benzene	50	3300	220	14000
m,p-Xylene	50	5100	220	22000
o-Xylene	50	1600	220	6800
Styrene	50	340	210	1400
Bromoform	50	Not Detected	520	Not Detected
Cumene	50	410	240	2000
1,1,2,2-Tetrachloroethane	50	Not Detected	340	Not Detected
Propylbenzene	50	270	240	1300
4-Ethyltoluene	50	930	240	4600
1,3,5-Trimethylbenzene	50	410	240	2000
1,2,4-Trimethylbenzene	50	870	240	4300
1,3-Dichlorobenzene	50	Not Detected	300	Not Detected
1,4-Dichlorobenzene	50	150	300	890
alpha-Chlorotoluene	50	Not Detected	260	Not Detected
1,2-Dichlorobenzene	50	Not Detected	300	Not Detected
1,2,4-Trichlorobenzene	200	Not Detected	1500	Not Detected
Hexachlorobutadiene	200	Not Detected	2100	Not Detected

E = Exceeds instrument calibration range.

Container Type: 1 Liter Tedlar Bag

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

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Client Sample ID: SEB-2

Lab ID#: 1203521-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032410**	**Date of Collection:**	**3/22/12 12:30:00 PM**
Dil. Factor:	**100**	**Date of Analysis:**	**3/24/12 12:27 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	50	210	250	1000
Freon 114	50	Not Detected	350	Not Detected
Chloromethane	500	Not Detected	1000	Not Detected
Vinyl Chloride	50	Not Detected	130	Not Detected
1,3-Butadiene	50	Not Detected	110	Not Detected
Bromomethane	500	Not Detected	1900	Not Detected
Chloroethane	200	Not Detected	530	Not Detected
Freon 11	50	Not Detected	280	Not Detected
Ethanol	200	38000 E	380	72000 E
Freon 113	50	Not Detected	380	Not Detected
1,1-Dichloroethene	50	Not Detected	200	Not Detected
Acetone	500	20000 E	1200	48000 E
2-Propanol	200	5500	490	13000
Carbon Disulfide	200	Not Detected	620	Not Detected
3-Chloropropene	200	Not Detected	630	Not Detected
Methylene Chloride	500	Not Detected	1700	Not Detected
Methyl tert-butyl ether	50	Not Detected	180	Not Detected
trans-1,2-Dichloroethene	50	Not Detected	200	Not Detected
Hexane	50	280	180	1000
1,1-Dichloroethane	50	Not Detected	200	Not Detected
2-Butanone (Methyl Ethyl Ketone)	200	16000	590	47000
cis-1,2-Dichloroethene	50	230	200	900
Tetrahydrofuran	50	1800	150	5300
Chloroform	50	Not Detected	240	Not Detected
1,1,1-Trichloroethane	50	Not Detected	270	Not Detected
Cyclohexane	50	270	170	930
Carbon Tetrachloride	50	Not Detected	310	Not Detected
2,2,4-Trimethylpentane	50	130	230	610
Benzene	50	1500	160	4900
1,2-Dichloroethane	50	Not Detected	200	Not Detected
Heptane	50	490	200	2000
Trichloroethene	50	82	270	440
1,2-Dichloropropane	50	Not Detected	230	Not Detected
1,4-Dioxane	200	Not Detected	720	Not Detected
Bromodichloromethane	50	Not Detected	340	Not Detected
cis-1,3-Dichloropropene	50	Not Detected	230	Not Detected
4-Methyl-2-pentanone	50	1100	200	4600
Toluene	50	7000	190	26000
trans-1,3-Dichloropropene	50	Not Detected	230	Not Detected
1,1,2-Trichloroethane	50	Not Detected	270	Not Detected
Tetrachloroethene	50	160	340	1100
2-Hexanone	200	Not Detected	820	Not Detected

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Client Sample ID: SEB-2

Lab ID#: 1203521-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032410**	**Date of Collection: 3/22/12 12:30:00 PM**	
Dil. Factor:	**100**	**Date of Analysis: 3/24/12 12:27 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	50	Not Detected	420	Not Detected
1,2-Dibromoethane (EDB)	50	Not Detected	380	Not Detected
Chlorobenzene	50	90	230	420
Ethyl Benzene	50	3600	220	16000
m,p-Xylene	50	5600	220	24000
o-Xylene	50	1800	220	7700
Styrene	50	380	210	1600
Bromoform	50	Not Detected	520	Not Detected
Cumene	50	490	240	2400
1,1,2,2-Tetrachloroethane	50	Not Detected	340	Not Detected
Propylbenzene	50	310	240	1500
4-Ethyltoluene	50	1100	240	5400
1,3,5-Trimethylbenzene	50	490	240	2400
1,2,4-Trimethylbenzene	50	1000	240	5100
1,3-Dichlorobenzene	50	Not Detected	300	Not Detected
1,4-Dichlorobenzene	50	180	300	1100
alpha-Chlorotoluene	50	Not Detected	260	Not Detected
1,2-Dichlorobenzene	50	Not Detected	300	Not Detected
1,2,4-Trichlorobenzene	200	Not Detected	1500	Not Detected
Hexachlorobutadiene	200	Not Detected	2100	Not Detected

E = Exceeds instrument calibration range.

Container Type: 1 Liter Tedlar Bag

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

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Client Sample ID: SEB-3

Lab ID#: 1203521-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032411**	**Date of Collection:**	**3/22/12 2:30:00 PM**
Dil. Factor:	**100**	**Date of Analysis:**	**3/24/12 12:57 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	50	200	250	990
Freon 114	50	Not Detected	350	Not Detected
Chloromethane	500	Not Detected	1000	Not Detected
Vinyl Chloride	50	Not Detected	130	Not Detected
1,3-Butadiene	50	Not Detected	110	Not Detected
Bromomethane	500	Not Detected	1900	Not Detected
Chloroethane	200	Not Detected	530	Not Detected
Freon 11	50	Not Detected	280	Not Detected
Ethanol	200	38000 E	380	72000 E
Freon 113	50	Not Detected	380	Not Detected
1,1-Dichloroethene	50	Not Detected	200	Not Detected
Acetone	500	20000	1200	46000
2-Propanol	200	5300	490	13000
Carbon Disulfide	200	Not Detected	620	Not Detected
3-Chloropropene	200	Not Detected	630	Not Detected
Methylene Chloride	500	Not Detected	1700	Not Detected
Methyl tert-butyl ether	50	Not Detected	180	Not Detected
trans-1,2-Dichloroethene	50	Not Detected	200	Not Detected
Hexane	50	260	180	930
1,1-Dichloroethane	50	Not Detected	200	Not Detected
2-Butanone (Methyl Ethyl Ketone)	200	16000	590	46000
cis-1,2-Dichloroethene	50	210	200	850
Tetrahydrofuran	50	1800	150	5400
Chloroform	50	Not Detected	240	Not Detected
1,1,1-Trichloroethane	50	Not Detected	270	Not Detected
Cyclohexane	50	260	170	880
Carbon Tetrachloride	50	Not Detected	310	Not Detected
2,2,4-Trimethylpentane	50	120	230	570
Benzene	50	1400	160	4600
1,2-Dichloroethane	50	74	200	300
Heptane	50	500	200	2000
Trichloroethene	50	84	270	450
1,2-Dichloropropane	50	Not Detected	230	Not Detected
1,4-Dioxane	200	Not Detected	720	Not Detected
Bromodichloromethane	50	Not Detected	340	Not Detected
cis-1,3-Dichloropropene	50	Not Detected	230	Not Detected
4-Methyl-2-pentanone	50	1100	200	4500
Toluene	50	6800	190	26000
trans-1,3-Dichloropropene	50	Not Detected	230	Not Detected
1,1,2-Trichloroethane	50	Not Detected	270	Not Detected
Tetrachloroethene	50	160	340	1000
2-Hexanone	200	Not Detected	820	Not Detected

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Client Sample ID: SEB-3

Lab ID#: 1203521-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032411**	**Date of Collection: 3/22/12 2:30:00 PM**	
Dil. Factor:	**100**	**Date of Analysis: 3/24/12 12:57 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	50	Not Detected	420	Not Detected
1,2-Dibromoethane (EDB)	50	Not Detected	380	Not Detected
Chlorobenzene	50	89	230	410
Ethyl Benzene	50	3500	220	15000
m,p-Xylene	50	5500	220	24000
o-Xylene	50	1700	220	7400
Styrene	50	380	210	1600
Bromoform	50	Not Detected	520	Not Detected
Cumene	50	440	240	2200
1,1,2,2-Tetrachloroethane	50	Not Detected	340	Not Detected
Propylbenzene	50	320	240	1600
4-Ethyltoluene	50	1100	240	5400
1,3,5-Trimethylbenzene	50	480	240	2400
1,2,4-Trimethylbenzene	50	1000	240	5100
1,3-Dichlorobenzene	50	Not Detected	300	Not Detected
1,4-Dichlorobenzene	50	170	300	1000
alpha-Chlorotoluene	50	Not Detected	260	Not Detected
1,2-Dichlorobenzene	50	Not Detected	300	Not Detected
1,2,4-Trichlorobenzene	200	Not Detected	1500	Not Detected
Hexachlorobutadiene	200	Not Detected	2100	Not Detected

E = Exceeds instrument calibration range.

Container Type: 1 Liter Tedlar Bag

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

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Client Sample ID: Lab Blank

Lab ID#: 1203521-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032408**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/24/12 11:13 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 1203521-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032408**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/24/12 11:13 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: CCV

Lab ID#: 1203521-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032402**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/24/12 08:26 AM**	

Compound	%Recovery
Freon 12	119
Freon 114	114
Chloromethane	134 Q
Vinyl Chloride	117
1,3-Butadiene	112
Bromomethane	113
Chloroethane	114
Freon 11	119
Ethanol	111
Freon 113	114
1,1-Dichloroethene	119
Acetone	117
2-Propanol	115
Carbon Disulfide	117
3-Chloropropene	111
Methylene Chloride	120
Methyl tert-butyl ether	113
trans-1,2-Dichloroethene	124
Hexane	115
1,1-Dichloroethane	120
2-Butanone (Methyl Ethyl Ketone)	115
cis-1,2-Dichloroethene	110
Tetrahydrofuran	115
Chloroform	118
1,1,1-Trichloroethane	116
Cyclohexane	110
Carbon Tetrachloride	119
2,2,4-Trimethylpentane	110
Benzene	121
1,2-Dichloroethane	130
Heptane	124
Trichloroethene	121
1,2-Dichloropropane	120
1,4-Dioxane	119
Bromodichloromethane	123
cis-1,3-Dichloropropene	121
4-Methyl-2-pentanone	120
Toluene	118
trans-1,3-Dichloropropene	122
1,1,2-Trichloroethane	116
Tetrachloroethene	120
2-Hexanone	124

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Client Sample ID: CCV

Lab ID#: 1203521-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032402**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 3/24/12 08:26 AM**

Compound	%Recovery
Dibromochloromethane	120
1,2-Dibromoethane (EDB)	119
Chlorobenzene	115
Ethyl Benzene	116
m,p-Xylene	114
o-Xylene	114
Styrene	117
Bromoform	117
Cumene	111
1,1,2,2-Tetrachloroethane	113
Propylbenzene	115
4-Ethyltoluene	112
1,3,5-Trimethylbenzene	110
1,2,4-Trimethylbenzene	112
1,3-Dichlorobenzene	112
1,4-Dichlorobenzene	112
alpha-Chlorotoluene	110
1,2-Dichlorobenzene	112
1,2,4-Trichlorobenzene	108
Hexachlorobutadiene	111

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: LCS

Lab ID#: 1203521-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032405**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 3/24/12 09:49 AM**

Compound	%Recovery
Freon 12	100
Freon 114	96
Chloromethane	112
Vinyl Chloride	96
1,3-Butadiene	93
Bromomethane	98
Chloroethane	109
Freon 11	101
Ethanol	90
Freon 113	99
1,1-Dichloroethene	107
Acetone	100
2-Propanol	97
Carbon Disulfide	125
3-Chloropropene	108
Methylene Chloride	104
Methyl tert-butyl ether	97
trans-1,2-Dichloroethene	119
Hexane	98
1,1-Dichloroethane	104
2-Butanone (Methyl Ethyl Ketone)	100
cis-1,2-Dichloroethene	96
Tetrahydrofuran	95
Chloroform	104
1,1,1-Trichloroethane	101
Cyclohexane	97
Carbon Tetrachloride	102
2,2,4-Trimethylpentane	97
Benzene	102
1,2-Dichloroethane	105
Heptane	103
Trichloroethene	100
1,2-Dichloropropane	101
1,4-Dioxane	96
Bromodichloromethane	103
cis-1,3-Dichloropropene	99
4-Methyl-2-pentanone	97
Toluene	97
trans-1,3-Dichloropropene	100
1,1,2-Trichloroethane	96
Tetrachloroethene	102
2-Hexanone	99

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Client Sample ID: LCS

Lab ID#: 1203521-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032405**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/24/12 09:49 AM**	

Compound	%Recovery
Dibromochloromethane	99
1,2-Dibromoethane (EDB)	102
Chlorobenzene	98
Ethyl Benzene	98
m,p-Xylene	96
o-Xylene	96
Styrene	99
Bromoform	97
Cumene	97
1,1,2,2-Tetrachloroethane	98
Propylbenzene	99
4-Ethyltoluene	92
1,3,5-Trimethylbenzene	94
1,2,4-Trimethylbenzene	94
1,3-Dichlorobenzene	96
1,4-Dichlorobenzene	97
alpha-Chlorotoluene	88
1,2-Dichlorobenzene	98
1,2,4-Trichlorobenzene	98
Hexachlorobutadiene	96

Container Type: NA - Not Applicable

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

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Client Sample ID: LCSD

Lab ID#: 1203521-06AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032406**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/24/12 10:17 AM**	

Compound	%Recovery
Freon 12	99
Freon 114	95
Chloromethane	105
Vinyl Chloride	94
1,3-Butadiene	95
Bromomethane	97
Chloroethane	96
Freon 11	98
Ethanol	88
Freon 113	98
1,1-Dichloroethene	107
Acetone	100
2-Propanol	96
Carbon Disulfide	124
3-Chloropropene	109
Methylene Chloride	102
Methyl tert-butyl ether	96
trans-1,2-Dichloroethene	116
Hexane	97
1,1-Dichloroethane	101
2-Butanone (Methyl Ethyl Ketone)	99
cis-1,2-Dichloroethene	95
Tetrahydrofuran	94
Chloroform	100
1,1,1-Trichloroethane	98
Cyclohexane	94
Carbon Tetrachloride	99
2,2,4-Trimethylpentane	96
Benzene	100
1,2-Dichloroethane	104
Heptane	104
Trichloroethene	100
1,2-Dichloropropane	100
1,4-Dioxane	97
Bromodichloromethane	100
cis-1,3-Dichloropropene	99
4-Methyl-2-pentanone	96
Toluene	97
trans-1,3-Dichloropropene	99
1,1,2-Trichloroethane	95
Tetrachloroethene	99
2-Hexanone	98

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Client Sample ID: LCSD

Lab ID#: 1203521-06AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032406**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/24/12 10:17 AM**	

Compound	%Recovery
Dibromochloromethane	98
1,2-Dibromoethane (EDB)	101
Chlorobenzene	97
Ethyl Benzene	95
m,p-Xylene	97
o-Xylene	97
Styrene	98
Bromoform	96
Cumene	96
1,1,2,2-Tetrachloroethane	100
Propylbenzene	99
4-Ethyltoluene	92
1,3,5-Trimethylbenzene	94
1,2,4-Trimethylbenzene	97
1,3-Dichlorobenzene	96
1,4-Dichlorobenzene	97
alpha-Chlorotoluene	88
1,2-Dichlorobenzene	98
1,2,4-Trichlorobenzene	98
Hexachlorobutadiene	97

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	103	70-130

Air Toxics LTD.

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

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Project Manager Mike Brack

Collected by: (Print and Sign) Mike Brack

Company Derenzo & Assoc. Email mbrack@derenzo.com

Address 39395 Schoolcraft City Livonia State MI Zip 48150

Phone 734-464-3880 Fax 734-464-4368

Project Info:
P.O. # FLD-15
Project # 120196
Project Name Seminole

Turn Around Time:
☐ Normal
☐ Rush 24 hr. 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	Final	Receipt	Final (psi)
01A	SEB-1	—	3/22/12	10:50	TO-15 modified	-	-		
02A	SEB-2	-	"	12:30	"	-	-		
03A	SEB-3	-	"	14:30	"	-	-		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
[signature]	3/22/12	[signature] AIR	3/23/12 0850
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes: Chlorinated Compound List 1

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	FED EX		NA	Good	Yes / No / None	1203521

Form 1293 rev.11