

FINAL REPORT # GTI-12/0007  
GTI PROJECT NUMBER 20792

---

# Guidance Document for the Introduction of Landfill- Derived Renewable Gas into Natural Gas Pipelines

## APPENDIX – Analytical Data

**Reporting Period:**  
8/1/10 – 12/31/11

**Report Issued:**  
May 02, 2012

**Project Investors:**  
Operations Technology Development (OTD)  
Atmos Energy Marketing  
Cambrian Energy  
Shell Energy  
Air Liquide  
SouthTex Treaters  
Clean Energy Fuels  
AGL Resources  
Montauk Energy  
Williams Pipeline  
TransCanada  
El Paso Corporation

**GTI Project Team:**

Karen Crippen	Alan G. Janos
Kristine Wiley	Dianne Joves
Russell J. Bora	Miguel Magallanes
Amanda Harmon	Jim Soldenwagner
Monica Ferrer	

**FINAL REPORT # GTI-12/0007**  
**GTI PROJECT NUMBER 20792**

---

## **Guidance Document for the Introduction of Landfill-Derived Renewable Gas into Natural Gas Pipelines**

### **APPENDIX – Analytical Data**

**Reporting Period:**  
8/1/10 – 12/31/11

**Report Issued:**  
May 02, 2012

**Project Investors:**  
Operations Technology Development (OTD)  
Atmos Energy Marketing  
Cambrian Energy  
Shell Energy  
Air Liquide  
SouthTex Treaters  
Clean Energy Fuels  
AGL Resources  
Montauk Energy  
Williams Pipeline  
TransCanada  
El Paso Corporation

**GTI Project Team:**

Karen Crippen	Alan G. Janos
Kristine Wiley	Dianne Joves
Russell J. Bora	Miguel Magallanes
Amanda Harmon	Jim Soldenwagner

**Gas Technology Institute**  
1700 S. Mount Prospect Rd.  
Des Plaines, Illinois 60018  
[www.gastechnology.org](http://www.gastechnology.org)

## Major Component Analysis by ASTM D1945 / D1946

Component	Detection Limit	101694-001	101694-002	101694-003	111212-001
		Cylinder 01 PSA Landfill #1 Mol %	Cylinder 02 PSA Landfill #1 Mol %	Cylinder 03 PSA Landfill #1 Mol %	Cylinder 01 PSA Landfill #8 Mol %
Ammonia	0.001	BDL	BDL	BDL	BDL
Helium	0.1	BDL	BDL	BDL	BDL
Carbon Dioxide	0.03	1.28	1.32	1.30	1.85
Oxygen/Argon	0.03	0.18	0.18	0.16	0.10
Nitrogen	0.03	2.27	2.46	2.37	1.50
Carbon Monoxide	0.03	BDL	BDL	BDL	BDL
Total Inerts + Diluents		3.73	3.96	3.84	3.46
Hydrogen	0.1	0.79	0.87	0.82	0.50
Methane	0.002	95.48	95.17	95.34	96.04
Ethane	0.002	BDL	BDL	BDL	BDL
Ethene	0.002	BDL	BDL	BDL	BDL
Ethyne	0.002	BDL	BDL	BDL	BDL
Propane	0.002	BDL	BDL	BDL	BDL
Propene	0.002	BDL	BDL	BDL	BDL
Propadiene	0.002	BDL	BDL	BDL	BDL
Propyne	0.002	BDL	BDL	BDL	BDL
i-Butane	0.002	BDL	BDL	BDL	BDL
n-Butane	0.002	BDL	BDL	BDL	BDL
1-Butene	0.002	BDL	BDL	BDL	BDL
i-Butene	0.002	BDL	BDL	BDL	BDL
trans-2-Butene	0.002	BDL	BDL	BDL	BDL
cis-2-Butene	0.002	BDL	BDL	BDL	BDL
1,3-Butadiene	0.002	BDL	BDL	BDL	BDL
i-Pentane	0.002	BDL	BDL	BDL	BDL
n-Pentane	0.002	BDL	BDL	BDL	BDL
neo-Pentane	0.002	BDL	BDL	BDL	BDL
Pentenes	0.002	BDL	BDL	BDL	BDL
Hexane Plus	0.0001	0.0005	0.0002	0.0009	BDL

Calculated Real Gas Properties	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia
Relative Density (Specific Gravity) (Dry)	0.5738	0.5745	0.5742	0.5771
HHV (Dry) (Btu/ft <sup>3</sup> )	971.0	968.2	969.8	975.8
HHV (Sat.) (Btu/ft <sup>3</sup> )	954.4	951.6	953.2	959.1
Wobbe Number	1281.9	1277.3	1279.8	1284.5
LHV (Dry) (Btu/ft <sup>3</sup> )	874.1	871.6	873.0	878.5
LHV (Sat.) (Btu/ft <sup>3</sup> )	859.2	856.7	858.1	863.5
Real Gas Density (lbs/ft <sup>3</sup> )	0.0439	0.0440	0.0439	0.0442
Methane Number	108	108	108	108

BDL = Below Detection Limit

air is likely present  
in this sample, the O<sub>2</sub>  
result is extrapolated

## Major Component Analysis by ASTM D1945 / D1946

Component	Detection Limit	111212-002	111212-003	111590-001	111590-002
		Cylinder 02 PSA Landfill #8 Mol %	Cylinder 03 PSA Landfill #8 Mol %	Cylinder 01 PSA Landfill #10 Mol %	Cylinder 02 PSA Landfill #10 Mol %
Ammonia	0.001	BDL	BDL	BDL	BDL
Helium	0.1	BDL	BDL	BDL	BDL
Carbon Dioxide	0.03	<b>1.84</b>	<b>1.83</b>	BDL	BDL
Oxygen/Argon	0.03	<b>0.08</b>	<b>0.09</b>	<b>0.21</b>	<b>0.07</b>
Nitrogen	0.03	<b>1.16</b>	<b>1.17</b>	<b>2.33</b>	<b>0.51</b>
Carbon Monoxide	0.03	BDL	BDL	BDL	BDL
Total Inerts + Diluents		<b>3.07</b>	<b>3.09</b>	<b>2.54</b>	<b>0.58</b>
Hydrogen	0.1	<b>0.33</b>	<b>0.32</b>	BDL	BDL
Methane	0.002	<b>96.60</b>	<b>96.59</b>	<b>97.46</b>	<b>99.41</b>
Ethane	0.002	BDL	BDL	BDL	<b>0.003</b>
Ethene	0.002	BDL	BDL	BDL	BDL
Ethyne	0.002	BDL	BDL	BDL	BDL
Propane	0.002	BDL	BDL	BDL	BDL
Propene	0.002	BDL	BDL	BDL	BDL
Propadiene	0.002	BDL	BDL	BDL	BDL
Propyne	0.002	BDL	BDL	BDL	BDL
i-Butane	0.002	BDL	BDL	BDL	BDL
n-Butane	0.002	BDL	BDL	BDL	BDL
1-Butene	0.002	BDL	BDL	BDL	BDL
i-Butene	0.002	BDL	BDL	BDL	BDL
trans-2-Butene	0.002	BDL	BDL	BDL	BDL
cis-2-Butene	0.002	BDL	BDL	BDL	BDL
1,3-Butadiene	0.002	BDL	BDL	BDL	BDL
i-Pentane	0.002	BDL	BDL	BDL	BDL
n-Pentane	0.002	BDL	BDL	BDL	BDL
neo-Pentane	0.002	BDL	BDL	BDL	BDL
Pentenes	0.002	BDL	BDL	BDL	BDL
Hexane Plus	0.0001	BDL	BDL	BDL	BDL

Calculated Real Gas Properties	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia
Relative Density (Specific Gravity) (Dry)	<b>0.5762</b>	<b>0.5763</b>	<b>0.5656</b>	<b>0.5574</b>
HHV (Dry) (Btu/ft <sup>3</sup> )	<b>980.9</b>	<b>980.8</b>	<b>988.5</b>	<b>1008.4</b>
HHV (Sat.) (Btu/ft <sup>3</sup> )	<b>964.1</b>	<b>964.1</b>	<b>971.6</b>	<b>991.2</b>
Wobbe Number	<b>1292.2</b>	<b>1292.0</b>	<b>1314.4</b>	<b>1350.8</b>
LHV (Dry) (Btu/ft <sup>3</sup> )	<b>883.1</b>	<b>883.1</b>	<b>890.1</b>	<b>908.0</b>
LHV (Sat.) (Btu/ft <sup>3</sup> )	<b>868.0</b>	<b>868.0</b>	<b>874.9</b>	<b>892.5</b>
Real Gas Density (lbs/ft <sup>3</sup> )	<b>0.0441</b>	<b>0.0441</b>	<b>0.0433</b>	<b>0.0427</b>
Methane Number	<b>108</b>	<b>108</b>	<b>108</b>	<b>108</b>

BDL = Below Detection Limit

## Major Component Analysis by ASTM D1945 / D1946

Component	Detection Limit	111590-003	101786-001	101786-002	101786-003
		Cylinder 03 PSA Landfill #10 Mol %	Cylinder 01 Solvent Landfill #5 Mol %	Cylinder 02 Solvent Landfill #5 Mol %	Cylinder 03 Solvent Landfill #5 Mol %
Ammonia	0.001	BDL	BDL	BDL	BDL
Helium	0.1	BDL	BDL	BDL	BDL
Carbon Dioxide	0.03	BDL	1.68	1.55	1.69
Oxygen/Argon	0.03	0.32	0.33	0.27	0.26
Nitrogen	0.03	1.44	6.03	5.89	5.75
Carbon Monoxide	0.03	BDL	BDL	BDL	BDL
Total Inerts + Diluents		1.76	8.05	7.71	7.70
Hydrogen	0.1	BDL	0.47	0.48	0.48
Methane	0.002	98.23	91.48	91.81	91.82
Ethane	0.002	0.003	BDL	BDL	BDL
Ethene	0.002	BDL	BDL	BDL	BDL
Ethyne	0.002	BDL	BDL	BDL	BDL
Propane	0.002	BDL	BDL	BDL	BDL
Propene	0.002	BDL	BDL	BDL	BDL
Propadiene	0.002	BDL	BDL	BDL	BDL
Propyne	0.002	BDL	BDL	BDL	BDL
i-Butane	0.002	BDL	BDL	BDL	BDL
n-Butane	0.002	BDL	BDL	BDL	BDL
1-Butene	0.002	BDL	BDL	BDL	BDL
i-Butene	0.002	BDL	BDL	BDL	BDL
trans-2-Butene	0.002	BDL	BDL	BDL	BDL
cis-2-Butene	0.002	BDL	BDL	BDL	BDL
1,3-Butadiene	0.002	BDL	BDL	BDL	BDL
i-Pentane	0.002	BDL	BDL	BDL	BDL
n-Pentane	0.002	BDL	BDL	BDL	BDL
neo-Pentane	0.002	BDL	BDL	BDL	BDL
Pentenes	0.002	BDL	BDL	BDL	BDL
Hexane Plus	0.0001	BDL	0.0012	0.0013	0.0011

Calculated Real Gas Properties	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia
Relative Density (Specific Gravity) (Dry)	0.5626	0.5956	0.5933	0.5941
HHV (Dry) (Btu/ft <sup>3</sup> )	996.4	929.4	932.8	932.9
HHV (Sat.) (Btu/ft <sup>3</sup> )	979.4	913.5	916.9	916.9
Wobbe Number	1328.5	1204.3	1211.0	1210.3
LHV (Dry) (Btu/ft <sup>3</sup> )	897.2	836.8	839.8	839.9
LHV (Sat.) (Btu/ft <sup>3</sup> )	881.8	822.5	825.5	825.5
Real Gas Density (lbs/ft <sup>3</sup> )	0.0431	0.0456	0.0454	0.0455
Methane Number	108	108	108	108

BDL = Below Detection Limit

## Major Component Analysis by ASTM D1945 / D1946

Component	Detection Limit	101788-001	101788-002	101788-003	111221-001
		Cylinder 01 Solvent Landfill #6 Mol %	Cylinder 02 Solvent Landfill #6 Mol %	Cylinder 03 Solvent Landfill #6 Mol %	Cylinder 01 Solvent Landfill #6 Mol %
Ammonia	0.001	BDL	BDL	BDL	BDL
Helium	0.1	BDL	BDL	BDL	BDL
Carbon Dioxide	0.03	1.82	1.81	1.82	1.60
Oxygen/Argon	0.03	0.09	0.09	0.10	0.19
Nitrogen	0.03	2.77	2.77	2.78	3.93
Carbon Monoxide	0.03	BDL	BDL	BDL	BDL
Total Inerts + Diluents		4.67	4.68	4.70	5.71
Hydrogen	0.1	0.41	0.41	0.41	0.36
Methane	0.002	94.92	94.91	94.90	93.93
Ethane	0.002	BDL	BDL	BDL	BDL
Ethene	0.002	BDL	BDL	BDL	BDL
Ethyne	0.002	BDL	BDL	BDL	BDL
Propane	0.002	BDL	BDL	BDL	BDL
Propene	0.002	BDL	BDL	BDL	BDL
Propadiene	0.002	BDL	BDL	BDL	BDL
Propyne	0.002	BDL	BDL	BDL	BDL
i-Butane	0.002	BDL	BDL	BDL	BDL
n-Butane	0.002	BDL	BDL	BDL	BDL
1-Butene	0.002	BDL	BDL	BDL	BDL
i-Butene	0.002	BDL	BDL	BDL	BDL
trans-2-Butene	0.002	BDL	BDL	BDL	BDL
cis-2-Butene	0.002	BDL	BDL	BDL	BDL
1,3-Butadiene	0.002	BDL	BDL	BDL	BDL
i-Pentane	0.002	BDL	BDL	BDL	BDL
n-Pentane	0.002	BDL	BDL	BDL	BDL
neo-Pentane	0.002	BDL	BDL	BDL	BDL
Pentenes	0.002	BDL	BDL	BDL	BDL
Hexane Plus	0.0001	0.0001	0.0001	0.0001	0.0001

Calculated Real Gas Properties	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia
Relative Density (Specific Gravity) (Dry)	0.5823	0.5824	0.5825	0.5858
HHV (Dry) (Btu/ft <sup>3</sup> )	964.2	964.1	963.9	953.9
HHV (Sat.) (Btu/ft <sup>3</sup> )	947.7	947.6	947.4	937.6
Wobbe Number	1263.5	1263.3	1263.0	1246.2
LHV (Dry) (Btu/ft <sup>3</sup> )	868.1	868.0	867.8	858.8
LHV (Sat.) (Btu/ft <sup>3</sup> )	853.2	853.1	853.0	844.1
Real Gas Density (lbs/ft <sup>3</sup> )	0.0446	0.0446	0.0446	0.0448
Methane Number	108	108	108	108

BDL = Below Detection Limit

## Major Component Analysis by ASTM D1945 / D1946

Component	Detection Limit	111221-002	111221-003	101793-001	101793-002
		Cylinder 02 Solvent Landfill #6 Mol %	Cylinder 03 Solvent Landfill #6 Mol %	Cylinder 01 Solvent Landfill #7 Mol %	Cylinder 02 Solvent Landfill #7 Mol %
Ammonia	0.001	BDL	BDL	BDL	BDL
Helium	0.1	BDL	BDL	BDL	BDL
Carbon Dioxide	0.03	1.60	1.59	2.21	2.19
Oxygen/Argon	0.03	0.18	0.21	0.41	0.45
Nitrogen	0.03	3.89	3.99	1.66	1.81
Carbon Monoxide	0.03	BDL	BDL	BDL	BDL
Total Inerts + Diluents		5.67	5.80	4.28	4.45
Hydrogen	0.1	0.37	0.36	0.16	0.15
Methane	0.002	93.96	93.84	95.56	95.40
Ethane	0.002	BDL	BDL	BDL	BDL
Ethene	0.002	BDL	BDL	BDL	BDL
Ethyne	0.002	BDL	BDL	BDL	BDL
Propane	0.002	BDL	BDL	BDL	BDL
Propene	0.002	BDL	BDL	BDL	BDL
Propadiene	0.002	BDL	BDL	BDL	BDL
Propyne	0.002	BDL	BDL	BDL	BDL
i-Butane	0.002	BDL	BDL	BDL	BDL
n-Butane	0.002	BDL	BDL	BDL	BDL
1-Butene	0.002	BDL	BDL	BDL	BDL
i-Butene	0.002	BDL	BDL	BDL	BDL
trans-2-Butene	0.002	BDL	BDL	BDL	BDL
cis-2-Butene	0.002	BDL	BDL	BDL	BDL
1,3-Butadiene	0.002	BDL	BDL	BDL	BDL
i-Pentane	0.002	BDL	BDL	BDL	BDL
n-Pentane	0.002	BDL	BDL	BDL	BDL
neo-Pentane	0.002	BDL	BDL	BDL	BDL
Pentenes	0.002	BDL	BDL	BDL	BDL
Hexane Plus	0.0001	0.0002	0.0001	0.0003	0.0002

Calculated Real Gas Properties	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia
Relative Density (Specific Gravity) (Dry)	0.5856	0.5861	0.5846	0.5853
HHV (Dry) (Btu/ft <sup>3</sup> )	954.2	953.0	969.8	968.2
HHV (Sat.) (Btu/ft <sup>3</sup> )	937.9	936.7	953.2	951.7
Wobbe Number	1246.9	1244.8	1268.4	1265.6
LHV (Dry) (Btu/ft <sup>3</sup> )	859.1	858.0	873.2	871.7
LHV (Sat.) (Btu/ft <sup>3</sup> )	844.4	843.3	858.3	856.8
Real Gas Density (lbs/ft <sup>3</sup> )	0.0448	0.0449	0.0447	0.0448
Methane Number	108	108	108	108

BDL = Below Detection Limit

## Major Component Analysis by ASTM D1945 / D1946

Component	Detection Limit	101793-003	111220-001	111220-002	111220-003
		Cylinder 03 Solvent Landfill #7 Mol %	Cylinder 01 Solvent Landfill #7 Mol %	Cylinder 02 Solvent Landfill #7 Mol %	Cylinder 03 Solvent Landfill #7 Mol %
Ammonia	0.001	BDL	BDL	BDL	BDL
Helium	0.1	BDL	BDL	BDL	BDL
Carbon Dioxide	0.03	2.20	1.70	1.70	1.70
Oxygen/Argon	0.03	0.42	0.36	0.36	0.36
Nitrogen	0.03	1.70	2.44	2.45	2.42
Carbon Monoxide	0.03	BDL	BDL	BDL	BDL
Total Inerts + Diluents		4.32	4.50	4.51	4.47
Hydrogen	0.1	0.17	0.28	0.28	0.29
Methane	0.002	95.51	95.22	95.21	95.25
Ethane	0.002	BDL	BDL	BDL	BDL
Ethene	0.002	BDL	BDL	BDL	BDL
Ethyne	0.002	BDL	BDL	BDL	BDL
Propane	0.002	BDL	BDL	BDL	BDL
Propene	0.002	BDL	BDL	BDL	BDL
Propadiene	0.002	BDL	BDL	BDL	BDL
Propyne	0.002	BDL	BDL	BDL	BDL
i-Butane	0.002	BDL	BDL	BDL	BDL
n-Butane	0.002	BDL	BDL	BDL	BDL
1-Butene	0.002	BDL	BDL	BDL	BDL
i-Butene	0.002	BDL	BDL	BDL	BDL
trans-2-Butene	0.002	BDL	BDL	BDL	BDL
cis-2-Butene	0.002	BDL	BDL	BDL	BDL
1,3-Butadiene	0.002	BDL	BDL	BDL	BDL
i-Pentane	0.002	BDL	BDL	BDL	BDL
n-Pentane	0.002	BDL	BDL	BDL	BDL
neo-Pentane	0.002	BDL	BDL	BDL	BDL
Pentenes	0.002	BDL	BDL	BDL	BDL
Hexane Plus	0.0001	0.0002	BDL	BDL	0.0002

Calculated Real Gas Properties	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia
Relative Density (Specific Gravity) (Dry)	0.5847	0.5820	0.5821	0.5818
HHV (Dry) (Btu/ft <sup>3</sup> )	969.4	966.8	966.6	967.0
HHV (Sat.) (Btu/ft <sup>3</sup> )	952.8	950.2	950.1	950.5
Wobbe Number	1267.7	1267.2	1267.0	1267.8
LHV (Dry) (Btu/ft <sup>3</sup> )	872.8	870.4	870.3	870.7
LHV (Sat.) (Btu/ft <sup>3</sup> )	857.9	855.5	855.4	855.8
Real Gas Density (lbs/ft <sup>3</sup> )	0.0447	0.0445	0.0445	0.0445
Methane Number	108	108	108	108

BDL = Below Detection Limit



## Major Component Analysis by ASTM D1945 / D1946

Component	Detection Limit	111225-001	111225-002	111225-003
		Cylinder 01 Membrane Landfill #9 Mol %	Cylinder 02 Membrane Landfill #9 Mol %	Cylinder 03 Membrane Landfill #9 Mol %
Ammonia	0.001	BDL	BDL	BDL
Helium	0.1	BDL	BDL	BDL
Carbon Dioxide	0.03	<b>1.88</b>	<b>1.79</b>	<b>1.85</b>
Oxygen/Argon	0.03	<b>0.12</b>	<b>0.13</b>	<b>0.12</b>
Nitrogen	0.03	<b>2.50</b>	<b>2.58</b>	<b>2.52</b>
Carbon Monoxide	0.03	BDL	BDL	BDL
Total Inerts + Diluents		<b>4.51</b>	<b>4.50</b>	<b>4.49</b>
Hydrogen	0.1	BDL	BDL	BDL
Methane	0.002	<b>95.49</b>	<b>95.49</b>	<b>95.51</b>
Ethane	0.002	BDL	BDL	BDL
Ethene	0.002	BDL	BDL	BDL
Ethyne	0.002	BDL	BDL	BDL
Propane	0.002	BDL	BDL	BDL
Propene	0.002	BDL	BDL	BDL
Propadiene	0.002	BDL	BDL	BDL
Propyne	0.002	BDL	BDL	BDL
i-Butane	0.002	BDL	BDL	BDL
n-Butane	0.002	BDL	BDL	BDL
1-Butene	0.002	BDL	BDL	BDL
i-Butene	0.002	BDL	BDL	BDL
trans-2-Butene	0.002	BDL	BDL	BDL
cis-2-Butene	0.002	BDL	BDL	BDL
1,3-Butadiene	0.002	BDL	BDL	BDL
i-Pentane	0.002	BDL	BDL	BDL
n-Pentane	0.002	BDL	BDL	BDL
neo-Pentane	0.002	BDL	BDL	BDL
Pentenes	0.002	BDL	BDL	BDL
Hexane Plus	0.0001	<b>0.0006</b>	<b>0.0003</b>	<b>0.0002</b>

Calculated Real Gas Properties	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia
Relative Density (Specific Gravity) (Dry)	<b>0.5841</b>	<b>0.5836</b>	<b>0.5838</b>
HHV (Dry) (Btu/ft <sup>3</sup> )	<b>968.7</b>	<b>968.8</b>	<b>968.9</b>
HHV (Sat.) (Btu/ft <sup>3</sup> )	<b>952.2</b>	<b>952.2</b>	<b>952.3</b>
Wobbe Number	<b>1267.5</b>	<b>1268.2</b>	<b>1268.0</b>
LHV (Dry) (Btu/ft <sup>3</sup> )	<b>872.2</b>	<b>872.3</b>	<b>872.4</b>
LHV (Sat.) (Btu/ft <sup>3</sup> )	<b>857.3</b>	<b>857.4</b>	<b>857.5</b>
Real Gas Density (lbs/ft <sup>3</sup> )	<b>0.0447</b>	<b>0.0447</b>	<b>0.0447</b>
Methane Number	<b>108</b>	<b>108</b>	<b>108</b>

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID

Component	Detection Limit	101694-001	101694-002	101694-003	111212-001
		Cylinder 01 PSA Landfill #1	Cylinder 02 PSA Landfill #1	Cylinder 03 PSA Landfill #1	Cylinder 01 PSA Landfill #8
		ppmv	ppmv	ppmv	ppmv
<b>C5-C7 Cycloalkanes</b>		<b>1</b>	<b>BDL</b>	<b>2</b>	<b>BDL</b>
Cyclopentane	1	BDL	BDL	BDL	BDL
Methylcyclopentane	1	BDL	BDL	BDL	BDL
Cyclohexane	1	<b>1</b>	BDL	<b>1</b>	BDL
Methylcyclohexane	1	BDL	BDL	<b>1</b>	BDL
<b>Heavier Aromatics</b>		BDL	BDL	BDL	BDL
C3 Benzenes	1	BDL	BDL	BDL	BDL
C1 Naphthalenes	1	BDL	BDL	BDL	BDL
C2 Naphthalenes	1	BDL	BDL	BDL	BDL
<b>C6+ Hydrocarbons</b>		<b>4</b>	<b>2</b>	<b>6</b>	BDL
Hexanes	1	<b>2</b>	<b>1</b>	<b>3</b>	BDL
Heptanes	1	<b>2</b>	<b>1</b>	<b>2</b>	BDL
2,2,4-Trimethylpentane	1	BDL	BDL	BDL	BDL
Octanes	1	BDL	BDL	<b>1</b>	BDL
Nonanes	1	BDL	BDL	BDL	BDL
Decanes	1	BDL	BDL	BDL	BDL
Undecanes	1	BDL	BDL	BDL	BDL
Dodecanes	1	BDL	BDL	BDL	BDL
Tridecanes	1	BDL	BDL	BDL	BDL
Tetradecanes	1	BDL	BDL	BDL	BDL
Pentadecanes	1	BDL	BDL	BDL	BDL
Hexadecanes	1	BDL	BDL	BDL	BDL
Heptadecanes	1	BDL	BDL	BDL	BDL
Octadecanes	1	BDL	BDL	BDL	BDL
Nonadecanes	1	BDL	BDL	BDL	BDL
Eicosanes +	1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID

Component	Detection Limit	111212-002	111212-003	111590-001	111590-002
		Cylinder 02 PSA Landfill #8	Cylinder 03 PSA Landfill #8	Cylinder 01 PSA Landfill #10	Cylinder 02 PSA Landfill #10
		ppmv	ppmv	ppmv	ppmv
<b>C5-C7 Cycloalkanes</b>		BDL	BDL	BDL	BDL
Cyclopentane	1	BDL	BDL	BDL	BDL
Methylcyclopentane	1	BDL	BDL	BDL	BDL
Cyclohexane	1	BDL	BDL	BDL	BDL
Methylcyclohexane	1	BDL	BDL	BDL	BDL
<b>Heavier Aromatics</b>		BDL	BDL	BDL	BDL
C3 Benzenes	1	BDL	BDL	BDL	BDL
C1 Naphthalenes	1	BDL	BDL	BDL	BDL
C2 Naphthalenes	1	BDL	BDL	BDL	BDL
<b>C6+ Hydrocarbons</b>		BDL	BDL	BDL	BDL
Hexanes	1	BDL	BDL	BDL	BDL
Heptanes	1	BDL	BDL	BDL	BDL
2,2,4-Trimethylpentane	1	BDL	BDL	BDL	BDL
Octanes	1	BDL	BDL	BDL	BDL
Nonanes	1	BDL	BDL	BDL	BDL
Decanes	1	BDL	BDL	BDL	BDL
Undecanes	1	BDL	BDL	BDL	BDL
Dodecanes	1	BDL	BDL	BDL	BDL
Tridecanes	1	BDL	BDL	BDL	BDL
Tetradecanes	1	BDL	BDL	BDL	BDL
Pentadecanes	1	BDL	BDL	BDL	BDL
Hexadecanes	1	BDL	BDL	BDL	BDL
Heptadecanes	1	BDL	BDL	BDL	BDL
Octadecanes	1	BDL	BDL	BDL	BDL
Nonadecanes	1	BDL	BDL	BDL	BDL
Eicosanes +	1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID

Component	Detection Limit	111590-003	101786-001	101786-002	101786-003
		Cylinder 03 PSA Landfill #10	Cylinder 01 Solvent Landfill #5	Cylinder 02 Solvent Landfill #5	Cylinder 03 Solvent Landfill #5
		ppmv	ppmv	ppmv	ppmv
<b>C5-C7 Cycloalkanes</b>		BDL	BDL	BDL	BDL
Cyclopentane	1	BDL	BDL	BDL	BDL
Methylcyclopentane	1	BDL	BDL	BDL	BDL
Cyclohexane	1	BDL	BDL	BDL	BDL
Methylcyclohexane	1	BDL	BDL	BDL	BDL
<b>Heavier Aromatics</b>		BDL	1	1	1
C3 Benzenes	1	BDL	1	1	1
C1 Naphthalenes	1	BDL	BDL	BDL	BDL
C2 Naphthalenes	1	BDL	BDL	BDL	BDL
<b>C6+ Hydrocarbons</b>		BDL	9	10	8
Hexanes	1	BDL	BDL	1	1
Heptanes	1	BDL	BDL	BDL	BDL
2,2,4-Trimethylpentane	1	BDL	BDL	BDL	BDL
Octanes	1	BDL	1	1	1
Nonanes	1	BDL	2	2	1
Decanes	1	BDL	4	4	4
Undecanes	1	BDL	2	2	1
Dodecanes	1	BDL	BDL	BDL	BDL
Tridecanes	1	BDL	BDL	BDL	BDL
Tetradecanes	1	BDL	BDL	BDL	BDL
Pentadecanes	1	BDL	BDL	BDL	BDL
Hexadecanes	1	BDL	BDL	BDL	BDL
Heptadecanes	1	BDL	BDL	BDL	BDL
Octadecanes	1	BDL	BDL	BDL	BDL
Nonadecanes	1	BDL	BDL	BDL	BDL
Eicosanes +	1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID

Component	Detection Limit	101788-001	101788-002	101788-003	111221-001
		Cylinder 01 Solvent Landfill #6	Cylinder 02 Solvent Landfill #6	Cylinder 03 Solvent Landfill #6	Cylinder 01 Solvent Landfill #6
		ppmv	ppmv	ppmv	ppmv
<b>C5-C7 Cycloalkanes</b>		BDL	BDL	BDL	BDL
Cyclopentane	1	BDL	BDL	BDL	BDL
Methylcyclopentane	1	BDL	BDL	BDL	BDL
Cyclohexane	1	BDL	BDL	BDL	BDL
Methylcyclohexane	1	BDL	BDL	BDL	BDL
<b>Heavier Aromatics</b>		BDL	BDL	BDL	BDL
C3 Benzenes	1	BDL	BDL	BDL	BDL
C1 Naphthalenes	1	BDL	BDL	BDL	BDL
C2 Naphthalenes	1	BDL	BDL	BDL	BDL
<b>C6+ Hydrocarbons</b>		<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Hexanes	1	BDL	BDL	BDL	BDL
Heptanes	1	BDL	BDL	BDL	BDL
2,2,4-Trimethylpentane	1	BDL	BDL	BDL	BDL
Octanes	1	BDL	BDL	BDL	BDL
Nonanes	1	BDL	BDL	BDL	BDL
Decanes	1	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Undecanes	1	BDL	BDL	BDL	BDL
Dodecanes	1	BDL	BDL	BDL	BDL
Tridecanes	1	BDL	BDL	BDL	BDL
Tetradecanes	1	BDL	BDL	BDL	BDL
Pentadecanes	1	BDL	BDL	BDL	BDL
Hexadecanes	1	BDL	BDL	BDL	BDL
Heptadecanes	1	BDL	BDL	BDL	BDL
Octadecanes	1	BDL	BDL	BDL	BDL
Nonadecanes	1	BDL	BDL	BDL	BDL
Eicosanes +	1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID

Component	Detection Limit	111221-002	111221-003	101793-001	101793-002
		Cylinder 02 Solvent Landfill #6	Cylinder 03 Solvent Landfill #6	Cylinder 01 Solvent Landfill #7	Cylinder 02 Solvent Landfill #7
		ppmv	ppmv	ppmv	ppmv
<b>C5-C7 Cycloalkanes</b>		BDL	BDL	BDL	BDL
Cyclopentane	1	BDL	BDL	BDL	BDL
Methylcyclopentane	1	BDL	BDL	BDL	BDL
Cyclohexane	1	BDL	BDL	BDL	BDL
Methylcyclohexane	1	BDL	BDL	BDL	BDL
<b>Heavier Aromatics</b>		BDL	BDL	BDL	BDL
C3 Benzenes	1	BDL	BDL	BDL	BDL
C1 Naphthalenes	1	BDL	BDL	BDL	BDL
C2 Naphthalenes	1	BDL	BDL	BDL	BDL
<b>C6+ Hydrocarbons</b>		<b>1</b>	<b>1</b>	<b>3</b>	<b>2</b>
Hexanes	1	BDL	BDL	BDL	BDL
Heptanes	1	BDL	BDL	BDL	BDL
2,2,4-Trimethylpentane	1	BDL	BDL	BDL	BDL
Octanes	1	BDL	BDL	BDL	BDL
Nonanes	1	BDL	BDL	BDL	BDL
Decanes	1	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>
Undecanes	1	BDL	BDL	<b>1</b>	<b>1</b>
Dodecanes	1	BDL	BDL	BDL	BDL
Tridecanes	1	BDL	BDL	BDL	BDL
Tetradecanes	1	BDL	BDL	BDL	BDL
Pentadecanes	1	BDL	BDL	BDL	BDL
Hexadecanes	1	BDL	BDL	BDL	BDL
Heptadecanes	1	BDL	BDL	BDL	BDL
Octadecanes	1	BDL	BDL	BDL	BDL
Nonadecanes	1	BDL	BDL	BDL	BDL
Eicosanes +	1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID

Component	Detection Limit	101793-003	111220-001	111220-002	111220-003
		Cylinder 03 Solvent Landfill #7	Cylinder 01 Solvent Landfill #7	Cylinder 02 Solvent Landfill #7	Cylinder 03 Solvent Landfill #7
		ppmv	ppmv	ppmv	ppmv
<b>C5-C7 Cycloalkanes</b>		BDL	BDL	BDL	BDL
Cyclopentane	1	BDL	BDL	BDL	BDL
Methylcyclopentane	1	BDL	BDL	BDL	BDL
Cyclohexane	1	BDL	BDL	BDL	BDL
Methylcyclohexane	1	BDL	BDL	BDL	BDL
<b>Heavier Aromatics</b>		BDL	BDL	BDL	BDL
C3 Benzenes	1	BDL	BDL	BDL	BDL
C1 Naphthalenes	1	BDL	BDL	BDL	BDL
C2 Naphthalenes	1	BDL	BDL	BDL	BDL
<b>C6+ Hydrocarbons</b>		<b>2</b>	BDL	BDL	<b>2</b>
Hexanes	1	BDL	BDL	BDL	BDL
Heptanes	1	BDL	BDL	BDL	BDL
2,2,4-Trimethylpentane	1	BDL	BDL	BDL	BDL
Octanes	1	BDL	BDL	BDL	BDL
Nonanes	1	BDL	BDL	BDL	BDL
Decanes	1	<b>1</b>	BDL	BDL	<b>1</b>
Undecanes	1	<b>1</b>	BDL	BDL	<b>1</b>
Dodecanes	1	BDL	BDL	BDL	BDL
Tridecanes	1	BDL	BDL	BDL	BDL
Tetradecanes	1	BDL	BDL	BDL	BDL
Pentadecanes	1	BDL	BDL	BDL	BDL
Hexadecanes	1	BDL	BDL	BDL	BDL
Heptadecanes	1	BDL	BDL	BDL	BDL
Octadecanes	1	BDL	BDL	BDL	BDL
Nonadecanes	1	BDL	BDL	BDL	BDL
Eicosanes +	1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID

Component	Detection Limit	111225-001	111225-002	111225-003
		Cylinder 01 Membrane Landfill #9	Cylinder 02 Membrane Landfill #9	Cylinder 03 Membrane Landfill #9
		ppmv	ppmv	ppmv
<b>C5-C7 Cycloalkanes</b>		2	1	1
Cyclopentane	1	1	1	1
Methylcyclopentane	1	1	BDL	BDL
Cyclohexane	1	BDL	BDL	BDL
Methylcyclohexane	1	BDL	BDL	BDL
<b>Heavier Aromatics</b>		BDL	BDL	BDL
C3 Benzenes	1	BDL	BDL	BDL
C1 Naphthalenes	1	BDL	BDL	BDL
C2 Naphthalenes	1	BDL	BDL	BDL
<b>C6+ Hydrocarbons</b>		4	2	1
Hexanes	1	4	2	1
Heptanes	1	BDL	BDL	BDL
2,2,4-Trimethylpentane	1	BDL	BDL	BDL
Octanes	1	BDL	BDL	BDL
Nonanes	1	BDL	BDL	BDL
Decanes	1	BDL	BDL	BDL
Undecanes	1	BDL	BDL	BDL
Dodecanes	1	BDL	BDL	BDL
Tridecanes	1	BDL	BDL	BDL
Tetradecanes	1	BDL	BDL	BDL
Pentadecanes	1	BDL	BDL	BDL
Hexadecanes	1	BDL	BDL	BDL
Heptadecanes	1	BDL	BDL	BDL
Octadecanes	1	BDL	BDL	BDL
Nonadecanes	1	BDL	BDL	BDL
Eicosanes +	1	BDL	BDL	BDL

BDL = Below Detection Limit



## Trace Sulfur Analysis by ASTM D6228

Component	101694-001	101694-002	101694-003	111212-001
	Cylinder 01	Cylinder 02	Cylinder 03	Cylinder 01
	PSA	PSA	PSA	PSA
	Landfill #1	Landfill #1	Landfill #1	Landfill #8
	ppmv	ppmv	ppmv	ppmv
Hydrogen Sulfide	BDL	BDL	BDL	BDL
Sulfur Dioxide	BDL	BDL	BDL	BDL
Carbonyl Sulfide	BDL	BDL	BDL	<b>0.07</b>
Carbon Disulfide	BDL	BDL	BDL	BDL
Methyl Mercaptan	BDL	BDL	BDL	BDL
Ethyl Mercaptan	BDL	BDL	BDL	BDL
i-Propyl Mercaptan	BDL	BDL	BDL	BDL
n-Propyl Mercaptan	BDL	BDL	BDL	BDL
t-Butyl Mercaptan	BDL	BDL	BDL	BDL
Dimethyl Sulfide	<b>1.24</b>	<b>0.39</b>	<b>1.25</b>	BDL
Methyl Ethyl Sulfide	BDL	BDL	BDL	BDL
Diethyl Sulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Sulfide	BDL	BDL	BDL	BDL
Dimethyl Disulfide	BDL	BDL	BDL	BDL
Methyl Ethyl Disulfide	BDL	BDL	BDL	BDL
Methyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Diethyl Disulfide	BDL	BDL	BDL	BDL
Methyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Methyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Ethyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-i-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Di-n-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
n-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Disulfide	BDL	BDL	BDL	BDL
Dimethyl Trisulfide	BDL	BDL	BDL	BDL
Diethyl Trisulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Trisulfide	BDL	BDL	BDL	BDL
Thiophene	BDL	BDL	BDL	BDL
C1-Thiophenes	BDL	BDL	BDL	BDL
C2-Thiophenes	BDL	BDL	BDL	BDL
C3-Thiophenes	BDL	BDL	BDL	BDL
Benzothiophene	BDL	BDL	BDL	BDL
C1-Benzothiophenes	BDL	BDL	BDL	BDL
C2-Benzothiophenes	BDL	BDL	BDL	BDL
Thiophane	BDL	BDL	BDL	BDL
Thiophenol	BDL	BDL	BDL	BDL
Total Sulfur as molar PPM S	<b>1.20</b>	<b>0.39</b>	<b>1.25</b>	<b>0.07</b>
As Grains/100 SCF @ 14.73 psia, 60°F	<b>0.071</b>	<b>0.023</b>	<b>0.074</b>	<b>0.004</b>

Detection Limit = 0.05 ppmv S

BDL = Below Detection Limit

The results within this report relate only to the items tested.

## Trace Sulfur Analysis by ASTM D6228

Component	111212-002	111212-003	111590-001	111590-002
	Cylinder 02	Cylinder 03	Cylinder 01	Cylinder 02
	PSA	PSA	PSA	PSA
	Landfill #8	Landfill #8	Landfill #10	Landfill #10
	ppmv	ppmv	ppmv	ppmv
Hydrogen Sulfide	BDL	BDL	BDL	BDL
Sulfur Dioxide	BDL	BDL	0.11	BDL
Carbonyl Sulfide	0.08	0.08	BDL	BDL
Carbon Disulfide	BDL	BDL	BDL	BDL
Methyl Mercaptan	BDL	BDL	BDL	BDL
Ethyl Mercaptan	BDL	BDL	BDL	BDL
i-Propyl Mercaptan	BDL	BDL	BDL	BDL
n-Propyl Mercaptan	BDL	BDL	BDL	BDL
t-Butyl Mercaptan	BDL	BDL	BDL	BDL
Dimethyl Sulfide	BDL	BDL	BDL	BDL
Methyl Ethyl Sulfide	BDL	BDL	BDL	BDL
Diethyl Sulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Sulfide	BDL	BDL	BDL	BDL
Dimethyl Disulfide	BDL	BDL	BDL	BDL
Methyl Ethyl Disulfide	BDL	BDL	BDL	BDL
Methyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Diethyl Disulfide	BDL	BDL	BDL	BDL
Methyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Methyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Ethyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-i-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Di-n-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
n-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Disulfide	BDL	BDL	BDL	BDL
Dimethyl Trisulfide	BDL	BDL	BDL	BDL
Diethyl Trisulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Trisulfide	BDL	BDL	BDL	BDL
Thiophene	BDL	BDL	BDL	BDL
C1-Thiophenes	BDL	BDL	BDL	BDL
C2-Thiophenes	BDL	BDL	BDL	BDL
C3-Thiophenes	BDL	BDL	BDL	BDL
Benzothiophene	BDL	BDL	BDL	BDL
C1-Benzothiophenes	BDL	BDL	BDL	BDL
C2-Benzothiophenes	BDL	BDL	BDL	BDL
Thiophane	BDL	BDL	BDL	BDL
Thiophenol	BDL	BDL	BDL	BDL
Total Sulfur as molar PPM S	0.08	0.08	0.11	BDL
As Grains/100 SCF @ 14.73 psia, 60°F	0.005	0.005	0.007	BDL

Detection Limit = 0.05 ppmv S

BDL = Below Detection Limit

The results within this report relate only to the items tested.

## Trace Sulfur Analysis by ASTM D6228

Component	111590-003	101786-001	101786-002	101786-003
	Cylinder 03	Cylinder 01	Cylinder 02	Cylinder 03
	PSA	Solvent	Solvent	Solvent
	Landfill #10	Landfill #5	Landfill #5	Landfill #5
	ppmv	ppmv	ppmv	ppmv
Hydrogen Sulfide	BDL	BDL	BDL	BDL
Sulfur Dioxide	0.25	BDL	BDL	BDL
Carbonyl Sulfide	BDL	BDL	BDL	BDL
Carbon Disulfide	BDL	BDL	BDL	BDL
Methyl Mercaptan	BDL	BDL	BDL	BDL
Ethyl Mercaptan	BDL	BDL	BDL	BDL
i-Propyl Mercaptan	BDL	BDL	BDL	BDL
n-Propyl Mercaptan	BDL	BDL	BDL	BDL
t-Butyl Mercaptan	BDL	BDL	BDL	BDL
Dimethyl Sulfide	BDL	BDL	BDL	BDL
Methyl Ethyl Sulfide	BDL	BDL	BDL	BDL
Diethyl Sulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Sulfide	BDL	BDL	BDL	BDL
Dimethyl Disulfide	BDL	BDL	BDL	BDL
Methyl Ethyl Disulfide	BDL	BDL	BDL	BDL
Methyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Diethyl Disulfide	BDL	BDL	BDL	BDL
Methyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Methyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Ethyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-i-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Di-n-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
n-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Disulfide	BDL	BDL	BDL	BDL
Dimethyl Trisulfide	BDL	BDL	BDL	BDL
Diethyl Trisulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Trisulfide	BDL	BDL	BDL	BDL
Thiophene	BDL	BDL	BDL	BDL
C1-Thiophenes	BDL	BDL	BDL	BDL
C2-Thiophenes	BDL	BDL	BDL	BDL
C3-Thiophenes	BDL	BDL	BDL	BDL
Benzothiophene	BDL	BDL	BDL	BDL
C1-Benzothiophenes	BDL	BDL	BDL	BDL
C2-Benzothiophenes	BDL	BDL	BDL	BDL
Thiophane	BDL	BDL	BDL	BDL
Thiophenol	BDL	BDL	BDL	BDL
Total Sulfur as molar PPM S	0.25	BDL	BDL	BDL
As Grains/100 SCF @ 14.73 psia, 60°F	0.015	BDL	BDL	BDL

Detection Limit = 0.05 ppmv S

BDL = Below Detection Limit

The results within this report relate only to the items tested.

### Trace Sulfur Analysis by ASTM D6228

Component	101788-001	101788-002	101788-003	111221-001
	Cylinder 01	Cylinder 02	Cylinder 03	Cylinder 01
	Solvent	Solvent	Solvent	Solvent
	Landfill #6	Landfill #6	Landfill #6	Landfill #6
	ppmv	ppmv	ppmv	ppmv
Hydrogen Sulfide	BDL	BDL	BDL	BDL
Sulfur Dioxide	BDL	BDL	BDL	BDL
Carbonyl Sulfide	BDL	BDL	BDL	BDL
Carbon Disulfide	BDL	BDL	BDL	BDL
Methyl Mercaptan	BDL	BDL	BDL	BDL
Ethyl Mercaptan	BDL	BDL	BDL	BDL
i-Propyl Mercaptan	BDL	BDL	BDL	BDL
n-Propyl Mercaptan	BDL	BDL	BDL	BDL
t-Butyl Mercaptan	BDL	BDL	BDL	BDL
Dimethyl Sulfide	BDL	BDL	BDL	BDL
Methyl Ethyl Sulfide	BDL	BDL	BDL	BDL
Diethyl Sulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Sulfide	BDL	BDL	BDL	BDL
Dimethyl Disulfide	BDL	BDL	BDL	BDL
Methyl Ethyl Disulfide	BDL	BDL	BDL	BDL
Methyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Diethyl Disulfide	BDL	BDL	BDL	BDL
Methyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Methyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Ethyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-i-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Di-n-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
n-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Disulfide	BDL	BDL	BDL	BDL
Dimethyl Trisulfide	BDL	BDL	BDL	BDL
Diethyl Trisulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Trisulfide	BDL	BDL	BDL	BDL
Thiophene	BDL	BDL	BDL	BDL
C1-Thiophenes	BDL	BDL	BDL	BDL
C2-Thiophenes	BDL	BDL	BDL	BDL
C3-Thiophenes	BDL	BDL	BDL	BDL
Benzothiophene	BDL	BDL	BDL	BDL
C1-Benzothiophenes	BDL	BDL	BDL	BDL
C2-Benzothiophenes	BDL	BDL	BDL	BDL
Thiophane	BDL	BDL	BDL	BDL
Thiophenol	BDL	BDL	BDL	BDL
Total Sulfur as molar PPM S	BDL	BDL	BDL	BDL
As Grains/100 SCF @ 14.73 psia, 60°F	BDL	BDL	BDL	BDL

Detection Limit = 0.05 ppmv S

BDL = Below Detection Limit

The results within this report relate only to the items tested.

## Trace Sulfur Analysis by ASTM D6228

Component	111221-002	111221-003	101793-001	101793-002
	Cylinder 02	Cylinder 03	Cylinder 01	Cylinder 02
	Solvent	Solvent	Solvent	Solvent
	Landfill #6	Landfill #6	Landfill #7	Landfill #7
	ppmv	ppmv	ppmv	ppmv
Hydrogen Sulfide	BDL	BDL	BDL	BDL
Sulfur Dioxide	BDL	BDL	BDL	BDL
Carbonyl Sulfide	BDL	BDL	BDL	BDL
Carbon Disulfide	BDL	BDL	BDL	BDL
Methyl Mercaptan	BDL	BDL	BDL	BDL
Ethyl Mercaptan	BDL	BDL	BDL	BDL
i-Propyl Mercaptan	BDL	BDL	BDL	BDL
n-Propyl Mercaptan	BDL	BDL	BDL	BDL
t-Butyl Mercaptan	BDL	BDL	BDL	BDL
Dimethyl Sulfide	BDL	BDL	<b>0.08</b>	<b>0.15</b>
Methyl Ethyl Sulfide	BDL	BDL	BDL	BDL
Diethyl Sulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Sulfide	BDL	BDL	BDL	BDL
Dimethyl Disulfide	BDL	BDL	BDL	BDL
Methyl Ethyl Disulfide	BDL	BDL	BDL	BDL
Methyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Diethyl Disulfide	BDL	BDL	BDL	BDL
Methyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Methyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Ethyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-i-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Di-n-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
n-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Disulfide	BDL	BDL	BDL	BDL
Dimethyl Trisulfide	BDL	BDL	BDL	BDL
Diethyl Trisulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Trisulfide	BDL	BDL	BDL	BDL
Thiophene	BDL	BDL	BDL	BDL
C1-Thiophenes	BDL	BDL	BDL	BDL
C2-Thiophenes	BDL	BDL	BDL	BDL
C3-Thiophenes	BDL	BDL	BDL	BDL
Benzothiophene	BDL	BDL	BDL	BDL
C1-Benzothiophenes	BDL	BDL	BDL	BDL
C2-Benzothiophenes	BDL	BDL	BDL	BDL
Thiophane	BDL	BDL	BDL	BDL
Thiophenol	BDL	BDL	BDL	BDL
Total Sulfur as molar PPM S	BDL	BDL	<b>0.08</b>	<b>0.15</b>
As Grains/100 SCF @ 14.73 psia, 60°F	BDL	BDL	<b>0.005</b>	<b>0.009</b>

Detection Limit = 0.05 ppmv S

BDL = Below Detection Limit

The results within this report relate only to the items tested.

## Trace Sulfur Analysis by ASTM D6228

Component	101793-003	111220-001	111220-002	111220-003
	Cylinder 03	Cylinder 01	Cylinder 02	Cylinder 03
	Solvent	Solvent	Solvent	Solvent
	Landfill #7	Landfill #7	Landfill #7	Landfill #7
	ppmv	ppmv	ppmv	ppmv
Hydrogen Sulfide	BDL	BDL	BDL	BDL
Sulfur Dioxide	BDL	BDL	BDL	BDL
Carbonyl Sulfide	BDL	BDL	BDL	BDL
Carbon Disulfide	BDL	BDL	BDL	BDL
Methyl Mercaptan	BDL	BDL	BDL	BDL
Ethyl Mercaptan	BDL	BDL	BDL	BDL
i-Propyl Mercaptan	BDL	BDL	BDL	BDL
n-Propyl Mercaptan	BDL	BDL	BDL	BDL
t-Butyl Mercaptan	BDL	BDL	BDL	BDL
Dimethyl Sulfide	<b>0.11</b>	BDL	BDL	BDL
Methyl Ethyl Sulfide	BDL	BDL	BDL	BDL
Diethyl Sulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Sulfide	BDL	BDL	BDL	BDL
Dimethyl Disulfide	BDL	BDL	BDL	BDL
Methyl Ethyl Disulfide	BDL	BDL	BDL	BDL
Methyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Diethyl Disulfide	BDL	BDL	BDL	BDL
Methyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Methyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Ethyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-i-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Di-n-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
n-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Disulfide	BDL	BDL	BDL	BDL
Dimethyl Trisulfide	BDL	BDL	BDL	BDL
Diethyl Trisulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Trisulfide	BDL	BDL	BDL	BDL
Thiophene	BDL	BDL	BDL	BDL
C1-Thiophenes	BDL	BDL	BDL	BDL
C2-Thiophenes	BDL	BDL	BDL	BDL
C3-Thiophenes	BDL	BDL	BDL	BDL
Benzothiophene	BDL	BDL	BDL	BDL
C1-Benzothiophenes	BDL	BDL	BDL	BDL
C2-Benzothiophenes	BDL	BDL	BDL	BDL
Thiophane	BDL	BDL	BDL	BDL
Thiophenol	BDL	BDL	BDL	BDL
Total Sulfur as molar PPM S	<b>0.11</b>	BDL	BDL	BDL
As Grains/100 SCF @ 14.73 psia, 60°F	<b>0.007</b>	BDL	BDL	BDL

Detection Limit = 0.05 ppmv S

BDL = Below Detection Limit

The results within this report relate only to the items tested.

## Trace Sulfur Analysis by ASTM D6228

Component	111225-001	111225-002	111225-003
	Cylinder 01 Membrane Landfill #9	Cylinder 02 Membrane Landfill #9	Cylinder 03 Membrane Landfill #9
	ppmv	ppmv	ppmv
Hydrogen Sulfide	BDL	BDL	BDL
Sulfur Dioxide	BDL	BDL	BDL
Carbonyl Sulfide	BDL	BDL	BDL
Carbon Disulfide	BDL	BDL	BDL
Methyl Mercaptan	BDL	BDL	BDL
Ethyl Mercaptan	BDL	BDL	BDL
i-Propyl Mercaptan	BDL	BDL	BDL
n-Propyl Mercaptan	BDL	BDL	BDL
t-Butyl Mercaptan	BDL	BDL	BDL
Dimethyl Sulfide	<b>5.18</b>	<b>5.45</b>	<b>5.45</b>
Methyl Ethyl Sulfide	BDL	BDL	BDL
Diethyl Sulfide	BDL	BDL	BDL
Di-t-Butyl Sulfide	BDL	BDL	BDL
Dimethyl Disulfide	BDL	BDL	BDL
Methyl Ethyl Disulfide	BDL	BDL	BDL
Methyl i-Propyl Disulfide	BDL	BDL	BDL
Diethyl Disulfide	BDL	BDL	BDL
Methyl n-Propyl Disulfide	BDL	BDL	BDL
Methyl t-Butyl Disulfide	BDL	BDL	BDL
Ethyl i-Propyl Disulfide	BDL	BDL	BDL
Ethyl n-Propyl Disulfide	BDL	BDL	BDL
Ethyl t-Butyl Disulfide	BDL	BDL	BDL
Di-i-Propyl Disulfide	BDL	BDL	BDL
i-Propyl n-Propyl Disulfide	BDL	BDL	BDL
Di-n-Propyl Disulfide	BDL	BDL	BDL
i-Propyl t-Butyl Disulfide	BDL	BDL	BDL
n-Propyl t-Butyl Disulfide	BDL	BDL	BDL
Di-t-Butyl Disulfide	BDL	BDL	BDL
Dimethyl Trisulfide	BDL	BDL	BDL
Diethyl Trisulfide	BDL	BDL	BDL
Di-t-Butyl Trisulfide	BDL	BDL	BDL
Thiophene	BDL	BDL	BDL
C1-Thiophenes	BDL	BDL	BDL
C2-Thiophenes	BDL	BDL	BDL
C3-Thiophenes	BDL	BDL	BDL
Benzothiophene	BDL	BDL	BDL
C1-Benzothiophenes	BDL	BDL	BDL
C2-Benzothiophenes	BDL	BDL	BDL
Thiophane	BDL	BDL	BDL
Thiophenol	BDL	BDL	BDL
Total Sulfur as molar PPM S	<b>5.18</b>	<b>5.45</b>	<b>5.45</b>
As Grains/100 SCF @ 14.73 psia, 60°F	<b>0.307</b>	<b>0.323</b>	<b>0.323</b>

Detection Limit = 0.05 ppmv S

BDL = Below Detection Limit

The results within this report relate only to the items tested.

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	101694-001	101694-002	101694-003	111212-001
		Cylinder 01	Cylinder 02	Cylinder 03	Cylinder 01
		PSA Landfill #1	PSA Landfill #1	PSA Landfill #1	PSA Landfill #8
	ppmv	ppmv	ppmv	ppmv	
Dichlorodifluoromethane (CFC-12)	0.10	0.14	0.11	0.11	BDL
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	BDL	BDL	BDL	BDL
Trichlorofluoromethane (CFC-11)	0.10	BDL	BDL	BDL	BDL
Chloromethane	0.10	BDL	BDL	BDL	BDL
Dichloromethane (Methylene Chloride)	0.10	BDL	BDL	BDL	BDL
Chloroform	0.10	BDL	BDL	BDL	BDL
Carbon Tetrachloride	0.10	BDL	BDL	BDL	BDL
Chloroethane	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
Hexachloroethane	0.10	BDL	BDL	BDL	BDL
Chloroethene (Vinylchloride)	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethene	0.10	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
trans-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
Trichloroethene	0.10	BDL	BDL	BDL	BDL
Tetrachloroethene	0.10	BDL	BDL	BDL	BDL
1,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
2,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	0.10	BDL	BDL	BDL	BDL
3-Chloropropene	0.10	BDL	BDL	BDL	BDL
1,1-Dichloropropene	0.10	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
Hexachloro-1,3-butadiene	0.10	BDL	BDL	BDL	BDL
Chlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,4-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
2-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
4-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
Bromomethane	0.10	BDL	BDL	BDL	BDL
Dibromomethane	0.10	BDL	BDL	BDL	BDL
Bromoform	0.10	BDL	BDL	BDL	BDL
Bromochloromethane	0.10	BDL	BDL	BDL	BDL
Bromodichloromethane	0.10	BDL	BDL	BDL	BDL
Dibromochloromethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromoethane	0.10	BDL	BDL	BDL	BDL



## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	101694-001	101694-002	101694-003	111212-001
		Cylinder 01	Cylinder 02	Cylinder 03	Cylinder 01
		PSA Landfill #1	PSA Landfill #1	PSA Landfill #1	PSA Landfill #8
		ppmv	ppmv	ppmv	ppmv
Bromochloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromo-3-chloropropene	0.10	BDL	BDL	BDL	BDL
Bromobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Butadiene	1.0	BDL	BDL	BDL	BDL
Acrylonitrile	1.0	BDL	BDL	BDL	BDL
Benzene	1.0	BDL	BDL	BDL	BDL
Toluene	1.0	BDL	BDL	BDL	BDL
Ethylbenzene	1.0	BDL	BDL	BDL	BDL
m,p-Xylene	1.0	BDL	BDL	BDL	BDL
o-Xylene	1.0	BDL	BDL	BDL	BDL
Styrene	1.0	BDL	BDL	BDL	BDL
i-Propylbenzene	1.0	BDL	BDL	BDL	BDL
4-Ethyltoluene	1.0	BDL	BDL	BDL	BDL
n-Propylbenzene	1.0	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
t-Butylbenzene	1.0	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
s-Butylbenzene	1.0	BDL	BDL	BDL	BDL
p-Isopropyltoluene	1.0	BDL	BDL	BDL	BDL
n-Butylbenzene	1.0	BDL	BDL	BDL	BDL
Naphthalene	1.0	BDL	BDL	BDL	BDL
Pyridine	1.0	BDL	BDL	BDL	BDL
Nitrobenzene	1.0	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	111212-002	111212-003	111590-001	111590-002
		Cylinder 02	Cylinder 03	Cylinder 01	Cylinder 02
		PSA Landfill #8	PSA Landfill #8	PSA Landfill #10	PSA Landfill #10
		ppmv	ppmv	ppmv	ppmv
Dichlorodifluoromethane (CFC-12)	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	BDL	BDL	BDL	BDL
Trichlorofluoromethane (CFC-11)	0.10	BDL	BDL	BDL	BDL
Chloromethane	0.10	BDL	BDL	BDL	BDL
Dichloromethane (Methylene Chloride)	0.10	BDL	BDL	BDL	BDL
Chloroform	0.10	BDL	BDL	BDL	BDL
Carbon Tetrachloride	0.10	BDL	BDL	BDL	BDL
Chloroethane	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
Hexachloroethane	0.10	BDL	BDL	BDL	BDL
Chloroethene (Vinylchloride)	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethene	0.10	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
trans-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
Trichloroethene	0.10	BDL	BDL	BDL	BDL
Tetrachloroethene	0.10	BDL	BDL	BDL	BDL
1,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
2,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	0.10	BDL	BDL	BDL	BDL
3-Chloropropene	0.10	BDL	BDL	BDL	BDL
1,1-Dichloropropene	0.10	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
Hexachloro-1,3-butadiene	0.10	BDL	BDL	BDL	BDL
Chlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,4-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
2-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
4-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
Bromomethane	0.10	BDL	BDL	BDL	BDL
Dibromomethane	0.10	BDL	BDL	BDL	BDL
Bromoform	0.10	BDL	BDL	BDL	BDL
Bromochloromethane	0.10	BDL	BDL	BDL	BDL
Bromodichloromethane	0.10	BDL	BDL	BDL	BDL
Dibromochloromethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromoethane	0.10	BDL	BDL	BDL	BDL

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	111212-002	111212-003	111590-001	111590-002
		Cylinder 02 PSA Landfill #8	Cylinder 03 PSA Landfill #8	Cylinder 01 PSA Landfill #10	Cylinder 02 PSA Landfill #10
		ppmv	ppmv	ppmv	ppmv
Bromochloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromo-3-chloropropene	0.10	BDL	BDL	BDL	BDL
Bromobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Butadiene	1.0	BDL	BDL	BDL	BDL
Acrylonitrile	1.0	BDL	BDL	BDL	BDL
Benzene	1.0	BDL	BDL	BDL	BDL
Toluene	1.0	BDL	BDL	BDL	BDL
Ethylbenzene	1.0	BDL	BDL	BDL	BDL
m,p-Xylene	1.0	BDL	BDL	BDL	BDL
o-Xylene	1.0	BDL	BDL	BDL	BDL
Styrene	1.0	BDL	BDL	BDL	BDL
i-Propylbenzene	1.0	BDL	BDL	BDL	BDL
4-Ethyltoluene	1.0	BDL	BDL	BDL	BDL
n-Propylbenzene	1.0	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
t-Butylbenzene	1.0	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
s-Butylbenzene	1.0	BDL	BDL	BDL	BDL
p-Isopropyltoluene	1.0	BDL	BDL	BDL	BDL
n-Butylbenzene	1.0	BDL	BDL	BDL	BDL
Naphthalene	1.0	BDL	BDL	BDL	BDL
Pyridine	1.0	BDL	BDL	BDL	BDL
Nitrobenzene	1.0	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	111590-003	101786-001	101786-002	101786-003
		Cylinder 03 PSA Landfill #10	Cylinder 01 Solvent Landfill #5	Cylinder 02 Solvent Landfill #5	Cylinder 03 Solvent Landfill #5
		ppmv	ppmv	ppmv	ppmv
Dichlorodifluoromethane (CFC-12)	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	BDL	BDL	BDL	BDL
Trichlorofluoromethane (CFC-11)	0.10	BDL	BDL	BDL	BDL
Chloromethane	0.10	BDL	BDL	BDL	BDL
Dichloromethane (Methylene Chloride)	0.10	BDL	BDL	BDL	BDL
Chloroform	0.10	BDL	BDL	BDL	BDL
Carbon Tetrachloride	0.10	BDL	BDL	BDL	BDL
Chloroethane	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
Hexachloroethane	0.10	BDL	BDL	BDL	BDL
Chloroethene (Vinylchloride)	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethene	0.10	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
trans-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
Trichloroethene	0.10	BDL	BDL	BDL	BDL
Tetrachloroethene	0.10	BDL	BDL	BDL	BDL
1,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
2,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	0.10	BDL	BDL	BDL	BDL
3-Chloropropene	0.10	BDL	BDL	BDL	BDL
1,1-Dichloropropene	0.10	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
Hexachloro-1,3-butadiene	0.10	BDL	BDL	BDL	BDL
Chlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,4-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
2-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
4-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
Bromomethane	0.10	BDL	BDL	BDL	BDL
Dibromomethane	0.10	BDL	BDL	BDL	BDL
Bromoform	0.10	BDL	BDL	BDL	BDL
Bromochloromethane	0.10	BDL	BDL	BDL	BDL
Bromodichloromethane	0.10	BDL	BDL	BDL	BDL
Dibromochloromethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromoethane	0.10	BDL	BDL	BDL	BDL

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	111590-003	101786-001	101786-002	101786-003
		Cylinder 03 PSA Landfill #10	Cylinder 01 Solvent Landfill #5	Cylinder 02 Solvent Landfill #5	Cylinder 03 Solvent Landfill #5
		ppmv	ppmv	ppmv	ppmv
Bromochloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromo-3-chloropropene	0.10	BDL	BDL	BDL	BDL
Bromobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Butadiene	1.0	BDL	BDL	BDL	BDL
Acrylonitrile	1.0	BDL	BDL	BDL	BDL
Benzene	1.0	BDL	BDL	BDL	BDL
Toluene	1.0	BDL	<b>1.4</b>	<b>1.3</b>	<b>1.4</b>
Ethylbenzene	1.0	BDL	BDL	BDL	BDL
m,p-Xylene	1.0	BDL	<b>1.0</b>	BDL	<b>1.0</b>
o-Xylene	1.0	BDL	BDL	BDL	BDL
Styrene	1.0	BDL	BDL	BDL	BDL
i-Propylbenzene	1.0	BDL	BDL	BDL	BDL
4-Ethyltoluene	1.0	BDL	BDL	BDL	BDL
n-Propylbenzene	1.0	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
t-Butylbenzene	1.0	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
s-Butylbenzene	1.0	BDL	BDL	BDL	BDL
p-Isopropyltoluene	1.0	BDL	BDL	BDL	BDL
n-Butylbenzene	1.0	BDL	BDL	BDL	BDL
Naphthalene	1.0	BDL	BDL	BDL	BDL
Pyridine	1.0	BDL	BDL	BDL	BDL
Nitrobenzene	1.0	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	101788-001	101788-002	101788-003	111221-001
		Cylinder 01 Solvent Landfill #6	Cylinder 02 Solvent Landfill #6	Cylinder 03 Solvent Landfill #6	Cylinder 01 Solvent Landfill #6
		ppmv	ppmv	ppmv	ppmv
Dichlorodifluoromethane (CFC-12)	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	BDL	BDL	BDL	BDL
Trichlorofluoromethane (CFC-11)	0.10	BDL	BDL	BDL	BDL
Chloromethane	0.10	BDL	BDL	BDL	BDL
Dichloromethane (Methylene Chloride)	0.10	BDL	BDL	BDL	BDL
Chloroform	0.10	BDL	BDL	BDL	BDL
Carbon Tetrachloride	0.10	BDL	BDL	BDL	BDL
Chloroethane	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
Hexachloroethane	0.10	BDL	BDL	BDL	BDL
Chloroethene (Vinylchloride)	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethene	0.10	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
trans-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
Trichloroethene	0.10	BDL	BDL	BDL	BDL
Tetrachloroethene	0.10	BDL	BDL	BDL	BDL
1,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
2,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	0.10	BDL	BDL	BDL	BDL
3-Chloropropene	0.10	BDL	BDL	BDL	BDL
1,1-Dichloropropene	0.10	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
Hexachloro-1,3-butadiene	0.10	BDL	BDL	BDL	BDL
Chlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,4-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
2-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
4-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
Bromomethane	0.10	BDL	BDL	BDL	BDL
Dibromomethane	0.10	BDL	BDL	BDL	BDL
Bromoform	0.10	BDL	BDL	BDL	BDL
Bromochloromethane	0.10	BDL	BDL	BDL	BDL
Bromodichloromethane	0.10	BDL	BDL	BDL	BDL
Dibromochloromethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromoethane	0.10	BDL	BDL	BDL	BDL

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	101788-001	101788-002	101788-003	111221-001
		Cylinder 01 Solvent Landfill #6	Cylinder 02 Solvent Landfill #6	Cylinder 03 Solvent Landfill #6	Cylinder 01 Solvent Landfill #6
		ppmv	ppmv	ppmv	ppmv
Bromochloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromo-3-chloropropene	0.10	BDL	BDL	BDL	BDL
Bromobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Butadiene	1.0	BDL	BDL	BDL	BDL
Acrylonitrile	1.0	BDL	BDL	BDL	BDL
Benzene	1.0	BDL	BDL	BDL	BDL
Toluene	1.0	BDL	BDL	BDL	BDL
Ethylbenzene	1.0	BDL	BDL	BDL	BDL
m,p-Xylene	1.0	BDL	BDL	BDL	BDL
o-Xylene	1.0	BDL	BDL	BDL	BDL
Styrene	1.0	BDL	BDL	BDL	BDL
i-Propylbenzene	1.0	BDL	BDL	BDL	BDL
4-Ethyltoluene	1.0	BDL	BDL	BDL	BDL
n-Propylbenzene	1.0	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
t-Butylbenzene	1.0	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
s-Butylbenzene	1.0	BDL	BDL	BDL	BDL
p-Isopropyltoluene	1.0	BDL	BDL	BDL	BDL
n-Butylbenzene	1.0	BDL	BDL	BDL	BDL
Naphthalene	1.0	BDL	BDL	BDL	BDL
Pyridine	1.0	BDL	BDL	BDL	BDL
Nitrobenzene	1.0	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	111221-002	111221-003	101793-001	101793-002
		Cylinder 02 Solvent Landfill #6	Cylinder 03 Solvent Landfill #6	Cylinder 01 Solvent Landfill #7	Cylinder 02 Solvent Landfill #7
		ppmv	ppmv	ppmv	ppmv
Dichlorodifluoromethane (CFC-12)	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	BDL	BDL	BDL	BDL
Trichlorofluoromethane (CFC-11)	0.10	BDL	BDL	BDL	BDL
Chloromethane	0.10	BDL	BDL	BDL	BDL
Dichloromethane (Methylene Chloride)	0.10	BDL	BDL	BDL	BDL
Chloroform	0.10	BDL	BDL	BDL	BDL
Carbon Tetrachloride	0.10	BDL	BDL	BDL	BDL
Chloroethane	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
Hexachloroethane	0.10	BDL	BDL	BDL	BDL
Chloroethene (Vinylchloride)	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethene	0.10	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
trans-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
Trichloroethene	0.10	BDL	BDL	BDL	BDL
Tetrachloroethene	0.10	BDL	BDL	BDL	BDL
1,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
2,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	0.10	BDL	BDL	BDL	BDL
3-Chloropropene	0.10	BDL	BDL	BDL	BDL
1,1-Dichloropropene	0.10	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
Hexachloro-1,3-butadiene	0.10	BDL	BDL	BDL	BDL
Chlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,4-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
2-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
4-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
Bromomethane	0.10	BDL	BDL	BDL	BDL
Dibromomethane	0.10	BDL	BDL	BDL	BDL
Bromoform	0.10	BDL	BDL	BDL	BDL
Bromochloromethane	0.10	BDL	BDL	BDL	BDL
Bromodichloromethane	0.10	BDL	BDL	BDL	BDL
Dibromochloromethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromoethane	0.10	BDL	BDL	BDL	BDL



## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	111221-002	111221-003	101793-001	101793-002
		Cylinder 02 Solvent Landfill #6	Cylinder 03 Solvent Landfill #6	Cylinder 01 Solvent Landfill #7	Cylinder 02 Solvent Landfill #7
		ppmv	ppmv	ppmv	ppmv
Bromochloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromo-3-chloropropene	0.10	BDL	BDL	BDL	BDL
Bromobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Butadiene	1.0	BDL	BDL	BDL	BDL
Acrylonitrile	1.0	BDL	BDL	BDL	BDL
Benzene	1.0	BDL	BDL	BDL	BDL
Toluene	1.0	BDL	BDL	BDL	BDL
Ethylbenzene	1.0	BDL	BDL	BDL	BDL
m,p-Xylene	1.0	BDL	BDL	BDL	BDL
o-Xylene	1.0	BDL	BDL	BDL	BDL
Styrene	1.0	BDL	BDL	BDL	BDL
i-Propylbenzene	1.0	BDL	BDL	BDL	BDL
4-Ethyltoluene	1.0	BDL	BDL	BDL	BDL
n-Propylbenzene	1.0	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
t-Butylbenzene	1.0	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
s-Butylbenzene	1.0	BDL	BDL	BDL	BDL
p-Isopropyltoluene	1.0	BDL	BDL	BDL	BDL
n-Butylbenzene	1.0	BDL	BDL	BDL	BDL
Naphthalene	1.0	BDL	BDL	BDL	BDL
Pyridine	1.0	BDL	BDL	BDL	BDL
Nitrobenzene	1.0	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	101793-003	111220-001	111220-002	111220-003
		Cylinder 03 Solvent Landfill #7	Cylinder 01 Solvent Landfill #7	Cylinder 02 Solvent Landfill #7	Cylinder 03 Solvent Landfill #7
		ppmv	ppmv	ppmv	ppmv
Dichlorodifluoromethane (CFC-12)	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	BDL	BDL	BDL	BDL
Trichlorofluoromethane (CFC-11)	0.10	BDL	BDL	BDL	BDL
Chloromethane	0.10	BDL	BDL	BDL	BDL
Dichloromethane (Methylene Chloride)	0.10	BDL	BDL	BDL	BDL
Chloroform	0.10	BDL	BDL	BDL	BDL
Carbon Tetrachloride	0.10	BDL	BDL	BDL	BDL
Chloroethane	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
Hexachloroethane	0.10	BDL	BDL	BDL	BDL
Chloroethene (Vinylchloride)	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethene	0.10	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
trans-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
Trichloroethene	0.10	BDL	BDL	BDL	BDL
Tetrachloroethene	0.10	BDL	BDL	BDL	BDL
1,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
2,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	0.10	BDL	BDL	BDL	BDL
3-Chloropropene	0.10	BDL	BDL	BDL	BDL
1,1-Dichloropropene	0.10	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
Hexachloro-1,3-butadiene	0.10	BDL	BDL	BDL	BDL
Chlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,4-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
2-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
4-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
Bromomethane	0.10	BDL	BDL	BDL	BDL
Dibromomethane	0.10	BDL	BDL	BDL	BDL
Bromoform	0.10	BDL	BDL	BDL	BDL
Bromochloromethane	0.10	BDL	BDL	BDL	BDL
Bromodichloromethane	0.10	BDL	BDL	BDL	BDL
Dibromochloromethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromoethane	0.10	BDL	BDL	BDL	BDL

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	101793-003	111220-001	111220-002	111220-003
		Cylinder 03 Solvent Landfill #7	Cylinder 01 Solvent Landfill #7	Cylinder 02 Solvent Landfill #7	Cylinder 03 Solvent Landfill #7
		ppmv	ppmv	ppmv	ppmv
Bromochloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromo-3-chloropropene	0.10	BDL	BDL	BDL	BDL
Bromobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Butadiene	1.0	BDL	BDL	BDL	BDL
Acrylonitrile	1.0	BDL	BDL	BDL	BDL
Benzene	1.0	BDL	BDL	BDL	BDL
Toluene	1.0	BDL	BDL	BDL	BDL
Ethylbenzene	1.0	BDL	BDL	BDL	BDL
m,p-Xylene	1.0	BDL	BDL	BDL	BDL
o-Xylene	1.0	BDL	BDL	BDL	BDL
Styrene	1.0	BDL	BDL	BDL	BDL
i-Propylbenzene	1.0	BDL	BDL	BDL	BDL
4-Ethyltoluene	1.0	BDL	BDL	BDL	BDL
n-Propylbenzene	1.0	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
t-Butylbenzene	1.0	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
s-Butylbenzene	1.0	BDL	BDL	BDL	BDL
p-Isopropyltoluene	1.0	BDL	BDL	BDL	BDL
n-Butylbenzene	1.0	BDL	BDL	BDL	BDL
Naphthalene	1.0	BDL	BDL	BDL	BDL
Pyridine	1.0	BDL	BDL	BDL	BDL
Nitrobenzene	1.0	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	111225-001	111225-002	111225-003
		Cylinder 01 Membrane Landfill #9	Cylinder 02 Membrane Landfill #9	Cylinder 03 Membrane Landfill #9
		ppmv	ppmv	ppmv
Dichlorodifluoromethane (CFC-12)	0.10	<b>2.30</b>	<b>2.28</b>	<b>2.25</b>
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	BDL	BDL	BDL
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	BDL	BDL	BDL
Trichlorofluoromethane (CFC-11)	0.10	BDL	BDL	BDL
Chloromethane	0.10	BDL	BDL	BDL
Dichloromethane (Methylene Chloride)	0.10	BDL	BDL	BDL
Chloroform	0.10	BDL	BDL	BDL
Carbon Tetrachloride	0.10	BDL	BDL	BDL
Chloroethane	0.10	<b>0.31</b>	<b>0.30</b>	<b>0.31</b>
1,1-Dichloroethane	0.10	BDL	BDL	BDL
1,2-Dichloroethane	0.10	BDL	BDL	BDL
1,1,1-Trichloroethane	0.10	BDL	BDL	BDL
1,1,2-Trichloroethane	0.10	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	0.10	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	0.10	BDL	BDL	BDL
Hexachloroethane	0.10	BDL	BDL	BDL
Chloroethene (Vinylchloride)	0.10	BDL	BDL	BDL
1,1-Dichloroethene	0.10	BDL	BDL	BDL
cis-1,2-Dichloroethene	0.10	BDL	BDL	BDL
trans-1,2-Dichloroethene	0.10	BDL	BDL	BDL
Trichloroethene	0.10	BDL	BDL	BDL
Tetrachloroethene	0.10	BDL	BDL	BDL
1,2-Dichloropropane	0.10	BDL	BDL	BDL
2,2-Dichloropropane	0.10	BDL	BDL	BDL
1,2,3-Trichloropropane	0.10	BDL	BDL	BDL
3-Chloropropene	0.10	BDL	BDL	BDL
1,1-Dichloropropene	0.10	BDL	BDL	BDL
cis-1,3-Dichloropropene	0.10	BDL	BDL	BDL
trans-1,3-Dichloropropene	0.10	BDL	BDL	BDL
Hexachloro-1,3-butadiene	0.10	BDL	BDL	BDL
Chlorobenzene	0.10	BDL	BDL	BDL
1,2-Dichlorobenzene	0.10	BDL	BDL	BDL
1,3-Dichlorobenzene	0.10	BDL	BDL	BDL
1,4-Dichlorobenzene	0.10	BDL	BDL	BDL
1,2,3-Trichlorobenzene	0.10	BDL	BDL	BDL
1,2,4-Trichlorobenzene	0.10	BDL	BDL	BDL
2-Chlorotoluene	0.10	BDL	BDL	BDL
4-Chlorotoluene	0.10	BDL	BDL	BDL
Bromomethane	0.10	BDL	BDL	BDL
Dibromomethane	0.10	BDL	BDL	BDL
Bromoform	0.10	BDL	BDL	BDL
Bromochloromethane	0.10	BDL	BDL	BDL
Bromodichloromethane	0.10	BDL	BDL	BDL
Dibromochloromethane	0.10	BDL	BDL	BDL
1,2-Dibromoethane	0.10	BDL	BDL	BDL

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	111225-001	111225-002	111225-003
		Cylinder 01 Membrane Landfill #9	Cylinder 02 Membrane Landfill #9	Cylinder 03 Membrane Landfill #9
		ppmv	ppmv	ppmv
Bromochloroethane	0.10	BDL	BDL	BDL
1,2-Dibromo-3-chloropropene	0.10	BDL	BDL	BDL
Bromobenzene	0.10	BDL	BDL	BDL
1,3-Butadiene	1.0	BDL	BDL	BDL
Acrylonitrile	1.0	BDL	BDL	BDL
Benzene	1.0	BDL	BDL	BDL
Toluene	1.0	BDL	BDL	BDL
Ethylbenzene	1.0	BDL	BDL	BDL
m,p-Xylene	1.0	BDL	BDL	BDL
o-Xylene	1.0	BDL	BDL	BDL
Styrene	1.0	BDL	BDL	BDL
i-Propylbenzene	1.0	BDL	BDL	BDL
4-Ethyltoluene	1.0	BDL	BDL	BDL
n-Propylbenzene	1.0	BDL	BDL	BDL
1,3,5-Trimethylbenzene	1.0	BDL	BDL	BDL
t-Butylbenzene	1.0	BDL	BDL	BDL
1,2,4-Trimethylbenzene	1.0	BDL	BDL	BDL
s-Butylbenzene	1.0	BDL	BDL	BDL
p-Isopropyltoluene	1.0	BDL	BDL	BDL
n-Butylbenzene	1.0	BDL	BDL	BDL
Naphthalene	1.0	BDL	BDL	BDL
Pyridine	1.0	BDL	BDL	BDL
Nitrobenzene	1.0	BDL	BDL	BDL

BDL = Below Detection Limit

## Semi-Volatile Organic Compound Analysis

Component	detection limit	101694-004	101694-005	101694-006	111212-011
		Tube 01	Tube 02	Tube 03	Tube 01
		PSA Landfill #1	PSA Landfill #1	PSA Landfill #1	PSA Landfill #8
		ppbv	ppbv	ppbv	ppbv
N-nitrosodimethylamine	1	BDL	BDL	BDL	BDL
Phenol	1	BDL	BDL	BDL	BDL
Aniline	1	BDL	BDL	BDL	BDL
Bis(2-Chloroethyl) ether	1	BDL	BDL	BDL	BDL
2-Chlorophenol	1	BDL	BDL	BDL	BDL
Benzyl Alcohol	1	BDL	BDL	BDL	BDL
2-methylphenol	1	BDL	BDL	BDL	BDL
bis(2-chloroisopropyl)ether	1	BDL	BDL	BDL	BDL
N-Nitroso-di-n-propylamine	1	BDL	BDL	BDL	BDL
4-methylphenol/3-methylphenol	1	BDL	BDL	BDL	BDL
Isophorone	1	BDL	BDL	BDL	BDL
2-nitrophenol	1	BDL	BDL	BDL	BDL
2,4-dimethylphenol	1	BDL	BDL	BDL	BDL
Bis(2-chloroethoxy)methane	1	BDL	BDL	BDL	BDL
2,4-dichlorophenol	1	BDL	BDL	BDL	BDL
4-Chloroaniline	1	BDL	BDL	BDL	BDL
4-chloro-3-methylphenol	1	BDL	BDL	BDL	BDL
2-methylnaphthalene	1	BDL	BDL	BDL	BDL
1-methylnaphthalene	1	BDL	BDL	BDL	BDL
Hexachlorocyclopentadiene	1	BDL	BDL	BDL	BDL
2,4,6-trichlorophenol	1	BDL	BDL	BDL	BDL
2,4,5-trichlorophenol	1	BDL	BDL	BDL	BDL
2-chloronaphthalene	1	BDL	BDL	BDL	BDL
2-Nitroaniline	1	BDL	BDL	BDL	BDL
1,4-dinitrobenzene	1	BDL	BDL	BDL	BDL
Dimethyl phthalate	1	BDL	BDL	BDL	BDL
1,3-dinitrobenzene	1	BDL	BDL	BDL	BDL
2,6-dinitrotoluene	1	BDL	BDL	BDL	BDL
Acenaphthylene	1	BDL	BDL	BDL	BDL
1,2-Dinitrobenzene	1	BDL	BDL	BDL	BDL
3-Nitroaniline	1	BDL	BDL	BDL	BDL
Acenaphthene	1	BDL	BDL	BDL	BDL
2,4-dinitrophenol	1	BDL	BDL	BDL	BDL
4-nitrophenol	1	BDL	BDL	BDL	BDL
Dibenzofuran	1	BDL	BDL	BDL	BDL
2,4-dinitrotoluene	1	BDL	BDL	BDL	BDL
2,3,4,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
2,3,5,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
Diethyl Phthalate	1	BDL	<b>B</b>	BDL	<b>B</b>

**B**

## Semi-Volatile Organic Compound Analysis

Component	detection limit	101694-004	101694-005		101694-006		111212-011		
		Tube 01	Tube 02		Tube 03		Tube 01		
		PSA Landfill #1	PSA Landfill #1	PSA Landfill #1	PSA Landfill #1	PSA Landfill #8	PSA Landfill #8		
		ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	
Fluorene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
4-chlorophenyl phenyl ether	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
4-Nitroaniline	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
4,6-dinitro-2-methylphenol	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Diphenylamine	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
n-Nitrosodiphenylamine	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Azobenzene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
4-Bromophenyl phenyl ether	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Hexachlorobenzene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Pentachlorophenol	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Phenanthrene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Anthracene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Carbazole	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Di-n-butyl phthalate	1	2.3	J,B	1.2	B	3.1	B	1.4	B
Fluoranthene	1	BDL		BDL		BDL		BDL	
Pyrene	1	BDL		BDL		BDL		BDL	
Benzyl butyl phthalate	1	BDL		BDL		BDL		BDL	
Bis(2-ethylhexyl)adipate	1	BDL		BDL		BDL		BDL	
Benzo(a)anthracene	1	BDL		BDL		BDL		BDL	
Chrysene	1	BDL		BDL		BDL		BDL	
Bis(2-ethylhexyl)phthalate	1	BDL		BDL		BDL		BDL	B
Di-n-octyl phthalate	1	BDL		BDL		BDL		BDL	
Benzo(b)fluoranthene	1	BDL		BDL		BDL		BDL	
Benzo(k)fluoranthene	1	BDL		BDL		BDL		BDL	
Benzo(a)pyrene	1	BDL		BDL		BDL		BDL	
Indeno(1,2,3-cd)pyrene	1	BDL		BDL		BDL		BDL	
Dibenzo(a,h)anthracene	1	BDL		BDL		BDL		BDL	
Benzo[g,h,i]perylene	1	BDL		BDL		BDL		BDL	

BDL - Below Detection Limit

B - Analyte detected in the Blank.

J - Estimated value; detected between the RL and DL.

D - Analyte reported from a diluted extract.

E - Estimate, result detected above calibration range.

I - Concentration/Peak ID uncertain due to potential interference.

## Semi-Volatile Organic Compound Analysis

Component	detection limit	111212-012	111212-013	111590-004	111590-005
		Tube 02 PSA Landfill #8	Tube 03 PSA Landfill #8	Tube 01 PSA Landfill #10	Tube 02 PSA Landfill #10
		ppbv	ppbv	ppbv	ppbv
N-nitrosodimethylamine	1	BDL	BDL	BDL	BDL
Phenol	1	BDL	BDL	BDL	BDL
Aniline	1	BDL	BDL	BDL	BDL
Bis(2-Chloroethyl) ether	1	BDL	BDL	BDL	BDL
2-Chlorophenol	1	BDL	BDL	BDL	BDL
Benzyl Alcohol	1	BDL	<b>B</b>	<b>B</b>	BDL
2-methylphenol	1	BDL	BDL	BDL	BDL
bis(2-chloroisopropyl)ether	1	BDL	BDL	BDL	BDL
N-Nitroso-di-n-propylamine	1	BDL	BDL	BDL	BDL
4-methylphenol/3-methylphenol	1	BDL	BDL	BDL	BDL
Isophorone	1	BDL	BDL	BDL	BDL
2-nitrophenol	1	BDL	BDL	BDL	BDL
2,4-dimethylphenol	1	BDL	BDL	BDL	BDL
Bis(2-chloroethoxy)methane	1	BDL	BDL	BDL	BDL
2,4-dichlorophenol	1	BDL	BDL	BDL	BDL
4-Chloroaniline	1	BDL	BDL	BDL	BDL
4-chloro-3-methylphenol	1	BDL	BDL	BDL	BDL
2-methylnaphthalene	1	BDL	BDL	BDL	BDL
1-methylnaphthalene	1	BDL	BDL	BDL	BDL
Hexachlorocyclopentadiene	1	BDL	BDL	BDL	BDL
2,4,6-trichlorophenol	1	BDL	BDL	BDL	BDL
2,4,5-trichlorophenol	1	BDL	BDL	BDL	BDL
2-chloronaphthalene	1	BDL	BDL	BDL	BDL
2-Nitroaniline	1	BDL	BDL	BDL	BDL
1,4-dinitrobenzene	1	BDL	BDL	BDL	BDL
Dimethyl phthalate	1	BDL	BDL	BDL	BDL
1,3-dinitrobenzene	1	BDL	BDL	BDL	BDL
2,6-dinitrotoluene	1	BDL	BDL	BDL	BDL
Acenaphthylene	1	BDL	BDL	BDL	BDL
1,2-Dinitrobenzene	1	BDL	BDL	BDL	BDL
3-Nitroaniline	1	BDL	BDL	BDL	BDL
Acenaphthene	1	BDL	BDL	BDL	BDL
2,4-dinitrophenol	1	BDL	BDL	BDL	BDL
4-nitrophenol	1	BDL	BDL	BDL	BDL
Dibenzofuran	1	BDL	BDL	BDL	BDL
2,4-dinitrotoluene	1	BDL	BDL	BDL	BDL
2,3,4,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
2,3,5,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
Diethyl Phthalate	1	BDL	BDL	BDL	BDL



## Semi-Volatile Organic Compound Analysis

Component	detection limit	111212-012	111212-013	111590-004	111590-005				
		Tube 02 PSA Landfill #8	Tube 03 PSA Landfill #8	Tube 01 PSA Landfill #10	Tube 02 PSA Landfill #10				
		ppbv	ppbv	ppbv	ppbv				
Fluorene	1	BDL	BDL	BDL	BDL				
4-chlorophenyl phenyl ether	1	BDL	BDL	BDL	BDL				
4-Nitroaniline	1	BDL	BDL	BDL	BDL				
4,6-dinitro-2-methylphenol	1	BDL	BDL	BDL	BDL				
Diphenylamine	1	BDL	BDL	BDL	BDL				
n-Nitrosodiphenylamine	1	BDL	BDL	BDL	BDL				
Azobenzene	1	BDL	BDL	BDL	<b>B</b>	BDL	<b>B</b>		
4-Bromophenyl phenyl ether	1	BDL	BDL	BDL	BDL	BDL	BDL		
Hexachlorobenzene	1	BDL	BDL	BDL	BDL	BDL	BDL		
Pentachlorophenol	1	BDL	BDL	BDL	BDL	BDL	BDL		
Phenanthrene	1	BDL	BDL	BDL	BDL	BDL	BDL		
Anthracene	1	BDL	BDL	BDL	BDL	BDL	BDL		
Carbazole	1	BDL	BDL	BDL	BDL	BDL	BDL		
Di-n-butyl phthalate	1	<b>1.0</b>	<b>B</b>	<b>1.0</b>	<b>B</b>	<b>3.1</b>	<b>B</b>	<b>4.3</b>	<b>B</b>
Fluoranthene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pyrene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzyl butyl phthalate	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bis(2-ethylhexyl)adipate	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(a)anthracene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chrysene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bis(2-ethylhexyl)phthalate	1	<b>3.4</b>	<b>B</b>	BDL	<b>B</b>	BDL	<b>B</b>	<b>1.1</b>	<b>J,B</b>
Di-n-octyl phthalate	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(b)fluoranthene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(k)fluoranthene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(a)pyrene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Indeno(1,2,3-cd)pyrene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dibenzo(a,h)anthracene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo[g,h,i]perylene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

BDL - Below Detection Limit

B - Analyte detected in the Blank.

J - Estimated value; detected between the RL and DL.

D - Analyte reported from a diluted extract.

E - Estimate, result detected above calibration range.

I - Concentration/Peak ID uncertain due to potential interference.

## Semi-Volatile Organic Compound Analysis

Component	detection limit	111590-006	101786-004	101786-005	101786-006
		Tube 03 PSA Landfill #10	Tube 01 Solvent Landfill #5	Tube 02 Solvent Landfill #5	Tube 03 Solvent Landfill #5
		ppbv	ppbv	ppbv	ppbv
N-nitrosodimethylamine	1	BDL	BDL	BDL	BDL
Phenol	1	BDL	BDL	BDL	BDL
Aniline	1	BDL	BDL	BDL	BDL
Bis(2-Chloroethyl) ether	1	BDL	BDL	BDL	BDL
2-Chlorophenol	1	BDL	BDL	BDL	BDL
Benzyl Alcohol	1	BDL	BDL	BDL	BDL
2-methylphenol	1	BDL	BDL	BDL	BDL
bis(2-chloroisopropyl)ether	1	BDL	BDL	BDL	BDL
N-Nitroso-di-n-propylamine	1	BDL	BDL	BDL	BDL
4-methylphenol/3-methylphenol	1	BDL	BDL	BDL	BDL
Isophorone	1	BDL	BDL	BDL	BDL
2-nitrophenol	1	BDL	BDL	BDL	BDL
2,4-dimethylphenol	1	BDL	BDL	BDL	BDL
Bis(2-chloroethoxy)methane	1	BDL	BDL	BDL	BDL
2,4-dichlorophenol	1	BDL	BDL	BDL	BDL
4-Chloroaniline	1	BDL	BDL	BDL	BDL
4-chloro-3-methylphenol	1	BDL	BDL	BDL	BDL
2-methylnaphthalene	1	BDL	BDL	BDL	BDL
1-methylnaphthalene	1	BDL	BDL	BDL	BDL
Hexachlorocyclopentadiene	1	BDL	BDL	BDL	BDL
2,4,6-trichlorophenol	1	BDL	BDL	BDL	BDL
2,4,5-trichlorophenol	1	BDL	BDL	BDL	BDL
2-chloronaphthalene	1	BDL	BDL	BDL	BDL
2-Nitroaniline	1	BDL	BDL	BDL	BDL
1,4-dinitrobenzene	1	BDL	BDL	BDL	BDL
Dimethyl phthalate	1	BDL	BDL	BDL	BDL
1,3-dinitrobenzene	1	BDL	BDL	BDL	BDL
2,6-dinitrotoluene	1	BDL	BDL	BDL	BDL
Acenaphthylene	1	BDL	BDL	BDL	BDL
1,2-Dinitrobenzene	1	BDL	BDL	BDL	BDL
3-Nitroaniline	1	BDL	BDL	BDL	BDL
Acenaphthene	1	BDL	BDL	BDL	BDL
2,4-dinitrophenol	1	BDL	BDL	BDL	BDL
4-nitrophenol	1	BDL	BDL	BDL	BDL
Dibenzofuran	1	BDL	BDL	BDL	BDL
2,4-dinitrotoluene	1	BDL	BDL	BDL	BDL
2,3,4,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
2,3,5,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
Diethyl Phthalate	1	BDL	BDL	BDL	BDL

## Semi-Volatile Organic Compound Analysis

Component	detection limit	111590-006	101786-004		101786-005		101786-006		
		Tube 03 PSA Landfill #10	Tube 01 Solvent Landfill #5	Tube 02 Solvent Landfill #5	Tube 03 Solvent Landfill #5	Tube 04 Solvent Landfill #5	Tube 05 Solvent Landfill #5		
		ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	
Fluorene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
4-chlorophenyl phenyl ether	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
4-Nitroaniline	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
4,6-dinitro-2-methylphenol	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Diphenylamine	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
n-Nitrosodiphenylamine	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Azobenzene	1	BDL	<b>B</b>	BDL	BDL	BDL	BDL	BDL	
4-Bromophenyl phenyl ether	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Hexachlorobenzene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Pentachlorophenol	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Phenanthrene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Anthracene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Carbazole	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Di-n-butyl phthalate	1	<b>1.1</b>	<b>B</b>	<b>2.5</b>	<b>B</b>	<b>1.9</b>	<b>B</b>	<b>3.3</b>	<b>B</b>
Fluoranthene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pyrene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzyl butyl phthalate	1	BDL	BDL	BDL	<b>B</b>	BDL	<b>B</b>	BDL	<b>B</b>
Bis(2-ethylhexyl)adipate	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(a)anthracene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chrysene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bis(2-ethylhexyl)phthalate	1	<b>1.0</b>	<b>J,B</b>	BDL	<b>B</b>	BDL	<b>B</b>	BDL	<b>B</b>
Di-n-octyl phthalate	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(b)fluoranthene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(k)fluoranthene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(a)pyrene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Indeno(1,2,3-cd)pyrene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dibenzo(a,h)anthracene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo[g,h,i]perylene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

BDL - Below Detection Limit

B - Analyte detected in the Blank.

J - Estimated value; detected between the RL and DL.

D - Analyte reported from a diluted extract.

E - Estimate, result detected above calibration range.

I - Concentration/Peak ID uncertain due to potential interference.

## Semi-Volatile Organic Compound Analysis

Component	detection limit	101788-004	101788-005	101788-006	111221-012
		Tube 01 Solvent Landfill #6	Tube 02 Solvent Landfill #6	Tube 03 Solvent Landfill #6	Tube 01 Solvent Landfill #6
		ppbv	ppbv	ppbv	ppbv
N-nitrosodimethylamine	1	BDL	BDL	BDL	BDL
Phenol	1	BDL	BDL	BDL	BDL
Aniline	1	BDL	BDL	BDL	BDL
Bis(2-Chloroethyl) ether	1	BDL	BDL	BDL	BDL
2-Chlorophenol	1	BDL	BDL	BDL	BDL
Benzyl Alcohol	1	BDL	BDL	BDL	BDL
2-methylphenol	1	BDL	BDL	BDL	BDL
bis(2-chloroisopropyl)ether	1	BDL	BDL	BDL	BDL
N-Nitroso-di-n-propylamine	1	BDL	BDL	BDL	BDL
4-methylphenol/3-methylphenol	1	BDL	BDL	BDL	BDL
Isophorone	1	BDL	BDL	BDL	BDL
2-nitrophenol	1	BDL	BDL	BDL	BDL
2,4-dimethylphenol	1	BDL	BDL	BDL	BDL
Bis(2-chloroethoxy)methane	1	BDL	BDL	BDL	BDL
2,4-dichlorophenol	1	BDL	BDL	BDL	BDL
4-Chloroaniline	1	BDL	BDL	BDL	BDL
4-chloro-3-methylphenol	1	BDL	BDL	BDL	BDL
2-methylnaphthalene	1	BDL	BDL	BDL	BDL
1-methylnaphthalene	1	BDL	BDL	BDL	BDL
Hexachlorocyclopentadiene	1	BDL	BDL	BDL	BDL
2,4,6-trichlorophenol	1	BDL	BDL	BDL	BDL
2,4,5-trichlorophenol	1	BDL	BDL	BDL	BDL
2-chloronaphthalene	1	BDL	BDL	BDL	BDL
2-Nitroaniline	1	BDL	BDL	BDL	BDL
1,4-dinitrobenzene	1	BDL	BDL	BDL	BDL
Dimethyl phthalate	1	BDL	BDL	BDL	BDL
1,3-dinitrobenzene	1	BDL	BDL	BDL	BDL
2,6-dinitrotoluene	1	BDL	BDL	BDL	BDL
Acenaphthylene	1	BDL	BDL	BDL	BDL
1,2-Dinitrobenzene	1	BDL	BDL	BDL	BDL
3-Nitroaniline	1	BDL	BDL	BDL	BDL
Acenaphthene	1	BDL	BDL	BDL	BDL
2,4-dinitrophenol	1	BDL	BDL	BDL	BDL
4-nitrophenol	1	BDL	BDL	BDL	BDL
Dibenzofuran	1	BDL	BDL	BDL	BDL
2,4-dinitrotoluene	1	BDL	BDL	BDL	BDL
2,3,4,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
2,3,5,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
Diethyl Phthalate	1	BDL	<b>B</b>	BDL	<b>B</b>

## Semi-Volatile Organic Compound Analysis

Component	detection limit	101788-004	101788-005	101788-006	111221-012
		Tube 01 Solvent Landfill #6	Tube 02 Solvent Landfill #6	Tube 03 Solvent Landfill #6	Tube 01 Solvent Landfill #6
		ppbv	ppbv	ppbv	ppbv
Fluorene	1	BDL	BDL	BDL	BDL
4-chlorophenyl phenyl ether	1	BDL	BDL	BDL	BDL
4-Nitroaniline	1	BDL	BDL	BDL	BDL
4,6-dinitro-2-methylphenol	1	BDL	BDL	BDL	BDL
Diphenylamine	1	BDL	BDL	BDL	BDL
n-Nitrosodiphenylamine	1	BDL	BDL	BDL	BDL
Azobenzene	1	BDL	BDL	BDL	BDL
4-Bromophenyl phenyl ether	1	BDL	BDL	BDL	BDL
Hexachlorobenzene	1	BDL	BDL	BDL	BDL
Pentachlorophenol	1	BDL	BDL	BDL	BDL
Phenanthrene	1	BDL	BDL	BDL	BDL
Anthracene	1	BDL	BDL	BDL	BDL
Carbazole	1	BDL	BDL	BDL	BDL
Di-n-butyl phthalate	1	BDL	<b>B</b>	BDL	<b>B</b>
Fluoranthene	1	BDL	BDL	BDL	BDL
Pyrene	1	BDL	BDL	BDL	BDL
Benzyl butyl phthalate	1	BDL	BDL	BDL	BDL
Bis(2-ethylhexyl)adipate	1	BDL	BDL	BDL	BDL
Benzo(a)anthracene	1	BDL	BDL	BDL	BDL
Chrysene	1	BDL	BDL	BDL	BDL
Bis(2-ethylhexyl)phthalate	1	BDL	<b>B</b>	BDL	<b>B</b>
Di-n-octyl phthalate	1	BDL	BDL	BDL	BDL
Benzo(b)fluoranthene	1	BDL	BDL	BDL	BDL
Benzo(k)fluoranthene	1	BDL	BDL	BDL	BDL
Benzo(a)pyrene	1	BDL	BDL	BDL	BDL
Indeno(1,2,3-cd)pyrene	1	BDL	BDL	BDL	BDL
Dibenzo(a,h)anthracene	1	BDL	BDL	BDL	BDL
Benzo[g,h,i]perylene	1	BDL	BDL	BDL	BDL

BDL - Below Detection Limit

B - Analyte detected in the Blank.

J - Estimated value; detected between the RL and DL.

D - Analyte reported from a diluted extract.

E - Estimate, result detected above calibration range.

I - Concentration/Peak ID uncertain due to potential interference.

## Semi-Volatile Organic Compound Analysis

Component	detection limit	111221-013	111221-014	101793-004	101793-005
		Tube 02 Solvent Landfill #6	Tube 03 Solvent Landfill #6	Tube 01 Solvent Landfill #7	Tube 02 Solvent Landfill #7
		ppbv	ppbv	ppbv	ppbv
N-nitrosodimethylamine	1	BDL	BDL	BDL	BDL
Phenol	1	BDL	BDL	BDL	BDL
Aniline	1	BDL	BDL	BDL	BDL
Bis(2-Chloroethyl) ether	1	BDL	BDL	BDL	BDL
2-Chlorophenol	1	BDL	BDL	BDL	BDL
Benzyl Alcohol	1	BDL	BDL	BDL	BDL
2-methylphenol	1	BDL	BDL	BDL	BDL
bis(2-chloroisopropyl)ether	1	BDL	BDL	BDL	BDL
N-Nitroso-di-n-propylamine	1	BDL	BDL	BDL	BDL
4-methylphenol/3-methylphenol	1	BDL	BDL	BDL	BDL
Isophorone	1	BDL	BDL	BDL	BDL
2-nitrophenol	1	BDL	BDL	BDL	BDL
2,4-dimethylphenol	1	BDL	BDL	BDL	BDL
Bis(2-chloroethoxy)methane	1	BDL	BDL	BDL	BDL
2,4-dichlorophenol	1	BDL	BDL	BDL	BDL
4-Chloroaniline	1	BDL	BDL	BDL	BDL
4-chloro-3-methylphenol	1	BDL	BDL	BDL	BDL
2-methylnaphthalene	1	BDL	BDL	BDL	BDL
1-methylnaphthalene	1	BDL	BDL	BDL	BDL
Hexachlorocyclopentadiene	1	BDL	BDL	BDL	BDL
2,4,6-trichlorophenol	1	BDL	BDL	BDL	BDL
2,4,5-trichlorophenol	1	BDL	BDL	BDL	BDL
2-chloronaphthalene	1	BDL	BDL	BDL	BDL
2-Nitroaniline	1	BDL	BDL	BDL	BDL
1,4-dinitrobenzene	1	BDL	BDL	BDL	BDL
Dimethyl phthalate	1	BDL	BDL	BDL	BDL
1,3-dinitrobenzene	1	BDL	BDL	BDL	BDL
2,6-dinitrotoluene	1	BDL	BDL	BDL	BDL
Acenaphthylene	1	BDL	BDL	BDL	BDL
1,2-Dinitrobenzene	1	BDL	BDL	BDL	BDL
3-Nitroaniline	1	BDL	BDL	BDL	BDL
Acenaphthene	1	BDL	BDL	BDL	BDL
2,4-dinitrophenol	1	BDL	BDL	BDL	BDL
4-nitrophenol	1	BDL	BDL	BDL	BDL
Dibenzofuran	1	BDL	BDL	BDL	BDL
2,4-dinitrotoluene	1	BDL	BDL	BDL	BDL
2,3,4,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
2,3,5,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
Diethyl Phthalate	1	BDL	BDL	BDL	BDL

## Semi-Volatile Organic Compound Analysis

Component	detection limit	111221-013	111221-014	101793-004	101793-005		
		Tube 02 Solvent Landfill #6	Tube 03 Solvent Landfill #6	Tube 01 Solvent Landfill #7	Tube 02 Solvent Landfill #7		
		ppbv	ppbv	ppbv	ppbv		
Fluorene	1	BDL	BDL	BDL	BDL		
4-chlorophenyl phenyl ether	1	BDL	BDL	BDL	BDL		
4-Nitroaniline	1	BDL	BDL	BDL	BDL		
4,6-dinitro-2-methylphenol	1	BDL	BDL	BDL	BDL		
Diphenylamine	1	BDL	BDL	BDL	BDL		
n-Nitrosodiphenylamine	1	BDL	BDL	BDL	BDL		
Azobenzene	1	BDL	BDL	BDL	BDL		
4-Bromophenyl phenyl ether	1	BDL	BDL	BDL	BDL		
Hexachlorobenzene	1	BDL	BDL	BDL	BDL		
Pentachlorophenol	1	BDL	BDL	BDL	BDL		
Phenanthrene	1	BDL	BDL	BDL	BDL		
Anthracene	1	BDL	BDL	BDL	BDL		
Carbazole	1	BDL	BDL	BDL	BDL		
Di-n-butyl phthalate	1	BDL	BDL	BDL	B	BDL	B
Fluoranthene	1	BDL	BDL	BDL	BDL	BDL	
Pyrene	1	BDL	BDL	BDL	BDL	BDL	
Benzyl butyl phthalate	1	BDL	BDL	BDL	BDL	BDL	
Bis(2-ethylhexyl)adipate	1	BDL	BDL	BDL	BDL	BDL	
Benzo(a)anthracene	1	BDL	BDL	BDL	BDL	BDL	
Chrysene	1	BDL	BDL	BDL	BDL	BDL	
Bis(2-ethylhexyl)phthalate	1	BDL	1.1	BDL	B	BDL	B
Di-n-octyl phthalate	1	BDL	BDL	BDL	BDL	BDL	
Benzo(b)fluoranthene	1	BDL	BDL	BDL	BDL	BDL	
Benzo(k)fluoranthene	1	BDL	BDL	BDL	BDL	BDL	
Benzo(a)pyrene	1	BDL	BDL	BDL	BDL	BDL	
Indeno(1,2,3-cd)pyrene	1	BDL	BDL	BDL	BDL	BDL	
Dibenzo(a,h)anthracene	1	BDL	BDL	BDL	BDL	BDL	
Benzo[g,h,i]perylene	1	BDL	BDL	BDL	BDL	BDL	

BDL - Below Detection Limit

B - Analyte detected in the Blank.

J - Estimated value; detected between the RL and DL.

D - Analyte reported from a diluted extract.

E - Estimate, result detected above calibration range.

I - Concentration/Peak ID uncertain due to potential interference.

## Semi-Volatile Organic Compound Analysis

Component	detection limit	101793-006	111220-011	111220-012	111220-013
		Tube 03 Solvent Landfill #7	Tube 01 Solvent Landfill #7	Tube 02 Solvent Landfill #7	Tube 03 Solvent Landfill #7
		ppbv	ppbv	ppbv	ppbv
N-nitrosodimethylamine	1	BDL	BDL	BDL	BDL
Phenol	1	BDL	BDL	BDL	BDL
Aniline	1	BDL	BDL	BDL	BDL
Bis(2-Chloroethyl) ether	1	BDL	BDL	BDL	BDL
2-Chlorophenol	1	BDL	BDL	BDL	BDL
Benzyl Alcohol	1	BDL	BDL	BDL	BDL
2-methylphenol	1	BDL	BDL	BDL	BDL
bis(2-chloroisopropyl)ether	1	BDL	BDL	BDL	BDL
N-Nitroso-di-n-propylamine	1	BDL	BDL	BDL	BDL
4-methylphenol/3-methylphenol	1	BDL	BDL	BDL	BDL
Isophorone	1	BDL	BDL	BDL	BDL
2-nitrophenol	1	BDL	BDL	BDL	BDL
2,4-dimethylphenol	1	BDL	BDL	BDL	BDL
Bis(2-chloroethoxy)methane	1	BDL	BDL	BDL	BDL
2,4-dichlorophenol	1	BDL	BDL	BDL	BDL
4-Chloroaniline	1	BDL	BDL	BDL	BDL
4-chloro-3-methylphenol	1	BDL	BDL	BDL	BDL
2-methylnaphthalene	1	BDL	BDL	BDL	BDL
1-methylnaphthalene	1	BDL	BDL	BDL	BDL
Hexachlorocyclopentadiene	1	BDL	BDL	BDL	BDL
2,4,6-trichlorophenol	1	BDL	BDL	BDL	BDL
2,4,5-trichlorophenol	1	BDL	BDL	BDL	BDL
2-chloronaphthalene	1	BDL	BDL	BDL	BDL
2-Nitroaniline	1	BDL	BDL	BDL	BDL
1,4-dinitrobenzene	1	BDL	BDL	BDL	BDL
Dimethyl phthalate	1	BDL	BDL	BDL	BDL
1,3-dinitrobenzene	1	BDL	BDL	BDL	BDL
2,6-dinitrotoluene	1	BDL	BDL	BDL	BDL
Acenaphthylene	1	BDL	BDL	BDL	BDL
1,2-Dinitrobenzene	1	BDL	BDL	BDL	BDL
3-Nitroaniline	1	BDL	BDL	BDL	BDL
Acenaphthene	1	BDL	BDL	BDL	BDL
2,4-dinitrophenol	1	BDL	BDL	BDL	BDL
4-nitrophenol	1	BDL	BDL	BDL	BDL
Dibenzofuran	1	BDL	BDL	BDL	BDL
2,4-dinitrotoluene	1	BDL	BDL	BDL	BDL
2,3,4,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
2,3,5,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
Diethyl Phthalate	1	BDL	BDL	BDL	BDL



## Semi-Volatile Organic Compound Analysis

Component	detection limit	101793-006	111220-011	111220-012	111220-013				
		Tube 03 Solvent Landfill #7	Tube 01 Solvent Landfill #7	Tube 02 Solvent Landfill #7	Tube 03 Solvent Landfill #7				
		ppbv	ppbv	ppbv	ppbv				
Fluorene	1	BDL	BDL	BDL	BDL				
4-chlorophenyl phenyl ether	1	BDL	BDL	BDL	BDL				
4-Nitroaniline	1	BDL	BDL	BDL	BDL				
4,6-dinitro-2-methylphenol	1	BDL	BDL	BDL	BDL				
Diphenylamine	1	BDL	BDL	BDL	BDL				
n-Nitrosodiphenylamine	1	BDL	BDL	BDL	BDL				
Azobenzene	1	BDL	BDL	BDL	BDL				
4-Bromophenyl phenyl ether	1	BDL	BDL	BDL	BDL				
Hexachlorobenzene	1	BDL	BDL	BDL	BDL				
Pentachlorophenol	1	BDL	BDL	BDL	BDL				
Phenanthrene	1	BDL	BDL	BDL	BDL				
Anthracene	1	BDL	BDL	BDL	BDL				
Carbazole	1	BDL	BDL	BDL	BDL				
Di-n-butyl phthalate	1	BDL	<b>B</b>	<b>1.1</b>	<b>B</b>	<b>1.1</b>	<b>B</b>	BDL	<b>B</b>
Fluoranthene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pyrene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzyl butyl phthalate	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bis(2-ethylhexyl)adipate	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(a)anthracene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chrysene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bis(2-ethylhexyl)phthalate	1	BDL	<b>B</b>	BDL	BDL	BDL	BDL	BDL	BDL
Di-n-octyl phthalate	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(b)fluoranthene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(k)fluoranthene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(a)pyrene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Indeno(1,2,3-cd)pyrene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dibenzo(a,h)anthracene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo[g,h,i]perylene	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

BDL - Below Detection Limit

B - Analyte detected in the Blank.

J - Estimated value; detected between the RL and DL.

D - Analyte reported from a diluted extract.

E - Estimate, result detected above calibration range.

I - Concentration/Peak ID uncertain due to potential interference.

## Semi-Volatile Organic Compound Analysis

Component	detection limit	111225-007	111225-008	111225-009
		Tube 01 Membrane Landfill #9	Tube 02 Membrane Landfill #9	Tube 03 Membrane Landfill #9
		ppbv	ppbv	ppbv
N-nitrosodimethylamine	1	BDL	BDL	BDL
Phenol	1	BDL	BDL	BDL
Aniline	1	BDL	BDL	BDL
Bis(2-Chloroethyl) ether	1	BDL	BDL	BDL
2-Chlorophenol	1	BDL	BDL	BDL
Benzyl Alcohol	1	BDL	BDL	BDL
2-methylphenol	1	BDL	BDL	BDL
bis(2-chloroisopropyl)ether	1	BDL	BDL	BDL
N-Nitroso-di-n-propylamine	1	BDL	BDL	BDL
4-methylphenol/3-methylphenol	1	BDL	BDL	BDL
Isophorone	1	BDL	BDL	BDL
2-nitrophenol	1	BDL	BDL	BDL
2,4-dimethylphenol	1	BDL	BDL	BDL
Bis(2-chloroethoxy)methane	1	BDL	BDL	BDL
2,4-dichlorophenol	1	BDL	BDL	BDL
4-Chloroaniline	1	BDL	BDL	BDL
4-chloro-3-methylphenol	1	BDL	BDL	BDL
2-methylnaphthalene	1	BDL	BDL	BDL
1-methylnaphthalene	1	BDL	BDL	BDL
Hexachlorocyclopentadiene	1	BDL	BDL	BDL
2,4,6-trichlorophenol	1	BDL	BDL	BDL
2,4,5-trichlorophenol	1	BDL	BDL	BDL
2-chloronaphthalene	1	BDL	BDL	BDL
2-Nitroaniline	1	BDL	BDL	BDL
1,4-dinitrobenzene	1	BDL	BDL	BDL
Dimethyl phthalate	1	BDL	BDL	BDL
1,3-dinitrobenzene	1	BDL	BDL	BDL
2,6-dinitrotoluene	1	BDL	BDL	BDL
Acenaphthylene	1	BDL	BDL	BDL
1,2-Dinitrobenzene	1	BDL	BDL	BDL
3-Nitroaniline	1	BDL	BDL	BDL
Acenaphthene	1	BDL	BDL	BDL
2,4-dinitrophenol	1	BDL	BDL	BDL
4-nitrophenol	1	BDL	BDL	BDL
Dibenzofuran	1	BDL	BDL	BDL
2,4-dinitrotoluene	1	BDL	BDL	BDL
2,3,4,6-Tetrachlorophenol	1	BDL	BDL	BDL
2,3,5,6-Tetrachlorophenol	1	BDL	BDL	BDL
Diethyl Phthalate	1	BDL	BDL	BDL

## Semi-Volatile Organic Compound Analysis

Component	detection limit	111225-007	111225-008		111225-009		
		Tube 01 Membrane Landfill #9	Tube 02 Membrane Landfill #9	Tube 03 Membrane Landfill #9	Tube 03 Membrane Landfill #9	Tube 03 Membrane Landfill #9	
		ppbv	ppbv				
Fluorene	1	BDL	BDL			BDL	
4-chlorophenyl phenyl ether	1	BDL	BDL			BDL	
4-Nitroaniline	1	BDL	BDL			BDL	
4,6-dinitro-2-methylphenol	1	BDL	BDL			BDL	
Diphenylamine	1	BDL	BDL			BDL	
n-Nitrosodiphenylamine	1	BDL	BDL			BDL	
Azobenzene	1	BDL	BDL			BDL	
4-Bromophenyl phenyl ether	1	BDL	BDL			BDL	
Hexachlorobenzene	1	BDL	BDL			BDL	
Pentachlorophenol	1	BDL	BDL			BDL	
Phenanthrene	1	BDL	BDL			BDL	
Anthracene	1	BDL	BDL			BDL	
Carbazole	1	BDL	BDL			BDL	
Di-n-butyl phthalate	1	BDL	<b>B</b>	<b>1.3</b>	<b>B</b>	BDL	<b>B</b>
Fluoranthene	1	BDL	BDL			BDL	
Pyrene	1	BDL	BDL			BDL	
Benzyl butyl phthalate	1	BDL	BDL			BDL	
Bis(2-ethylhexyl)adipate	1	BDL	BDL			BDL	
Benzo(a)anthracene	1	BDL	BDL			BDL	
Chrysene	1	BDL	BDL			BDL	
Bis(2-ethylhexyl)phthalate	1	BDL	<b>B</b>	BDL	<b>B</b>	BDL	<b>B</b>
Di-n-octyl phthalate	1	BDL	BDL			BDL	
Benzo(b)fluoranthene	1	BDL	BDL			BDL	
Benzo(k)fluoranthene	1	BDL	BDL			BDL	
Benzo(a)pyrene	1	BDL	BDL			BDL	
Indeno(1,2,3-cd)pyrene	1	BDL	BDL			BDL	
Dibenzo(a,h)anthracene	1	BDL	BDL			BDL	
Benzo[g,h,i]perylene	1	BDL	BDL			BDL	

BDL - Below Detection Limit

B - Analyte detected in the Blank.

J - Estimated value; detected between the RL and DL.

D - Analyte reported from a diluted extract.

E - Estimate, result detected above calibration range.

I - Concentration/Peak ID uncertain due to potential interferer

## Aldehyde and Ketone Compounds

Component	detection limit	101694-007	101694-008	101694-009	111212-015
		Tube 01 PSA Landfill #1	Tube 02 PSA Landfill #1	Tube 03 PSA Landfill #1	Tube 01 PSA Landfill #8
		ppbv	ppbv	ppbv	ppbv
Formaldehyde	10	1	1	1	33
Acetaldehyde	7	BDL	BDL	BDL	BDL
Acetone	5	BDL	BDL	BDL	14
Acrolein (2-propenal)	6	BDL	BDL	BDL	BDL
Propionaldehyde	5	BDL	BDL	BDL	10
Crotonaldehyde	5	BDL	BDL	BDL	BDL
2-Butanone (MEK)	5	BDL	BDL	BDL	BDL
Methacrolein (Isobutenal)	5	BDL	BDL	BDL	BDL
Butyraldehyde (Butanal)	5	BDL	BDL	BDL	BDL
Benzaldehyde	5	BDL	BDL	BDL	BDL
Valeraldehyde (Pentanal)	5	BDL	BDL	BDL	10
p-Tolualdehyde	5	BDL	BDL	BDL	BDL
Hexanaldehyde (Hexanal)	5	BDL	BDL	BDL	BDL

Detection limit of MEK for 101694 sample set is 40 ppbv.

## Aldehyde and Ketone Compounds

Component	detection limit	111212-016	111212-017	111590-008	111590-009
		Tube 02	Tube 03	Tube 01	Tube 02
		PSA Landfill #8	PSA Landfill #8	PSA Landfill #10	PSA Landfill #10
		ppbv	ppbv	ppbv	ppbv
Formaldehyde	10	BDL	19	BDL	BDL
Acetaldehyde	7	11	8	BDL	BDL
Acetone	5	9	11	5	6
Acrolein (2-propenal)	6	BDL	BDL	BDL	BDL
Propionaldehyde	5	BDL	BDL	BDL	BDL
Crotonaldehyde	5	BDL	2.50	BDL	BDL
2-Butanone (MEK)	5	BDL	96	BDL	BDL
Methacrolein (Isobutenal)	5	BDL	BDL	BDL	BDL
Butyraldehyde (Butanal)	5	BDL	BDL	BDL	BDL
Benzaldehyde	5	BDL	BDL	BDL	BDL
Valeraldehyde (Pentanal)	5	4	BDL	BDL	BDL
p-Tolualdehyde	5	BDL	BDL	BDL	BDL
Hexanaldehyde (Hexanal)	5	BDL	BDL	BDL	BDL

Acetone found in blank for sample set 111590.

## Aldehyde and Ketone Compounds

Component	detection limit	111590-010	101786-008	101786-009	101786-010
		Tube 03 PSA Landfill #10	Tube 01 Solvent Landfill #5	Tube 02 Solvent Landfill #5	Tube 03 Solvent Landfill #5
		ppbv	ppbv	ppbv	ppbv
Formaldehyde	10	BDL	BDL	BDL	BDL
Acetaldehyde	7	BDL	14	10	BDL
Acetone	5	5	96	54	39
Acrolein (2-propenal)	6	BDL	BDL	BDL	BDL
Propionaldehyde	5	BDL	BDL	BDL	BDL
Crotonaldehyde	5	BDL	BDL	BDL	BDL
2-Butanone (MEK)	5	BDL	18	11	7
Methacrolein (Isobutenal)	5	BDL	BDL	BDL	BDL
Butyraldehyde (Butanal)	5	BDL	BDL	BDL	BDL
Benzaldehyde	5	BDL	BDL	BDL	BDL
Valeraldehyde (Pentanal)	5	BDL	BDL	BDL	BDL
p-Tolualdehyde	5	BDL	BDL	BDL	BDL
Hexanaldehyde (Hexanal)	5	BDL	BDL	BDL	BDL

Acetone found in blank for sample set 111590.

## Aldehyde and Ketone Compounds

Component	detection limit	101788-008	101788-009	101788-010	111221-016
		Tube 01	Tube 02	Tube 03	Tube 01
		Solvent Landfill #6	Solvent Landfill #6	Solvent Landfill #6	Solvent Landfill #6
		ppbv	ppbv	ppbv	ppbv
Formaldehyde	10	BDL	BDL	BDL	BDL
Acetaldehyde	7	15	14	11	7
Acetone	5	22	23	16	22
Acrolein (2-propenal)	6	BDL	BDL	BDL	BDL
Propionaldehyde	5	BDL	BDL	BDL	BDL
Crotonaldehyde	5	BDL	BDL	BDL	6
2-Butanone (MEK)	5	15	15	12	8
Methacrolein (Isobutenal)	5	BDL	BDL	BDL	BDL
Butyraldehyde (Butanal)	5	BDL	BDL	BDL	BDL
Benzaldehyde	5	BDL	BDL	BDL	BDL
Valeraldehyde (Pentanal)	5	BDL	BDL	BDL	BDL
p-Tolualdehyde	5	BDL	BDL	BDL	5
Hexanaldehyde (Hexanal)	5	BDL	BDL	BDL	BDL

Formaldehyde found in blank for sample set 111221.

## Aldehyde and Ketone Compounds

Component	detection limit	111221-017	111221-018	101793-008	101793-009
		Tube 02	Tube 03	Tube 01	Tube 02
		Solvent Landfill #6	Solvent Landfill #6	Solvent Landfill #7	Solvent Landfill #7
		ppbv	ppbv	ppbv	ppbv
Formaldehyde	10	23	18	BDL	BDL
Acetaldehyde	7	20	11	22	31
Acetone	5	52	31	41	60
Acrolein (2-propenal)	6	BDL	BDL	BDL	BDL
Propionaldehyde	5	BDL	BDL	BDL	BDL
Crotonaldehyde	5	10	8	BDL	BDL
2-Butanone (MEK)	5	16	19	17	32
Methacrolein (Isobutenal)	5	BDL	BDL	BDL	BDL
Butyraldehyde (Butanal)	5	BDL	69	BDL	BDL
Benzaldehyde	5	BDL	BDL	BDL	BDL
Valeraldehyde (Pentanal)	5	BDL	BDL	BDL	BDL
p-Tolualdehyde	5	11	8	BDL	BDL
Hexanaldehyde (Hexanal)	5	BDL	BDL	BDL	BDL

Formaldehyde found in blank for sample set 111221.



## Aldehyde and Ketone Compounds

Component	detection limit	101793-010	111220-015	111220-016	111220-017
		Tube 03 Solvent Landfill #7	Tube 01 Solvent Landfill #7	Tube 02 Solvent Landfill #7	Tube 03 Solvent Landfill #7
		ppbv	ppbv	ppbv	ppbv
Formaldehyde	10	BDL	12	BDL	57
Acetaldehyde	7	32	35	BDL	147
Acetone	5	49	177	26	180
Acrolein (2-propenal)	6	BDL	BDL	BDL	BDL
Propionaldehyde	5	BDL	BDL	BDL	BDL
Crotonaldehyde	5	BDL	26	4	54
2-Butanone (MEK)	5	28	95	9	81
Methacrolein (Isobutenal)	5	BDL	BDL	BDL	BDL
Butyraldehyde (Butanal)	5	BDL	BDL	BDL	BDL
Benzaldehyde	5	BDL	BDL	BDL	BDL
Valeraldehyde (Pentanal)	5	BDL	BDL	BDL	107
p-Tolualdehyde	5	BDL	BDL	BDL	BDL
Hexanaldehyde (Hexanal)	5	BDL	36	BDL	250

Formaldehyde found in blank for sample set 111220.

highlighted cells are for data outside the calibration range

## Aldehyde and Ketone Compounds

Component	detection limit	111225-011	111225-012	111225-013
		Tube 01 Membrane Landfill #9	Tube 02 Membrane Landfill #9	Tube 03 Membrane Landfill #9
		ppbv	ppbv	ppbv
Formaldehyde	10	17	14	15
Acetaldehyde	7	70	68	66
Acetone	5	461	444	522
Acrolein (2-propenal)	6	BDL	BDL	BDL
Propionaldehyde	5	BDL	BDL	BDL
Crotonaldehyde	5	BDL	BDL	BDL
2-Butanone (MEK)	5	BDL	BDL	BDL
Methacrolein (Isobutenal)	5	BDL	BDL	BDL
Butyraldehyde (Butanal)	5	BDL	BDL	BDL
Benzaldehyde	5	BDL	BDL	BDL
Valeraldehyde (Pentanal)	5	BDL	BDL	BDL
p-Tolualdehyde	5	BDL	BDL	BDL
Hexanaldehyde (Hexanal)	5	BDL	BDL	BDL

Formaldehyde found in blank for sample set 111225.

highlighted cells are for data outside the calibration range

## Target Siloxanes

Component	Detection Limit	101694-001	101694-002	101694-003	111212-001
		Cylinder 01	Cylinder 02	Cylinder 03	Cylinder 01
		PSA Landfill #1	PSA Landfill #1	PSA Landfill #1	PSA Landfill #8
		mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>
1,1,3,3-Tetramethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Pentamethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisilane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisiloxane (L2, MM)	0.1	BDL	BDL	BDL	BDL
Octamethyltrisiloxane (L3, MDM)	0.1	BDL	BDL	BDL	BDL
Octamethylcyclotetrasiloxane (D4)	0.1	BDL	BDL	BDL	BDL
Decamethyltetrasiloxane (L4, MD2M)	0.1	BDL	BDL	BDL	BDL
Decamethylcyclopentasiloxane (D5)	0.1	BDL	BDL	BDL	BDL
Dodecamethylpentasiloxane (L5, MD3M)	0.1	BDL	BDL	BDL	BDL
Dodecamethylcyclohexasiloxane (D6)	0.1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Target Siloxanes

Component	Detection Limit	111212-002	111212-003	111590-001	111590-002
		Cylinder 02	Cylinder 03	Cylinder 01	Cylinder 02
		PSA Landfill #8	PSA Landfill #8	PSA Landfill #10	PSA Landfill #10
		mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>
1,1,3,3-Tetramethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Pentamethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisilane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisiloxane (L2, MM)	0.1	BDL	BDL	BDL	BDL
Octamethyltrisiloxane (L3, MDM)	0.1	BDL	BDL	BDL	BDL
Octamethylcyclotetrasiloxane (D4)	0.1	BDL	BDL	BDL	BDL
Decamethyltetrasiloxane (L4, MD2M)	0.1	BDL	BDL	BDL	BDL
Decamethylcyclopentasiloxane (D5)	0.1	BDL	BDL	BDL	BDL
Dodecamethylpentasiloxane (L5, MD3M)	0.1	BDL	BDL	BDL	BDL
Dodecamethylcyclohexasiloxane (D6)	0.1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Target Siloxanes

Component	Detection Limit	111590-003	101786-001	101786-002	101786-003
		Cylinder 03	Cylinder 01	Cylinder 02	Cylinder 03
		PSA Landfill #10	Solvent Landfill #5	Solvent Landfill #5	Solvent Landfill #5
		mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>
1,1,3,3-Tetramethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Pentamethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisilane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisiloxane (L2, MM)	0.1	BDL	BDL	BDL	BDL
Octamethyltrisiloxane (L3, MDM)	0.1	BDL	BDL	BDL	BDL
Octamethylcyclotetrasiloxane (D4)	0.1	BDL	<b>0.4</b>	<b>0.3</b>	<b>0.3</b>
Decamethyltetrasiloxane (L4, MD2M)	0.1	BDL	BDL	BDL	BDL
Decamethylcyclopentasiloxane (D5)	0.1	BDL	BDL	BDL	BDL
Dodecamethylpentasiloxane (L5, MD3M)	0.1	BDL	BDL	BDL	BDL
Dodecamethylcyclohexasiloxane (D6)	0.1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Target Siloxanes

Component	Detection Limit	101788-001	101788-002	101788-003	111221-001
		Cylinder 01	Cylinder 02	Cylinder 03	Cylinder 01
		Solvent Landfill #6	Solvent Landfill #6	Solvent Landfill #6	Solvent Landfill #6
		mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>
1,1,3,3-Tetramethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Pentamethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisilane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisiloxane (L2, MM)	0.1	BDL	BDL	BDL	BDL
Octamethyltrisiloxane (L3, MDM)	0.1	BDL	BDL	BDL	BDL
Octamethylcyclotetrasiloxane (D4)	0.1	BDL	BDL	BDL	BDL
Decamethyltetrasiloxane (L4, MD2M)	0.1	BDL	BDL	BDL	BDL
Decamethylcyclopentasiloxane (D5)	0.1	BDL	BDL	BDL	BDL
Dodecamethylpentasiloxane (L5, MD3M)	0.1	BDL	BDL	BDL	BDL
Dodecamethylcyclohexasiloxane (D6)	0.1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Target Siloxanes

Component	Detection Limit	111221-002	111221-003	101793-001	101793-002
		Cylinder 02	Cylinder 03	Cylinder 01	Cylinder 02
		Solvent Landfill #6	Solvent Landfill #6	Solvent Landfill #7	Solvent Landfill #7
		mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>
1,1,3,3-Tetramethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Pentamethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisilane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisiloxane (L2, MM)	0.1	BDL	BDL	BDL	BDL
Octamethyltrisiloxane (L3, MDM)	0.1	BDL	BDL	BDL	BDL
Octamethylcyclotetrasiloxane (D4)	0.1	BDL	BDL	BDL	<b>0.1</b>
Decamethyltetrasiloxane (L4, MD2M)	0.1	BDL	BDL	BDL	BDL
Decamethylcyclopentasiloxane (D5)	0.1	BDL	BDL	BDL	BDL
Dodecamethylpentasiloxane (L5, MD3M)	0.1	BDL	BDL	BDL	BDL
Dodecamethylcyclohexasiloxane (D6)	0.1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Target Siloxanes

Component	Detection Limit	101793-003	111220-001	111220-002	111220-003
		Cylinder 03	Cylinder 01	Cylinder 02	Cylinder 03
		Solvent Landfill #7	Solvent Landfill #7	Solvent Landfill #7	Solvent Landfill #7
		mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>
1,1,3,3-Tetramethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Pentamethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisilane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisiloxane (L2, MM)	0.1	BDL	BDL	BDL	BDL
Octamethyltrisiloxane (L3, MDM)	0.1	BDL	BDL	BDL	BDL
Octamethylcyclotetrasiloxane (D4)	0.1	<b>0.1</b>	BDL	BDL	BDL
Decamethyltetrasiloxane (L4, MD2M)	0.1	BDL	BDL	BDL	BDL
Decamethylcyclopentasiloxane (D5)	0.1	BDL	BDL	BDL	BDL
Dodecamethylpentasiloxane (L5, MD3M)	0.1	BDL	BDL	BDL	BDL
Dodecamethylcyclohexasiloxane (D6)	0.1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit



## Target Siloxanes

Component	Detection Limit	111225-001	111225-002	111225-003
		Cylinder 01	Cylinder 02	Cylinder 03
		Membrane Landfill #9	Membrane Landfill #9	Membrane Landfill #9
		mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>	mg Si / m <sup>3</sup>
1,1,3,3-Tetramethyldisiloxane	0.1	BDL	BDL	BDL
Pentamethyldisiloxane	0.1	BDL	BDL	BDL
Hexamethyldisilane	0.1	BDL	BDL	BDL
Hexamethyldisiloxane (L2, MM)	0.1	BDL	BDL	BDL
Octamethyltrisiloxane (L3, MDM)	0.1	BDL	BDL	BDL
Octamethylcyclotetrasiloxane (D4)	0.1	BDL	BDL	BDL
Decamethyltetrasiloxane (L4, MD2M)	0.1	BDL	BDL	BDL
Decamethylcyclopentasiloxane (D5)	0.1	BDL	BDL	BDL
Dodecamethylpentasiloxane (L5, MD3M)	0.1	BDL	BDL	BDL
Dodecamethylcyclohexasiloxane (D6)	0.1	BDL	BDL	BDL

BDL = Below Detection Limit

## Volatile Metals Analysis

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	101694-010	101694-011	101694-012	111212-019
		Tube 1 PSA Landfill #1 $\mu\text{g}/\text{m}^3$	Tube 2 PSA Landfill #1 $\mu\text{g}/\text{m}^3$	Tube 3 PSA Landfill #1 $\mu\text{g}/\text{m}^3$	Tube 1 PSA Landfill #8 $\mu\text{g}/\text{m}^3$
Mercury	0.01	BDL	BDL	BDL	0.04

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	101694-017	101694-018	101694-020	111212-008
		Impinger 1 PSA Landfill #1 $\mu\text{g}/\text{m}^3$	Impinger 2 PSA Landfill #1 $\mu\text{g}/\text{m}^3$	Impinger 3 PSA Landfill #1 $\mu\text{g}/\text{m}^3$	Impinger 1 PSA Landfill #8 $\mu\text{g}/\text{m}^3$
Arsenic	30	BDL	BDL	BDL	BDL
Barium	30	BDL	BDL	BDL	BDL
Beryllium	30	BDL	BDL	BDL	BDL
Cadmium	30	BDL	BDL	BDL	BDL
Cobalt	30	BDL	BDL	BDL	BDL
Chromium	30	BDL	BDL	175	BDL
Copper *	30	BDL	118	BDL	45
Manganese	30	BDL	BDL	BDL	BDL
Molybdenum	30	BDL	BDL	BDL	BDL
Nickel	30	BDL	BDL	BDL	BDL
Lead	30	BDL	BDL	BDL	BDL
Antimony	30	BDL	BDL	BDL	BDL
Selenium	30	BDL	BDL	BDL	BDL
Strontium	30	BDL	BDL	BDL	BDL
Thallium	30	BDL	BDL	BDL	BDL
Zinc *	30	219	253	BDL	23

\* Zinc and copper found in field blanks.

Inconsistent metals data is likely due to particulate contamination from the gas stream, especially those metals that are part of the pipeline construction materials.

## Volatile Metals Analysis

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	111212-020	111212-021	111590-019	111590-020
		Tube 2	Tube 3	Tube 1	Tube 2
		PSA Landfill #8	PSA Landfill #8	PSA Landfill #10	PSA Landfill #10
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Mercury	0.01	0.05	0.04	BDL	0.02

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	111212-009	111212-010	111590-012	111590-013
		Impinger 2	Impinger 3	Impinger 1	Impinger 2
		PSA Landfill #8	PSA Landfill #8	PSA Landfill #10	PSA Landfill #10
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Arsenic	30	BDL	BDL	BDL	BDL
Barium	30	BDL	BDL	BDL	BDL
Beryllium	30	BDL	BDL	BDL	BDL
Cadmium	30	BDL	BDL	BDL	BDL
Cobalt	30	BDL	BDL	BDL	BDL
Chromium	30	BDL	BDL	BDL	BDL
Copper *	30	BDL	BDL	BDL	BDL
Manganese	30	BDL	BDL	BDL	BDL
Molybdenum	30	BDL	BDL	BDL	BDL
Nickel	30	BDL	BDL	BDL	BDL
Lead	30	<b>18</b>	BDL	BDL	BDL
Antimony	30	BDL	BDL	BDL	BDL
Selenium	30	BDL	BDL	BDL	BDL
Strontium	30	BDL	BDL	BDL	BDL
Thallium	30	BDL	BDL	BDL	BDL
Zinc *	30	BDL	BDL	BDL	BDL

\* Zinc and copper found in field blanks.

Inconsistent metals data is likely due to particulate contamination from the gas stream, especially those metals that are part of the pipeline construction materials.

## Volatile Metals Analysis

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	111590-021	101786-015	101786-016	101786-017
		Tube 3 PSA Landfill #10 $\mu\text{g}/\text{m}^3$	Tube 1 Solvent Landfill #5 $\mu\text{g}/\text{m}^3$	Tube 2 Solvent Landfill #5 $\mu\text{g}/\text{m}^3$	Tube 3 Solvent Landfill #5 $\mu\text{g}/\text{m}^3$
Mercury	0.01	BDL	BDL	BDL	BDL

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	111590-014	101786-019	101786-020	101786-021
		Impinger 3 PSA Landfill #10 $\mu\text{g}/\text{m}^3$	Impinger 1 Solvent Landfill #5 $\mu\text{g}/\text{m}^3$	Impinger 2 Solvent Landfill #5 $\mu\text{g}/\text{m}^3$	Impinger 3 Solvent Landfill #5 $\mu\text{g}/\text{m}^3$
Arsenic	30	BDL	BDL	BDL	BDL
Barium	30	BDL	BDL	BDL	BDL
Beryllium	30	BDL	BDL	BDL	BDL
Cadmium	30	BDL	BDL	BDL	BDL
Cobalt	30	BDL	BDL	BDL	BDL
Chromium	30	BDL	BDL	BDL	BDL
Copper *	30	BDL	BDL	BDL	38
Manganese	30	BDL	BDL	BDL	BDL
Molybdenum	30	BDL	BDL	BDL	BDL
Nickel	30	BDL	BDL	BDL	BDL
Lead	30	BDL	BDL	BDL	BDL
Antimony	30	BDL	BDL	BDL	BDL
Selenium	30	BDL	BDL	BDL	BDL
Strontium	30	BDL	BDL	BDL	BDL
Thallium	30	BDL	BDL	BDL	BDL
Zinc *	30	BDL	BDL	BDL	BDL

\* Zinc and copper found in field blanks.

Inconsistent metals data is likely due to particulate contamination from the gas stream, especially those metals that are part of the pipeline construction materials.

## Volatile Metals Analysis

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	101788-015	101788-016	101788-017	111221-020
		Tube 1 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$	Tube 2 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$	Tube 3 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$	Tube 1 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$
Mercury	0.01	0.02	BDL	BDL	BDL

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	101788-019	101788-020	101788-021	111221-005
		Impinger 1 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$	Impinger 2 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$	Impinger 3 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$	Impinger 1 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$
Arsenic	30	BDL	BDL	BDL	BDL
Barium	30	BDL	BDL	BDL	BDL
Beryllium	30	BDL	BDL	BDL	BDL
Cadmium	30	BDL	BDL	BDL	BDL
Cobalt	30	BDL	BDL	BDL	BDL
Chromium	30	BDL	BDL	BDL	BDL
Copper *	30	BDL	BDL	BDL	BDL
Manganese	30	BDL	BDL	65	BDL
Molybdenum	30	BDL	BDL	BDL	BDL
Nickel	30	BDL	BDL	BDL	BDL
Lead	30	BDL	BDL	BDL	BDL
Antimony	30	BDL	BDL	BDL	BDL
Selenium	30	BDL	BDL	BDL	BDL
Strontium	30	BDL	BDL	BDL	BDL
Thallium	30	BDL	BDL	BDL	BDL
Zinc *	30	BDL	31	BDL	BDL

\* Zinc and copper found in field blanks.

Inconsistent metals data is likely due to particulate contamination from the gas stream, especially those metals that are part of the pipeline construction materials.

## Volatile Metals Analysis

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	111221-021	111221-022	101793-015	101793-016
		Tube 2 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$	Tube 3 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$	Tube 1 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$	Tube 2 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$
Mercury	0.01	BDL		BDL	BDL

bad sample collected

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	111221-006	111221-007	101793-019	101793-020
		Impinger 2 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$	Impinger 3 Solvent Landfill #6 $\mu\text{g}/\text{m}^3$	Impinger 1 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$	Impinger 2 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$
Arsenic	30	BDL	BDL	BDL	BDL
Barium	30	BDL	BDL	BDL	BDL
Beryllium	30	BDL	BDL	BDL	BDL
Cadmium	30	BDL	BDL	BDL	BDL
Cobalt	30	BDL	BDL	BDL	BDL
Chromium	30	BDL	BDL	BDL	BDL
Copper *	30	BDL	BDL	BDL	BDL
Manganese	30	BDL	BDL	BDL	BDL
Molybdenum	30	BDL	BDL	BDL	BDL
Nickel	30	BDL	BDL	BDL	BDL
Lead	30	BDL	BDL	155	BDL
Antimony	30	BDL	BDL	BDL	BDL
Selenium	30	BDL	BDL	BDL	BDL
Strontium	30	BDL	BDL	BDL	BDL
Thallium	30	BDL	BDL	BDL	BDL
Zinc *	30	BDL	BDL	BDL	BDL

\* Zinc and copper found in field blanks.

Inconsistent metals data is likely due to particulate contamination from the gas stream, especially those metals that are part of the pipeline construction materials.

## Volatile Metals Analysis

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	101793-017	111220-019	111220-020	111220-021
		Tube 3 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$	Tube 1 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$	Tube 2 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$	Tube 3 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$
Mercury	0.01	BDL		BDL	BDL

sorbent blown out  
during sampling

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	101793-021	111220-005	111220-006	111220-007
		Impinger 3 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$	Impinger 1 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$	Impinger 2 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$	Impinger 3 Solvent Landfill #7 $\mu\text{g}/\text{m}^3$
Arsenic	30	BDL	BDL	BDL	BDL
Barium	30	BDL	BDL	BDL	BDL
Beryllium	30	BDL	BDL	BDL	BDL
Cadmium	30	BDL	BDL	BDL	BDL
Cobalt	30	BDL	BDL	BDL	BDL
Chromium	30	BDL	BDL	BDL	BDL
Copper *	30	BDL	BDL	BDL	BDL
Manganese	30	BDL	BDL	BDL	BDL
Molybdenum	30	BDL	BDL	BDL	BDL
Nickel	30	BDL	BDL	BDL	BDL
Lead	30	<b>39</b>	BDL	BDL	BDL
Antimony	30	BDL	BDL	BDL	BDL
Selenium	30	BDL	BDL	BDL	BDL
Strontium	30	BDL	BDL	BDL	BDL
Thallium	30	BDL	BDL	BDL	BDL
Zinc *	30	BDL	BDL	BDL	BDL

\* Zinc and copper found in field blanks.

Inconsistent metals data is likely due to particulate contamination from the gas stream, especially those metals that are part of the pipeline construction materials.

## Volatile Metals Analysis

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	111225-015	111225-016	111225-017
		Tube 1 Membrane Landfill #9 $\mu\text{g}/\text{m}^3$	Tube 2 Membrane Landfill #9 $\mu\text{g}/\text{m}^3$	Tube 3 Membrane Landfill #9 $\mu\text{g}/\text{m}^3$
Mercury	0.01	BDL	0.01	BDL

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	111225-004	111225-005	111225-006
		Impinger 1 Membrane Landfill #9 $\mu\text{g}/\text{m}^3$	Impinger 2 Membrane Landfill #9 $\mu\text{g}/\text{m}^3$	Impinger 3 Membrane Landfill #9 $\mu\text{g}/\text{m}^3$
Arsenic	30	BDL	BDL	BDL
Barium	30	BDL	BDL	BDL
Beryllium	30	BDL	BDL	BDL
Cadmium	30	BDL	BDL	BDL
Cobalt	30	BDL	BDL	BDL
Chromium	30	BDL	BDL	BDL
Copper *	30	BDL	BDL	BDL
Manganese	30	BDL	BDL	BDL
Molybdenum	30	BDL	BDL	BDL
Nickel	30	BDL	BDL	BDL
Lead	30	BDL	BDL	BDL
Antimony	30	BDL	BDL	32
Selenium	30	BDL	BDL	BDL
Strontium	30	BDL	BDL	BDL
Thallium	30	BDL	BDL	BDL
Zinc *	30	BDL	BDL	BDL

\* Zinc and copper found in field blanks.

Inconsistent metals data is likely due to particulate contaminant from the gas stream, especially those metals that are part of pipeline construction materials.



## qPCR and Bacteria/Spore Biological Analysis

Component	101694-013	101694-014	101694-015	111212-004
	Filter 1	Filter 2	Filter 3	Filter 1
	PSA	PSA	PSA	PSA
	Landfill #1	Landfill #1	Landfill #1	Landfill #8
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>qPCR Biological Analysis</b>				
Total Bacteria	4.80E+06	4.16E+06	3.17E+06	2.37E+06
Total Acid-producing Bacteria (APB)	5.13E+04	5.85E+04	1.59E+04	ND
Total Iron-oxidizing Bacteria (IOB)	ND	ND	ND	4.29E+04
Total Sulfate-reducing Bacteria (SRB)	ND	ND	ND	ND
<b>Live Bacteria</b>				
Anaerobic	<130	<172	<133	<126
Aerobic	<130	<172	<133	<126
Total	<260	<344	<266	<252
<b>Spores</b>				
Anaerobic	217	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	217	ND	ND	ND

ND=Not Detected

Component	101694-013	101694-014	101694-015	111212-004
	Filter 1	Filter 2	Filter 3	Filter 1
	PSA	PSA	PSA	PSA
	Landfill #1	Landfill #1	Landfill #1	Landfill #8
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>CONVERTED TO BASE 10 LOG</b>				
<b>qPCR Biological Analysis</b>				
Total Bacteria	6.68	6.62	6.50	6.37
Total Acid-producing Bacteria (APB)	4.71	4.77	4.20	ND
Total Iron-oxidizing Bacteria (IOB)	ND	ND	ND	4.63
Total Sulfate-reducing Bacteria (SRB)	ND	ND	ND	ND
<b>Live Bacteria</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND
<b>Spores</b>				
Anaerobic	2.34	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	2.34	ND	ND	ND

ND=Not Detected

## qPCR and Bacteria/Spore Biological Analysis

Component	111212-005	111212-006	111590-016	111590-017
	Filter 2	Filter 3	Filter 1	Filter 2
	PSA	PSA	PSA	PSA
	Landfill #8	Landfill #8	Landfill #10	Landfill #10
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>qPCR Biological Analysis</b>				
Total Bacteria	9.11E+05	6.67E+06	3.29E+08	8.00E+07
Total Acid-producing Bacteria (APB)	ND	3.01E+04	1.44E+05	1.12E+04
Total Iron-oxidizing Bacteria (IOB)	ND	4.14E+04	5.97E+04	5.93E+04
Total Sulfate-reducing Bacteria (SRB)	ND	2.27E+03	ND	ND
<b>Live Bacteria</b>				
Anaerobic	960	1020	<192	<171
Aerobic	<115	<122	<192	<171
Total	960	1020	<384	<342
<b>Spores</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND

ND=Not Detected

Component	111212-005	111212-006	111590-016	111590-017
	Filter 2	Filter 3	Filter 1	Filter 2
	PSA	PSA	PSA	PSA
	Landfill #8	Landfill #8	Landfill #10	Landfill #10
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>CONVERTED TO BASE 10 LOG</b>				
<b>qPCR Biological Analysis</b>				
Total Bacteria	5.96	6.82	8.52	7.90
Total Acid-producing Bacteria (APB)	ND	4.48	5.16	4.05
Total Iron-oxidizing Bacteria (IOB)	ND	4.62	4.78	4.77
Total Sulfate-reducing Bacteria (SRB)	ND	3.36	ND	ND
<b>Live Bacteria</b>				
Anaerobic	2.98	3.01	ND	ND
Aerobic	ND	ND	ND	ND
Total	2.98	3.01	ND	ND
<b>Spores</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND

ND=Not Detected

## qPCR and Bacteria/Spore Biological Analysis

Component	111590-018	101786-012	101786-013	101786-014
	Filter 3	Filter 1	Filter 2	Filter 3
	PSA	Solvent	Solvent	Solvent
	Landfill #10	Landfill #5	Landfill #5	Landfill #5
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>qPCR Biological Analysis</b>				
Total Bacteria	4.46E+07	1.48E+06	6.39E+06	5.13E+05
Total Acid-producing Bacteria (APB)	8.99E+03	1.42E+05	6.94E+04	7.98E+04
Total Iron-oxidizing Bacteria (IOB)	3.53E+04	ND	1.27E+04	2.23E+04
Total Sulfate-reducing Bacteria (SRB)	2.52E+04	ND	ND	ND
<b>Live Bacteria</b>				
Anaerobic	<143	<158	<152	<172
Aerobic	<143	<158	<152	<172
Total	<286	<316	<304	<344
<b>Spores</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND

ND=Not Detected

Component	111590-018	101786-012	101786-013	101786-014
	Filter 3	Filter 1	Filter 2	Filter 3
	PSA	Solvent	Solvent	Solvent
	Landfill #10	Landfill #5	Landfill #5	Landfill #5
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>CONVERTED TO BASE 10 LOG</b>				
<b>qPCR Biological Analysis</b>				
Total Bacteria	7.65	6.17	6.81	5.71
Total Acid-producing Bacteria (APB)	3.95	5.15	4.84	4.90
Total Iron-oxidizing Bacteria (IOB)	4.55	ND	4.10	4.35
Total Sulfate-reducing Bacteria (SRB)	4.40	ND	ND	ND
<b>Live Bacteria</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND
<b>Spores</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND

ND=Not Detected

## qPCR and Bacteria/Spore Biological Analysis

Component	101788-012	101788-013	101788-014	111221-008
	Filter 1	Filter 2	Filter 3	Filter 1
	Solvent	Solvent	Solvent	Solvent
	Landfill #6	Landfill #6	Landfill #6	Landfill #6
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>qPCR Biological Analysis</b>				
Total Bacteria	7.09E+05	5.28E+05	7.52E+05	2.38E+06
Total Acid-producing Bacteria (APB)	9.41E+04	6.20E+04	5.39E+04	7.95E+04
Total Iron-oxidizing Bacteria (IOB)	ND	ND	ND	5.59E+04
Total Sulfate-reducing Bacteria (SRB)	ND	ND	ND	ND
<b>Live Bacteria</b>				
Anaerobic	<165	<130	<140	<180
Aerobic	<165	<130	<140	<180
Total	<330	<260	<280	<360
<b>Spores</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND

ND=Not Detected

Component	101788-012	101788-013	101788-014	111221-008
	Filter 1	Filter 2	Filter 3	Filter 1
	Solvent	Solvent	Solvent	Solvent
	Landfill #6	Landfill #6	Landfill #6	Landfill #6
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>CONVERTED TO BASE 10 LOG</b>				
<b>qPCR Biological Analysis</b>				
Total Bacteria	5.85	5.72	5.88	6.38
Total Acid-producing Bacteria (APB)	4.97	4.79	4.73	4.90
Total Iron-oxidizing Bacteria (IOB)	ND	ND	ND	4.75
Total Sulfate-reducing Bacteria (SRB)	ND	ND	ND	ND
<b>Live Bacteria</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND
<b>Spores</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND

ND=Not Detected

## qPCR and Bacteria/Spore Biological Analysis

Component	111221-009	111221-010	101793-012	101793-013
	Filter 2	Filter 3	Filter 1	Filter 2
	Solvent	Solvent	Solvent	Solvent
	Landfill #6	Landfill #6	Landfill #7	Landfill #7
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>qPCR Biological Analysis</b>				
Total Bacteria	2.95E+06	1.82E+07	5.24E+05	6.93E+05
Total Acid-producing Bacteria (APB)	2.02E+05	1.81E+05	8.83E+04	1.35E+05
Total Iron-oxidizing Bacteria (IOB)	6.25E+04	ND	ND	1.43E+04
Total Sulfate-reducing Bacteria (SRB)	ND	ND	ND	ND
<b>Live Bacteria</b>				
Anaerobic	<180	<180	<165	<166
Aerobic	<180	<180	220	<166
Total	<360	<360	220	<332
<b>Spores</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND

ND=Not Detected

Component	111221-009	111221-010	101793-012	101793-013
	Filter 2	Filter 3	Filter 1	Filter 2
	Solvent	Solvent	Solvent	Solvent
	Landfill #6	Landfill #6	Landfill #7	Landfill #7
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>CONVERTED TO BASE 10 LOG</b>				
<b>qPCR Biological Analysis</b>				
Total Bacteria	6.47	7.26	5.72	5.84
Total Acid-producing Bacteria (APB)	5.31	5.26	4.95	5.13
Total Iron-oxidizing Bacteria (IOB)	4.80	ND	ND	4.16
Total Sulfate-reducing Bacteria (SRB)	ND	ND	ND	ND
<b>Live Bacteria</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	2.34	ND
Total	ND	ND	2.34	ND
<b>Spores</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND

ND=Not Detected

## qPCR and Bacteria/Spore Biological Analysis

Component	101793-014	111220-008	111220-009	111220-010
	Filter 3	Filter 1	Filter 2	Filter 3
	Solvent	Solvent	Solvent	Solvent
	Landfill #7	Landfill #7	Landfill #7	Landfill #7
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>qPCR Biological Analysis</b>				
Total Bacteria	7.60E+05	1.07E+06	1.61E+06	2.00E+06
Total Acid-producing Bacteria (APB)	6.81E+04	1.93E+05	2.93E+04	8.27E+04
Total Iron-oxidizing Bacteria (IOB)	ND	7.02E+04	5.49E+04	ND
Total Sulfate-reducing Bacteria (SRB)	ND	ND	ND	ND
<b>Live Bacteria</b>				
Anaerobic	<163	<128	<128	<128
Aerobic	<163	<128	<128	<128
Total	<326	<256	<256	<256
<b>Spores</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND

ND=Not Detected

Component	101793-014	111220-008	111220-009	111220-010
	Filter 3	Filter 1	Filter 2	Filter 3
	Solvent	Solvent	Solvent	Solvent
	Landfill #7	Landfill #7	Landfill #7	Landfill #7
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>CONVERTED TO BASE 10 LOG</b>				
<b>qPCR Biological Analysis</b>				
Total Bacteria	5.88	6.03	6.21	6.30
Total Acid-producing Bacteria (APB)	4.83	5.29	4.47	4.92
Total Iron-oxidizing Bacteria (IOB)	ND	4.85	4.74	ND
Total Sulfate-reducing Bacteria (SRB)	ND	ND	ND	ND
<b>Live Bacteria</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND
<b>Spores</b>				
Anaerobic	ND	ND	ND	ND
Aerobic	ND	ND	ND	ND
Total	ND	ND	ND	ND

ND=Not Detected

## qPCR and Bacteria/Spore Biological Analysis

Component	111225-019	111225-020	111225-021
	Filter 1	Filter 2	Filter 3
	Membrane	Membrane	Membrane
	Landfill #9	Landfill #9	Landfill #9
	# per 100 scf	# per 100 scf	# per 100 scf
<b>qPCR Biological Analysis</b>			
Total Bacteria	3.54E+06	2.22E+06	2.76E+06
Total Acid-producing Bacteria (APB)	ND	7.57E+04	1.10E+05
Total Iron-oxidizing Bacteria (IOB)	7.61E+04	6.26E+04	7.67E+04
Total Sulfate-reducing Bacteria (SRB)	ND	ND	ND
<b>Live Bacteria</b>			
Anaerobic	<170	228	<171
Aerobic	<170	<171	<171
Total	<340	228	<342
<b>Spores</b>			
Anaerobic	ND	ND	ND
Aerobic	ND	ND	ND
Total	ND	ND	ND

ND=Not Detected

Component	111225-019	111225-020	111225-021
	Filter 1	Filter 2	Filter 3
	Membrane	Membrane	Membrane
	Landfill #9	Landfill #9	Landfill #9
	# per 100 scf	# per 100 scf	# per 100 scf
<b>CONVERTED TO BASE 10 LOG</b>			
<b>qPCR Biological Analysis</b>			
Total Bacteria	6.55	6.35	6.44
Total Acid-producing Bacteria (APB)	ND	4.88	5.04
Total Iron-oxidizing Bacteria (IOB)	4.88	4.80	4.88
Total Sulfate-reducing Bacteria (SRB)	ND	ND	ND
<b>Live Bacteria</b>			
Anaerobic	ND	2.36	ND
Aerobic	ND	ND	ND
Total	ND	2.36	ND
<b>Spores</b>			
Anaerobic	ND	ND	ND
Aerobic	ND	ND	ND
Total	ND	ND	ND

ND=Not Detected

## Major Component Analysis by ASTM D1945 / D1946 Summary Statistics

Component	Detection Limit	total # of		% that are BDL	Min value Mol %	Max value Mol %	0.90 Percentile Mol %
		samples analyzed	total # of hits				
Ammonia	0.001	27	0	100	BDL	BDL	BDL
Helium	0.1	27	0	100	BDL	BDL	BDL
Carbon Dioxide	0.03	27	24	11	BDL	2.21	2.00
Oxygen/Argon	0.03	27	27	0	0.07	0.45	0.38
Nitrogen	0.03	27	27	0	0.51	6.03	4.70
Carbon Monoxide	0.03	27	0	100	BDL	BDL	BDL
Total Inerts + Diluents		27	27	0	0.58	8.05	6.56
Hydrogen	0.1	27	21	22	BDL	0.87	0.62
Methane	0.002	27	27	0	91.48	99.41	96.94
Ethane	0.002	27	2	93	BDL	0.003	BDL
Ethene	0.002	27	0	100	BDL	BDL	BDL
Ethyne	0.002	27	0	100	BDL	BDL	BDL
Propane	0.002	27	0	100	BDL	BDL	BDL
Propene	0.002	27	0	100	BDL	BDL	BDL
Propadiene	0.002	27	0	100	BDL	BDL	BDL
Propyne	0.002	27	0	100	BDL	BDL	BDL
i-Butane	0.002	27	0	100	BDL	BDL	BDL
n-Butane	0.002	27	0	100	BDL	BDL	BDL
1-Butene	0.002	27	0	100	BDL	BDL	BDL
i-Butene	0.002	27	0	100	BDL	BDL	BDL
trans-2-Butene	0.002	27	0	100	BDL	BDL	BDL
cis-2-Butene	0.002	27	0	100	BDL	BDL	BDL
1,3-Butadiene	0.002	27	0	100	BDL	BDL	BDL
i-Pentane	0.002	27	0	100	BDL	BDL	BDL
n-Pentane	0.002	27	0	100	BDL	BDL	BDL
neo-Pentane	0.002	27	0	100	BDL	BDL	BDL
Pentenes	0.002	27	0	100	BDL	BDL	BDL
Hexane Plus	0.0001	27	19	30	BDL	0.0013	0.0010

### Calculated Real Gas Properties

	----- 60 °F, 14.73 psia -----					
Relative Density (Specific Gravity) (Dry)	27	27	0	0.5574	0.5956	0.5890
HHV (Dry) (Btu/ft <sup>3</sup> )	27	27	0	929.4	1008.4	984.0
HHV (Sat.) (Btu/ft <sup>3</sup> )	27	27	0	913.5	991.2	967.1
Wobbe Number	27	27	0	1204.3	1350.8	1301.1
LHV (Dry) (Btu/ft <sup>3</sup> )	27	27	0	836.8	908.0	885.9
LHV (Sat.) (Btu/ft <sup>3</sup> )	27	27	0	822.5	892.5	870.8
Real Gas Density (lbs/ft <sup>3</sup> )	27	27	0	0.0427	0.0456	0.0451
Methane Number	27	27	0	108.40	108	

BDL = Below Detection Limit



## Major Component Analysis by ASTM D1945 / D1946 Summary Statistics, Continued

<b>Component</b>	<b>Detection Limit</b>	<b>Average Mol %</b>	<b>Median Mol %</b>	<b>std dev Mol %</b>	<b>Variance</b>	<b>Standard Error</b>
Ammonia	0.001	BDL	BDL			
Helium	0.1	BDL	BDL			
Carbon Dioxide	0.03	1.55	1.70	0.59	0.35	0.11
Oxygen/Argon	0.03	0.22	0.18	0.12	0.01	0.02
Nitrogen	0.03	2.71	2.45	1.38	1.91	0.27
Carbon Monoxide	0.03	BDL	BDL			
Total Inerts + Diluents		4.47	4.49	1.62	2.63	0.31
Hydrogen	0.1	0.33	0.33	0.23	0.05	0.04
Methane	0.002	95.20	95.34	1.71	2.94	0.33
Ethane	0.002	BDL	BDL			
Ethene	0.002	BDL	BDL			
Ethyne	0.002	BDL	BDL			
Propane	0.002	BDL	BDL			
Propene	0.002	BDL	BDL			
Propadiene	0.002	BDL	BDL			
Propyne	0.002	BDL	BDL			
i-Butane	0.002	BDL	BDL			
n-Butane	0.002	BDL	BDL			
1-Butene	0.002	BDL	BDL			
i-Butene	0.002	BDL	BDL			
trans-2-Butene	0.002	BDL	BDL			
cis-2-Butene	0.002	BDL	BDL			
1,3-Butadiene	0.002	BDL	BDL			
i-Pentane	0.002	BDL	BDL			
n-Pentane	0.002	BDL	BDL			
neo-Pentane	0.002	BDL	BDL			
Pentenes	0.002	BDL	BDL			
Hexane Plus	0.0001	0.0003	0.0002	0.0004	1.37E-07	0.00007

### Calculated Real Gas Properties

----- 60 °F, 14.73 psia -----

Relative Density (Specific Gravity) (Dry)	0.5806	0.5824	0.0086	7.47E-05	0.0017
HHV (Dry) (Btu/ft <sup>3</sup> )	966.8	968.2	17.1	291.2	3.3
HHV (Sat.) (Btu/ft <sup>3</sup> )	950.2	951.7	16.8	281.3	3.2
Wobbe Number	1269.0	1267.7	31.4	987.2	6.0
LHV (Dry) (Btu/ft <sup>3</sup> )	870.4	871.7	15.4	236.6	3.0
LHV (Sat.) (Btu/ft <sup>3</sup> )	855.5	856.8	15.1	228.6	2.9
Real Gas Density (lbs/ft <sup>3</sup> )	0.0444	0.0446	0.0007	4.38E-07	0.0001
Methane Number	108	108	0.01	0.000	0.001

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID Summary Statistics

Component	Detection Limit	total # of samples analyzed	total # of hits	% that are BDL	Min value ppmv	Max value ppmv	0.90 Percentile ppmv
<b>C5-C7 Cycloalkanes</b>		<b>27</b>	<b>5</b>	<b>81</b>	<b>BDL</b>	<b>2</b>	<b>1</b>
Cyclopentane	1	27	3	89	BDL	1	BDL
Methylcyclopentane	1	27	1	96	BDL	1	BDL
Cyclohexane	1	27	2	93	BDL	1	BDL
Methylcyclohexane	1	27	1	96	BDL	1	BDL
<b>Heavier Aromatics</b>		<b>27</b>	<b>3</b>	<b>89</b>	<b>BDL</b>	<b>1</b>	<b>BDL</b>
C3 Benzenes	1	27	3	89	BDL	1	BDL
C1 Naphthalenes	1	27	0	100	BDL	BDL	BDL
C2 Naphthalenes	1	27	0	100	BDL	BDL	BDL
<b>C6+ Hydrocarbons</b>		<b>27</b>	<b>19</b>	<b>30</b>	<b>BDL</b>	<b>10</b>	<b>7</b>
Hexanes	1	27	8	70	BDL	4	2
Heptanes	1	27	3	89	BDL	2	BDL
2,2,4-Trimethylpentane	1	27	0	100	BDL	BDL	BDL
Octanes	1	27	4	85	BDL	1	1
Nonanes	1	27	3	89	BDL	2	BDL
Decanes	1	27	13	52	BDL	4	3
Undecanes	1	27	7	74	BDL	2	1
Dodecanes	1	27	0	100	BDL	BDL	BDL
Tridecanes	1	27	0	100	BDL	BDL	BDL
Tetradecanes	1	27	0	100	BDL	BDL	BDL
Pentadecanes	1	27	0	100	BDL	BDL	BDL
Hexadecanes	1	27	0	100	BDL	BDL	BDL
Heptadecanes	1	27	0	100	BDL	BDL	BDL
Octadecanes	1	27	0	100	BDL	BDL	BDL
Nonadecanes	1	27	0	100	BDL	BDL	BDL
Eicosanes +	1	27	0	100	BDL	BDL	BDL

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID Summary Statistics, Continued

Component	Detection Limit	Average ppmv	Median ppmv	std dev ppmv	Variance	Standard Error
<b>C5-C7 Cycloalkanes</b>		BDL	BDL	0.4	0.2	0.08
Cyclopentane	1	BDL	BDL			
Methylcyclopentane	1	BDL	BDL			
Cyclohexane	1	BDL	BDL			
Methylcyclohexane	1	BDL	BDL			
<b>Heavier Aromatics</b>		BDL	BDL			
C3 Benzenes	1	BDL	BDL			
C1 Naphthalenes	1	BDL	BDL			
C2 Naphthalenes	1	BDL	BDL			
<b>C6+ Hydrocarbons</b>		2.4	1	2.7	7.2	0.52
Hexanes	1	0.9	BDL	0.9	0.7	0.16
Heptanes	1	BDL	BDL			
2,2,4-Trimethylpentane	1	BDL	BDL			
Octanes	1	BDL	BDL	0.2	0.03	0.03
Nonanes	1	BDL	BDL			
Decanes	1	1.1	BDL	1.1	1.2	0.21
Undecanes	1	0.7	BDL	0.4	0.2	0.08
Dodecanes	1	BDL	BDL			
Tridecanes	1	BDL	BDL			
Tetradecanes	1	BDL	BDL			
Pentadecanes	1	BDL	BDL			
Hexadecanes	1	BDL	BDL			
Heptadecanes	1	BDL	BDL			
Octadecanes	1	BDL	BDL			
Nonadecanes	1	BDL	BDL			
Eicosanes +	1	BDL	BDL			

BDL = Below Detection Limit

## Trace Sulfur Analysis by ASTM D6228 Summary Statistics

Component	total # of samples analyzed	total # of hits	% that are BDL	Min value ppmv	Max value ppmv	0.90 Percentile ppmv
Hydrogen Sulfide	27	0	100	BDL	BDL	BDL
Sulfur Dioxide	27	2	93	BDL	0.25	BDL
Carbonyl Sulfide	27	3	89	BDL	0.08	BDL
Carbon Disulfide	27	0	100	BDL	BDL	BDL
Methyl Mercaptan	27	0	100	BDL	BDL	BDL
Ethyl Mercaptan	27	0	100	BDL	BDL	BDL
i-Propyl Mercaptan	27	0	100	BDL	BDL	BDL
n-Propyl Mercaptan	27	0	100	BDL	BDL	BDL
t-Butyl Mercaptan	27	0	100	BDL	BDL	BDL
Dimethyl Sulfide	27	9	67	BDL	5.45	2.82
Methyl Ethyl Sulfide	27	0	100	BDL	BDL	BDL
Diethyl Sulfide	27	0	100	BDL	BDL	BDL
Di-t-Butyl Sulfide	27	0	100	BDL	BDL	BDL
Dimethyl Disulfide	27	0	100	BDL	BDL	BDL
Methyl Ethyl Disulfide	27	0	100	BDL	BDL	BDL
Methyl i-Propyl Disulfide	27	0	100	BDL	BDL	BDL
Diethyl Disulfide	27	0	100	BDL	BDL	BDL
Methyl n-Propyl Disulfide	27	0	100	BDL	BDL	BDL
Methyl t-Butyl Disulfide	27	0	100	BDL	BDL	BDL
Ethyl i-Propyl Disulfide	27	0	100	BDL	BDL	BDL
Ethyl n-Propyl Disulfide	27	0	100	BDL	BDL	BDL
Ethyl t-Butyl Disulfide	27	0	100	BDL	BDL	BDL
Di-i-Propyl Disulfide	27	0	100	BDL	BDL	BDL
i-Propyl n-Propyl Disulfide	27	0	100	BDL	BDL	BDL
Di-n-Propyl Disulfide	27	0	100	BDL	BDL	BDL
i-Propyl t-Butyl Disulfide	27	0	100	BDL	BDL	BDL
n-Propyl t-Butyl Disulfide	27	0	100	BDL	BDL	BDL
Di-t-Butyl Disulfide	27	0	100	BDL	BDL	BDL
Dimethyl Trisulfide	27	0	100	BDL	BDL	BDL
Diethyl Trisulfide	27	0	100	BDL	BDL	BDL
Di-t-Butyl Trisulfide	27	0	100	BDL	BDL	BDL
Thiophene	27	0	100	BDL	BDL	BDL
C1-Thiophenes	27	0	100	BDL	BDL	BDL
C2-Thiophenes	27	0	100	BDL	BDL	BDL
C3-Thiophenes	27	0	100	BDL	BDL	BDL
Benzothiophene	27	0	100	BDL	BDL	BDL
C1-Benzothiophenes	27	0	100	BDL	BDL	BDL
C2-Benzothiophenes	27	0	100	BDL	BDL	BDL
Thiophane	27	0	100	BDL	BDL	BDL
Thiophenol	27	0	100	BDL	BDL	BDL
Total Sulfur as molar PPM S	27	14	48	BDL	5.45	2.82
As Grains/100 SCF @ 14.73 psia, 60°F	27	14	48	BDL	0.32	0.17

Detection Limit = 0.05 ppmv S

## Trace Sulfur Analysis by ASTM D6228 Summary Statistics, Continued

Component	Average ppmv	Median ppmv	std dev ppmv	Variance	Standard Error
Hydrogen Sulfide	BDL	BDL			
Sulfur Dioxide	BDL	BDL			
Carbonyl Sulfide	BDL	BDL			
Carbon Disulfide	BDL	BDL			
Methyl Mercaptan	BDL	BDL			
Ethyl Mercaptan	BDL	BDL			
i-Propyl Mercaptan	BDL	BDL			
n-Propyl Mercaptan	BDL	BDL			
t-Butyl Mercaptan	BDL	BDL			
Dimethyl Sulfide	<b>0.73</b>	BDL	<b>1.67</b>	<b>2.78</b>	<b>0.32</b>
Methyl Ethyl Sulfide	BDL	BDL			
Diethyl Sulfide	BDL	BDL			
Di-t-Butyl Sulfide	BDL	BDL			
Dimethyl Disulfide	BDL	BDL			
Methyl Ethyl Disulfide	BDL	BDL			
Methyl i-Propyl Disulfide	BDL	BDL			
Diethyl Disulfide	BDL	BDL			
Methyl n-Propyl Disulfide	BDL	BDL			
Methyl t-Butyl Disulfide	BDL	BDL			
Ethyl i-Propyl Disulfide	BDL	BDL			
Ethyl n-Propyl Disulfide	BDL	BDL			
Ethyl t-Butyl Disulfide	BDL	BDL			
Di-i-Propyl Disulfide	BDL	BDL			
i-Propyl n-Propyl Disulfide	BDL	BDL			
Di-n-Propyl Disulfide	BDL	BDL			
i-Propyl t-Butyl Disulfide	BDL	BDL			
n-Propyl t-Butyl Disulfide	BDL	BDL			
Di-t-Butyl Disulfide	BDL	BDL			
Dimethyl Trisulfide	BDL	BDL			
Diethyl Trisulfide	BDL	BDL			
Di-t-Butyl Trisulfide	BDL	BDL			
Thiophene	BDL	BDL			
C1-Thiophenes	BDL	BDL			
C2-Thiophenes	BDL	BDL			
C3-Thiophenes	BDL	BDL			
Benzothiophene	BDL	BDL			
C1-Benzothiophenes	BDL	BDL			
C2-Benzothiophenes	BDL	BDL			
Thiophane	BDL	BDL			
Thiophenol	BDL	BDL			
Total Sulfur as molar PPM S	<b>0.75</b>	<b>0.07</b>	<b>1.66</b>	<b>2.75</b>	<b>0.32</b>
As Grains/100 SCF @ 14.73 psia, 60°F	<b>0.04</b>	<b>0.00</b>	<b>0.10</b>	<b>0.01</b>	<b>0.02</b>
Detection Limit = 0.05 ppmv S					

## TO-14 Halocarbon and Volatile Organic Compound Analysis Summary Statistics

Component	Detection Limit	total # of		% that are BDL	Min value ppmv	Max value ppmv	0.90 Percentile ppmv
		samples analyzed	total # of hits				
Dichlorodifluoromethane (CFC-12)	0.10	27	6	78	BDL	2.30	0.98
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	27	0	100	BDL	BDL	BDL
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	27	0	100	BDL	BDL	BDL
Trichlorofluoromethane (CFC-11)	0.10	27	0	100	BDL	BDL	BDL
Chloromethane	0.10	27	0	100	BDL	BDL	BDL
Dichloromethane (Methylene Chloride)	0.10	27	0	100	BDL	BDL	BDL
Chloroform	0.10	27	0	100	BDL	BDL	BDL
Carbon Tetrachloride	0.10	27	0	100	BDL	BDL	BDL
Chloroethane	0.10	27	3	89	BDL	0.31	0.15
1,1-Dichloroethane	0.10	27	0	100	BDL	BDL	BDL
1,2-Dichloroethane	0.10	27	0	100	BDL	BDL	BDL
1,1,1-Trichloroethane	0.10	27	0	100	BDL	BDL	BDL
1,1,2-Trichloroethane	0.10	27	0	100	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	0.10	27	0	100	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	0.10	27	0	100	BDL	BDL	BDL
Hexachloroethane	0.10	27	0	100	BDL	BDL	BDL
Chloroethene (Vinylchloride)	0.10	27	0	100	BDL	BDL	BDL
1,1-Dichloroethene	0.10	27	0	100	BDL	BDL	BDL
cis-1,2-Dichloroethene	0.10	27	0	100	BDL	BDL	BDL
trans-1,2-Dichloroethene	0.10	27	0	100	BDL	BDL	BDL
Trichloroethene	0.10	27	0	100	BDL	BDL	BDL
Tetrachloroethene	0.10	27	0	100	BDL	BDL	BDL
1,2-Dichloropropane	0.10	27	0	100	BDL	BDL	BDL
2,2-Dichloropropane	0.10	27	0	100	BDL	BDL	BDL
1,2,3-Trichloropropane	0.10	27	0	100	BDL	BDL	BDL
3-Chloropropene	0.10	27	0	100	BDL	BDL	BDL
1,1-Dichloropropene	0.10	27	0	100	BDL	BDL	BDL
cis-1,3-Dichloropropene	0.10	27	0	100	BDL	BDL	BDL
trans-1,3-Dichloropropene	0.10	27	0	100	BDL	BDL	BDL
Hexachloro-1,3-butadiene	0.10	27	0	100	BDL	BDL	BDL
Chlorobenzene	0.10	27	0	100	BDL	BDL	BDL
1,2-Dichlorobenzene	0.10	27	0	100	BDL	BDL	BDL
1,3-Dichlorobenzene	0.10	27	0	100	BDL	BDL	BDL
1,4-Dichlorobenzene	0.10	27	0	100	BDL	BDL	BDL
1,2,3-Trichlorobenzene	0.10	27	0	100	BDL	BDL	BDL
1,2,4-Trichlorobenzene	0.10	27	0	100	BDL	BDL	BDL
2-Chlorotoluene	0.10	27	0	100	BDL	BDL	BDL
4-Chlorotoluene	0.10	27	0	100	BDL	BDL	BDL
Bromomethane	0.10	27	0	100	BDL	BDL	BDL
Dibromomethane	0.10	27	0	100	BDL	BDL	BDL
Bromoform	0.10	27	0	100	BDL	BDL	BDL
Bromochloromethane	0.10	27	0	100	BDL	BDL	BDL
Bromodichloromethane	0.10	27	0	100	BDL	BDL	BDL
Dibromochloromethane	0.10	27	0	100	BDL	BDL	BDL
1,2-Dibromoethane	0.10	27	0	100	BDL	BDL	BDL

## TO-14 Halocarbon and Volatile Organic Compound Analysis Summary Statistics

Component	Detection Limit	total # of		% that are BDL	Min value ppmv	Max value ppmv	0.90 Percentile ppmv
		samples analyzed	total # of hits				
Bromochloroethane	0.10	27	0	100	BDL	BDL	BDL
1,2-Dibromo-3-chloropropene	0.10	27	0	100	BDL	BDL	BDL
Bromobenzene	0.10	27	0	100	BDL	BDL	BDL
1,3-Butadiene	1.0	27	0	100	BDL	BDL	BDL
Acrylonitrile	1.0	27	0	100	BDL	BDL	BDL
Benzene	1.0	27	0	100	BDL	BDL	BDL
Toluene	1.0	27	3	89	BDL	1.4	BDL
Ethylbenzene	1.0	27	0	100	BDL	BDL	BDL
m,p-Xylene	1.0	27	2	93	BDL	1.0	BDL
o-Xylene	1.0	27	0	100	BDL	BDL	BDL
Styrene	1.0	27	0	100	BDL	BDL	BDL
i-Propylbenzene	1.0	27	0	100	BDL	BDL	BDL
4-Ethyltoluene	1.0	27	0	100	BDL	BDL	BDL
n-Propylbenzene	1.0	27	0	100	BDL	BDL	BDL
1,3,5-Trimethylbenzene	1.0	27	0	100	BDL	BDL	BDL
t-Butylbenzene	1.0	27	0	100	BDL	BDL	BDL
1,2,4-Trimethylbenzene	1.0	27	0	100	BDL	BDL	BDL
s-Butylbenzene	1.0	27	0	100	BDL	BDL	BDL
p-Isopropyltoluene	1.0	27	0	100	BDL	BDL	BDL
n-Butylbenzene	1.0	27	0	100	BDL	BDL	BDL
Naphthalene	1.0	27	0	100	BDL	BDL	BDL
Pyridine	1.0	27	0	100	BDL	BDL	BDL
Nitrobenzene	1.0	27	0	100	BDL	BDL	BDL

BDL = Below Detection Limit

## TO-14 Halocarbon and Volatile Organic Compound Analysis Summary Statistics, Continued

Component	Detection Limit	Average ppmv	Median ppmv	std dev ppmv	Variance	Standard Error
Dichlorodifluoromethane (CFC-12)	0.10	<b>0.31</b>	<b>0.05</b>	<b>0.70</b>	<b>0.49</b>	<b>0.13</b>
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	BDL	BDL			
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	BDL	BDL			
Trichlorofluoromethane (CFC-11)	0.10	BDL	BDL			
Chloromethane	0.10	BDL	BDL			
Dichloromethane (Methylene Chloride)	0.10	BDL	BDL			
Chloroform	0.10	BDL	BDL			
Carbon Tetrachloride	0.10	BDL	BDL			
Chloroethane	0.10	BDL	BDL			
1,1-Dichloroethane	0.10	BDL	BDL			
1,2-Dichloroethane	0.10	BDL	BDL			
1,1,1-Trichloroethane	0.10	BDL	BDL			
1,1,2-Trichloroethane	0.10	BDL	BDL			
1,1,1,2-Tetrachloroethane	0.10	BDL	BDL			
1,1,2,2-Tetrachloroethane	0.10	BDL	BDL			
Hexachloroethane	0.10	BDL	BDL			
Chloroethene (Vinylchloride)	0.10	BDL	BDL			
1,1-Dichloroethene	0.10	BDL	BDL			
cis-1,2-Dichloroethene	0.10	BDL	BDL			
trans-1,2-Dichloroethene	0.10	BDL	BDL			
Trichloroethene	0.10	BDL	BDL			
Tetrachloroethene	0.10	BDL	BDL			
1,2-Dichloropropane	0.10	BDL	BDL			
2,2-Dichloropropane	0.10	BDL	BDL			
1,2,3-Trichloropropane	0.10	BDL	BDL			
3-Chloropropene	0.10	BDL	BDL			
1,1-Dichloropropene	0.10	BDL	BDL			
cis-1,3-Dichloropropene	0.10	BDL	BDL			
trans-1,3-Dichloropropene	0.10	BDL	BDL			
Hexachloro-1,3-butadiene	0.10	BDL	BDL			
Chlorobenzene	0.10	BDL	BDL			
1,2-Dichlorobenzene	0.10	BDL	BDL			
1,3-Dichlorobenzene	0.10	BDL	BDL			
1,4-Dichlorobenzene	0.10	BDL	BDL			
1,2,3-Trichlorobenzene	0.10	BDL	BDL			
1,2,4-Trichlorobenzene	0.10	BDL	BDL			
2-Chlorotoluene	0.10	BDL	BDL			
4-Chlorotoluene	0.10	BDL	BDL			
Bromomethane	0.10	BDL	BDL			
Dibromomethane	0.10	BDL	BDL			
Bromoform	0.10	BDL	BDL			
Bromochloromethane	0.10	BDL	BDL			
Bromodichloromethane	0.10	BDL	BDL			
Dibromochloromethane	0.10	BDL	BDL			
1,2-Dibromoethane	0.10	BDL	BDL			



## TO-14 Halocarbon and Volatile Organic Compound Analysis Summary Statistics, Continued

Component	Detection Limit	Average ppmv	Median ppmv	std dev ppmv	Variance	Standard Error
Bromochloroethane	0.10	BDL	BDL			
1,2-Dibromo-3-chloropropene	0.10	BDL	BDL			
Bromobenzene	0.10	BDL	BDL			
1,3-Butadiene	1.0	BDL	BDL			
Acrylonitrile	1.0	BDL	BDL			
Benzene	1.0	BDL	BDL			
Toluene	1.0	BDL	BDL			
Ethylbenzene	1.0	BDL	BDL			
m,p-Xylene	1.0	BDL	BDL			
o-Xylene	1.0	BDL	BDL			
Styrene	1.0	BDL	BDL			
i-Propylbenzene	1.0	BDL	BDL			
4-Ethyltoluene	1.0	BDL	BDL			
n-Propylbenzene	1.0	BDL	BDL			
1,3,5-Trimethylbenzene	1.0	BDL	BDL			
t-Butylbenzene	1.0	BDL	BDL			
1,2,4-Trimethylbenzene	1.0	BDL	BDL			
s-Butylbenzene	1.0	BDL	BDL			
p-Isopropyltoluene	1.0	BDL	BDL			
n-Butylbenzene	1.0	BDL	BDL			
Naphthalene	1.0	BDL	BDL			
Pyridine	1.0	BDL	BDL			
Nitrobenzene	1.0	BDL	BDL			

BDL = Below Detection Limit

## Semi-Volatile Organic Compound Analysis Summary Statistics

Component	detection limit	total # of samples analyzed	total # of hits	% that are BDL	Min value ppbv	Max value ppbv	Average ppbv
N-nitrosodimethylamine	1	27	0	100	BDL	BDL	BDL
Phenol	1	27	0	100	BDL	BDL	BDL
Aniline	1	27	0	100	BDL	BDL	BDL
Bis(2-Chloroethyl) ether	1	27	0	100	BDL	BDL	BDL
2-Chlorophenol	1	27	0	100	BDL	BDL	BDL
Benzyl Alcohol	1	27	0	100	BDL	BDL	BDL
2-methylphenol	1	27	0	100	BDL	BDL	BDL
bis(2-chloroisopropyl)ether	1	27	0	100	BDL	BDL	BDL
N-Nitroso-di-n-propylamine	1	27	0	100	BDL	BDL	BDL
4-methylphenol/3-methylphenol	1	27	0	100	BDL	BDL	BDL
Isophorone	1	27	0	100	BDL	BDL	BDL
2-nitrophenol	1	27	0	100	BDL	BDL	BDL
2,4-dimethylphenol	1	27	0	100	BDL	BDL	BDL
Bis(2-chloroethoxy)methane	1	27	0	100	BDL	BDL	BDL
2,4-dichlorophenol	1	27	0	100	BDL	BDL	BDL
4-Chloroaniline	1	27	0	100	BDL	BDL	BDL
4-chloro-3-methylphenol	1	27	0	100	BDL	BDL	BDL
2-methylnaphthalene	1	27	0	100	BDL	BDL	BDL
1-methylnaphthalene	1	27	0	100	BDL	BDL	BDL
Hexachlorocyclopentadiene	1	27	0	100	BDL	BDL	BDL
2,4,6-trichlorophenol	1	27	0	100	BDL	BDL	BDL
2,4,5-trichlorophenol	1	27	0	100	BDL	BDL	BDL
2-chloronaphthalene	1	27	0	100	BDL	BDL	BDL
2-Nitroaniline	1	27	0	100	BDL	BDL	BDL
1,4-dinitrobenzene	1	27	0	100	BDL	BDL	BDL
Dimethyl phthalate	1	27	0	100	BDL	BDL	BDL
1,3-dinitrobenzene	1	27	0	100	BDL	BDL	BDL
2,6-dinitrotoluene	1	27	0	100	BDL	BDL	BDL
Acenaphthylene	1	27	0	100	BDL	BDL	BDL
1,2-Dinitrobenzene	1	27	0	100	BDL	BDL	BDL
3-Nitroaniline	1	27	0	100	BDL	BDL	BDL
Acenaphthene	1	27	0	100	BDL	BDL	BDL
2,4-dinitrophenol	1	27	0	100	BDL	BDL	BDL
4-nitrophenol	1	27	0	100	BDL	BDL	BDL
Dibenzofuran	1	27	0	100	BDL	BDL	BDL
2,4-dinitrotoluene	1	27	0	100	BDL	BDL	BDL
2,3,4,6-Tetrachlorophenol	1	27	0	100	BDL	BDL	BDL
2,3,5,6-Tetrachlorophenol	1	27	0	100	BDL	BDL	BDL
Diethyl Phthalate	1	27	0	100	BDL	BDL	BDL

## Semi-Volatile Organic Compound Analysis Summary Statistics

Component	detection limit	total # of		% that are BDL	Min value ppbv	Max value ppbv	Average ppbv
		samples analyzed	total # of hits				
Fluorene	1	27	0	100	BDL	BDL	BDL
4-chlorophenyl phenyl ether	1	27	0	100	BDL	BDL	BDL
4-Nitroaniline	1	27	0	100	BDL	BDL	BDL
4,6-dinitro-2-methylphenol	1	27	0	100	BDL	BDL	BDL
Diphenylamine	1	27	0	100	BDL	BDL	BDL
n-Nitrosodiphenylamine	1	27	0	100	BDL	BDL	BDL
Azobenzene	1	27	0	100	BDL	BDL	BDL
4-Bromophenyl phenyl ether	1	27	0	100	BDL	BDL	BDL
Hexachlorobenzene	1	27	0	100	BDL	BDL	BDL
Pentachlorophenol	1	27	0	100	BDL	BDL	BDL
Phenanthrene	1	27	0	100	BDL	BDL	BDL
Anthracene	1	27	0	100	BDL	BDL	BDL
Carbazole	1	27	0	100	BDL	BDL	BDL
Di-n-butyl phthalate	1	27	15	44	BDL	4.3	1.3
Fluoranthene	1	27	0	100	BDL	BDL	BDL
Pyrene	1	27	0	100	BDL	BDL	BDL
Benzyl butyl phthalate	1	27	0	100	BDL	BDL	BDL
Bis(2-ethylhexyl)adipate	1	27	0	100	BDL	BDL	BDL
Benzo(a)anthracene	1	27	0	100	BDL	BDL	BDL
Chrysene	1	27	0	100	BDL	BDL	BDL
Bis(2-ethylhexyl)phthalate	1	27	4	85	BDL	3.4	BDL
Di-n-octyl phthalate	1	27	0	100	BDL	BDL	BDL
Benzo(b)fluoranthene	1	27	0	100	BDL	BDL	BDL
Benzo(k)fluoranthene	1	27	0	100	BDL	BDL	BDL
Benzo(a)pyrene	1	27	0	100	BDL	BDL	BDL
Indeno(1,2,3-cd)pyrene	1	27	0	100	BDL	BDL	BDL
Dibenzo(a,h)anthracene	1	27	0	100	BDL	BDL	BDL
Benzo[g,h,i]perylene	1	27	0	100	BDL	BDL	BDL

## Semi-Volatile Organic Compound Analysis Summary Statistics, Continued

Component	detection limit	Median ppbv	std dev ppbv	Variance	Standard Error	0.90 Percentile ppbv
N-nitrosodimethylamine	1	BDL				BDL
Phenol	1	BDL				BDL
Aniline	1	BDL				BDL
Bis(2-Chloroethyl) ether	1	BDL				BDL
2-Chlorophenol	1	BDL				BDL
Benzyl Alcohol	1	BDL				BDL
2-methylphenol	1	BDL				BDL
bis(2-chloroisopropyl)ether	1	BDL				BDL
N-Nitroso-di-n-propylamine	1	BDL				BDL
4-methylphenol/3-methylphenol	1	BDL				BDL
Isophorone	1	BDL				BDL
2-nitrophenol	1	BDL				BDL
2,4-dimethylphenol	1	BDL				BDL
Bis(2-chloroethoxy)methane	1	BDL				BDL
2,4-dichlorophenol	1	BDL				BDL
4-Chloroaniline	1	BDL				BDL
4-chloro-3-methylphenol	1	BDL				BDL
2-methylnaphthalene	1	BDL				BDL
1-methylnaphthalene	1	BDL				BDL
Hexachlorocyclopentadiene	1	BDL				BDL
2,4,6-trichlorophenol	1	BDL				BDL
2,4,5-trichlorophenol	1	BDL				BDL
2-chloronaphthalene	1	BDL				BDL
2-Nitroaniline	1	BDL				BDL
1,4-dinitrobenzene	1	BDL				BDL
Dimethyl phthalate	1	BDL				BDL
1,3-dinitrobenzene	1	BDL				BDL
2,6-dinitrotoluene	1	BDL				BDL
Acenaphthylene	1	BDL				BDL
1,2-Dinitrobenzene	1	BDL				BDL
3-Nitroaniline	1	BDL				BDL
Acenaphthene	1	BDL				BDL
2,4-dinitrophenol	1	BDL				BDL
4-nitrophenol	1	BDL				BDL
Dibenzofuran	1	BDL				BDL
2,4-dinitrotoluene	1	BDL				BDL
2,3,4,6-Tetrachlorophenol	1	BDL				BDL
2,3,5,6-Tetrachlorophenol	1	BDL				BDL
Diethyl Phthalate	1	BDL				BDL

## Semi-Volatile Organic Compound Analysis Summary Statistics, Continued

Component	detection limit	Median ppbv	std dev ppbv	Variance	Standard Error	0.90 Percentile ppbv
Fluorene	1	BDL				BDL
4-chlorophenyl phenyl ether	1	BDL				BDL
4-Nitroaniline	1	BDL				BDL
4,6-dinitro-2-methylphenol	1	BDL				BDL
Diphenylamine	1	BDL				BDL
n-Nitrosodiphenylamine	1	BDL				BDL
Azobenzene	1	BDL				BDL
4-Bromophenyl phenyl ether	1	BDL				BDL
Hexachlorobenzene	1	BDL				BDL
Pentachlorophenol	1	BDL				BDL
Phenanthrene	1	BDL				BDL
Anthracene	1	BDL				BDL
Carbazole	1	BDL				BDL
Di-n-butyl phthalate	1	<b>1.0</b>	<b>1.06</b>	<b>1.12</b>	<b>0.20</b>	<b>1.10</b>
Fluoranthene	1	BDL				BDL
Pyrene	1	BDL				BDL
Benzyl butyl phthalate	1	BDL				BDL
Bis(2-ethylhexyl)adipate	1	BDL				BDL
Benzo(a)anthracene	1	BDL				BDL
Chrysene	1	BDL				BDL
Bis(2-ethylhexyl)phthalate	1	BDL	<b>0.56</b>	<b>0.32</b>	<b>0.11</b>	BDL
Di-n-octyl phthalate	1	BDL				BDL
Benzo(b)fluoranthene	1	BDL				BDL
Benzo(k)fluoranthene	1	BDL				BDL
Benzo(a)pyrene	1	BDL				BDL
Indeno(1,2,3-cd)pyrene	1	BDL				BDL
Dibenzo(a,h)anthracene	1	BDL				BDL
Benzo[g,h,i]perylene	1	BDL				BDL

## Aldehyde and Ketone Compounds Summary Statistics

<b>Component</b>	<b>detection limit</b>	<b>samples analyzed</b>	<b>total # of hits</b>	<b>% that are BDL</b>	<b>Min value ppbv</b>	<b>Max value ppbv</b>	<b>0.90 Percentile ppbv</b>
Formaldehyde	10	27	12	56	BDL	57	21
Acetaldehyde	7	27	18	33	BDL	147	67
Acetone	5	27	24	11	BDL	522	285
Acrolein (2-propenal)	6	27	0	100	BDL	BDL	BDL
Propionaldehyde	5	27	1	96	BDL	10	BDL
Crotonaldehyde	5	27	6	78	BDL	54	9
2-Butanone (MEK)	5	27	19	30	BDL	96	52
Methacrolein (Isobutenal)	5	27	0	100	BDL	BDL	BDL
Butyraldehyde (Butanal)	5	27	1	96	BDL	69	BDL
Benzaldehyde	5	27	0	100	BDL	BDL	BDL
Valeraldehyde (Pentanal)	5	27	3	89	BDL	107	BDL
p-Tolualdehyde	5	27	3	89	BDL	11	BDL
Hexanaldehyde (Hexanal)	5	27	2	93	BDL	250	BDL

## Aldehyde and Ketone Compounds Summary Statistics, Continued

<b>Component</b>	<b>detection limit</b>	<b>Average ppbv</b>	<b>Median ppbv</b>	<b>std dev ppbv</b>	<b>Variance</b>	<b>Standard Error</b>
Formaldehyde	10	<b>11</b>	<b>BDL</b>	<b>12</b>	<b>140</b>	<b>BDL</b>
Acetaldehyde	7	<b>23</b>	<b>11</b>	<b>31</b>	<b>983</b>	<b>BDL</b>
Acetone	5	<b>88</b>	<b>26</b>	<b>145</b>	<b>20929</b>	<b>BDL</b>
Acrolein (2-propenal)	6	<b>BDL</b>	<b>BDL</b>			
Propionaldehyde	5	<b>BDL</b>	<b>BDL</b>			
Crotonaldehyde	5	<b>6</b>	<b>BDL</b>	<b>11</b>	<b>112</b>	<b>BDL</b>
2-Butanone (MEK)	5	<b>20</b>	<b>15</b>	<b>26</b>	<b>687</b>	<b>BDL</b>
Methacrolein (Isobutenal)	5	<b>BDL</b>	<b>BDL</b>			
Butyraldehyde (Butanal)	5	<b>BDL</b>	<b>BDL</b>			
Benzaldehyde	5	<b>BDL</b>	<b>BDL</b>			
Valeraldehyde (Pentanal)	5	<b>7</b>	<b>BDL</b>			
p-Tolualdehyde	5	<b>BDL</b>	<b>BDL</b>			
Hexanaldehyde (Hexanal)	5	<b>13</b>	<b>BDL</b>			

## Target Organic Silicon, including Siloxanes Summary Statistics

Component	Detection Limit	total # of		% that are BDL	Min value mg Si / m <sup>3</sup>	Max value mg Si / m <sup>3</sup>	0.90
		samples analyzed	total # of hits				Percentile mg Si / m <sup>3</sup>
1,1,3,3-Tetramethyldisiloxane	0.1	27	0	100	BDL	BDL	BDL
Pentamethyldisiloxane	0.1	27	0	100	BDL	BDL	BDL
Hexamethyldisilane	0.1	27	0	100	BDL	BDL	BDL
Hexamethyldisiloxane (L2, MM)	0.1	27	0	100	BDL	BDL	BDL
Octamethyltrisiloxane (L3, MDM)	0.1	27	0	100	BDL	BDL	BDL
Octamethylcyclotetrasiloxane (D4)	0.1	27	5	81	BDL	0.4	0.18
Decamethyltetrasiloxane (L4, MD2M)	0.1	27	0	100	BDL	BDL	BDL
Decamethylcyclopentasiloxane (D5)	0.1	27	0	100	BDL	BDL	BDL
Dodecamethylpentasiloxane (L5, MD3M)	0.1	27	0	100	BDL	BDL	BDL
Dodecamethylcyclohexasiloxane (D6)	0.1	27	0	100	BDL	BDL	BDL

BDL = Below Detection Limit



## Target Siloxanes Summary Statistics, Continued

Component	Detection Limit	Average mg Si / m <sup>3</sup>	Median mg Si / m <sup>3</sup>	std dev mg Si / m <sup>3</sup>	Variance	Standard Error
1,1,3,3-Tetramethyldisiloxane	0.1	BDL	BDL			
Pentamethyldisiloxane	0.1	BDL	BDL			
Hexamethyldisilane	0.1	BDL	BDL			
Hexamethyldisiloxane (L2, MM)	0.1	BDL	BDL			
Octamethyltrisiloxane (L3, MDM)	0.1	BDL	BDL			
Octamethylcyclotetrasiloxane (D4)	0.1	<b>0.09</b>	BDL	<b>0.09</b>	<b>0.01</b>	<b>0.02</b>
Decamethyltetrasiloxane (L4, MD2M)	0.1	BDL	BDL			
Decamethylcyclopentasiloxane (D5)	0.1	BDL	BDL			
Dodecamethylpentasiloxane (L5, MD3M)	0.1	BDL	BDL			
Dodecamethylcyclohexasiloxane (D6)	0.1	BDL	BDL			

BDL = Below Detection Limit

## Volatile Metals Analysis Summary Statistics

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	samples analyzed	total # of hits	% that are BDL	Min value $\mu\text{g}/\text{m}^3$	Max value $\mu\text{g}/\text{m}^3$	0.90 Percentile $\mu\text{g}/\text{m}^3$
Mercury	0.01	25	6	76	BDL	0.05	0.04

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	samples analyzed	total # of hits	% that are BDL	Min value $\mu\text{g}/\text{m}^3$	Max value $\mu\text{g}/\text{m}^3$	0.90 Percentile $\mu\text{g}/\text{m}^3$
Arsenic	30	27	0	100	BDL	BDL	BDL
Barium	30	27	0	100	BDL	BDL	BDL
Beryllium	30	27	0	100	BDL	BDL	BDL
Cadmium	30	27	0	100	BDL	BDL	BDL
Cobalt	30	27	0	100	BDL	BDL	BDL
Chromium	30	27	1	96	BDL	175	BDL
Copper *	30	27	3	89	BDL	118	BDL
Manganese	30	27	1	96	BDL	65	BDL
Molybdenum	30	27	0	100	BDL	BDL	BDL
Nickel	30	27	0	100	BDL	BDL	BDL
Lead	30	27	3	89	BDL	155	BDL
Antimony	30	27	1	96	BDL	32	BDL
Selenium	30	27	0	100	BDL	BDL	BDL
Strontium	30	27	0	100	BDL	BDL	BDL
Thallium	30	27	0	100	BDL	BDL	BDL
Zinc *	30	27	4	85	BDL	253	BDL

\* Zinc and copper found in field blanks.

Inconsistent metals data is likely due to particulate contamination from the gas stream, especially those metals that are part of the pipeline construction materials.

## Volatile Metals Analysis Summary Statistics, Continued

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	Average $\mu\text{g}/\text{m}^3$	Median $\mu\text{g}/\text{m}^3$	std dev $\mu\text{g}/\text{m}^3$	Variance	Standard Error
Mercury	0.01	0.01	BDL	0.01	0.0002	0.003

Component	Detection Limit, $\mu\text{g}/\text{m}^3$	Average $\mu\text{g}/\text{m}^3$	Median $\mu\text{g}/\text{m}^3$	std dev $\mu\text{g}/\text{m}^3$	Variance	Standard Error
Arsenic	30	BDL	BDL			
Barium	30	BDL	BDL			
Beryllium	30	BDL	BDL			
Cadmium	30	BDL	BDL			
Cobalt	30	BDL	BDL			
Chromium	30	BDL	BDL			
Copper *	30	BDL	BDL			
Manganese	30	BDL	BDL			
Molybdenum	30	BDL	BDL			
Nickel	30	BDL	BDL			
Lead	30	BDL	BDL			
Antimony	30	BDL	BDL			
Selenium	30	BDL	BDL			
Strontium	30	BDL	BDL			
Thallium	30	BDL	BDL			
Zinc *	30	32	BDL	58	3353	11

\* Zinc and copper found in field blanks.

Inconsistent metals data is likely due to particulate contamination from the gas stream, especially those metals that are part of the pipeline construction materials.

## qPCR and Bacteria/Spore Biological Analysis Summary Statistics

Component	total # of samples analyzed	total # of hits	% that are BDL	Min value # per 100 scf	Max value # per 100 scf	0.90 Percentile # per 100 scf
<b>qPCR Biological Analysis</b>						
Total Bacteria	27	27	0	5.13E+05	3.29E+08	2.88E+07
Total acid-producing bacteria (APB)	27	24	11	ND	2.02E+05	1.69E+05
Total iron-oxidizing bacteria (IOB)	27	15	44	ND	7.67E+04	7.37E+04
Total sulfate-reducing bacteria (SRB)	27	2	93	ND	2.52E+04	ND
<b>Live Bacteria</b>						
Anaerobic	27	3	89	ND	1.02E+03	ND
Aerobic	27	1	96	ND	2.20E+02	ND
Total	27	4	85	ND	1.02E+03	ND
<b>Spores</b>						
Anaerobic	27	1	96	ND	2.17E+02	ND
Aerobic	27	0	100	ND	ND	ND
Total	27	1	96	ND	2.17E+02	ND

ND=Not Detected

Statistical data calculated for hits only.

## qPCR and Bacteria/Spore Biological Analysis Summary Statistics, Continued

Component	Average # per 100 scf	Median # per 100 scf	std dev # per 100 scf	Variance	Standard Error
<b>qPCR Biological Analysis</b>					
Total Bacteria	1.94E+07	2.37E+06	6.29E+07	3.95E+15	1.21E+07
Total acid-producing bacteria (APB)	8.60E+04	7.76E+04	5.42E+04	2.94E+09	1.04E+04
Total iron-oxidizing bacteria (IOB)	4.98E+04	5.59E+04	2.02E+04	4.08E+08	3.89E+03
Total sulfate-reducing bacteria (SRB)	ND	ND			
<b>Live Bacteria</b>					
Anaerobic	ND	ND			
Aerobic	ND	ND			
Total	ND	ND			
<b>Spores</b>					
Anaerobic	ND	ND			
Aerobic	ND	ND			
Total	ND	ND			

ND=Not Detected

Statistical data calculated for hits only.

## Major Component Analysis by ASTM D1945 / D1946

Component	Detection Limit	091713-003	111618-001	111654-001	111654-002
		Cylinder Natural Gas #4 Mol %	Cylinder Natural Gas #5 Mol %	Cylinder Natural Gas #6 Mol %	Cylinder Natural Gas #7 Mol %
Ammonia	0.001%	BDL	BDL	BDL	BDL
Helium	0.1%	BDL	BDL	BDL	BDL
Carbon Dioxide	0.03%	1.09	0.98	1.66	1.37
Oxygen/Argon	0.03%	BDL	0.13	BDL	BDL
Nitrogen	0.03%	0.69	1.20	0.41	0.36
Carbon Monoxide	0.03%	BDL	BDL	BDL	BDL
Total Inerts + Diluents		1.77	2.30	2.07	1.73
Hydrogen	0.1%	BDL	BDL	BDL	BDL
Methane	0.002%	95.59	95.73	96.24	96.71
Ethane	0.002%	2.21	1.71	1.47	1.29
Ethene	0.002%	BDL	BDL	BDL	BDL
Ethyne	0.002%	BDL	BDL	BDL	BDL
Propane	0.002%	0.27	0.18	0.14	0.16
Propene	0.002%	BDL	BDL	BDL	BDL
Propadiene	0.002%	BDL	BDL	BDL	BDL
Propyne	0.002%	BDL	BDL	BDL	BDL
i-Butane	0.002%	0.041	0.021	0.022	0.033
n-Butane	0.002%	0.049	0.025	0.023	0.033
1-Butene	0.002%	BDL	BDL	BDL	BDL
i-Butene	0.002%	BDL	BDL	BDL	BDL
trans-2-Butene	0.002%	BDL	BDL	BDL	BDL
cis-2-Butene	0.002%	BDL	BDL	BDL	BDL
1,3-Butadiene	0.002%	BDL	BDL	BDL	BDL
i-Pentane	0.002%	0.016	0.007	0.009	0.014
n-Pentane	0.002%	0.011	0.005	0.006	0.009
neo-Pentane	0.002%	BDL	BDL	BDL	BDL
Pentenes	0.002%	BDL	BDL	BDL	BDL
Hexane Plus	0.0001%	0.0326	0.0146	0.0149	0.0321

Calculated Real Gas Properties at	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia	60 °F, 14.73 psia
Relative Density (Specific Gravity) (Dry)	0.5843	0.5814	0.5825	0.5796
HHV (Dry) (Btu/ft <sup>3</sup> )	1021.6	1008.9	1008.9	1012.7
HHV (Sat.) (Btu/ft <sup>3</sup> )	1004.2	991.6	991.6	995.4
Wobbe Number	1336.5	1323.1	1321.9	1330.1
LHV (Dry) (Btu/ft <sup>3</sup> )	920.7	909.0	908.9	912.3
LHV (Sat.) (Btu/ft <sup>3</sup> )	905.0	893.5	893.4	896.7
Real Gas Density (lbs/ft <sup>3</sup> )	0.045	0.0445	0.0446	0.0444
Methane Number	100	102	103	103

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID

Component	Detection Limit	091713-003	111618-001	111654-001	111654-002
		Cylinder Natural Gas #4	Cylinder Natural Gas #5	Cylinder Natural Gas #6	Cylinder Natural Gas #7
		ppmv	ppmv	ppmv	ppmv
<b>C5-C7 Cycloalkanes</b>					
Cyclopentane	1	17	8	8	15
Methylcyclopentane	1	14	7	6	14
Cyclohexane	1	15	9	8	14
Methylcyclohexane	1	17	10	9	18
<b>Heavier Aromatics</b>					
C3 Benzenes	1	1	BDL	1	2
C1 Naphthalenes	1	BDL	BDL	BDL	BDL
C2 Naphthalenes	1	BDL	BDL	BDL	BDL
<b>C6+ Hydrocarbons</b>					
Hexanes	1	119	52	42	97
Heptanes	1	57	25	30	52
2,2,4-Trimethylpentane	1	2	1	1	2
Octanes	1	29	14	15	32
Nonanes	1	11	5	6	14
Decanes	1	4	1	2	4
Undecanes	1	1	BDL	1	1
Dodecanes	1	BDL	BDL	1	1
Tridecanes	1	BDL	BDL	1	BDL
Tetradecanes	1	BDL	BDL	BDL	1
Pentadecanes	1	BDL	BDL	BDL	BDL
Hexadecanes	1	BDL	BDL	BDL	BDL
Heptadecanes	1	BDL	BDL	BDL	BDL
Octadecanes	1	BDL	BDL	BDL	BDL
Nonadecanes	1	BDL	BDL	BDL	BDL
Eicosanes +	1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Trace Sulfur Analysis by ASTM D6228

Component	091713-001	111618-001	111654-001	111654-002
	Tedlar Natural Gas #4	Cylinder Natural Gas #5	Cylinder Natural Gas #6	Cylinder Natural Gas #7
	ppmv	ppmv	ppmv	ppmv
Hydrogen Sulfide	0.37	BDL	BDL	0.48
Sulfur Dioxide	0.59	BDL	BDL	BDL
Carbonyl Sulfide	BDL	BDL	BDL	0.09
Carbon Disulfide	BDL	BDL	BDL	BDL
Methyl Mercaptan	BDL	BDL	BDL	0.19
Ethyl Mercaptan	BDL	BDL	BDL	BDL
i-Propyl Mercaptan	0.26	BDL	BDL	BDL
n-Propyl Mercaptan	BDL	BDL	BDL	BDL
t-Butyl Mercaptan	1.47	2.36	BDL	0.14
Dimethyl Sulfide	0.07	1.18	BDL	0.06
Methyl Ethyl Sulfide	BDL	BDL	BDL	BDL
Diethyl Sulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Sulfide	BDL	BDL	BDL	BDL
Dimethyl Disulfide	BDL	BDL	BDL	BDL
Methyl Ethyl Disulfide	BDL	BDL	BDL	BDL
Methyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Diethyl Disulfide	BDL	BDL	BDL	BDL
Methyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Methyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Ethyl i-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Ethyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-i-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl n-Propyl Disulfide	BDL	BDL	BDL	BDL
Di-n-Propyl Disulfide	BDL	BDL	BDL	BDL
i-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
n-Propyl t-Butyl Disulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Disulfide	BDL	BDL	BDL	BDL
Dimethyl Trisulfide	BDL	BDL	BDL	BDL
Diethyl Trisulfide	BDL	BDL	BDL	BDL
Di-t-Butyl Trisulfide	BDL	BDL	BDL	BDL
Thiophene	BDL	BDL	BDL	BDL
C1-Thiophenes	BDL	BDL	BDL	BDL
C2-Thiophenes	BDL	BDL	BDL	BDL
C3-Thiophenes	BDL	BDL	BDL	BDL
Benzothiophene	BDL	BDL	BDL	BDL
C1-Benzothiophenes	BDL	BDL	BDL	BDL
C2-Benzothiophenes	BDL	BDL	BDL	BDL
Thiophane	BDL	BDL	BDL	BDL
Thiophenol	BDL	BDL	BDL	BDL
Total Sulfur as molar PPM S	2.76	4.08	BDL	0.96
As Grains/100 SCF @ 14.73 psia, 60°F	0.164	0.242	BDL	0.057

Detection Limit = 0.05 ppmv S

The results within this report relate only to the items tested.



## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	091713-003	111618-001	111654-001	111654-002
		Cylinder Natural Gas #4	Cylinder Natural Gas #5	Cylinder Natural Gas #6	Cylinder Natural Gas #7
		ppmv	ppmv	ppmv	ppmv
Dichlorodifluoromethane (CFC-12)	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	BDL	BDL	BDL	BDL
Trichlorofluoromethane (CFC-11)	0.10	BDL	BDL	BDL	BDL
Chloromethane	0.10	BDL	BDL	BDL	BDL
Dichloromethane (Methylene Chloride)	0.10	BDL	BDL	BDL	BDL
Chloroform	0.10	BDL	BDL	BDL	BDL
Carbon Tetrachloride	0.10	BDL	BDL	BDL	BDL
Chloroethane	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	0.10	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	0.10	BDL	BDL	BDL	BDL
Hexachloroethane	0.10	BDL	BDL	BDL	BDL
Chloroethene (Vinylchloride)	0.10	BDL	BDL	BDL	BDL
1,1-Dichloroethene	0.10	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
trans-1,2-Dichloroethene	0.10	BDL	BDL	BDL	BDL
Trichloroethene	0.10	BDL	BDL	BDL	BDL
Tetrachloroethene	0.10	BDL	BDL	BDL	BDL
1,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
2,2-Dichloropropane	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	0.10	BDL	BDL	BDL	BDL
3-Chloropropene	0.10	BDL	BDL	BDL	BDL
1,1-Dichloropropene	0.10	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropene	0.10	BDL	BDL	BDL	BDL
Hexachloro-1,3-butadiene	0.10	BDL	BDL	BDL	BDL
Chlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
1,2,4-Trichlorobenzene	0.10	BDL	BDL	BDL	BDL
2-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
4-Chlorotoluene	0.10	BDL	BDL	BDL	BDL
Bromomethane	0.10	BDL	BDL	BDL	BDL
Dibromomethane	0.10	BDL	BDL	BDL	BDL
Bromoform	0.10	BDL	BDL	BDL	BDL
Bromochloromethane	0.10	BDL	BDL	BDL	BDL
Bromodichloromethane	0.10	BDL	BDL	BDL	BDL
Dibromochloromethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromoethane	0.10	BDL	BDL	BDL	BDL

## TO-14 Halocarbon and Volatile Organic Compound Analysis

Component	Detection Limit	091713-003	111618-001	111654-001	111654-002
		Cylinder Natural Gas #4	Cylinder Natural Gas #5	Cylinder Natural Gas #6	Cylinder Natural Gas #7
		ppmv	ppmv	ppmv	ppmv
Bromochloroethane	0.10	BDL	BDL	BDL	BDL
1,2-Dibromo-3-chloropropene	0.10	BDL	BDL	BDL	BDL
Bromobenzene	0.10	BDL	BDL	BDL	BDL
1,3-Butadiene	1.0	<b>11.3</b>	<b>5.7</b>	<b>4.8</b>	<b>8.6</b>
Acrylonitrile	1.0	BDL	<b>2.4</b>	<b>2.1</b>	<b>4.0</b>
Benzene	1.0	<b>18.0</b>	<b>7.1</b>	<b>6.7</b>	<b>21.9</b>
Toluene	1.0	<b>9.5</b>	<b>4.6</b>	<b>5.4</b>	<b>15.5</b>
Ethylbenzene	1.0	BDL	BDL	BDL	BDL
m,p-Xylene	1.0	<b>2.3</b>	<b>1.3</b>	<b>1.6</b>	<b>4.8</b>
o-Xylene	1.0	<b>0.6</b>	BDL	BDL	<b>1.5</b>
Styrene	1.0	BDL	BDL	BDL	BDL
i-Propylbenzene	1.0	BDL	BDL	BDL	BDL
4-Ethyltoluene	1.0	BDL	BDL	BDL	BDL
n-Propylbenzene	1.0	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
t-Butylbenzene	1.0	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	1.0	BDL	BDL	BDL	BDL
s-Butylbenzene	1.0	BDL	BDL	BDL	BDL
p-Isopropyltoluene	1.0	BDL	BDL	BDL	BDL
n-Butylbenzene	1.0	BDL	BDL	BDL	BDL
Naphthalene	1.0	BDL	BDL	BDL	BDL
Pyridine	1.0	BDL	BDL	BDL	BDL
Nitrobenzene	1.0	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Semi-Volatile Organic Compound Analysis

Component	detection limit	091713-034	111618-006	111654-007	111654-009
		Tube Natural Gas #4	Tube Natural Gas #5	Tube Natural Gas #6	Tube Natural Gas #7
		ppbv	ppbv	ppbv	ppbv
N-nitrosodimethylamine	1	BDL	BDL	BDL	BDL
Phenol	1	BDL	BDL	BDL	BDL
Aniline	1	BDL	BDL	BDL	BDL
Bis(2-Chloroethyl) ether	1	BDL	BDL	BDL	BDL
2-Chlorophenol	1	BDL	BDL	BDL	BDL
Benzyl Alcohol	1	BDL	BDL	BDL	BDL
2-methylphenol	1	BDL	BDL	BDL	BDL
bis(2-chloroisopropyl)ether	1	BDL	BDL	BDL	BDL
N-Nitroso-di-n-propylamine	1	BDL	BDL	BDL	BDL
4-methylphenol/3-methylphenol	1	BDL	BDL	BDL	BDL
Isophorone	1	BDL	BDL	BDL	BDL
2-nitrophenol	1	BDL	BDL	BDL	BDL
2,4-dimethylphenol	1	BDL	BDL	BDL	BDL
Bis(2-chloroethoxy)methane	1	BDL	BDL	BDL	BDL
2,4-dichlorophenol	1	BDL	BDL	BDL	BDL
4-Chloroaniline	1	BDL	BDL	BDL	BDL
4-chloro-3-methylphenol	1	BDL	BDL	BDL	BDL
2-methylnaphthalene	1	<b>2.4</b>	BDL	<b>0.7</b>	<b>2.3</b>
1-methylnaphthalene	1	<b>1.4</b>	BDL	<b>0.3</b>	<b>1.1</b>
Hexachlorocyclopentadiene	1	BDL	BDL	BDL	BDL
2,4,6-trichlorophenol	1	BDL	BDL	BDL	BDL
2,4,5-trichlorophenol	1	BDL	BDL	BDL	BDL
2-chloronaphthalene	1	BDL	BDL	BDL	BDL
2-Nitroaniline	1	BDL	BDL	BDL	BDL
1,4-dinitrobenzene	1	BDL	BDL	BDL	BDL
Dimethyl phthalate	1	BDL	BDL	BDL	BDL
1,3-dinitrobenzene	1	BDL	BDL	BDL	BDL
2,6-dinitrotoluene	1	BDL	BDL	BDL	BDL
Acenaphthylene	1	BDL	BDL	BDL	BDL
1,2-Dinitrobenzene	1	BDL	BDL	BDL	BDL
3-Nitroaniline	1	BDL	BDL	BDL	BDL
Acenaphthene	1	BDL	BDL	BDL	BDL
2,4-dinitrophenol	1	BDL	BDL	BDL	BDL
4-nitrophenol	1	BDL	BDL	BDL	BDL
Dibenzofuran	1	BDL	BDL	BDL	BDL
2,4-dinitrotoluene	1	BDL	BDL	BDL	BDL
2,3,4,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
2,3,5,6-Tetrachlorophenol	1	BDL	BDL	BDL	BDL
Diethyl Phthalate	1	BDL	<b>B</b>	BDL	BDL

## Semi-Volatile Organic Compound Analysis

Component	detection limit	091713-034	111618-006	111654-007	111654-009			
		Tube Natural Gas #4	Tube Natural Gas #5	Tube Natural Gas #6	Tube Natural Gas #7	Tube Natural Gas #7		
		ppbv	ppbv	ppbv	ppbv	ppbv		
Fluorene	1	BDL	BDL	BDL		BDL		
4-chlorophenyl phenyl ether	1	BDL	BDL	BDL		BDL		
4-Nitroaniline	1	BDL	BDL	BDL		BDL		
4,6-dinitro-2-methylphenol	1	BDL	BDL	BDL		BDL		
Diphenylamine	1	BDL	BDL	BDL		BDL		
n-Nitrosodiphenylamine	1	BDL	BDL	BDL		BDL		
Azobenzene	1	BDL	BDL	<b>B</b>	BDL	BDL		
4-Bromophenyl phenyl ether	1	BDL	BDL	BDL		BDL		
Hexachlorobenzene	1	BDL	BDL	BDL		BDL		
Pentachlorophenol	1	BDL	BDL	BDL		BDL		
Phenanthrene	1	BDL	BDL	BDL		BDL		
Anthracene	1	BDL	BDL	BDL		BDL		
Carbazole	1	BDL	BDL	BDL		BDL		
Di-n-butyl phthalate	1	BDL	<b>0.4</b>	<b>B,J</b>	<b>0.3</b>	<b>B,J</b>	<b>0.7</b>	<b>B,J</b>
Fluoranthene	1	BDL	BDL	BDL		BDL		
Pyrene	1	BDL	BDL	BDL		BDL		
Benzyl butyl phthalate	1	BDL	BDL	BDL		BDL		
Bis(2-ethylhexyl)adipate	1	BDL	BDL	BDL		BDL		
Benzo(a)anthracene	1	BDL	BDL	BDL		BDL		
Chrysene	1	BDL	BDL	BDL		BDL		
Bis(2-ethylhexyl)phthalate	1	BDL	<b>0.7</b>	<b>B,J</b>	<b>0.6</b>	<b>B,J</b>	<b>0.6</b>	<b>B,J</b>
Di-n-octyl phthalate	1	BDL	BDL	BDL		BDL		
Benzo(b)fluoranthene	1	BDL	BDL	BDL		BDL		
Benzo(k)fluoranthene	1	BDL	BDL	BDL		BDL		
Benzo(a)pyrene	1	BDL	BDL	BDL		BDL		
Indeno(1,2,3-cd)pyrene	1	BDL	BDL	BDL		BDL		
Dibenzo(a,h)anthracene	1	BDL	BDL	BDL		BDL		
Benzo[g,h,i]perylene	1	BDL	BDL	BDL		BDL		

BDL - Below Detection Limit

B - Analyte detected in the Blank.

J - Estimated value; detected between the RL and DL.

D - Analyte reported from a diluted extract.

E - Estimate, result detected above calibration range.

I - Concentration/Peak ID uncertain due to potential interference.

## Aldehyde and Ketone Compounds

Component	detection limit	091713-033	111618-008	111654-011	111654-013
		Tube	Tube	Tube	Tube
		Natural Gas #4	Natural Gas #5	Natural Gas #6	Natural Gas #7
		ppbv	ppbv	ppbv	ppbv
Formaldehyde	10	BDL	BDL	BDL	BDL
Acetaldehyde	7	95	49	49	34
Acetone	5	98	58	87	103
Acrolein (2-propenal)	6	BDL	BDL	BDL	BDL
Propionaldehyde	5	3	BDL	BDL	BDL
Crotonaldehyde	5	BDL	BDL	6	8
2-Butanone (MEK)	5	BDL	BDL	BDL	BDL
Methacrolein (Isobutenal)	5	10	BDL	BDL	BDL
Butanal	5	7	8	29	38
Benzaldehyde	5	BDL	BDL	BDL	BDL
Pentanal	5	BDL	BDL	BDL	BDL
p-Tolualdehyde	5	BDL	BDL	BDL	BDL
Hexanal	5	BDL	BDL	BDL	BDL

acetone found in blanks

## Target Siloxanes

Component	Detection Limit	091713-003	111618-001	111654-001	111654-002
		Cylinder Natural Gas #4	Cylinder Natural Gas #5	Cylinder Natural Gas #6	Cylinder Natural Gas #7
		mg Si / M <sup>3</sup>	mg Si / M <sup>3</sup>	mg Si / M <sup>3</sup>	mg Si / M <sup>3</sup>
1,1,3,3-Tetramethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Pentamethyldisiloxane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisilane	0.1	BDL	BDL	BDL	BDL
Hexamethyldisiloxane (L2, MM)	0.1	BDL	BDL	BDL	BDL
Octamethyltrisiloxane (L3, MDM)	0.1	BDL	BDL	BDL	BDL
Octamethylcyclotetrasiloxane (D4)	0.1	BDL	BDL	BDL	BDL
Decamethyltetrasiloxane (L4, MD2M)	0.1	BDL	BDL	BDL	BDL
Decamethylcyclopentasiloxane (D5)	0.1	BDL	BDL	BDL	BDL
Dodecamethylpentasiloxane (L5, MD3M)	0.1	BDL	BDL	BDL	BDL
Dodecamethylcyclohexasiloxane (D6)	0.1	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

## Volatile Metals Analysis

Component	Detection Limit, $\mu\text{g}/\text{M}^3$	091713-018	091713-019	111618-002	111618-003
		Tube 1 Natural Gas #4 $\mu\text{g}/\text{m}^3$	Tube 2 Natural Gas #4 $\mu\text{g}/\text{m}^3$	Tube 1 Natural Gas #5 $\mu\text{g}/\text{m}^3$	Tube 2 Natural Gas #5 $\mu\text{g}/\text{m}^3$
Mercury	0.01	BDL	BDL	BDL	BDL

Component	Detection Limit, $\mu\text{g}/\text{M}^3$	091713-026	111618-004
		Impinger Natural Gas #4 $\mu\text{g}/\text{m}^3$	Impinger Natural Gas #5 $\mu\text{g}/\text{m}^3$
Arsenic	30	BDL	BDL
Barium	30	BDL	BDL
Beryllium	30	BDL	BDL
Cadmium	30	BDL	BDL
Cobalt	30	BDL	BDL
Chromium	30	BDL	BDL
Copper *	30	BDL	76
Manganese	30	BDL	BDL
Molybdenum	30	BDL	BDL
Nickel	30	BDL	BDL
Lead	30	BDL	BDL
Antimony	30	BDL	BDL
Selenium	30	BDL	BDL
Strontium	30	BDL	BDL
Thallium	30	BDL	BDL
Zinc *	30	BDL	28

\* Zinc and copper found in field blanks.

Inconsistent metals data is likely due to particulate contamination from the gas stream, especially those metals that are part of the pipeline construction materials.

## Volatile Metals Analysis

Component	Detection Limit, $\mu\text{g}/\text{M}^3$	111654-017	111654-018	111654-019	111654-020
		Tube 1 Natural Gas #6 $\mu\text{g}/\text{m}^3$	Tube 2 Natural Gas #6 $\mu\text{g}/\text{m}^3$	Tube 1 Natural Gas #7 $\mu\text{g}/\text{m}^3$	Tube 2 Natural Gas #7 $\mu\text{g}/\text{m}^3$
Mercury	0.01	BDL	0.01	BDL	BDL

Component	Detection Limit, $\mu\text{g}/\text{M}^3$	111654-003	111654-005
		Impinger Natural Gas #6 $\mu\text{g}/\text{m}^3$	Impinger Natural Gas #7 $\mu\text{g}/\text{m}^3$
Arsenic	30	BDL	BDL
Barium	30	BDL	BDL
Beryllium	30	BDL	BDL
Cadmium	30	BDL	BDL
Cobalt	30	BDL	BDL
Chromium	30	BDL	BDL
Copper *	30	52	BDL
Manganese	30	BDL	BDL
Molybdenum	30	BDL	BDL
Nickel	30	BDL	BDL
Lead	30	BDL	BDL
Antimony	30	BDL	BDL
Selenium	30	BDL	BDL
Strontium	30	BDL	BDL
Thallium	30	BDL	BDL
Zinc *	30	BDL	BDL

\* Zinc and copper found in field blanks.

Inconsistent metals data is likely due to particulate contamination from the gas stream, especially those metals that are part of the pipeline construction materials.



## qPCR and Bacteria/Spore Biological Analysis

Component	091713-032	111618-010	111654-015	111654-016
	Filter	Filter	Filter	Filter
	Natural Gas #4	Natural Gas #5	Natural Gas #6	Natural Gas #7
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>qPCR Biological Analysis</b>				
Total Bacteria	6.30E+06	6.39E+07	6.17E+07	5.82E+07
Total acid-producing bacteria (APB)	5.09E+05	1.75E+04	1.09E+04	4.87E+04
Total iron-oxidizing bacteria (IOB)	1.04E+04	4.98E+04	4.39E+04	2.15E+04
Total sulfate-reducing bacteria (SRB)	ND	2.76E+04	ND	1.94E+04
<b>Live Bacteria</b>				
Anaerobic	not analyzed	<185	<160	<167
Aerobic	not analyzed	<185	<162	<167
Total	not analyzed	<370	<320	<334
<b>Spores</b>				
Anaerobic	not analyzed	ND	ND	ND
Aerobic	not analyzed	ND	ND	ND
Total	not analyzed	ND	ND	ND

ND=Not Detected

Component	091713-032	111618-010	111654-015	111654-016
	Filter	Filter	Filter	Filter
	Natural Gas #4	Natural Gas #5	Natural Gas #6	Natural Gas #7
	# per 100 scf	# per 100 scf	# per 100 scf	# per 100 scf
<b>CONVERTED TO BASE 10 LOG</b>				
<b>qPCR Biological Analysis</b>				
Total Bacteria	6.80	7.81	7.79	7.76
Total Acid-producing Bacteria (APB)	5.71	4.24	4.04	4.69
Total Iron-oxidizing Bacteria (IOB)	4.02	4.70	4.64	4.33
Total Sulfate-reducing Bacteria (SRB)	ND	4.44	ND	4.29
<b>Live Bacteria</b>				
Anaerobic	not analyzed	ND	ND	ND
Aerobic	not analyzed	ND	ND	ND
Total	not analyzed	ND	ND	ND
<b>Spores</b>				
Anaerobic	not analyzed	ND	ND	ND
Aerobic	not analyzed	ND	ND	ND
Total	not analyzed	ND	ND	ND

ND=Not Detected

## Major Component Analysis by ASTM D1945 / D1946 Summary Statistics

Component	Detection Limit	total # of samples analyzed	total # of hits	% that are BDL	Min value Mol %	Max value Mol %	0.90 Percentile Mol %
Ammonia	0.001%	4	0	100	BDL	BDL	BDL
Helium	0.1%	4	0	100	BDL	BDL	BDL
Carbon Dioxide	0.03%	4	4	0	0.98	1.66	1.57
Oxygen/Argon	0.03%	4	1	75	BDL	0.13	BDL
Nitrogen	0.03%	4	4	0	0.36	1.20	1.04
Carbon Monoxide	0.03%	4	0	100	BDL	BDL	BDL
Total Inerts + Diluents		4	4	0	1.73	2.30	2.23
Hydrogen	0.1%	4	0	100	BDL	BDL	BDL
Methane	0.002%	4	4	0	95.59	96.71	96.57
Ethane	0.002%	4	4	0	1.29	2.21	2.06
Ethene	0.002%	4	0	100	BDL	BDL	BDL
Ethyne	0.002%	4	0	100	BDL	BDL	BDL
Propane	0.002%	4	4	0	0.14	0.27	0.24
Propene	0.002%	4	0	100	BDL	BDL	BDL
Propadiene	0.002%	4	0	100	BDL	BDL	BDL
Propyne	0.002%	4	0	100	BDL	BDL	BDL
i-Butane	0.002%	4	4	0	0.021	0.041	0.038
n-Butane	0.002%	4	4	0	0.023	0.049	0.044
1-Butene	0.002%	4	0	100	BDL	BDL	BDL
i-Butene	0.002%	4	0	100	BDL	BDL	BDL
trans-2-Butene	0.002%	4	0	100	BDL	BDL	BDL
cis-2-Butene	0.002%	4	0	100	BDL	BDL	BDL
1,3-Butadiene	0.002%	4	0	100	BDL	BDL	BDL
i-Pentane	0.002%	4	4	0	0.007	0.016	0.016
n-Pentane	0.002%	4	4	0	0.005	0.011	0.010
neo-Pentane	0.002%	4	0	100	BDL	BDL	BDL
Pentenes	0.002%	4	0	100	BDL	BDL	BDL
Hexane Plus	0.0001%	4	4		0.0146	0.0326	0.0325

Calculated Real Gas Properties at	----- 60 °F, 14.73 psia -----					
Relative Density (Specific Gravity) (Dry)	4	4	0	0.5796	0.5843	0.5838
HHV (Dry) (Btu/ft <sup>3</sup> )	4	4	0	1008.9	1021.6	1018.9
HHV (Sat.) (Btu/ft <sup>3</sup> )	4	4	0	991.6	1004.2	1001.5
Wobbe Number	4	4	0	1321.9	1336.5	1334.6
LHV (Dry) (Btu/ft <sup>3</sup> )	4	4	0	908.9	920.7	918.2
LHV (Sat.) (Btu/ft <sup>3</sup> )	4	4	0	893.4	905.0	902.5
Real Gas Density (lbs/ft <sup>3</sup> )	4	4	0	0.0444	0.0447	0.0447
Methane Number	4	4	0	100	103	103

BDL = Below Detection Limit

## Major Component Analysis by ASTM D1945 / D1946 Summary Statistics, Continued

Component	Detection Limit	Average Mol %	Median Mol %	std dev Mol %	Variance	Standard Error
Ammonia	0.001%	BDL	BDL			
Helium	0.1%	BDL	BDL			
Carbon Dioxide	0.03%	<b>1.27</b>	<b>1.23</b>	<b>0.3</b>	<b>0.07</b>	<b>0.13</b>
Oxygen/Argon	0.03%					
Nitrogen	0.03%	<b>0.66</b>	<b>0.55</b>	<b>0.3</b>	<b>0.11</b>	<b>0.17</b>
Carbon Monoxide	0.03%	BDL	BDL			
Total Inerts + Diluents		<b>1.97</b>	<b>1.92</b>	<b>0.2</b>	<b>0.05</b>	<b>0.12</b>
Hydrogen	0.1%	BDL	BDL			
Methane	0.002%	<b>96.07</b>	<b>95.99</b>	<b>0.44</b>	<b>0.20</b>	<b>0.22</b>
Ethane	0.002%	<b>1.67</b>	<b>1.59</b>	<b>0.35</b>	<b>0.12</b>	<b>0.17</b>
Ethene	0.002%	BDL	BDL			
Ethyne	0.002%	BDL	BDL			
Propane	0.002%	<b>0.19</b>	<b>0.17</b>	<b>0.05</b>	<b>0.00</b>	<b>0.02</b>
Propene	0.002%	BDL	BDL			
Propadiene	0.002%	BDL	BDL			
Propyne	0.002%	BDL	BDL			
i-Butane	0.002%	<b>0.029</b>	<b>0.027</b>	<b>0.008</b>	<b>7E-05</b>	<b>0.004</b>
n-Butane	0.002%	<b>0.033</b>	<b>0.029</b>	<b>0.010</b>	<b>0.0001</b>	<b>0.005</b>
1-Butene	0.002%	BDL	BDL			
i-Butene	0.002%	BDL	BDL			
trans-2-Butene	0.002%	BDL	BDL			
cis-2-Butene	0.002%	BDL	BDL			
1,3-Butadiene	0.002%	BDL	BDL			
i-Pentane	0.002%	<b>0.012</b>	<b>0.011</b>	<b>0.004</b>	<b>1E-05</b>	<b>0.0019</b>
n-Pentane	0.002%	<b>0.008</b>	<b>0.007</b>	<b>0.002</b>	<b>5E-06</b>	<b>0.0011</b>
neo-Pentane	0.002%	BDL	BDL			
Pentenes	0.002%	BDL	BDL			
Hexane Plus	0.0001%	<b>0.0236</b>	<b>0.0235</b>	<b>0.0088</b>	<b>0.0001</b>	<b>0.0044</b>

### Calculated Real Gas Properties at

----- 60 °F, 14.73 psia -----

Relative Density (Specific Gravity) (Dry)	<b>0.5820</b>	<b>0.5819</b>	<b>0.0017</b>	<b>0.00</b>	<b>0.00</b>
HHV (Dry) (Btu/ft <sup>3</sup> )	<b>1013.0</b>	<b>1010.8</b>	<b>5.2</b>	<b>27.09</b>	<b>2.60</b>
HHV (Sat.) (Btu/ft <sup>3</sup> )	<b>995.7</b>	<b>993.5</b>	<b>5.1</b>	<b>26.18</b>	<b>2.56</b>
Wobbe Number	<b>1327.9</b>	<b>1326.6</b>	<b>5.9</b>	<b>34.26</b>	<b>2.93</b>
LHV (Dry) (Btu/ft <sup>3</sup> )	<b>912.7</b>	<b>910.7</b>	<b>4.8</b>	<b>23.08</b>	<b>2.40</b>
LHV (Sat.) (Btu/ft <sup>3</sup> )	<b>897.1</b>	<b>895.1</b>	<b>4.7</b>	<b>22.31</b>	<b>2.36</b>
Real Gas Density (lbs/ft <sup>3</sup> )	<b>0.0445</b>	<b>0.0445</b>	<b>0.0001</b>	<b>2E-08</b>	<b>6E-05</b>
Methane Number	<b>102</b>	<b>102</b>	<b>1.3</b>	<b>1.7</b>	<b>0.6</b>

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID Summary Statistics

Component	Detection Limit	total # of samples analyzed	total # of hits	% that are BDL	Min value ppmv	Max value ppmv	0.90 Percentile ppmv
<b>C5-C7 Cycloalkanes</b>							
Cyclopentane	1	4	4	0	8	17	16
Methylcyclopentane	1	4	4	0	6	14	14
Cyclohexane	1	4	4	0	8	15	15
Methylcyclohexane	1	4	4	0	9	18	18
<b>Heavier Aromatics</b>							
C3 Benzenes	1	4	3	25	BDL	2	2
C1 Naphthalenes	1	4	0	100	BDL	BDL	BDL
C2 Naphthalenes	1	4	0	100	BDL	BDL	BDL
<b>C6+ Hydrocarbons</b>							
Hexanes	1	4	4	0	42	119	112
Heptanes	1	4	4	0	25	57	56
2,2,4-Trimethylpentane	1	4	4	0	1	2	2
Octanes	1	4	4	0	14	32	31
Nonanes	1	4	4	0	5	14	13
Decanes	1	4	4	0	1	4	4
Undecanes	1	4	3	25	BDL	1	1
Dodecanes	1	4	2	50	BDL	1	BDL
Tridecanes	1	4	1	75	BDL	1	BDL
Tetradecanes	1	4	1	75	BDL	1	BDL
Pentadecanes	1	4	0	100	BDL	BDL	BDL
Hexadecanes	1	4	0	100	BDL	BDL	BDL
Heptadecanes	1	4	0	100	BDL	BDL	BDL
Octadecanes	1	4	0	100	BDL	BDL	BDL
Nonadecanes	1	4	0	100	BDL	BDL	BDL
Eicosanes +	1	4	0	100	BDL	BDL	BDL
Total from Cyclopentane to Eicosanes +		4	4		146	326	325

BDL = Below Detection Limit

## Extended Hydrocarbon Analysis by GC/FID Summary Statistics, Continued

Component	Detection Limit	Average ppmv	Median ppmv	std dev ppmv	Variance	Standard Error
<b>C5-C7 Cycloalkanes</b>						
Cyclopentane	1	12	12	4.1	16.5	2.03
Methylcyclopentane	1	10	11	3.8	14.2	1.88
Cyclohexane	1	12	12	3.0	9.3	1.52
Methylcyclohexane	1	14	14	4.0	16.3	2.02
<b>Heavier Aromatics</b>						
C3 Benzenes	1	1	1	0.5	0.3	0.27
C1 Naphthalenes	1	BDL	BDL			
C2 Naphthalenes	1	BDL	BDL			
<b>C6+ Hydrocarbons</b>						
Hexanes	1	78	75	31.7	1003.3	15.84
Heptanes	1	41	41	13.7	188.5	6.86
2,2,4-Trimethylpentane	1	2	2	0.5	0.3	0.25
Octanes	1	23	22	8.1	65.3	4.04
Nonanes	1	9	9	3.7	13.5	1.84
Decanes	1	3	3	1.3	1.7	0.65
Undecanes	1	1	1			
Dodecanes	1	BDL	BDL			
Tridecanes	1	BDL	BDL			
Tetradecanes	1	BDL	BDL			
Pentadecanes	1	BDL	BDL			
Hexadecanes	1	BDL	BDL			
Heptadecanes	1	BDL	BDL			
Octadecanes	1	BDL	BDL			
Nonadecanes	1	BDL	BDL			
Eicosanes +	1	BDL	BDL			
Total from Cyclopentane to Eicosanes +		236	235	88.02		

BDL = Below Detection Limit

## Trace Sulfur Analysis by ASTM D6228 Summary Statistics

Component	total # of samples analyzed	total # of hits	% that are BDL	Min value ppmv	Max value ppmv	0.90 Percentile ppmv
Hydrogen Sulfide	4	2	50	BDL	0.48	0.45
Sulfur Dioxide	4	1	75	BDL	0.59	0.59
Carbonyl Sulfide	4	1	75	BDL	0.09	0.09
Carbon Disulfide	4	0	100	BDL	BDL	BDL
Methyl Mercaptan	4	1	75	BDL	0.19	BDL
Ethyl Mercaptan	4	0	100	BDL	BDL	BDL
i-Propyl Mercaptan	4	1	75	BDL	0.26	BDL
n-Propyl Mercaptan	4	0	100	BDL	BDL	BDL
t-Butyl Mercaptan	4	3	25	BDL	2.36	2.09
Dimethyl Sulfide	4	3	25	BDL	1.18	0.85
Methyl Ethyl Sulfide	4	0	100	BDL	BDL	BDL
Diethyl Sulfide	4	0	100	BDL	BDL	BDL
Di-t-Butyl Sulfide	4	0	100	BDL	BDL	BDL
Dimethyl Disulfide	4	0	100	BDL	BDL	BDL
Methyl Ethyl Disulfide	4	0	100	BDL	BDL	BDL
Methyl i-Propyl Disulfide	4	0	100	BDL	BDL	BDL
Diethyl Disulfide	4	0	100	BDL	BDL	BDL
Methyl n-Propyl Disulfide	4	0	100	BDL	BDL	BDL
Methyl t-Butyl Disulfide	4	0	100	BDL	BDL	BDL
Ethyl i-Propyl Disulfide	4	0	100	BDL	BDL	BDL
Ethyl n-Propyl Disulfide	4	0	100	BDL	BDL	BDL
Ethyl t-Butyl Disulfide	4	0	100	BDL	BDL	BDL
Di-i-Propyl Disulfide	4	0	100	BDL	BDL	BDL
i-Propyl n-Propyl Disulfide	4	0	100	BDL	BDL	BDL
Di-n-Propyl Disulfide	4	0	100	BDL	BDL	BDL
i-Propyl t-Butyl Disulfide	4	0	100	BDL	BDL	BDL
n-Propyl t-Butyl Disulfide	4	0	100	BDL	BDL	BDL
Di-t-Butyl Disulfide	4	0	100	BDL	BDL	BDL
Dimethyl Trisulfide	4	0	100	BDL	BDL	BDL
Diethyl Trisulfide	4	0	100	BDL	BDL	BDL
Di-t-Butyl Trisulfide	4	0	100	BDL	BDL	BDL
Thiophene	4	0	100	BDL	BDL	BDL
C1-Thiophenes	4	0	100	BDL	BDL	BDL
C2-Thiophenes	4	0	100	BDL	BDL	BDL
C3-Thiophenes	4	0	100	BDL	BDL	BDL
Benzothiophene	4	0	100	BDL	BDL	BDL
C1-Benzothiophenes	4	0	100	BDL	BDL	BDL
C2-Benzothiophenes	4	0	100	BDL	BDL	BDL
Thiophane	4	0	100	BDL	BDL	BDL
Thiophenol	4	0	100	BDL	BDL	BDL
Total Sulfur as molar PPM S	4	3	25	BDL	4.08	3.82
As Grains/100 SCF @ 14.73 psia, 60°F	4	3	25	BDL	0.242	0.226

Detection Limit = 0.05 ppmv S

The results within this report relate only to the items tested.

## Trace Sulfur Analysis by ASTM D6228 Summary Statistics, Continued

Component	Average ppmv	Median ppmv	std dev ppmv	Variance	Standard Error
Hydrogen Sulfide	<b>0.23</b>	<b>0.20</b>	<b>0.204</b>	<b>0.042</b>	<b>0.10</b>
Sulfur Dioxide	BDL	BDL			
Carbonyl Sulfide	BDL	BDL			
Carbon Disulfide	BDL	BDL			
Methyl Mercaptan	BDL	BDL			
Ethyl Mercaptan	BDL	BDL			
i-Propyl Mercaptan	BDL	BDL			
n-Propyl Mercaptan	BDL	BDL			
t-Butyl Mercaptan	<b>1.00</b>	<b>0.81</b>	<b>0.970</b>	<b>0.94</b>	<b>0.48</b>
Dimethyl Sulfide	<b>0.33</b>	<b>0.07</b>	<b>0.489</b>	<b>0.24</b>	<b>0.24</b>
Methyl Ethyl Sulfide	BDL	BDL			
Diethyl Sulfide	BDL	BDL			
Di-t-Butyl Sulfide	BDL	BDL			
Dimethyl Disulfide	BDL	BDL			
Methyl Ethyl Disulfide	BDL	BDL			
Methyl i-Propyl Disulfide	BDL	BDL			
Diethyl Disulfide	BDL	BDL			
Methyl n-Propyl Disulfide	BDL	BDL			
Methyl t-Butyl Disulfide	BDL	BDL			
Ethyl i-Propyl Disulfide	BDL	BDL			
Ethyl n-Propyl Disulfide	BDL	BDL			
Ethyl t-Butyl Disulfide	BDL	BDL			
Di-i-Propyl Disulfide	BDL	BDL			
i-Propyl n-Propyl Disulfide	BDL	BDL			
Di-n-Propyl Disulfide	BDL	BDL			
i-Propyl t-Butyl Disulfide	BDL	BDL			
n-Propyl t-Butyl Disulfide	BDL	BDL			
Di-t-Butyl Disulfide	BDL	BDL			
Dimethyl Trisulfide	BDL	BDL			
Diethyl Trisulfide	BDL	BDL			
Di-t-Butyl Trisulfide	BDL	BDL			
Thiophene	BDL	BDL			
C1-Thiophenes	BDL	BDL			
C2-Thiophenes	BDL	BDL			
C3-Thiophenes	BDL	BDL			
Benzothiophene	BDL	BDL			
C1-Benzothiophenes	BDL	BDL			
C2-Benzothiophenes	BDL	BDL			
Thiophane	BDL	BDL			
Thiophenol	BDL	BDL			
Total Sulfur as molar PPM S	<b>2.60</b>	<b>2.76</b>	<b>1.279</b>	<b>1.64</b>	<b>0.64</b>
As Grains/100 SCF @ 14.73 psia, 60°F	<b>0.154</b>	<b>0.164</b>	<b>0.076</b>	<b>0.006</b>	<b>0.038</b>

Detection Limit = 0.05 ppmv S

The results within this report relate only to the items tested.

## TO-14 Halocarbon and Volatile Organic Compound Analysis Summary Statistics

Component	Detection Limit	total # of		% that are BDL	Min value ppmv	Max value ppmv	0.90 Percentile ppmv
		samples analyzed	total # of hits				
Dichlorodifluoromethane (CFC-12)	0.10	4	0	100	BDL	BDL	BDL
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	4	0	100	BDL	BDL	BDL
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	4	0	100	BDL	BDL	BDL
Trichlorofluoromethane (CFC-11)	0.10	4	0	100	BDL	BDL	BDL
Chloromethane	0.10	4	0	100	BDL	BDL	BDL
Dichloromethane (Methylene Chloride)	0.10	4	0	100	BDL	BDL	BDL
Chloroform	0.10	4	0	100	BDL	BDL	BDL
Carbon Tetrachloride	0.10	4	0	100	BDL	BDL	BDL
Chloroethane	0.10	4	0	100	BDL	BDL	BDL
1,1-Dichloroethane	0.10	4	0	100	BDL	BDL	BDL
1,2-Dichloroethane	0.10	4	0	100	BDL	BDL	BDL
1,1,1-Trichloroethane	0.10	4	0	100	BDL	BDL	BDL
1,1,2-Trichloroethane	0.10	4	0	100	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	0.10	4	0	100	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	0.10	4	0	100	BDL	BDL	BDL
Hexachloroethane	0.10	4	0	100	BDL	BDL	BDL
Chloroethene (Vinylchloride)	0.10	4	0	100	BDL	BDL	BDL
1,1-Dichloroethene	0.10	4	0	100	BDL	BDL	BDL
cis-1,2-Dichloroethene	0.10	4	0	100	BDL	BDL	BDL
trans-1,2-Dichloroethene	0.10	4	0	100	BDL	BDL	BDL
Trichloroethene	0.10	4	0	100	BDL	BDL	BDL
Tetrachloroethene	0.10	4	0	100	BDL	BDL	BDL
1,2-Dichloropropane	0.10	4	0	100	BDL	BDL	BDL
2,2-Dichloropropane	0.10	4	0	100	BDL	BDL	BDL
1,2,3-Trichloropropane	0.10	4	0	100	BDL	BDL	BDL
3-Chloropropene	0.10	4	0	100	BDL	BDL	BDL
1,1-Dichloropropene	0.10	4	0	100	BDL	BDL	BDL
cis-1,3-Dichloropropene	0.10	4	0	100	BDL	BDL	BDL
trans-1,3-Dichloropropene	0.10	4	0	100	BDL	BDL	BDL
Hexachloro-1,3-butadiene	0.10	4	0	100	BDL	BDL	BDL
Chlorobenzene	0.10	4	0	100	BDL	BDL	BDL
1,2-Dichlorobenzene	0.10	4	0	100	BDL	BDL	BDL
1,3-Dichlorobenzene	0.10	4	0	100	BDL	BDL	BDL
1,4-Dichlorobenzene	0.10	4	0	100	BDL	BDL	BDL
1,2,3-Trichlorobenzene	0.10	4	0	100	BDL	BDL	BDL
1,2,4-Trichlorobenzene	0.10	4	0	100	BDL	BDL	BDL
2-Chlorotoluene	0.10	4	0	100	BDL	BDL	BDL
4-Chlorotoluene	0.10	4	0	100	BDL	BDL	BDL
Bromomethane	0.10	4	0	100	BDL	BDL	BDL
Dibromomethane	0.10	4	0	100	BDL	BDL	BDL
Bromoform	0.10	4	0	100	BDL	BDL	BDL
Bromochloromethane	0.10	4	0	100	BDL	BDL	BDL
Bromodichloromethane	0.10	4	0	100	BDL	BDL	BDL
Dibromochloromethane	0.10	4	0	100	BDL	BDL	BDL
1,2-Dibromoethane	0.10	4	0	100	BDL	BDL	BDL



## TO-14 Halocarbon and Volatile Organic Compound Analysis Summary Statistics

Component	Detection Limit	total # of samples analyzed	total # of hits	% that are BDL	Min value ppmv	Max value ppmv	0.90 Percentile ppmv
Bromochloroethane	0.10	4	0	100	BDL	BDL	BDL
1,2-Dibromo-3-chloropropene	0.10	4	0	100	BDL	BDL	BDL
Bromobenzene	0.10	4	0	100	BDL	BDL	BDL
1,3-Butadiene	1.0	4	4	0	4.8	11.3	10.5
Acrylonitrile	1.0	4	3	25	BDL	4.0	3.5
Benzene	1.0	4	4	0	6.7	21.9	20.7
Toluene	1.0	4	4	0	4.6	15.5	13.7
Ethylbenzene	1.0	4	0	100	BDL	BDL	BDL
m,p-Xylene	1.0	4	4	0	1.3	4.8	4.1
o-Xylene	1.0	4	2	50	BDL	1.5	1.2
Styrene	1.0	4	0	100	BDL	BDL	BDL
i-Propylbenzene	1.0	4	0	100	BDL	BDL	BDL
4-Ethyltoluene	1.0	4	0	100	BDL	BDL	BDL
n-Propylbenzene	1.0	4	0	100	BDL	BDL	BDL
1,3,5-Trimethylbenzene	1.0	4	0	100	BDL	BDL	BDL
t-Butylbenzene	1.0	4	0	100	BDL	BDL	BDL
1,2,4-Trimethylbenzene	1.0	4	0	100	BDL	BDL	BDL
s-Butylbenzene	1.0	4	0	100	BDL	BDL	BDL
p-Isopropyltoluene	1.0	4	0	100	BDL	BDL	BDL
n-Butylbenzene	1.0	4	0	100	BDL	BDL	BDL
Naphthalene	1.0	4	0	100	BDL	BDL	BDL
Pyridine	1.0	4	0	100	BDL	BDL	BDL
Nitrobenzene	1.0	4	0	100	BDL	BDL	BDL

BDL = Below Detection Limit

## TO-14 Halocarbon and Volatile Organic Compound Analysis Summary Statistics, Continued

Component	Detection Limit	Average ppmv	Median ppmv	std dev ppmv	Variance	Standard Error
Dichlorodifluoromethane (CFC-12)	0.10	BDL	BDL			
1,2-Dichlorotetrafluoroethane (CFC-114)	0.10	BDL	BDL			
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	0.10	BDL	BDL			
Trichlorofluoromethane (CFC-11)	0.10	BDL	BDL			
Chloromethane	0.10	BDL	BDL			
Dichloromethane (Methylene Chloride)	0.10	BDL	BDL			
Chloroform	0.10	BDL	BDL			
Carbon Tetrachloride	0.10	BDL	BDL			
Chloroethane	0.10	BDL	BDL			
1,1-Dichloroethane	0.10	BDL	BDL			
1,2-Dichloroethane	0.10	BDL	BDL			
1,1,1-Trichloroethane	0.10	BDL	BDL			
1,1,2-Trichloroethane	0.10	BDL	BDL			
1,1,1,2-Tetrachloroethane	0.10	BDL	BDL			
1,1,2,2-Tetrachloroethane	0.10	BDL	BDL			
Hexachloroethane	0.10	BDL	BDL			
Chloroethene (Vinylchloride)	0.10	BDL	BDL			
1,1-Dichloroethene	0.10	BDL	BDL			
cis-1,2-Dichloroethene	0.10	BDL	BDL			
trans-1,2-Dichloroethene	0.10	BDL	BDL			
Trichloroethene	0.10	BDL	BDL			
Tetrachloroethene	0.10	BDL	BDL			
1,2-Dichloropropane	0.10	BDL	BDL			
2,2-Dichloropropane	0.10	BDL	BDL			
1,2,3-Trichloropropane	0.10	BDL	BDL			
3-Chloropropene	0.10	BDL	BDL			
1,1-Dichloropropene	0.10	BDL	BDL			
cis-1,3-Dichloropropene	0.10	BDL	BDL			
trans-1,3-Dichloropropene	0.10	BDL	BDL			
Hexachloro-1,3-butadiene	0.10	BDL	BDL			
Chlorobenzene	0.10	BDL	BDL			
1,2-Dichlorobenzene	0.10	BDL	BDL			
1,3-Dichlorobenzene	0.10	BDL	BDL			
1,4-Dichlorobenzene	0.10	BDL	BDL			
1,2,3-Trichlorobenzene	0.10	BDL	BDL			
1,2,4-Trichlorobenzene	0.10	BDL	BDL			
2-Chlorotoluene	0.10	BDL	BDL			
4-Chlorotoluene	0.10	BDL	BDL			
Bromomethane	0.10	BDL	BDL			
Dibromomethane	0.10	BDL	BDL			
Bromoform	0.10	BDL	BDL			
Bromochloromethane	0.10	BDL	BDL			
Bromodichloromethane	0.10	BDL	BDL			
Dibromochloromethane	0.10	BDL	BDL			
1,2-Dibromoethane	0.10	BDL	BDL			

## TO-14 Halocarbon and Volatile Organic Compound Analysis Summary Statistics, Continued

Component	Detection Limit	Average ppmv	Median ppmv	std dev ppmv	Variance	Standard Error
Bromochloroethane	0.10	BDL	BDL			
1,2-Dibromo-3-chloropropene	0.10	BDL	BDL			
Bromobenzene	0.10	BDL	BDL			
1,3-Butadiene	1.0	<b>7.6</b>	<b>7.2</b>	<b>2.56</b>	<b>6.54</b>	<b>1.28</b>
Acrylonitrile	1.0	<b>2.3</b>	<b>2.3</b>	<b>1.24</b>	<b>1.54</b>	<b>0.62</b>
Benzene	1.0	<b>13.4</b>	<b>12.6</b>	<b>6.67</b>	<b>44.50</b>	<b>3.34</b>
Toluene	1.0	<b>8.8</b>	<b>7.5</b>	<b>4.32</b>	<b>18.64</b>	<b>2.16</b>
Ethylbenzene	1.0	BDL	BDL			
m,p-Xylene	1.0	<b>2.5</b>	<b>2.0</b>	<b>1.38</b>	<b>1.90</b>	<b>0.69</b>
o-Xylene	1.0	<b>0.8</b>	<b>0.6</b>	<b>0.42</b>	<b>0.18</b>	<b>0.21</b>
Styrene	1.0	BDL	BDL			
i-Propylbenzene	1.0	BDL	BDL			
4-Ethyltoluene	1.0	BDL	BDL			
n-Propylbenzene	1.0	BDL	BDL			
1,3,5-Trimethylbenzene	1.0	BDL	BDL			
t-Butylbenzene	1.0	BDL	BDL			
1,2,4-Trimethylbenzene	1.0	BDL	BDL			
s-Butylbenzene	1.0	BDL	BDL			
p-Isopropyltoluene	1.0	BDL	BDL			
n-Butylbenzene	1.0	BDL	BDL			
Naphthalene	1.0	BDL	BDL			
Pyridine	1.0	BDL	BDL			
Nitrobenzene	1.0	BDL	BDL			

BDL = Below Detection Limit

## Semi-Volatile Organic Compound Analysis Summary Statistics

Component	detection limit	total # of samples analyzed	total # of hits	% that are BDL	Min value ppbv	Max value ppbv	0.90 Percentile ppbv
N-nitrosodimethylamine	1	4	0	100	BDL	BDL	BDL
Phenol	1	4	0	100	BDL	BDL	BDL
Aniline	1	4	0	100	BDL	BDL	BDL
Bis(2-Chloroethyl) ether	1	4	0	100	BDL	BDL	BDL
2-Chlorophenol	1	4	0	100	BDL	BDL	BDL
Benzyl Alcohol	1	4	0	100	BDL	BDL	BDL
2-methylphenol	1	4	0	100	BDL	BDL	BDL
bis(2-chloroisopropyl)ether	1	4	0	100	BDL	BDL	BDL
N-Nitroso-di-n-propylamine	1	4	0	100	BDL	BDL	BDL
4-methylphenol/3-methylphenol	1	4	0	100	BDL	BDL	BDL
Isophorone	1	4	0	100	BDL	BDL	BDL
2-nitrophenol	1	4	0	100	BDL	BDL	BDL
2,4-dimethylphenol	1	4	0	100	BDL	BDL	BDL
Bis(2-chloroethoxy)methane	1	4	0	100	BDL	BDL	BDL
2,4-dichlorophenol	1	4	0	100	BDL	BDL	BDL
4-Chloroaniline	1	4	0	100	BDL	BDL	BDL
4-chloro-3-methylphenol	1	4	0	100	BDL	BDL	BDL
2-methylnaphthalene	1	4	2	50	BDL	2.4	2.4
1-methylnaphthalene	1	4	2	50	BDL	1.4	1.3
Hexachlorocyclopentadiene	1	4	0	100	BDL	BDL	BDL
2,4,6-trichlorophenol	1	4	0	100	BDL	BDL	BDL
2,4,5-trichlorophenol	1	4	0	100	BDL	BDL	BDL
2-chloronaphthalene	1	4	0	100	BDL	BDL	BDL
2-Nitroaniline	1	4	0	100	BDL	BDL	BDL
1,4-dinitrobenzene	1	4	0	100	BDL	BDL	BDL
Dimethyl phthalate	1	4	0	100	BDL	BDL	BDL
1,3-dinitrobenzene	1	4	0	100	BDL	BDL	BDL
2,6-dinitrotoluene	1	4	0	100	BDL	BDL	BDL
Acenaphthylene	1	4	0	100	BDL	BDL	BDL
1,2-Dinitrobenzene	1	4	0	100	BDL	BDL	BDL
3-Nitroaniline	1	4	0	100	BDL	BDL	BDL
Acenaphthene	1	4	0	100	BDL	BDL	BDL
2,4-dinitrophenol	1	4	0	100	BDL	BDL	BDL
4-nitrophenol	1	4	0	100	BDL	BDL	BDL
Dibenzofuran	1	4	0	100	BDL	BDL	BDL
2,4-dinitrotoluene	1	4	0	100	BDL	BDL	BDL
2,3,4,6-Tetrachlorophenol	1	4	0	100	BDL	BDL	BDL
2,3,5,6-Tetrachlorophenol	1	4	0	100	BDL	BDL	BDL
Diethyl Phthalate	1	4	0	100	BDL	BDL	BDL

## Semi-Volatile Organic Compound Analysis Summary Statistics

Component	detection limit	total # of samples analyzed	total # of hits	% that are BDL	Min value ppbv	Max value ppbv	0.90 Percentile ppbv
Fluorene	1	4	0	100	BDL	BDL	BDL
4-chlorophenyl phenyl ether	1	4	0	100	BDL	BDL	BDL
4-Nitroaniline	1	4	0	100	BDL	BDL	BDL
4,6-dinitro-2-methylphenol	1	4	0	100	BDL	BDL	BDL
Diphenylamine	1	4	0	100	BDL	BDL	BDL
n-Nitrosodiphenylamine	1	4	0	100	BDL	BDL	BDL
Azobenzene	1	4	0	100	BDL	BDL	BDL
4-Bromophenyl phenyl ether	1	4	0	100	BDL	BDL	BDL
Hexachlorobenzene	1	4	0	100	BDL	BDL	BDL
Pentachlorophenol	1	4	0	100	BDL	BDL	BDL
Phenanthrene	1	4	0	100	BDL	BDL	BDL
Anthracene	1	4	0	100	BDL	BDL	BDL
Carbazole	1	4	0	100	BDL	BDL	BDL
Di-n-butyl phthalate	1	4	0	100	BDL	BDL	BDL
Fluoranthene	1	4	0	100	BDL	BDL	BDL
Pyrene	1	4	0	100	BDL	BDL	BDL
Benzyl butyl phthalate	1	4	0	100	BDL	BDL	BDL
Bis(2-ethylhexyl)adipate	1	4	0	100	BDL	BDL	BDL
Benzo(a)anthracene	1	4	0	100	BDL	BDL	BDL
Chrysene	1	4	0	100	BDL	BDL	BDL
Bis(2-ethylhexyl)phthalate	1	4	0	100	BDL	BDL	BDL
Di-n-octyl phthalate	1	4	0	100	BDL	BDL	BDL
Benzo(b)fluoranthene	1	4	0	100	BDL	BDL	BDL
Benzo(k)fluoranthene	1	4	0	100	BDL	BDL	BDL
Benzo(a)pyrene	1	4	0	100	BDL	BDL	BDL
Indeno(1,2,3-cd)pyrene	1	4	0	100	BDL	BDL	BDL
Dibenzo(a,h)anthracene	1	4	0	100	BDL	BDL	BDL
Benzo[g,h,i]perylene	1	4	0	100	BDL	BDL	BDL

## Semi-Volatile Organic Compound Analysis Summary Statistics, Continued

Component	detection limit	Average ppbv	Median ppbv	std dev ppbv	Variance	Standard Error
N-nitrosodimethylamine	1	BDL	BDL			
Phenol	1	BDL	BDL			
Aniline	1	BDL	BDL			
Bis(2-Chloroethyl) ether	1	BDL	BDL			
2-Chlorophenol	1	BDL	BDL			
Benzyl Alcohol	1	BDL	BDL			
2-methylphenol	1	BDL	BDL			
bis(2-chloroisopropyl)ether	1	BDL	BDL			
N-Nitroso-di-n-propylamine	1	BDL	BDL			
4-methylphenol/3-methylphenol	1	BDL	BDL			
Isophorone	1	BDL	BDL			
2-nitrophenol	1	BDL	BDL			
2,4-dimethylphenol	1	BDL	BDL			
Bis(2-chloroethoxy)methane	1	BDL	BDL			
2,4-dichlorophenol	1	BDL	BDL			
4-Chloroaniline	1	BDL	BDL			
4-chloro-3-methylphenol	1	BDL	BDL			
2-methylnaphthalene	1	<b>1.4</b>	<b>1.4</b>	<b>0.9</b>	<b>0.9</b>	<b>0.5</b>
1-methylnaphthalene	1	BDL	BDL	<b>0.4</b>	<b>0.2</b>	<b>0.2</b>
Hexachlorocyclopentadiene	1	BDL	BDL			
2,4,6-trichlorophenol	1	BDL	BDL			
2,4,5-trichlorophenol	1	BDL	BDL			
2-chloronaphthalene	1	BDL	BDL			
2-Nitroaniline	1	BDL	BDL			
1,4-dinitrobenzene	1	BDL	BDL			
Dimethyl phthalate	1	BDL	BDL			
1,3-dinitrobenzene	1	BDL	BDL			
2,6-dinitrotoluene	1	BDL	BDL			
Acenaphthylene	1	BDL	BDL			
1,2-Dinitrobenzene	1	BDL	BDL			
3-Nitroaniline	1	BDL	BDL			
Acenaphthene	1	BDL	BDL			
2,4-dinitrophenol	1	BDL	BDL			
4-nitrophenol	1	BDL	BDL			
Dibenzofuran	1	BDL	BDL			
2,4-dinitrotoluene	1	BDL	BDL			
2,3,4,6-Tetrachlorophenol	1	BDL	BDL			
2,3,5,6-Tetrachlorophenol	1	BDL	BDL			
Diethyl Phthalate	1	BDL	BDL			

## Semi-Volatile Organic Compound Analysis Summary Statistics, Continued

Component	detection limit	Average ppbv	Median ppbv	std dev ppbv	Variance	Standard Error
Fluorene	1	BDL	BDL			
4-chlorophenyl phenyl ether	1	BDL	BDL			
4-Nitroaniline	1	BDL	BDL			
4,6-dinitro-2-methylphenol	1	BDL	BDL			
Diphenylamine	1	BDL	BDL			
n-Nitrosodiphenylamine	1	BDL	BDL			
Azobenzene	1	BDL	BDL			
4-Bromophenyl phenyl ether	1	BDL	BDL			
Hexachlorobenzene	1	BDL	BDL			
Pentachlorophenol	1	BDL	BDL			
Phenanthrene	1	BDL	BDL			
Anthracene	1	BDL	BDL			
Carbazole	1	BDL	BDL			
Di-n-butyl phthalate	1	BDL	BDL			
Fluoranthene	1	BDL	BDL			
Pyrene	1	BDL	BDL			
Benzyl butyl phthalate	1	BDL	BDL			
Bis(2-ethylhexyl)adipate	1	BDL	BDL			
Benzo(a)anthracene	1	BDL	BDL			
Chrysene	1	BDL	BDL			
Bis(2-ethylhexyl)phthalate	1	BDL	BDL			
Di-n-octyl phthalate	1	BDL	BDL			
Benzo(b)fluoranthene	1	BDL	BDL			
Benzo(k)fluoranthene	1	BDL	BDL			
Benzo(a)pyrene	1	BDL	BDL			
Indeno(1,2,3-cd)pyrene	1	BDL	BDL			
Dibenzo(a,h)anthracene	1	BDL	BDL			
Benzo[g,h,i]perylene	1	BDL	BDL			

## Aldehyde and Ketone Compounds Summary Statistics

<b>Component</b>	<b>detection limit</b>	<b>total # of samples analyzed</b>	<b>total # of hits</b>	<b>% that are BDL</b>	<b>Min value ppbv</b>	<b>Max value ppbv</b>	<b>0.90 Percentile ppbv</b>
Formaldehyde	10	4	0	100	BDL	BDL	BDL
Acetaldehyde	7	4	4	0	34	95	81
Acetone	5	4	4	0	58	103	101
Acrolein (2-propenal)	6	4	0	100	BDL	BDL	BDL
Propionaldehyde	5	4	1	75	BDL	3	3
Crotonaldehyde	5	4	2	50	BDL	8	8
2-Butanone (MEK)	5	4	0	100	BDL	BDL	BDL
Methacrolein (Isobutenal)	5	4	1	75	BDL	10	10
Butanal	5	4	4	0	7	38	36
Benzaldehyde	5	4	0	100	BDL	BDL	BDL
Pentanal	5	4	0	100	BDL	BDL	BDL
p-Tolualdehyde	5	4	0	100	BDL	BDL	BDL
Hexanal	5	4	0	100	BDL	BDL	BDL



## Aldehyde and Ketone Compounds Summary Statistics, Continued

<b>Component</b>	<b>detection limit</b>	<b>Average ppbv</b>	<b>Median ppbv</b>	<b>std dev ppbv</b>	<b>Variance</b>
Formaldehyde	10	BDL	BDL		
Acetaldehyde	7	<b>57</b>	<b>49</b>	<b>22.8</b>	<b>518</b>
Acetone	5	<b>87</b>	<b>93</b>	<b>17.3</b>	<b>299</b>
Acrolein (2-propenal)	6	BDL	BDL		
Propionaldehyde	5	BDL	BDL		
Crotonaldehyde	5	<b>5</b>	<b>4</b>	<b>2.5</b>	<b>6</b>
2-Butanone (MEK)	5	BDL	BDL		
Methacrolein (Isobutenal)	5	BDL	BDL		
Butanal	5	<b>21</b>	<b>19</b>	<b>13.5</b>	<b>184</b>
Benzaldehyde	5	BDL	BDL		
Pentanal	5	BDL	BDL		
p-Tolualdehyde	5	BDL	BDL		
Hexanal	5	BDL	BDL		

## Target Siloxanes Summary Statistics

Component	Detection Limit	total # of samples analyzed	total # of hits	% that are BDL	Min value mg Si / M <sup>3</sup>	Max value mg Si / M <sup>3</sup>	0.90 Percentile mg Si / M <sup>3</sup>
1,1,3,3-Tetramethyldisiloxane	0.1	4	0	100	BDL	BDL	BDL
Pentamethyldisiloxane	0.1	4	0	100	BDL	BDL	BDL
Hexamethyldisilane	0.1	4	0	100	BDL	BDL	BDL
Hexamethyldisiloxane (L2, MM)	0.1	4	0	100	BDL	BDL	BDL
Octamethyltrisiloxane (L3, MDM)	0.1	4	0	100	BDL	BDL	BDL
Octamethylcyclotetrasiloxane (D4)	0.1	4	0	100	BDL	BDL	BDL
Decamethyltetrasiloxane (L4, MD2M)	0.1	4	0	100	BDL	BDL	BDL
Decamethylcyclopentasiloxane (D5)	0.1	4	0	100	BDL	BDL	BDL
Dodecamethylpentasiloxane (L5, MD3M)	0.1	4	0	100	BDL	BDL	BDL
Dodecamethylcyclohexasiloxane (D6)	0.1	4	0	100	BDL	BDL	BDL

BDL = Below Detection Limit

## Target Siloxanes Summary Statistics, Continued

Component	Detection Limit	Average mg Si / M <sup>3</sup>	Median mg Si / M <sup>3</sup>	std dev ppmv	Variance	Standard Error
1,1,3,3-Tetramethyldisiloxane	0.1	BDL	BDL			
Pentamethyldisiloxane	0.1	BDL	BDL			
Hexamethyldisilane	0.1	BDL	BDL			
Hexamethyldisiloxane (L2, MM)	0.1	BDL	BDL			
Octamethyltrisiloxane (L3, MDM)	0.1	BDL	BDL			
Octamethylcyclotetrasiloxane (D4)	0.1	BDL	BDL			
Decamethyltetrasiloxane (L4, MD2M)	0.1	BDL	BDL			
Decamethylcyclopentasiloxane (D5)	0.1	BDL	BDL			
Dodecamethylpentasiloxane (L5, MD3M)	0.1	BDL	BDL			
Dodecamethylcyclohexasiloxane (D6)	0.1	BDL	BDL			

BDL = Below Detection Limit

## Volatile Metals Analysis Summary Statistics

Component	Detection Limit, $\mu\text{g}/\text{M}^3$	total # of samples analyzed	total # of hits	% that are BDL	Min value $\mu\text{g}/\text{m}^3$	Max value $\mu\text{g}/\text{m}^3$	0.90 Percentile $\mu\text{g}/\text{m}^3$
Mercury	0.01	8	1	88	BDL	0.01	0.01

Component	Detection Limit, $\mu\text{g}/\text{M}^3$	total # of samples analyzed	total # of hits	% that are BDL	Min value $\mu\text{g}/\text{m}^3$	Max value $\mu\text{g}/\text{m}^3$	0.90 Percentile $\mu\text{g}/\text{m}^3$
Arsenic	30	4	0	100	BDL	BDL	BDL
Barium	30	4	0	100	BDL	BDL	BDL
Beryllium	30	4	0	100	BDL	BDL	BDL
Cadmium	30	4	0	100	BDL	BDL	BDL
Cobalt	30	4	0	100	BDL	BDL	BDL
Chromium	30	4	0	100	BDL	BDL	BDL
Copper *	30	4	2	50	BDL	76	69
Manganese	30	4	0	100	BDL	BDL	BDL
Molybdenum	30	4	0	100	BDL	BDL	BDL
Nickel	30	4	0	100	BDL	BDL	BDL
Lead	30	4	0	100	BDL	BDL	BDL
Antimony	30	4	0	100	BDL	BDL	BDL
Selenium	30	4	0	100	BDL	BDL	BDL
Strontium	30	4	0	100	BDL	BDL	BDL
Thallium	30	4	0	100	BDL	BDL	BDL
Zinc *	30	4	1	75	BDL	28	28

## Volatile Metals Analysis Summary Statistics, Continued

Component	Detection Limit, $\mu\text{g}/\text{M}^3$	Average $\mu\text{g}/\text{m}^3$	Median $\mu\text{g}/\text{m}^3$	std dev $\mu\text{g}/\text{m}^3$	Variance	Standard Error
Mercury	0.01	BDL	BDL			

Component	Detection Limit, $\mu\text{g}/\text{M}^3$	Average $\mu\text{g}/\text{m}^3$	Median $\mu\text{g}/\text{m}^3$	std dev $\mu\text{g}/\text{m}^3$	Variance	Standard Error
Arsenic	30	BDL	BDL			
Barium	30	BDL	BDL			
Beryllium	30	BDL	BDL			
Cadmium	30	BDL	BDL			
Cobalt	30	BDL	BDL			
Chromium	30	BDL	BDL			
Copper *	30	40	34	26	672	13.0
Manganese	30	BDL	BDL			
Molybdenum	30	BDL	BDL			
Nickel	30	BDL	BDL			
Lead	30	BDL	BDL			
Antimony	30	BDL	BDL			
Selenium	30	BDL	BDL			
Strontium	30	BDL	BDL			
Thallium	30	BDL	BDL			
Zinc *	30	BDL	BDL			



## qPCR and Bacteria/Spore Biological Analysis Summary Statistics

Component	total # of samples analyzed	total # of hits	% that are BDL	Min value # per 100 scf	Max value # per 100 scf	0.90 Percentile # per 100 scf
<b>qPCR Biological Analysis</b>						
Total Bacteria	4	4	0	6.30E+06	6.39E+07	6.32E+07
Total acid-producing bacteria (APB)	4	4	0	1.09E+04	5.09E+05	3.71E+05
Total iron-oxidizing bacteria (IOB)	4	4	0	1.04E+04	4.98E+04	4.80E+04
Total sulfate-reducing bacteria (SRB)	4	2	50	ND	2.76E+04	2.67E+04
<b>Live Bacteria</b>						
Anaerobic	4	0	100	ND	ND	ND
Aerobic	4	0	100	ND	ND	ND
Total	4	0	100	ND	ND	ND
<b>Spores</b>						
Anaerobic	4	0	100	ND	ND	ND
Aerobic	4	0	100	ND	ND	ND
Total	4	0	100	ND	ND	ND

ND=Not Detected

Statistical data calculated for hits only.

### CONVERTED TO BASE 10 LOG

Component	total # of samples analyzed	total # of hits	% that are BDL	Min value # per 100 scf	Max value # per 100 scf	0.90 Percentile # per 100 scf
<b>qPCR Biological Analysis</b>						
Total Bacteria	4	4	0	6.80	7.81	7.80
Total Acid-producing Bacteria (APB)	4	4	0	4.04	5.71	5.40
Total Iron-oxidizing Bacteria (IOB)	4	4	0	4.02	4.70	4.68
Total Sulfate-reducing Bacteria (SRB)	4	2	50	ND	4.44	4.43
<b>Live Bacteria</b>						
Anaerobic	4	0	100	ND	ND	ND
Aerobic	4	0	100	ND	ND	ND
Total	4	0	100	ND	ND	ND
<b>Spores</b>						
Anaerobic	4	0	100	ND	ND	ND
Aerobic	4	0	100	ND	ND	ND
Total	4	0	100	ND	ND	ND

ND=Not Detected

Statistical data calculated for hits only.

## qPCR and Bacteria/Spore Biological Analysis Summary Statistics, Continued

Component	Average # per 100 scf	Median # per 100 scf	std dev # per 100 scf	Variance	Standard Error
<b>qPCR Biological Analysis</b>					
Total Bacteria	4.75E+07	6.00E+07	2.39E+07	5.70E+14	1.19E+07
Total acid-producing bacteria (APB)	1.46E+05	3.31E+04	2.10E+05	4.39E+10	1.05E+05
Total iron-oxidizing bacteria (IOB)	3.14E+04	3.27E+04	1.61E+04	2.58E+08	8.03E+03
Total sulfate-reducing bacteria (SRB)	2.35E+04	2.35E+04	4.08E+03	1.66E+07	2.04E+03

### Live Bacteria

Anaerobic	ND	ND
Aerobic	ND	ND
Total	ND	ND

### Spores

Anaerobic	ND	ND
Aerobic	ND	ND
Total	ND	ND

ND=Not Detected

Statistical data calculated for hits only.

## CONVERTED TO BASE 10 LOG

Component	Average # per 100 scf	Median # per 100 scf	std dev # per 100 scf	Variance	Standard Error
<b>qPCR Biological Analysis</b>					
Total Bacteria	7.54	7.78	0.43	0.18	0.21
Total Acid-producing Bacteria (APB)	4.67	4.47	0.64	0.41	0.32
Total Iron-oxidizing Bacteria (IOB)	4.42	4.49	0.27	0.07	0.14
Total Sulfate-reducing Bacteria (SRB)	4.36	4.36	0.08	0.006	0.04

### Live Bacteria

Anaerobic	ND	ND
Aerobic	ND	ND
Total	ND	ND

### Spores

Anaerobic	ND	ND
Aerobic	ND	ND
Total	ND	ND

ND=Not Detected

Statistical data calculated for hits only.