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**Stantec**

**Summary of Ambient Air  
Sampling at Bridgeton Landfill  
Second Comprehensive  
Sampling Study**

Presentation of Laboratory Analytical  
Results in Comparison to Relative  
Standards and Guidelines

August 27, 2013

# Sign-off Sheet



**Stantec**

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## **Summary of Ambient Air Sampling at Bridgeton Landfill Second Comprehensive Sampling Study April 16, 2013 & May 7-8, 2013**

On behalf of Bridgeton Landfill, LLC (Bridgeton), Stantec Consulting Services, Inc (Stantec) conducted a second comprehensive ambient air sampling study at Bridgeton Landfill. The first comprehensive sampling study was conducted August 16-17, 2012. A detailed report entitled "*Bridgeton Landfill Air and Landfill Gas Sampling, August 2012: Summary of Findings*" was prepared and submitted to Bridgeton Landfill in October 2012. As in the first study, Stantec personnel co-located samples alongside samples being collected by the Missouri Department of Natural Resources (MDNR) and/or representatives of MDNR. As requested and approved by MDNR in a Work Plan submitted to MDNR before the April 16 study, samples of air and landfill gas were analyzed for individual constituents and analytical groupings (see Table 1). Analytical methods selected and utilized were specified by United States Environmental Protection Agency (US EPA), the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), the American Society for Testing and Materials (ASTM) and methods developed by Columbia Analytical Laboratories (AQL) specifically for odor investigations. All methods were presented in the Work Plan and approved by MDNR.

Table 1 (Attachment 1) summarizes sampling activity which was conducted during three days at Bridgeton Landfill. Note that samples collected on April 16, 2013 and May 7, 2013 are combined into one round of samples (Round #1) because onsite samples were collected on April 16, 2013 and upwind and downwind samples were collected on May 7, 2013. For Round #2, all onsite, upwind and downwind samples were collected on May 8, 2013. Analytical results for samples collected under the Flexible Membrane Liner (FML) are presented in Table 5; however, the results are not discussed in this summary because they do not represent potential pathways of occupational or offsite exposure.

### **Laboratory Analytical Results**

Stantec has reviewed the laboratory analytical results for all the ambient air samples collected onsite, upwind and downwind of Bridgeton Landfill for potential occupational and public health significance. Sample results were compared to the US EPA industrial and residential regional screening levels (RSLs), to the OSHA permissible exposure limits (PELs) and to the American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit values (TLVs®). The laboratory analytical results as well as relevant comparisons are presented in the following tables (Attachment 1):

- Table 2: Summary of Round #1 laboratory analytical results for data collected on April 16, 2013 and May 7, 2013 along with recognized regulatory and/or industrial screening guidelines or standards;

- Table 3: Summary of Round #2 laboratory analytical results along with guidelines or standards for samples collected on May 8, 2013;
- Table 4: Polychlorinated Dibenzo-p-Dioxins (PCDD) and Polychlorinated Dibenzofurans (PCDF) Air Sampling Summary - Comprehensive Sampling Study # 2 – Ambient Air Sampling - May 7 to May 8, 2013 along with regulatory screening guidelines;
- Table 5: Source Gas Sampling Summary – Comprehensive #2 – April 16, 2013 and May 8, 2013

### **Discussion of Results**

#### **Applicable Public Health Standards:**

When available, US EPA RSL concentrations for exposure to constituents in air in industrial and residential settings are presented on Tables 2, 3 and 4. US EPA RSLs have been derived using conservative assumptions to correspond to an excess lifetime cancer risk of 1 in 1,000,000 (1 in 1 million or 1E-06) for a person (receptor) who is assumed to be exposed to that concentration on an ongoing basis over an extended period of time (25 years for industrial and 30 years for residential). RSLs for the adverse non-cancer effects produced by chemicals are concentrations that are very unlikely to produce health effects in people who are exposed over many years. Concentrations of constituents below applicable RSL concentrations are generally not considered to be of concern for public health. RSLs are very conservative risk based screening values; *concentrations above RSLs do not necessarily mean that adverse health effects will occur, but do indicate that additional evaluation may be appropriate. RSLs are useful when evaluating public health significance of potential exposures in industrial and residential settings and whether further evaluation may be appropriate.*

#### **Applicable Occupational Standards/Guidelines:**

The following occupational standards and guidelines are useful when evaluating onsite exposures by workers at Bridgeton Landfill.

The Occupational Safety and Health Administration sets enforceable permissible exposure limits (PELs) to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air. OSHA PELs are generally based on an 8-hour time weighted average (TWA) exposure. (<https://www.osha.gov/dsg/topics/pel/>)

The American Conference of Governmental Industrial Hygienists threshold limit values (TLV<sup>®</sup>) are guidelines established to protect worker health. TLVs refer to “airborne concentrations of chemical substances, and represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse health effects.” Exposure to chemical compound

concentrations at or below the level of the TLV<sup>®</sup> does not represent an unreasonable risk of disease or injury to workers. (<http://www.acgih.org/tlv/>).

### **Discussion of Results – Onsite, Upwind and Downwind Samples**

**Hydrogen cyanide, amine compounds, mercury, ammonia and sulfur dioxide** were not detected in any upwind, downwind or onsite sample during the second comprehensive sampling study.

**Hydrogen Chloride (HCl)** was detected at low concentrations in samples collected at onsite, upwind and downwind locations on April 16, 2013 and May 7, 2013. Hydrogen chloride was not detected in any samples collected on May 8, 2013. The detected concentrations from April 16, 2013 and May 7, 2013 (range 11  $\mu\text{g}/\text{m}^3$  to 21  $\mu\text{g}/\text{m}^3$ ) exceed the conservative RSLs (Industrial RSL 8.8  $\mu\text{g}/\text{m}^3$ ; residential RSL 2.1  $\mu\text{g}/\text{m}^3$ , respectively. The concentrations are well below OSHA PEL (7,000  $\mu\text{g}/\text{m}^3$ ) and ACGIH TLV (3,000  $\mu\text{g}/\text{m}^3$ ) for HCl and do not present an occupational exposure health risk. Hydrogen chloride was detected on April 16, 2013 on the landfill in a concentration below the residential RSL, and upwind and downwind of the landfill on May 7, 2013 in concentrations exceeding the RSLs. This suggests that there may be regional sources of HCl besides the landfill, such as; industrial sources associated with food processing, manufacturing of fertilizers and dyes and combustion from coal burning power plants (<http://www.atsdr.cdc.gov/facts173.html>; <http://www.inchem.org/documents/ehc/ehc/ehc21.htm>). An exceedance of the RSL does not necessarily pose a public health risk.

**Aldehydes** were detected at low concentrations in all upwind, downwind and onsite samples collected during the second comprehensive sampling study. The concentrations of formaldehyde and acetaldehyde exceeded the conservative industrial and residential RSLs, but never approached levels above OSHA PELs or ACGIH TLVs. The presence of these aldehydes in upwind, downwind, and onsite samples suggest that there may be regional sources of aldehydes besides the landfill, including, but not limited to combustion of fossil fuels (including diesel fuel) such as from cars, and combustion of wood. Formaldehyde and acetaldehyde are also commonly encountered in industrial settings. An exceedance of the RSL does not necessarily pose a public health risk.

Four (4) **carboxylic acid compounds** were detected at low concentrations in the onsite sample collected on May 8, 2013. Carboxylic acids were not detected in any downwind or upwind sample collected during round one of the second comprehensive sampling study. There are no published occupational guidelines or standards or USEPA RSLs for the detected compounds. Based on the fact that carboxylic acids were detected at low concentrations and only at the onsite sampling locations, carboxylic acids are not expected to pose a risk to public health nor do they represent an occupational exposure concern.

**Volatile organic compounds (VOCs)** were detected in onsite, upwind and downwind samples collected during the second comprehensive sampling study. The concentrations and variety of VOCs were greater for

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the onsite samples as compared to downwind or upwind samples. No compounds were detected onsite at concentrations exceeding OSHA PELs or ACGIH TLVs.

On May 7, 2013, the concentration of benzene in the two downwind locations exceeded industrial and residential RSLs and ethylbenzene concentrations exceeded the residential RSL. It should be noted that both of these constituents are components of gasoline and combustion. The downwind locations were near two businesses with significant automobile and semi-truck traffic, which may have contributed to benzene and ethylbenzene concentrations. On May 8, 2013, the concentration of benzene ( $0.79 \mu\text{g}/\text{m}^3$ ) in the downwind location slightly exceeded the residential RSL ( $0.31 \mu\text{g}/\text{m}^3$ ). The detected benzene concentration may have been elevated due to automobile traffic on St. Charles Rock Road and heavy truck traffic in the Allied Waste parking lot, which were both near the downwind sample location on May 8, 2013. An exceedance of the RSL does not necessarily pose a public health risk.

On April 16, 2013, furan was detected on the landfill at  $26 \mu\text{g}/\text{m}^3$ . On May 7, 2013, furan was detected downwind at two locations at  $9 \mu\text{g}/\text{m}^3$  and  $6.8 \mu\text{g}/\text{m}^3$ . On May 8, 2013, furan was detected onsite at a concentration of  $7 \mu\text{g}/\text{m}^3$ . It should be noted that furan is a VOC and unrelated both in structure and toxicological properties from polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF), which are discussed below. These detected concentrations are minimal. While there are no published residential or industrial RSLs for furan, the AIHA WEEL recommends that "exposure to furan be minimized to the fullest extent possible." (AIHA, *The AIHA 2010 ERPG and WEEL Handbook*, AIHA, Fairfax, VA, 2010).

The National Advisory Committee (NAC) for Acute Exposure Guidelines Levels (AEGL) for Hazardous Substances provides guidance for approximately 200 compounds, including furan. An AEGL-2 is the airborne concentration of a substance below which it is predicted that the general population, including susceptible individuals, would not be expected to experience irreversible or other serious, long-lasting adverse health effects, or an impaired ability to escape. The AEGL-2 for furan is  $2,400 \mu\text{g}/\text{m}^3$  for an exposure lasting 8 hours. All the measured furan concentrations are well below this value.

On April 16, 2013, two (2) **reduced sulfur compounds**, dimethyl sulfide and dimethyl disulfide, were detected onsite. There are no published residential or industrial RSLs, but the concentrations detected are well below ACGIH TLVs. The concentrations detected are not expected to pose a risk to public health nor do they represent an occupational exposure concern.

**Polynuclear aromatic hydrocarbons** were detected in all onsite, upwind and downwind samples. No concentration in the upwind or downwind samples exceeded US EPA RSLs. Similarly, the concentrations detected onsite did not exceed OSHA PELs or ACGIH TLVs. Benzo(a)pyrene and other combustion-related

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carcinogenic PAHs were not detected in any sample. The concentrations do not pose a risk to public health nor do they represent an occupational exposure concern.

***Polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF)*** were detected in onsite, upwind and downwind samples at concentrations below residential RSLs. The observed concentrations of PCDDs and PCDFs do not pose a risk to public health or the environment.



# **ATTACHMENT 1**

Summary Tables of Laboratory Analytical Results

**Table 1. Bridgeton Landfill, LLC  
Summary of Sampling Activities  
Comprehensive Sampling Event #2  
April 16, 2013, May 7-8, 2013**

Compound/Analytical Group	Laboratory Analytical Method	4/16/2013	5/7/2013	5/8/2013
		Round #1		Round #2
<b>Low Flow Sampling Pumps</b>				
Hydrogen Chloride	NIOSH 7903	OS <sup>1</sup>	UW <sup>2</sup> x 2; DW <sup>3</sup> x 2	OS; UW; DW
Aldehydes	EPA TO-11a	OS	UW x 2; DW x 2	OS; UW; DW
Hydrogen Cyanide	NIOSH 6010	OS	UW x 2; DW x 2	OS; UW; DW
Amines	AQL 101	OS	UW x 2; DW x 2	OS; UW; DW
Mercury	NIOSH 6009	OS	UW x 2; DW x 2	OS; UW; DW
Ammonia	OSHA ID-188	OS	UW x 2; DW x 2	OS; UW; DW
Carboxylic Acids	AQL 102	OS	UW x 2; DW x 2	OS; UW; DW
Sulfur Dioxide	OSHA ID-200	OS	UW x 2; DW x 2	OS; UW; DW
<b>SUMMA Canisters</b>				
Fixed Gases	EPA 3Cm	OS	UW x 2; DW x 2	OS; UW; DW
Volatile Organic Compounds	EPA TO-15 + TICs	OS	UW x 2; DW x 2	OS; UW; DW
Reduced Sulfur Compounds	ASTM D5504	OS	UW x 2; DW x 2	OS; UW; DW
<b>High Volume Sampling<sup>4,5</sup></b>				
PAH	EPA TO13	--	OS; UW; DW	Under FML
Dioxins/Furans	EPA TO 9	--	OS; UW; DW	Under FML
1. "OS": = On-Site sampling in active area of remedial activities of Bridgeton Landfill 2. "UW" = Monitoring location which is situated upwind of Bridgeton Landfill 3. "DW" = Monitoring location which is situated downwind of Bridgeton Landfill 4. "OS" High Volume Samples were collected for a 24 hour period beginning on May 7, 2013 and ending on May 8, 2013. 5. "Under FML": Flexible Membrane Liner. Samples collected over a 2 hour period under the FML in 3 locations in active areas of the landfill				

**Table 2: Ambient Air Sampling Summary  
Comprehensive Sampling Study #2 – Round #1  
April 16, 2013 & May 7, 2013  
Concentration in Ambient Air – All Units  $\mu\text{g}/\text{m}^3$**

Analyte	Screening Levels				Sample Locations				
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Amphitheater	Grassy Knoll Lower Level	Grassy Knoll Upper Level	MSD Lift Station	Materiologic East End
					4/16/2013 Onsite	5/7/2013 Upwind 1	5/7/2013 Upwind 2	5/7/2013 Downwind 1	5/7/2013 Downwind 2
<b>Hydrogen Chloride – NIOSH 7903</b>									
Hydrogen Chloride	8.80E+00	2.10E+00	7.00E+03	3.00E+03	Detect (1.8 $\mu\text{g}$ ) <sup>5</sup>	11 <sup>6</sup>	-- <sup>7</sup>	21	--
<b>Aldehydes/Carbonyl Compounds – Method: EPA TO-11a</b>									
Formaldehyde	9.40E-01	1.90E-01	9.21E+02	3.68E+02	1.8 <sup>8</sup>	2.3	2.4	3	2.6
Acetaldehyde	5.60E+00	1.10E+00	3.31E+04	4.50E+04	4.4	1.3	1.1	3	2.1
Propionaldehyde	3.50E+00	8.30E-01	NA <sup>9</sup>	4.75E+04	--	--	--	0.4	--
Butyraldehyde	NA	NA	7.37E+3 AIHA WEEL <sup>10</sup>		--	--	--	0.5	--
n-Hexaldehyde	NA	NA	NA	NA	--	0.3	0.4	0.5	0.4
2,5-Dimethylbenzaldehyde	NA	NA	NA	NA	--	0.4	--	1.2	--
<b>Hydrogen Cyanide – Method: NIOSH 6010</b>									
No compounds detected	3.50E+00	8.30E-01	1.10E+03	NA	--	--	--	--	--
<b>Amine Compounds – Method: NIOSH 2010m</b>									
No compounds detected	NA	NA	NA	NA	--	--	--	--	--
<b>Mercury – Method: NIOSH 6009</b>									
No compounds detected	1.30E+00	3.10E-01	1.00E+02	2.50E+01	--	--	--	--	--
<b>Ammonia – Method: OSHA ID 188</b>									
No compounds detected	4.40E+02	1.00E+02	3.50E+04	NA	--	--	--	--	--
<b>Carboxylic Acid Compounds – Method: CAS AQL 102</b>									
No compounds detected	NA	NA	NA	NA	--	--	--	--	--
<b>Sulfur Dioxide – Method: OSHA ID 200</b>									
No compounds detected	NA	NA	1.31E+04	NA	--	--	--	--	--
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs</b>									
Propene	1.30E+04	3.10E+03	NA	8.61E+05	14	--	--	5.9	3.3
Dichlorodifluoromethane (CFC 12)	4.40E+02	1.00E+02	4.95E+06	4.21E+04	2.1	2.5	2.8	2.1	2.1
Ethanol	1.40E+05	3.20E+04	1.89E+06	1.88E+06	58	--	--	--	7.7

**Table 2: Ambient Air Sampling Summary  
Comprehensive Sampling Study #2 – Round #1  
April 16, 2013 & May 7, 2013  
Concentration in Ambient Air – All Units  $\mu\text{g}/\text{m}^3$**

Analyte	Screening Levels				Sample Locations				
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Amphitheater	Grassy Knoll Lower Level	Grassy Knoll Upper Level	MSD Lift Station	Materiologic East End
					4/16/2013 Onsite	5/7/2013 Upwind 1	5/7/2013 Upwind 2	5/7/2013 Downwind 1	5/7/2013 Downwind 2
Acetonitrile	2.60E+02	6.30E+01	6.72E+04	3.36E+04	--	4.8	6	35	5
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs (Cont.)</b>									
Acetone	1.40E+05	3.20E+04	2.38E+06	1.19E+06	66	--	--	18	12
Trichlorofluoromethane	3.10E+02	7.30E+01	5.62E+06	5.62E+06	1.2	--	--	--	0.97
2-Propanol (Isopropyl Alcohol)	3.10E+03	7.30E+02	NA	9.80E+05	38	--	--	--	--
Methylene Chloride	1.20E+03	9.60E+01	8.68E+04	1.74E+05	1.8	6.6	4.7	4	2.6
2-Butanone (MEK)	2.20E+04	5.20E+03	5.90E+05	5.90E+05	32	--	--	--	--
Ethyl Acetate	NA	NA	1.44E+06	1.44E+06	4.9	--	--	--	--
Tetrahydrofuran (THF)	8.80E+03	2.10E+03	5.90E+05	1.47E+05	27	--	--	5.8	3.5
Benzene	1.60E+00	3.10E-01	3.19E+03	1.60E+03	<b>27</b>	--	--	<b>25</b>	<b>12</b>
4-Methyl-2-pentanone	NA	NA	NA	NA	2.1	--	--	--	--
Toluene	2.20E+04	5.20E+03	7.54E+05	7.54E+04	8.8	3.1	--	6	3.3
n-Butyl Acetate	NA	NA	7.13E+05	7.10E+05	1.6	1.5	--	--	--
Ethylbenzene	4.90E+00	9.70E-01	4.34E+05	8.68E+04	<b>2</b>	--	--	<b>1.8</b>	<b>0.97</b>
m,p-Xylenes	4.40E+02	1.00E+02	4.34E+05	4.34E+05	3.9	--	--	3.2	1.7
o-Xylene	4.40E+02	1.00E+02	4.34E+05	4.34E+05	1.1	--	--	--	--
n-Nonane	8.80E+02	2.10E+02	1.05E+06	1.05E+06	1.1	--	--	--	0.76
alpha-Pinene	NA	NA	5.57E+05	1.11E+05	1.4	--	--	1.6	1
d-Limonene	NA	NA	1.67E+05	NA	1.3	--	--	1.8	1.1
<b>Volatile Organic Compounds (VOCs) – Tentatively Identified Compounds - Method: EPA TO15 + TICs<sup>11</sup></b>									
Bromotrifluoromethane	NA	NA	6.09E+06	6.09E+06	5.4	--	--	--	--
Dimethyl Ether	NA	NA	1.88E+06 WEEL		6.7	--	--	--	4.2
Isobutane	NA	NA	1.90E+06 WEEL		10	--	--	--	--
Isobutene	NA	NA	NA	NA	6.9	--	--	--	--
C4H8 Alkene	NA	NA	NA	NA	--	--	--	6.4	--
Furan	NA	NA	Lowest feasible, WEEL		26	--	--	9	6.8
n-Pentane	4.40E+02	1.00E+02	2.95E+06	2.95E+06	7.1	50	--	--	--
Dimethyl Sulfide	NA	NA	NA	2.54E+04	34	--	--	8.8	5.6

**Table 2: Ambient Air Sampling Summary  
Comprehensive Sampling Study #2 – Round #1  
April 16, 2013 & May 7, 2013  
Concentration in Ambient Air – All Units  $\mu\text{g}/\text{m}^3$**

Analyte	Screening Levels				Sample Locations				
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Amphitheater	Grassy Knoll Lower Level	Grassy Knoll Upper Level	MSD Lift Station	Materiologic East End
					4/16/2013 Onsite	5/7/2013 Upwind 1	5/7/2013 Upwind 2	5/7/2013 Downwind 1	5/7/2013 Downwind 2
<b>Volatile Organic Compounds (VOCs) – Tentatively Identified Compounds - Method: EPA TO15 + TICs<sup>11</sup> (Cont.)</b>									
Methylfuran isomer	NA	NA	NA	NA	9.7	--	--	8.8	5.3
2-Butanol	NA	NA	4.55E+05	3.03E+05	15	--	--	--	--
Methyl Propionate	NA	NA	NA	NA	9.9	--	--	--	--
1-Butanol	NA	NA	3.00E+05	6.00+04	17	--	--	--	--
Methylcyclopentene Isomer+1-Butanol	NA	NA	NA	NA	--	--	--	6.3	3.7
Hexamethylcyclotrisiloxane	NA	NA	NA	NA	--	--	14	--	4.8
n-Octanal + Unidentified Cmpd	NA	NA	NA	NA	--	8.7	15	26	7.7
Methyl Butyrate	NA	NA	NA	NA	13	--	--	--	--
2-Ethyl-1-hexanol	NA	NA	NA	NA	5.6	34	21	37	38
n-Nonanal	NA	NA	NA	NA	10	24	19	18	24
2-Ethylhexylacetate	NA	NA	NA	NA	--	15	19	18	18
Unidentified Siloxane	NA	NA	NA	NA	--	13	21	15	6.3
Unidentified Compound	NA	NA	NA	NA	--	6.1	--	--	4.9
n-Decanal	NA	NA	NA	NA	5.5	17	--	10	14
C13H28 Branched Alkane	NA	NA	NA	NA	--	5.8	--	--	--
C13H28 Branched Alkane	NA	NA	NA	NA	--	5.6	--	--	--
C14H30 Branched Alkane	NA	NA	NA	NA	--	8.5	--	--	--
Unidentified Compound	NA	NA	NA	NA	--	--	--	--	4.2
Unidentified Siloxane	NA	NA	NA	NA	--	11	14	8.7	6
C15H32 Branched Alkane	NA	NA	NA	NA	--	7.2	--	--	--
<b>Reduced Sulfur Compound – ASTM D5504</b>									
Dimethyl Sulfide	NA	NA	NA	2.54E+04	37	--	--	--	--
Dimethyl Disulfide	NA	NA	NA	1.93E+03	26	--	--	--	--
<b>Polynuclear Aromatic Hydrocarbons - Method: EPA TO13a Modified<sup>12</sup></b>									
Naphthalene	3.60E-01	7.20E-02	5.24E+04	5.24E+04	<b>0.13</b>	NS <sup>13</sup>	0.048	0.024	NS
Acenaphthene	NA	NA	NA	NA	0.013	NS	0.0036	0.002	NS

**Table 2: Ambient Air Sampling Summary  
Comprehensive Sampling Study #2 – Round #1  
April 16, 2013 & May 7, 2013  
Concentration in Ambient Air – All Units  $\mu\text{g}/\text{m}^3$**

Analyte	Screening Levels				Sample Locations				
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Amphitheater	Grassy Knoll Lower Level	Grassy Knoll Upper Level	MSD Lift Station	Materiologic East End
					4/16/2013 Onsite	5/7/2013 Upwind 1	5/7/2013 Upwind 2	5/7/2013 Downwind 1	5/7/2013 Downwind 2
<b>Polynuclear Aromatic Hydrocarbons - Method: EPA TO13a Modified (Cont.)</b>									
Fluorene	NA	NA	NA	NA	0.014	NS	0.0056	0.0017	NS
Phenanthrene	NA	NA	2.00E+02	2.00E+02	0.024	NS	0.016	0.0035	NS
Fluoranthene	NA	NA	2.00E+02	2.00E+02	0.005	NS	0.0038	--	NS
Pyrene	NA	NA	2.00E+02	2.00E+02	0.003	NS	0.0016	--	NS
<b>Polychlorinated Dibenzo-p-Dioxins, Dibenzofurans – EPA Method TO-9A</b>									
2,3,7,8-TCDD	3.20E-07	6.40E-08	2.0E-04 (Leung HW) <sup>14</sup>		6.31E-09	NS	1.22E-08	1.69E-08	NS

1. United States Environmental Protection Agency Regional Screening Levels for Industrial Air
2. United States Environmental Protection Agency Regional Screening Levels for Residential Air
3. Occupational Safety & Health Administration (OSHA) Permissible Exposure Limit
4. American Conference of Governmental Industrial Hygienists- Threshold Limit Value
5. Hydrogen Chloride was detected at the onsite location, however, the pump failed during the 4-hour sampling event so an accurate determination of the volume of air sampled could not be determined. Therefore the concentration of the constituent could not be calculated.
6. Bold and shading indicate that the detected concentration exceeds the United States Environmental Protection Agency Regional Screening Level for Residential Air.
7. “—” = Compound not detected
8. Italics indicate that the detected concentration exceeds the United States Environmental Protection Agency Regional Screening Level for Industrial Air.
9. “NA” = Not Available
10. American Industrial Hygiene Association Workplace Environmental Exposure Level
11. Tentatively Identified Compounds – under Method: EPA TO15 + TICs. The reported concentrations for TICs are estimated.
12. The Onsite sample was collected on 5/7/2013 at the Amphitheater
13. “NS” = Not Sampled
14. Leung HW et al; Am Ind Hyg Assoc J 49 (9): 466-74 (1988)

**Table 3: Ambient Air Sampling Summary**  
**Comprehensive Sampling Study #2 – Round #2**  
**May 8, 2013**  
**Concentration in Ambient Air – All Units  $\mu\text{g}/\text{m}^3$**

Analyte	Screening Levels				Sample Locations		
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Second Tier Service Road	Pond	Northwest Auto Repair
					5/8/2013 Onsite	5/8/2013 Upwind 1	5/8/2013 Downwind 1
<b>Hydrogen Chloride – NIOSH 7903</b>							
Hydrogen Chloride	8.80E+00	2.10E+00	7.00E+03	3.00E+03	-- <sup>5</sup>	--	--
<b>Aldehydes/Carbonyl Compounds – Method: EPA TO-11a</b>							
Formaldehyde	9.40E-01	1.90E-01	9.21E+02	3.68E+02	<b>3.9</b> <sup>8</sup>	<b>2.9</b>	<b>3.3</b>
Acetaldehyde	5.60E+00	1.10E+00	3.31E+04	4.50E+04	<b>3.1</b>	<b>1.3</b>	<b>1.7</b>
Propionaldehyde	3.50E+00	8.30E-01	NA <sup>6</sup>	4.75E+04	0.41	--	--
Butyraldehyde	NA	NA	7.37E+3 AIHA WEEL <sup>7</sup>		0.49	--	--
n-Hexaldehyde	NA	NA	NA	NA	1	0.8	1.4
<b>Hydrogen Cyanide – Method: NIOSH 6010</b>							
No compounds detected	3.50E+00	8.30E-01	1.10E+03	NA	--	--	--
<b>Amine Compounds – Method: NIOSH 2010m</b>							
No compounds detected	NA	NA	NA	NA	--	--	--
<b>Mercury – Method: NIOSH 6009</b>							
No compounds detected	1.30E+00	3.10E-01	1.00E+02	2.50E+01	--	--	--
<b>Ammonia – Method: OSHA ID 188</b>							
No compounds detected	4.40E+02	1.00E+02	3.50E+04	NA	--	--	--
<b>Carboxylic Acid Compounds – Method: CAS AQL 102</b>							
Hexanoic Acid (Caproic)	NA	NA	NA	NA	11	--	--
Pentanoic Acid (Valeric)	NA	NA	NA	NA	4.4	--	--
Butanoic Acid (Butyric)	NA	NA	NA	NA	12	--	--
Propionic Acid (Propanoic)	NA	NA	NA	NA	5.6	--	--
<b>Sulfur Dioxide – Method: OSHA ID 200</b>							
No compounds detected	NA	NA	1.31E+04		--	--	--
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs</b>							
Propene	1.30E+04	3.10E+03	NA	8.61E+05	2.1	1.1	0.79
Dichlorodifluoromethane (CFC 12)	4.40E+02	1.00E+02	4.95E+06	4.21E+04	2.1	2	1.9
Ethanol	1.40E+05	3.20E+04	1.89E+06	1.88E+06	11	--	--

**Table 3: Ambient Air Sampling Summary**  
**Comprehensive Sampling Study #2 – Round #2**  
**May 8, 2013**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations		
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Second Tier Service Road	Pond	Northwest Auto Repair
					5/8/2013 Onsite	5/8/2013 Upwind 1	5/8/2013 Downwind 1
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs (Cont.)</b>							
Acetonitrile	2.60E+02	6.30E+01	6.72E+04	3.36E+04	5.4	0.79	4.2
Acetone	1.40E+05	3.20E+04	2.38E+06	1.19E+06	18	6.5	9
Trichlorofluoromethane	3.10E+02	7.30E+01	5.62E+06	5.62E+06	1	1	0.95
Methylene Chloride	1.20E+03	9.60E+01	8.68E+04	1.74E+05	0.73	0.68	1.1
Trichloroethene	3.0E+00	4.3E-01	5.37E+05	NA	<b>0.98</b>	<b>0.97</b>	<b>1</b>
2-Butanone (MEK)	2.20E+04	5.20E+03	5.90E+05	5.90E+05	9.5	--	--
Tetrahydrofuran (THF)	8.80E+03	2.10E+03	5.90E+05	1.47E+05	4.7	--	--
Benzene	1.60E+00	3.10E-01	3.19E+03	1.60E+03	<b>9.7</b>	--	<b>0.79</b>
1,2,4-Trimethylbenzene	3.1E+01	7.3E+00	NA	NA	2.4	--	--
1,4-Dichlorobenzene	1.10E+00	2.20E-01	4.51E+05	6.00E+04	<b>2.4</b>	--	--
Naphthalene	3.60E-01	7.20E-02	5.24E+04	5.24E+04	<b>1.5</b>	--	--
Toluene	2.20E+04	5.20E+03	7.54E+05	7.54E+04	3.6	1.4	1.5
n-Butyl Acetate	NA	NA	7.13E+05	7.10E+05	1.1	--	--
Ethylbenzene	4.90E+00	9.70E-01	4.34E+05	8.68E+04	<b>1.9</b>	--	--
m,p-Xylenes	4.40E+02	1.00E+02	4.34E+05	4.34E+05	3.7	--	--
o-Xylene	4.40E+02	1.00E+02	4.34E+05	4.34E+05	1.4	--	--
n-Nonane	8.80E+02	2.10E+02	1.05E+06	1.05E+06	1	--	--
alpha-Pinene	NA	NA	NA	1.11E+05	0.9	--	--
d-Limonene	NA	NA	1.67E+5 AIHA WEEL		1.7	--	--
<b>Volatile Organic Compounds (VOCs) – Tentatively Identified Compounds - Method: EPA TO15 + TICs<sup>9</sup></b>							
Isopentane	NA	NA	NA	NA	--	3.2	2.8
Furan	NA	NA	Lowest feasible, WEEL		7	--	--
Dimethyl Sulfide	NA	NA	NA	2.54E+04	12	--	--
Trimethylsilanol	NA	NA	NA	NA	--	--	2.5
Methylfuran Isomer	NA	NA	NA	NA	3.9	--	--
1-Butanol	NA	NA	3.00E+05	6.00+04	6.1	--	--
Methyl Butyrate	NA	NA	NA	NA	11	--	--
Hexamethylcyclotrisiloxane	NA	NA	NA	NA	--	--	8.4

**Table 3: Ambient Air Sampling Summary  
Comprehensive Sampling Study #2 – Round #2  
May 8, 2013  
Concentration in Ambient Air – All Units  $\mu\text{g}/\text{m}^3$**

Analyte	Screening Levels				Sample Locations		
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Second Tier Service Road	Pond	Northwest Auto Repair
					5/8/2013 Onsite	5/8/2013 Upwind 1	5/8/2013 Downwind 1
<b>Volatile Organic Compounds (VOCs) – Tentatively Identified Compounds - Method: EPA TO15 + TICs<sup>9</sup> (Cont)</b>							
Methyl hexanoate	NA	NA	NA	NA	6.6	--	--
n-Octanal	NA	NA	NA	NA	3.6	--	--
Unidentified Compound	NA	NA	NA	NA	--	5.9	7.7
2-Ethyl-1-hexanol	NA	NA	NA	NA	14	--	--
p-Cymene	NA	NA	NA	NA	14	--	--
n-Nonanal	NA	NA	NA	NA	17	3.5	5
n-Undecane	NA	NA	NA	NA	9.9	--	--
2-Ethylhexylacetate	NA	NA	NA	NA	3.4	--	--
Unidentified Compound	NA	NA	NA	NA	3.3	--	--
n-Decanal	NA	NA	NA	NA	8.1	--	--
n-Dodecane	NA	NA	NA	NA	5.3	--	--
<b>Reduced Sulfur Compound – ASTM D5504</b>							
No compounds detected	NA	NA	NA	NA	--	--	--
<b>Polynuclear Aromatic Hydrocarbons - Method: EPA TO13a Modified</b>							
Results presented in Table 2	NA	NA	NA	NA	NS <sup>10</sup>	NS	NS
<b>Polychlorinated Dibenzo-p-Dioxins, Dibenzofurans – EPA Method TO-9A</b>							
Results presented in Table 2	NA	NA	NA	NA	NS	NS	NS
1. United States Environmental Protection Agency Regional Screening Level for Industrial Air 2. United States Environmental Protection Agency Regional Screening Level for Residential Air 3. Occupational Safety & Health Administration (OSHA) Permissible Exposure Limit 4. American Conference of Governmental Industrial Hygienists- Threshold Limit Value 5. -- = Compound not detected: 6. "NA" = Not Available" 7. American Industrial Hygiene Association Workplace Environmental Exposure Level 8. Bold and shading indicate that the found concentration exceeds the United States Environmental Protection Agency Regional Screening Level for Residential Air. 9. Tentatively Identified Compounds- under Method: EPA TO-15 + TICs. The reported concentrations for TICs are estimated. 10. "NS" = Not Sampled – Results of PAH and Dioxin/Furan sampling presented in table 2.							

**Table 4. Polychlorinated Dibenzo-p-Dioxins (PCDD) and Polychlorinated Dibenzofurans (PCDF) Air Sampling Summary  
Comprehensive Sampling Study # 2 – Ambient Air Sampling  
May 7 to May 8, 2013<sup>1,2</sup>**

Name	TEF <sup>3</sup>	Grassy Knoll Location (Upwind)				Proximate to MSD Lift Station (Downwind)				Amphitheater (Onsite)			
		Mass	TEQ <sup>4</sup>	Air volume	Concentration <sup>5</sup>	Mass	TEQ	Air volume	Concentration	Mass	TEQ	Air volume	Concentration
Units	--	pg <sup>6</sup>	pg	Liters	ug/m <sup>3</sup>	pg	pg	Liters	ug/m <sup>3</sup>	pg	pg	Liters	ug/m <sup>3</sup>
2,3,7,8-TCDD	1	ND <sup>7</sup>	-- <sup>8</sup>	353,312	--	ND	--	364,573	--	ND	--	371,622	--
1,2,3,7,8-PeCDD	1	3.00	3.00	353,312	8.49E-09	3.83	3.83	364,573	1.05E-08	ND	--	371,622	--
1,2,3,4,7,8-HxCDD	0.1	ND	--	353,312	--	2.68	0.268	364,573	7.35E-10	2.00	0.200	371,622	5.38E-10
1,2,3,6,7,8-HxCDD	0.1	ND	--	353,312	--	1.81	0.181	364,573	4.96E-10	2.11	0.211	371,622	5.68E-10
1,2,3,7,8,9-HxCDD	0.1	2.45	0.245	353,312	6.93E-10	2.94	0.294	364,573	8.06E-10	2.30	0.230	371,622	6.19E-10
1,2,3,4,6,7,8-HpCDD	0.01	11.1	0.111	353,312	3.14E-10	18.0	0.180	364,573	4.94E-10	12.4	0.124	371,622	3.34E-10
OCDD	0.0003	42.0	0.0126	353,312	3.57E-11	70.8	0.0212	364,573	5.83E-11	60.2	0.0181	371,622	4.86E-11
2,3,7,8-TCDF	0.1	5.57	0.557	353,312	1.58E-09	3.47	0.347	364,573	9.52E-10	5.03	0.503	371,622	1.35E-09
1,2,3,7,8-PeCDF	0.03	2.93	0.0879	353,312	2.49E-10	ND	--	364,573	--	2.95	0.0885	371,622	2.38E-10
2,3,4,7,8-PeCDF	0.3	ND	--	353,312	--	ND	--	364,573	--	1.33	0.399	371,622	1.07E-09
1,2,3,4,7,8-HxCDF	0.1	ND	--	353,312	--	3.00	0.300	364,573	8.23E-10	2.64	0.264	371,622	7.10E-10
1,2,3,6,7,8-HxCDF	0.1	2.31	0.231	353,312	6.54E-10	2.78	0.278	364,573	7.63E-10	2.23	0.223	371,622	6.00E-10
1,2,3,7,8,9-HxCDF	0.1	ND	--	353,312	--	1.09	0.109	364,573	2.99E-10	ND	--	371,622	--
2,3,4,6,7,8-HxCDF	0.1	ND	--	353,312	--	2.54	0.254	364,573	6.97E-10	ND	--	371,622	--
1,2,3,4,6,7,8-HpCDF	0.01	5.86	0.0586	353,312	1.66E-10	8.87	0.0887	364,573	2.43E-10	7.11	0.0711	371,622	1.91E-10
1,2,3,4,7,8,9-HpCDF	0.01	ND	--	353,312	--	1.83	0.0183	364,573	5.02E-11	1.30	0.0130	371,622	3.50E-11
OCDF	0.0003	4.44	0.00133	353,312	3.77E-12	7.53	0.00226	364,573	6.20E-12	5.05	0.00152	371,622	4.08E-12
<b>Total TCDD TEQ<sup>9</sup></b>			<b>4.30</b>		<b>1.22E-08</b>		<b>6.17</b>		<b>1.69E-08</b>		<b>2.35</b>		<b>6.31E-09</b>
<b>USEPA Industrial RSL<sup>10</sup></b>					<b>3.20E-07</b>				<b>3.20E-07</b>				<b>3.20E-07</b>
<b>USEPA Residential RSL<sup>11</sup></b>					<b>6.40E-08</b>				<b>6.40E-08</b>				<b>6.40E-08</b>

1. Sampling was conducted between 11:00 A.M. May 22 to 11:00 A.M. May 23, 2013  
2. Analytical Method: EPA TO-9a  
3. TEF: 2005 World Health Organization (WHO) Toxicity Equivalence Factor  
4. TEQ: TCDD Toxicity Equivalent Mass/Concentration  
5. Concentration calculation: ((TEQ \* Air Volume) \* 1,000)/1,000,000  
6. pg: Picograms  
7. ND: Not Detected  
8. "--" Not available due to mass being ND  
9. Total TCDD TEQ: Total Tetrachlorodibenzodioxin TEQ  
10. RSL: Regional Screening Level for Dioxins in Industrial Air  
11. RSL: Regional Screening Level for Dioxins in Residential Air

**Table 5: Source Gas Sampling Summary  
Second Comprehensive Sampling Study  
April 16, 2013, May 7 - 8, 2013  
Concentration in Source Gas Under FML – All Units  $\mu\text{g}/\text{m}^3$**

Analyte	Sample Locations					
	Amphitheater		Second Tier		East Face	
	4/16/2013	5/8/2013	4/16/2013	5/8/2013	4/16/2013	5/8/2013
	BFML-	58FML1-	CFML-	58FML2-	DFML-	58FML3-
<b>Hydrogen Chloride – NIOSH 7903</b>						
Hydrogen Chloride	1,100		1,100		1,600	
<b>Aldehydes/Carbonyl Compounds – Method: EPA TO-11a</b>						
Acetaldehyde	3,400	NS	120	NS	--	NS
Propionaldehyde	1,700	NS	180	NS	280	NS
Butyraldehyde	6,000	NS	1,100	NS	560	NS
Benzaldehyde	2,100	NS	--	NS	--	NS
Isovaleraldehyde	340	NS	--	NS	--	NS
m,p-Tolualdehyde	5,500	NS	21,000	NS	--	NS
n-Hexaldehyde	1,700	NS	--	NS	840	NS
<b>Hydrogen Cyanide – Method: NIOSH 6010</b>						
No Compound Detected	--	NS	--	NS	--	NS
<b>Amine Compounds – Method: NIOSH 2010m</b>						
Isopropylamine	2,400	NS	--	NS	--	NS
sec-Butylamine	2,700	NS	6,200	NS	2,100	NS
Diisopropylamine	--	NS	5,700	NS	--	NS
Triethylamine	--	NS	1,700	NS	--	NS
<b>Mercury – Method: NIOSH 6009</b>						
No Compound Detected	--	NS	--	NS	--	NS
<b>Ammonia – Method: OSHA ID 188</b>						
No Compound Detected	--	NS	--	NS	--	NS
<b>Carboxylic Acid Compounds – Method: CAS AQL 102</b>						
Acetic Acid	94,000	NS	99,000	NS	53,000	NS
Propionic Acid (Propanoic)	100,000	NS	140,000	NS	89,000	NS

**Table 5: Source Gas Sampling Summary**  
**Second Comprehensive Sampling Study**  
**April 16, 2013, May 7 - 8, 2013**  
**Concentration in Source Gas Under FML – All Units  $\mu\text{g}/\text{m}^3$**

Analyte	Sample Locations					
	Amphitheater		Second Tier		East Face	
	4/16/2013	5/8/2013	4/16/2013	5/8/2013	4/16/2013	5/8/2013
	BFML-	58FML1-	CFML-	58FML2-	DFML-	58FML3-
2-Methylpropanoic Acid (Isobutyric)	46,000	NS	170,000	NS	73,000	NS
Butanoic Acid (Butyric)	290,000	NS	590,000	NS	200,000	NS
2-Methylbutanoic Acid	17,000	NS	51,000	NS	19,000	NS
3-Methylbutanoic Acid (Isovaleric)	28,000	NS	89,000	NS	34,000	NS
Pentanoic Acid (Valeric)	84,000	NS	58,000	NS	24,000	NS
2-Methylpentanoic Acid	1,900	NS	--	NS	950	NS
3-Methylpentanoic Acid	350	NS	--	NS	--	NS
4-Methylpentanoic Acid (Isocaproic)	2,000	NS	--	NS	--	NS
Hexanoic Acid (Caproic)	110,000	NS	15,000	NS	13,000	NS
Heptanoic Acid (Enanthoic)	3,600	NS	290	NS	320	NS
2-Ethylhexanoic Acid	1,300	NS	480	NS	1,000	NS
Octanoic Acid (Caprylic)	320	NS	--	NS	--	NS
<b>Sulfur Dioxide – Method: OSHA ID 200</b>						
Sulfur Dioxide	2,600	NS	9,100	NS	1,600	NS
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs</b>						
Propene	160,000	NS	200,000	NS	160,000	NS
Chloromethane	7,100	NS	--	NS	8,200	NS
1,3-Butadiene	3,800	NS	--	NS	4,000	NS
Ethanol	290,000	NS	--	NS	--	NS
Acetone	600,000	NS	980,000	NS	88,000	NS
2-Propanol (Isopropyl Alcohol)	110,000	NS	480,000	NS	--	NS
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs</b>						
2-Butanone (MEK)	440,000	NS	1,300,000	NS	91,000	NS
Ethyl Acetate	29,000	NS	120,000	NS	--	NS
n-Hexane	4,200	NS	--	NS	7,600	NS
Tetrahydrofuran (THF)	190,000	NS	1,400,000	NS	92,000	NS

**Table 5: Source Gas Sampling Summary  
Second Comprehensive Sampling Study  
April 16, 2013, May 7 - 8, 2013  
Concentration in Source Gas Under FML – All Units  $\mu\text{g}/\text{m}^3$**

Analyte	Sample Locations					
	Amphitheater		Second Tier		East Face	
	4/16/2013	5/8/2013	4/16/2013	5/8/2013	4/16/2013	5/8/2013
	BFML-	58FML1-	CFML-	58FML2-	DFML-	58FML3-
Benzene	370,000	NS	2,000,000	NS	360,000	NS
1,4-Dioxane	5,400	NS	--	NS	--	NS
n-Heptane	5,300	NS	13,000	NS	6,000	NS
4-Methyl-2-pentanone	15,000	NS	140,000	NS	5,100	NS
Toluene	53,000	NS	420,000	NS	40,000	NS
2-Hexanone	9,500	NS	17,000	NS	--	NS
n-Butyl Acetate	25,000	NS	54,000	NS	--	NS
n-Octane	12,000	NS	59,000	NS	10,000	NS
Ethylbenzene	18,000	NS	160,000	NS	16,000	NS
m,p-Xylenes	31,000	NS	260,000	NS	21,000	NS
o-Xylene	9,700	NS	72,000	NS	9,900	NS
n-Nonane	8,600	NS	76,000	NS	5,900	NS
Cumene	--	NS	19,000	NS	--	NS
alpha-Pinene	6,400	NS	180,000	NS	5,700	NS
1,2,4-Trimethylbenzene	5,100	NS	--	NS	3,800	NS
d-Limonene	4,000	NS	46,000	NS	6,700	NS
<b>Volatile Organic Compounds (VOCs) – Tentatively Identified Compounds - Method: EPA TO15 + TICs <sup>4</sup></b>						
Dimethyl Ether	130,000	NS	210,000	NS	130,000	NS
Isobutene	140,000	NS	--	NS	230,000	NS
C4H8 Alkene (4.92)	110,000	NS	200,000	NS	--	NS
C4H8 Alkene (5.29)	--	NS	--	NS	98,000	NS
C4H8 Alkene (5.58)	100,000	NS	140,000	NS	84,000	NS
Furan	340,000	NS	1,400,000	NS	540,000	NS

**Table 5: Source Gas Sampling Summary  
Second Comprehensive Sampling Study  
April 16, 2013, May 7 - 8, 2013  
Concentration in Source Gas Under FML – All Units  $\mu\text{g}/\text{m}^3$**

Analyte	Sample Locations					
	Amphitheater		Second Tier		East Face	
	4/16/2013	5/8/2013	4/16/2013	5/8/2013	4/16/2013	5/8/2013
	BFML-	58FML1-	CFML-	58FML2-	DFML-	58FML3-
Dimethyl Sulfide	710,000	NS	2,000,000	NS	1,300,000	NS
C5H10 Compound	--	NS	--	NS	70,000	NS
Cyclopentane	--	NS	--	NS	90,000	NS
Methyl Acetate	400,000	NS	280,000	NS	--	NS
2-Butanol	--	NS	440,000	NS	--	NS
Methylfuran Isomer	190,000	NS	890,000	NS	400,000	NS
Methyl Propionate	220,000	NS	230,000	NS	57,000	NS
1-Butanol	140,000	NS	--	NS	--	NS
Methylcyclopentene Isomer	58,000	NS	150,000	NS	150,000	NS
2-Pentanone	--	NS	150,000	NS	--	NS
Methyl Isobutyrate	61,000	NS	170,000	NS	--	NS
C7H12 Compound (13.71)	--	NS	160,000	NS	98,000	NS
C7H12 Compound (13.75)	--	NS	220,000	NS	120,000	NS
Methyl Butyrate	370,000	NS	540,000	NS	--	NS
Dimethyl disulfide	100,000	NS	--	NS	100,000	NS
Methylvalerate	55,000	NS	--	NS	190,000	NS
<b>Reduced Sulfur Compound – ASTM D5504</b>						
Hydrogen Sulfide	4,500	NS	38,000	NS	1,600	
Carbonyl Sulfide	--	NS	190	NS	--	
Methyl Mercaptan	25,000	NS	60,000	NS	54,000	NS
Ethyl Mercaptan	1,600	NS	3,200	NS	370	NS
Dimethyl Sulfide	740,000	NS	1,400,000	NS	920,000	NS
Carbon Disulfide	170	NS	250	NS	38	NS
Isopropyl Mercaptan	880	NS	2,700	NS	150	NS
Ethyl Methyl Sulfide	--	NS	--	NS	12,000	NS
tert-Butyl Mercaptan	220	NS	1,200	NS	--	NS

**Table 5: Source Gas Sampling Summary  
Second Comprehensive Sampling Study  
April 16, 2013, May 7 - 8, 2013  
Concentration in Source Gas Under FML – All Units  $\mu\text{g}/\text{m}^3$**

Analyte	Sample Locations					
	Amphitheater		Second Tier		East Face	
	4/16/2013	5/8/2013	4/16/2013	5/8/2013	4/16/2013	5/8/2013
	<b>BFML-</b>	<b>58FML1-</b>	<b>CFML-</b>	<b>58FML2-</b>	<b>DFML-</b>	<b>58FML3-</b>
n-Propyl Mercaptan	480	NS	--	NS	--	NS
Ethyl Methyl Sulfide	8,900	NS	35,000	NS	--	NS
Thiophene	14,000	NS	56,000	NS	31,000	NS
n-Butyl Mercaptan	2,600	NS	13,000	NS	3,400	NS
Dimethyl Disulfide	82,000	NS	26,000	NS	130,000	NS
3-Methylthiophene	1,600	NS	8,400	NS	3,300	NS
Tetrahydrothiophene	3,400	NS	7,900	NS	4,700	NS
2,5-Dimethylthiophene	580	NS	2,100	NS	830	NS
2-Ethylthiophene	290	NS	2,500	NS	760	NS
<b>Polynuclear Aromatic Hydrocarbons - Method: EPA TO13a Modified</b>						
Naphthalene	NS	220	NS	30	NS	120
Acenaphthene	NS	35	NS	0.18	NS	5.4
Fluorene	NS	12	NS	0.051	NS	1.3
Phenanthrene	NS	1.0	NS	0.029	NS	--
<b>Polychlorinated Dibenzo-p-Dioxins, Dibenzofurans – EPA Method TO-9A</b>						
2,3,7,8-TCDD	NS	8.68E-08	NS	1.49E-07	NS	1.05E-07

1. "NA" = Not Available
2. "--" = Compound not detected
3. Bold and shading indicate that the found concentration exceeds the United States Environmental Protection Agency Regional Screening Level for Residential Air.
4. The reported concentrations for TICs are estimated
5. "NS" = Not Sampled