

**Bridgeton Landfill Ambient Air  
and Landfill Source Gas  
Sampling-July 2015**

Summary of Findings from the  
July 2015 Comprehensive  
Sampling Event



Prepared for:  
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October 27, 2015

## Sign-off Sheet

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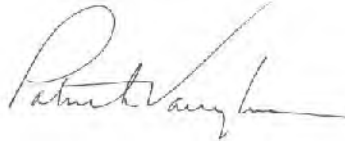
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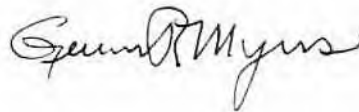
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## Executive Summary

This report describes the methodology and presents the findings from the comprehensive sampling event conducted by Stantec Consulting Services Inc. (Stantec) on July 28 through July 31, 2015 on and around the Bridgeton Landfill, LLC (Bridgeton) facility located at 13570 St. Charles Rock Road, Bridgeton, Missouri (the landfill). The purpose of this comprehensive sampling event was to fulfill the requirements of the June 19, 2014 Second Amendment to Order of Preliminary Injunction (Second Amended Order) issued by the State of Missouri Attorney General and the Missouri Department of Natural Resources (MDNR). The Order required Bridgeton Landfill to *"undertake three air sampling events, initiating the first within 45 days of the entry of this Second Amendment, the second seven months following entry of this Second Amendment, and the third thirteen months from entry of this Second Amendment. These air sampling events will include all parameters included in the August 2012 Stantec sampling event. The sampling event will sample from the inlet prior to the flare, and from agreed locations...using under liner collection ports to sample the South Quarry, neck area and North Quarry."*

As of the date of this report, five comprehensive sampling events have been conducted to characterize constituents of potential concern in ambient air and source gas; August 2012, April/May 2013, July 2014, January 2015 and July 2015. Reports for the first four events can be found on the Bridgeton Landfill website. The subject of this report is the fifth event conducted in July 2015 (designated as the third comprehensive sampling event by the June 19, 2014 Second Amended Order).

The Second Amended Order mandated that ambient air and source gas samples be analyzed for the following list of parameters by the methods indicated below.

- Fixed Gases (hydrogen, oxygen + argon, nitrogen, carbon monoxide, carbon dioxide, methane): EPA Method 3Cm
- Ammonia: OSHA Method ID-188
- Mercury and Compounds: NIOSH Method 6009
- Hydrogen Cyanide: NIOSH Method 6010
- Reduced Sulfur Compounds: ASTM Method D5504
- Volatile Organic Compounds and Tentatively Identified Compounds: EPA Method TO-15
- Aldehydes (Carbonyl Compounds): EPA Method TO-11A
- Amines (Aliphatic): (ALS Laboratory in-house method) AQL 101
- Carboxylic Acids: (ALS Laboratory in-house method) AQL 102
- Polycyclic Aromatic Hydrocarbons (PAHs): EPA Method TO-13A
- Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans (Dioxins/Dibenzofurans): EPA Method TO-9

### Conclusions

The following conclusions are based on the findings of the five comprehensive sampling events conducted in August 2012, April/May 2013, July 2014, January 2015 and July 2015.

- Low concentrations of aldehydes, PAHs and dioxins/dibenzofurans were detected in ambient air. The following evidence indicates that the landfill is not the source of these compounds.
  - Concentrations of aldehydes, PAHs and dioxins/dibenzofurans in ambient air on the landfill and at downwind locations were similar to the concentrations in upwind ambient air for all samples collected in 2012, 2013, 2014 and 2015.
  - The concentrations of aldehydes detected in ambient air are within the background range for urban areas, including St. Louis.
  - Benzo[a]pyrene and related carcinogenic PAHs (cPAHs) associated with incomplete combustion of organic matter have not been detected in any sample of source gas or ambient air collected in 2012, 2013, 2014 and 2015.
  - The concentrations of dioxins/dibenzofurans in landfill source gas were similar to ambient background in 2012, 2013, 2014 and 2015; and are within the background range for urban areas.
- Ammonia was detected in only one sample of ambient air (Flare Station in 2014) and has not been detected in landfill source gas samples from 2012, 2013, 2014 and 2015. The landfill is not a source of ammonia in ambient air.
- Hydrogen cyanide has not been detected in any sample of ambient air or in any landfill source gas sample from 2012, 2013, 2014 and 2015.
- Mercury has not been detected in any sample of ambient air. Mercury was detected in source gas from the Flare Inlet in 2014 and 2015, but has not been detected in any other landfill source gas sample from 2012, 2013, 2014 and 2015.
- Benzene is the constituent of greatest potential concern for public health that is present in landfill source gas which could be released to ambient air.
  - Concentrations of benzene detected in ambient air from locations on the landfill and at downwind fence-line locations have decreased significantly in 2014 and 2015 as compared to 2012 and 2013. Benzene concentrations are now generally equal to industrial RSLs and consistent with the annual average benzene concentration ( $1.5 \mu\text{g}/\text{m}^3$ ) reported by the St. Louis Community Air Project (US EPA 2005).
  - The dramatic decrease in concentrations of benzene in ambient air at sample locations on the landfill and at downwind fence-line locations in 2014

and 2015 coincides with completion of the EVOH liner over the reaction area, operation of the new leachate treatment system and enhanced gas collection system and flare.

- In 2012, 2013, 2014 and 2015 benzene concentrations were below occupational exposure standards, which apply to trained landfill employees, in all samples of ambient air from locations on the landfill.
- The source gas samples from the Neck support the conclusion that the reaction is not moving towards the North Quarry. The Neck represents the transition between the South Quarry and the North Quarry and is a “sentinel” for potential movement of the reaction towards the North Quarry.
- The major groups of compounds contributing to the occasional odors are VOCs, reduced sulfur compounds (e.g. dimethyl sulfide, dimethyldisulfide and mercaptans), and carboxylic acids (e.g. butanoic and hexanoic acids).
- The constituents of concern contributing to occasional odors in the community are of low order of toxicity and do not pose a health threat to members of the community.
- Based on benzene as the key indicator compound, it is evident that the concentrations of constituents of concern in ambient air that could have been related to releases of landfill gas decreased dramatically from 2013 to July 2014 through July 2015. This coincides with the time period when the remedial measures were implemented by Bridgeton Landfill were substantively complete: the reaction area was covered with EVOH cap; the leachate collection and treatment system became operational; and improvements to the gas collection system and flare were completed.

### Recommendations

The findings from the five comprehensive sampling events conducted in August 2012, April/May 2013, July 2014, January 2015 and July 2015 support the following recommendations.

Continued sampling for the following constituents in ambient air and source gas should be discontinued:

- Ammonia
- Mercury and Compounds
- Hydrogen Cyanide
- Aldehydes
- Amines
- Polycyclic Aromatic Hydrocarbons (PAHs)

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- Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans (Dioxins/Dibenzofurans)

Although unwarranted, any future sampling of ambient air and source gas should focus on the following constituents of concern present in the landfill source gas that are likely to be associated with the odor and are of greatest potential concern for public health (benzene):

- Fixed gases (source gas only)
- VOCs (particularly benzene)
- Reduced sulfur compounds, and
- Carboxylic acids



## Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienist
cPAHs	Carcinogenic Polycyclic Aromatic Hydrocarbons
CIH	Certified Industrial Hygienist
EVOH Cap	Ethylene Vinyl Alcohol Cap
FML	Flexible Membrane Liner
MDNR	Missouri Department of Natural Resources
NIOSH	National Institute of Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbon
PEL	Permissible Exposure Limit
SWAPE	Soil Water Air Protection Enterprise
TCDD	2, 3, 7, 8-Tetrachlorodibenzo-p-dioxin
TEQ	2, 3, 7, 8-TCDD Toxicity Equivalent Concentration
TICs	Tentatively Identified Compounds
TLV	Threshold Limit Value
USEPA	United States Environmental Protection Agency
USEPA RSL	U.S. EPA Regional Screening Levels
VOC	Volatile Organic Compound

# BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

Introduction  
October 27, 2015

## 1.0 INTRODUCTION

This report describes the methodology and presents the findings from the comprehensive sampling event conducted by Stantec Consulting Services Inc. (Stantec) between July 28 and July 31, 2015 on and around the Bridgeton Landfill, LLC (Bridgeton) facility located at 13570 St. Charles Rock Road, Bridgeton, Missouri (the landfill). The purpose of this comprehensive sampling event was to fulfill the requirements of the June 19, 2014 Second Amendment to Order of Preliminary Injunction (Second Amended Order) issued by the State of Missouri Attorney General and the Missouri Department of Natural Resources (MDNR). The Order required Bridgeton Landfill to “undertake three air sampling events, initiating the first within 45 days of the entry of this Second Amendment Order, the second seven months following entry of this Second Amendment, and the third thirteen months from entry of this Second Amendment. These air sampling events will include all parameters included in the August 2012 Stantec sampling event. The sampling event will sample from the inlet prior to the flare, and from agreed locations...using under liner collection ports to sample the South Quarry, neck area and North Quarry.”

The July 2015 sampling is the fifth comprehensive air sampling event to be conducted at the landfill, and the third and final event specified by the Second Amended Order. The first event specified by the second Amended Order was conducted in July 2014 followed by the second comprehensive event in January 2015. These reports are available on-line (“*Bridgeton Landfill Ambient Air and Landfill Source Gas Sampling-July 2014*” – issue date January 7, 2015 and “*Bridgeton Landfill Ambient Air and Landfill Source Gas Sampling-January 2015*” – issue date July 12, 2015): available at:

- [http://www.bridgetonlandfill.com/sites/default/files/docs/air\\_monitoring/air\\_sampling\\_reports/Summary%20of%20Stantec%20Consulting%20Services%2C%20Inc%20Ambient%20Air%20and%20Landfill%20Source%20Gas%20Sampling%20July%202014.pdf](http://www.bridgetonlandfill.com/sites/default/files/docs/air_monitoring/air_sampling_reports/Summary%20of%20Stantec%20Consulting%20Services%2C%20Inc%20Ambient%20Air%20and%20Landfill%20Source%20Gas%20Sampling%20July%202014.pdf).
- [http://www.bridgetonlandfill.com/sites/default/files/docs/air\\_monitoring/air\\_sampling\\_reports/ambient-air-and-landfill-gas-sampling-jan-2015-061215.pdf](http://www.bridgetonlandfill.com/sites/default/files/docs/air_monitoring/air_sampling_reports/ambient-air-and-landfill-gas-sampling-jan-2015-061215.pdf)

In addition to the three sampling events specified by the Second Amended Order, Stantec conducted two previous comprehensive sampling events at the request of **Bridgeton**:

The first event was conducted in August 2012 (as referenced in the Second Amendment Order). The summary report (“*Bridgeton Landfill Air and Landfill Gas Sampling August 2012: Summary of Findings*” – Issue date October 19, 2012) is available at:

- [http://www.bridgetonlandfill.com/sites/default/files/docs/air\\_monitoring/air\\_sampling\\_reports/a6cce178-69d1-4b1d-9ae8-9b7dc2f8a970.pdf](http://www.bridgetonlandfill.com/sites/default/files/docs/air_monitoring/air_sampling_reports/a6cce178-69d1-4b1d-9ae8-9b7dc2f8a970.pdf)



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The second event was conducted in April/May 2013. The summary report ("*Summary of Ambient Air Sampling at Bridgeton Landfill Second Comprehensive Sampling Study*" – Issue date August 27, 2013) is available at:

- [http://www.bridgetonlandfill.com/sites/default/files/docs/air\\_monitoring/air\\_sampling\\_reports/2cf706a9-d1f3-42f0-8660-f8732dc2d660.pdf](http://www.bridgetonlandfill.com/sites/default/files/docs/air_monitoring/air_sampling_reports/2cf706a9-d1f3-42f0-8660-f8732dc2d660.pdf)

In addition to the comprehensive sampling described in this report, MDNR instituted a regular community air monitoring program in May 2013. This program, which is ongoing as of the date of this report, consists of fixed monitors (AreaRAEs) that continuously record total VOCs, sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), hydrogen sulfide (H<sub>2</sub>S), oxygen (O<sub>2</sub>), % Lower Explosive Limit (%LEL), and gamma radiation. The data from the AreaRAE monitors is supplemented by an individual who traverses a prescribed path around the exterior of the landfill recording odors, and taking real-time measurements of benzene (UltraRAE benzene monitor) and H<sub>2</sub>S (Jerome J-605 monitor). MDNR also collects 8-hour ambient air samples for laboratory analysis of volatile organic compounds on a weekly basis. The results of MDNR's monitoring are on the Agency website along with weekly interpretations of the results from the Missouri Department of Health and Senior Services (DHSS).

## 2.0 CONSTITUENTS OF CONCERN IN LANDFILL SOURCE GAS AND AMBIENT AIR

As specified by the Second Amended Order, the July 2015 comprehensive sampling event addressed the same analytical groupings as the August 2012 sampling event. The 2013 comprehensive sampling event included all of the same analytical groupings as 2012, but also included sulfur dioxide and hydrogen chloride. Landfill source gas and ambient air samples were analyzed for constituents that are commonly associated with odors and/or are of concern to public health at low concentrations in ambient air, and for which there are well-accepted laboratory analytical methods. In 2012, Stantec initially proposed sampling for the following groups of compounds which may be associated with objectionable odors and include individual constituents that may be of concern for public health at low concentrations (in parentheses):

- Aldehydes (acetaldehyde and formaldehyde)
- Amines
- Carboxylic acids
- Reduced sulfur compounds (hydrogen sulfide)
- Ammonia
- Volatile Organic Compounds (benzene)

MDNR required that the following additional groups of analytes be addressed in the sampling.



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- Fixed Gases
- Mercury
- Hydrogen cyanide
- Polycyclic aromatic hydrocarbons, specifically carcinogenic PAHs (e.g. benzo[a]pyrene)
- Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (dioxins/dibenzofurans).

Consistent with previous sampling events in 2012, 2013, 2014 and 2015, ambient air and landfill source gas were analyzed for the preceding constituents of concern (referred to as the full suite of analytes) in July 2015.

### 3.0 SAMPLING METHODOLOGY

The sampling methodology for the July 2015 event was consistent with methods employed during the July 2014 and January 2015 sampling events. A detailed description of the methodology can be found in the following report: *“Bridgeton Landfill Ambient Air and Landfill Source Gas Sampling-July 2014”* – issue date January 7, 2015. Any deviations from the sampling methodology during the July 2015 sampling event are discussed in section 3.4 of this report.

The following table summarizes the methods and sample collection media and also provides links to the analytical methods.

<b>Analytical Methods and Collection Media</b>	
<b>Constituents of Concern</b>	<b>Analytical Method</b>
<b>1 Liter or 6 Liter Batch Certified Clean Silonite® Summa Canisters</b>	
Fixed Gases	EPA 3C <a href="http://www.epa.gov/ttn/emc/promgate/m-03c.pdf">http://www.epa.gov/ttn/emc/promgate/m-03c.pdf</a>
Reduced Sulfur Compounds	ASTM D5504 <a href="http://www.astm.org/Standards/D5504.htm">http://www.astm.org/Standards/D5504.htm</a>
Volatile Organic Compounds + TICs	EPA TO-15 <a href="http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-15r.pdf">http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-15r.pdf</a>
<b>Sorbent Tube; low flow sampling pump</b>	
Ammonia	OSHA ID-188F <a href="http://www.osha.gov/dts/sitc/methods/inorganic/id188/id188.html">http://www.osha.gov/dts/sitc/methods/inorganic/id188/id188.html</a>
Mercury and Compounds	NIOSH 6009 <a href="http://www.cdc.gov/niosh/docs/2003-154/pdfs/6009.pdf">http://www.cdc.gov/niosh/docs/2003-154/pdfs/6009.pdf</a>
Hydrogen Cyanide	NIOSH 6010 <a href="http://www.cdc.gov/niosh/docs/2003-154/pdfs/6010.pdf">http://www.cdc.gov/niosh/docs/2003-154/pdfs/6010.pdf</a>
Aldehydes (Carbonyl Compounds)	EPA TO-11A <a href="http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-15r.pdf">http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-15r.pdf</a> <a href="http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-11ar.pdf">http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-11ar.pdf</a>
Amines	ALS Lab Method AQL 101 <a href="http://www.caslabs.com/Forms-Downloads/Flyers/CARBOXYLIC%20Sampling%20FLYER.pdf">http://www.caslabs.com/Forms-Downloads/Flyers/CARBOXYLIC Sampling FLYER.pdf</a>
Carboxylic Acids	ALS Lab Method AQL 102



## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

Sampling Methodology  
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Analytical Methods and Collection Media	
Constituents of Concern	Analytical Method
	<a href="http://www.caslab.com/Forms-Downloads/Flyers/AMINES Method 101 FLYER.pdf">http://www.caslab.com/Forms-Downloads/Flyers/AMINES Method 101 FLYER.pdf</a>
Polyurethane Foam (PUF) media; high-volume sampling apparatus	
Polycyclic Aromatic Hydrocarbons	EPA TO-13A <a href="http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-15r.pdf">http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-15r.pdf</a> <a href="http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-13arr.pdf">http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-13arr.pdf</a>
Dioxins/Dibenzofurans	EPA TO-9 <a href="http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-15r.pdf">http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-15r.pdf</a> <a href="http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-9arr.pdf">http://www.epa.gov/ttnamti1/files/ambient/airtoxic/to-9arr.pdf</a>

### 3.1 SOURCE GAS

The major objective of collecting source gas samples from beneath the Ethylene Vinyl Alcohol (EVOH) cap is to characterize the chemical constituents in the landfill source gas from the specified locations without interference from ambient sources of the same constituents (e.g. gasoline or diesel powered equipment operating on and near the landfill). The sampling methodology in July 2015 was consistent with the July 2014 and January 2015 sampling methodology, with the exception of any deviations noted in section 3.4. As of the date of this report, the EVOH covers most of the landfill. In 2012 and 2013, source gas samples were collected from beneath the flexible membrane liner (FML) that covered portions of the landfill at that time.

The following list describes specific source gas sample locations, and the analyte/analyte groups sampled at each on-site landfill location. The "full suite" of analytes refers to the constituents of concern listed in the preceding table.

- **Flare – 7/29/2015** - Full Suite of Analytes less PAHs and Dioxins/Dibenzofurans
- **North Quarry - 7/29/2015 & 7/31/2015** - Full Suite of Analytes
- **Neck - 7/29/2015 & 7/31/2015** - Full Suite of Analytes
- **South Quarry – 7/29/2015 & 7/31/2015** – Full Suite of Analytes

PAH and Dioxins/Dibenzofuran samples were not collected from the gas stream entering the flare due to the practical difficulties in configuring a sample port into existing infrastructure as well as difficulties with collecting a representative sample from a high pressure gas line using the high-volume samplers and PUF media required for these analytical methods. Source gas samples for PAHs and Dioxins/Dibenzofurans were collected on July 31, 2015. Samples for all other analytes were collected on July 29, 2015.

The following photographs (Figure 6) depict source gas sampling methods using sorbent tubes with personal sampling pumps (PSPs) and polyurethane foam filters (PUFs) with high volume sampling pumps:

- Photograph #1: Source Gas Sampling Flux Box



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Sampling Methodology  
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- Photograph #2: source gas sampling sorbent tubes and low flow PSPs connected via Teflon tubing to the airtight barbed fittings in the flux box.
- Photograph #3: High Volume sampling of source gas from under the EVOH.
- Photograph #4: Benzene monitoring of high-volume source gas exhaust at the south quarry location.
- Photograph #5: Collection of source gas PAH/dioxin samples with MDNR oversight.

A detailed description of the source gas sampling methodology can be found in: "*Bridgeton Landfill Ambient Air and Landfill Source Gas Sampling-July 2014*" – issue date January 7, 2015.

### 3.2 COLLECTION OF AMBIENT AIR SAMPLES

Samples were collected to characterize the constituents of concern in the local/regional ambient air mass moving onto the landfill before passing over the landfill (upwind or background); ambient air on the landfill at the same locations where source gas was collected; and ambient air moving off of the landfill towards the surrounding community (downwind). Sampling methodology was consistent with the July 2014 and January 2015 sampling methodology with the exception of the deviations noted in section 3.4.

The following list describes specific ambient air sample locations, relative wind direction associated with sample location and the analyte/analyte groups sampled at each location. Detailed summary tables of sampling procedures are provided as Appendix A.

- **On-site landfill locations**
  - *7/28/2015 – Flare Station* – Full Suite of Analytes less PAHs
  - *7/31/2015 – Flare Station* – PAHs
  - *7/29/2015 - North Quarry* – Full Suite of Analytes less PAHs and Dioxins/Dibenzofurans
  - *7/29/2015 - Neck* – Full Suite of Analytes less PAHs and dioxins/dibenzofurans
  - *7/28/2015 - South Quarry* – Full Suite of Analytes less PAHs and dioxins/dibenzofurans
- **Upwind Locations**
  - *7/28/2015 – South Fence* - Full Suite of Analytes less PAHs
  - *7/31/2015 – Grassy Knoll Lower Level* - PAHs
  - *7/29/2015 – Grassy Knoll Upper Level* - (VOCs, reduced sulfur compounds, fixed gases, aldehydes amines, ammonia and carboxylic acids)
- **Downwind Locations**
  - *7/28/2015 – Fence by Republic Parking Lot* – Full Suite of Analytes less PAHs
  - *7/31/2015 – East Fence* - PAHs

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- o **7/28/2015 – Upper Road by Neck**– Limited Suite of Analytes (VOCs, reduced sulfur compounds, aldehydes amines, ammonia and carboxylic acids)
- o **7/29/2015 – East Fence Near Flare Station** - Limited Suite of Analytes (VOCs, reduced sulfur compounds, fixed gases, aldehydes amines, ammonia and carboxylic acids)
- o **7/29/2015 – Fence by Retention Pond** - Limited Suite of Analytes (Aldehydes amines, ammonia and carboxylic acids)

Samples for PAHs were not collected on July 28, 2015 at the Flare Station, or the upwind and downwind locations due to defective polyurethane foam sampling media. The media was too dense and the high-volume samplers did not have enough capacity to pull air at an adequate flow rate through the media. Replacement media was obtained from the lab on July 30, 2015 and high volume samplers were deployed using the new media on July 30, 2015.

The full suite of analytes was collected at one on-site landfill location (Flare Station) and one upwind and downwind location.

Hydrogen cyanide and mercury samples were not collected during every sampling event as these compounds have not been detected in ambient air in previous comprehensive sampling events.

The following photographs depict typical ambient air sampling assemblies:

- Photograph #6: Ambient air sample pumps and Silonite® canister at the Flare Station.
- Photograph #7: Ambient air sample pump setup with MDNR oversight.
- Photograph #8: Ambient dioxins/dibenzofuran sample at the Flare Station.

A detailed description of the ambient air sampling methodology can be found in the following report: *“Bridgeton Landfill Ambient Air and Landfill Source Gas Sampling-July 2014”* – issue date January 7, 2015.

### 3.3 QUALITY ASSURANCE PROCEDURES

The Quality Assurance/Quality Control procedures for this project address: field sampling procedures; documentation of sampling conditions, instrument calibration, sample identification and sample custody; validation of the analytical results received from ALS Laboratories; technical review and checking of all data summary tables; and both quality review and independent peer review of this report.

#### 3.3.1 Quality Assurance for Field Sampling

Sampling quality assurance encompasses procedures used for pre-sample calibration of sampling pumps, handling of samples before, during, and after collection, post-calibration of sampling pumps; and procedures to minimize potential cross contamination and interferences.



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Appendix A, Tables A-1 through A-4 provide specific details on sample collection times and instrument calibration.

Table 1 lists all samples collected by analytical group, date, sample identifiers and laboratory report identifiers. As specified on Table 1, representative trip blanks/field duplicate samples were submitted for each analytical method.

### Instrument Calibration

A detailed description of instrument calibration procedures (PSPs and Tisch® High Volume Sampling Pumps) can be found in the following report: *“Bridgeton Landfill Ambient Air and Landfill Source Gas Sampling-July 2014”* – issue date January 7, 2015.

### Handling of Sample Media

PUF media for Method TO-9 dioxin/dibenzofuran analysis were received from the ALS Laboratory in Houston, TX and the PUF media for the Method TO-13 PAH analysis were received from the ALS Laboratory in Simi Valley, CA. A detailed description of media handling procedures from receipt to shipment for analyses can be found in the following report: *“Bridgeton Landfill Ambient Air and Landfill Source Gas Sampling-July 2014”* – issue date January 7, 2015.

A unique identifier was assigned to each sample (Table 1) and recorded on the Chain of Custody forms supplied by ALS Laboratories. All samples and blanks were shipped following laboratory guidance using overnight delivery to ensure maximum holding times were not exceeded. Proper chain-of-custody forms were used for all shipped samples.

### 3.3.2 Independent Data Validation

All of the data packages and Electronic Data Deliverables (EDDs) received from ALS Laboratories were reviewed by a Stantec analytical chemist. As part of the review, data validation reports corresponding to the laboratory data packages were prepared (see Appendix C). All data were deemed acceptable with regards to precision, sensitivity, accuracy, representativeness, method compliance and completeness.

### Technical Quality Assurance for Report Preparation

This report has undergone both technical quality and independent peer review by appropriate senior level individuals.

- All data tables were checked against the original laboratory analytical reports by a team member who did not compile the original tables. Other quantitative information presented in this report, such as exposure screening levels were independently verified.



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- The Quality Review and Independent Peer Reviews were conducted by senior-level individuals with the appropriate expertise and credentials, and who have minimal or no involvement in preparing the report.

### 3.4 DEVIATIONS FROM SAMPLING SCHEDULE OR METHODS

The following list details all deviations from the sampling schedule as presented in Table 1:

- 24 hour ambient air samples for PAHs were not collected on July 28, 2015 at the flare location, upwind and downwind locations due to defective polyurethane foam (PUF) sampling media. The media was too dense and the high-volume samplers did not have enough capacity to pull air at an adequate flow rate through the media. Replacement media was obtained from the lab on July 30, 2015 and high volume samplers were deployed at on-site (Flare location), upwind and downwind locations using the new media on July 30, 2015. Samples were collected for 24 hours.
- All high volume source gas sampling was conducted on July 31, 2015.
- The sample durations for high volume sampling of source gas were reduced from 4 hours to 2 hours due to concerns over moisture and oversaturation of sample media. Laboratory reporting limits were acceptable and all data are acceptable for the intended purpose.

## 4.0 SAMPLING LOCATIONS

Table 1 summarizes the ambient air and landfill source gas samples collected July 28 through July 31, 2015. Figure 1 shows ambient air and source gas sample locations on an aerial view of the Bridgeton Landfill and immediately adjacent properties. The sampling strategy was designed to characterize the constituents of concern in the landfill source gas; the local/regional ambient air mass moving onto the landfill before passing over the landfill (upwind or background); ambient air on the landfill at the same locations where source gas was collected; and ambient air moving off of the landfill towards the surrounding community (downwind). All downwind sample locations were on the facility boundary (fence-line).

### 4.1 SOURCE GAS SAMPLE LOCATIONS

As indicated in Section 1.0, source gas samples were collected in those locations specified by MDNR and agreed to by Bridgeton. In the June 19, 2014 Second Amended Order, MDNR specified that source gas be collected from the following locations:

- *North Quarry*
- *Neck*
- *South Quarry*



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- ***Inlet to the Flare***

During the July 2014, January 2015 and July 2015 comprehensive sampling events, source gas samples were collected from the Flare, North Quarry, Neck and South Quarry. Samples from the North Quarry, Neck and South Quarry were collected utilizing specially-constructed “flux-boxes” that minimized ambient air dilution of the gas and are representative of source gas that has migrated upwards from deeper in the waste mass and accumulated under the EVOH (see photo). The North Quarry represents source gas from the area of the landfill where the subsurface reaction has not occurred. The Neck is a location between the North Quarry and the South Quarry. The South Quarry represents source gas from the area where the reaction was occurring at the time of the sampling.

Samples collected from the Flare were collected from a port at the Inlet to the Flare. This sample is representative of the mixed stream of gas from all locations in the collection system. The gas collection system draws from deep within the waste mass from all areas of the landfill.

### 4.2 AMBIENT AIR SAMPLING LOCATIONS

Sampling locations were selected based on wind direction relative to the landfill at onset of sampling and, when possible, to correlate with sample locations from historical comprehensive sampling events at the landfill. Ambient air samples were collected to characterize the local/regional ambient air mass moving onto the landfill before passing over the landfill (upwind or background); ambient air on the landfill; and ambient air moving off of the landfill towards the surrounding community (downwind).

#### 4.2.1 On Landfill Locations

In July 2015, ambient (on-landfill) air samples were collected at the same four locations as the source gas samples (Figure 1). On-landfill ambient samples were located within 10 feet of the flux-boxes on top of the EVOH at the North Quarry, Neck and South Quarry. The sample at the Flare Station was collected approximately 50 feet from the Flare Inlet. Samples for the full suite of analytes were collected from the Flare Station. Samples from the North Quarry, Neck and South Quarry were analyzed for all analytes except PAHs and dioxins/dibenzofurans. On-landfill ambient air samples were collected from the Flare Station and South Quarry on July 28, 2015. The 24 hour high volume PUF sample for PAHs at the Flare Station was collected beginning on July 30, 2015 and ending on July 31, 2015. On-landfill ambient air samples were collected from the North Quarry and Neck on July 29, 2015. Time-integrated on-landfill ambient samples were not collected when the source gas samples for dioxin/dibenzofurans and PAH analyses were being collected to avoid potential influence from the source gas being exhausted through the high volume sampling units.

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### 4.2.2 Downwind Sample Locations

Downwind ambient air samples representing air moving from the landfill into the surrounding community were collected at locations inside the facility fence-line. On certain sample days there was an intermittent odor at the downwind ambient sample locations; however, landfill odors were not consistently present in the same locations or at the same intensity.

On July 27, 2015 winds were out of the northwest at approximately 6 mph. Stantec deployed the downwind high volume samplers at the midline of the east fence location. Due to aforementioned quality issues with the PUF media for PAH sampling, only samples for dioxins/dibenzofurans were collected on this date.

July 28, 2015 winds were light (4 mph) and were generally out of the south to south/southeast. Two downwind samples were collected at the following locations:

1. Fence by Republic Parking Lot (full suite of analytes less PAHs and dioxins/dibenzofurans)
2. Upper Road by Neck (VOCs, reduced sulfur compounds, fixed gasses, aldehydes, amines, ammonia and carboxylic acids).

On July 29, 2015 winds averaged 8 mph out of the northwest. Two downwind samples were collected at the following locations:

1. East Fence near Flare Station (VOCs, reduced sulfur compounds, fixed gasses, aldehydes, amines, ammonia and carboxylic acids)
2. Road heading toward east fence by retention pond (VOCs, reduced sulfur compounds, fixed gasses, aldehydes, amines, ammonia and carboxylic acids).

As noted previously, the 24 hour high volume PUF samples for PAHs were collected beginning on July 30, 2015 and ending on July 31, 2015. Winds were out of the northwest at approximately 6 mph. The downwind ambient PAH sample was collected at the midline of the East Fence location.

### 4.2.3 Upwind Sample Locations

On July 27, 2015 winds were out of the northwest at approximately 6 mph. Stantec deployed the upwind high volume samplers at the Grassy Knoll upper level location. Due to aforementioned quality issues with the PUF media for PAH sampling, only samples for dioxins/dibenzofurans were collected on this date.

On July 28, 2015, upwind ambient air samples representing local/regional background were collected (full suite of analytes less PAHs and dioxins/dibenzofurans) at the South Fence location (Figure 1). No landfill odor was present at this location during sample collection.

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On July 29, 2015, the upwind ambient samples were collected at the Grassy Knoll Upper Level (limited to VOCs, reduced sulfur compounds, fixed gasses, aldehydes, amines, ammonia and carboxylic acids).

The upwind 24 hour high volume PUF sample for PAHs was collected beginning on July 30, 2015 and ending on July 31, 2015. Winds were out of the northwest at approximately 6 mph. The upwind ambient PAH sample was collected at the Grassy Knoll lower level location.

### 5.0 ANALYTICAL RESULTS

Review of the laboratory analytical reports, data validation forms, field notes and instrument calibration records indicate that all data are acceptable for the intended purpose. Appendix A, Tables A-1 through A-4 summarize the sampling procedures, sample identifiers and relevant calibration information for each date and location for the July 2015 sampling event. Analytical reports from ALS Laboratories are presented in Appendix B. Stantec's analytical chemist reviewed the laboratory data packages from ALS Laboratories for samples collected in July 2015. With the exception of two samples described below, all data were considered usable. The data validation reports are provided in Appendix C.

- Two trip blank Silonite® canisters were sent to the laboratory for analysis, **730TB-Summa** and **730TB-G Summa**. Trip blank **730TB-Summa** was received by the laboratory depressurized. The canister was not opened by the sampling team. The results of the sample are invalid and not used. The analytical results from trip blank **730TB-G Summa** were valid and were used for QA/QC and data validation for this report.
- The source gas sample **729sNQ-Summa** was collected on July 29, 2015 at the North Quarry. The canister valve was faulty or was not fully engaged during sampling; therefore not enough sample volume was collected. The results of the sample are invalid and not used. A sample (Sample ID - **NQ Source 523**) of source gas from the North Quarry location was collected on October 8, 2015, and the results are presented in this report.
- Dimethylamine – GC/NPD continuing calibration dated 08/03/15 - %/r below limits.
  - Associated sample results flagged "J" if positive or "UJ" if non-detect and are biased low.
- Butyraldehyde – Relative Percent Difference for duplicate pair (728Dup01, 728U1-Ald) were not within limits.
  - Associated result flagged "J" if positive or "UJ" if non-detect for duplicate sample pair only.
- TO-11A Aldehydes and GC/MS carboxylic acids - The laboratory noted breakthrough of analytes during elution.

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- Associated results flagged "J"
- Trip Blank **730TB-Summa** received by the laboratory depressurized. The canister was not opened by the sampling team.
  - The results of the sample are invalid and not used.
- The source gas sample **729sNO-Summa** was collected on July 29, 2015 at the North Quarry. The canister valve was not fully engaged during sampling; therefore not enough sample volume was collected.
  - The results of the sample are invalid and not used.
- Trip blank **730TB-G Summa** contained: Oxygen + Argon (0.179% v/v), Nitrogen (0.65 % v/v) and hexamethylcyclotrisiloxane (290 µg/m<sup>3</sup>).
  - Associated results below the blank concentration are validated to non-detect and flagged "UJB". Sample results greater than the blank concentration but less than 10 times the blank concentration are flagged "JB". The detection limit is changed to the blank concentration. Results greater than 10 times the blank concentration require no qualifying.
- Vinyl Acetate - Continuing calibration dated 08/10/15 - %D above ±25% limit for Vinyl Acetate at +28% and Continuing calibration dated 08/11/15 - %D above ±25% limit for vinyl acetate at +29%.
  - Associated positive sample results flagged "J" and are biased high.
- Relative Percent Difference for paired duplicate sample (729U1-SUMMA, 729-Dupe11) were within limits for EPA 3C and ASTM D15504. TO-15 analyte RPDs within limits except acetone, ethyl acetate, 1, 4-dioxane, toluene and n-butyl acetate.
  - Associated results flagged "J" if positive or "UJ" if non-detect for duplicate samples only.
- RPDs for duplicate pair (728D1-SUMMA, 728-DUPE10) were within limits for EPA 3C and ASTM D15504. TO-15 analyte RPDs within limits except toluene, ethylbenzene, m, p-xylene, 1,2,4-trimethylbenzene and naphthalene.
  - Associated results flagged "J" if positive or "UJ" if non-detect for duplicate samples only.
- The %Recovery for 3 of 4 surrogates below 10% and 4<sup>th</sup> surrogate below 60 to 120% limits at 11%.
  - Associated results flagged "J" if positive or "R" if non-detect for **731sSQ-PAH** only.
- Laboratory control sample recoveries %Rs below limits for acenaphthylene (51%), acenaphthene (57%) and naphthalene (57%).
  - Associated sample results flagged "J" if positive or "UJ" if non-detect.

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## 5.1 AMBIENT AIR

As described in Sections 3 and 4, ambient air samples were collected to characterize the upwind/background air mass arriving at the landfill, ambient air at the source gas sample locations and ambient air at downwind locations along the facility fence-line where the odor was observed at the time sample collection was initiated.

The analytical results for ambient air are organized and discussed for each of the days when samples were collected. Table 2 presents the analytical results for all ambient samples collected on July 28, 2015, Table 3 presents results for July 29, 2015. It should be noted that only nitrogen and oxygen, the normal constituents of ambient air, were detected by EPA Method 3Cm.

### 5.1.1 Constituents of Concern in Ambient Air on July 28, 2015

**Climate summary for Tuesday July 28:** Low temperature 76 deg. F, high temperature 100 deg. F; no precipitation; partly cloudy; winds 0 to 5mph out of south/southeast.

**Analytical results for all ambient samples collected on July 28 are presented in Table 2.**

#### 5.1.1.1 Analytical Results for Upwind Ambient Air on July 28, 2015

**Upwind Sample Location:** The South Fence location close to the junction of the East Fence and South Fence (Figure 1);

**Constituents analyzed for but not detected:** Hydrogen cyanide, amines, mercury, ammonia, reduced sulfur compounds, hydrogen, carbon monoxide, methane and carbon dioxide.

**Aldehydes:** Acetaldehyde, benzaldehyde, butyraldehyde and formaldehyde were detected.

**Carboxylic acids:** Acetic acid was detected.

**VOCs:** Low concentrations of the following VOCs were detected: 2-butanone (MEK), isopropyl alcohol, acetone, acetonitrile, acrolein, benzene, carbon tetrachloride, dichlorodifluoromethane (Freon 12), d-limonene, ethanol, ethyl acetate, methylene chloride, n-hexane, propene, toluene, trichlorofluoromethane, trichlorotrifluoroethane and vinyl acetate.

**TICs:** The following tentatively identified compounds (TICs) were detected in the July 28, 2015 upwind sample: unknown, trimethylsilanol, acetic acid, hexamethylcyclotrisiloxane, unknown siloxane, n-nonanal, unknown siloxane and unknown.

**PAHs:** A twenty-four (24) hour high-volume sample was collected starting on July 30 and ending on July 31, 2015 and submitted for analysis of PAHs. The sample was collected at the Grassy Knoll lower level location. Low concentrations of the following PAHs were detected: acenaphthene, fluoranthene, fluorene, naphthalene, phenanthrene and pyrene.

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**Dioxins/Dibenzofurans:** A twenty-four (24) hour high-volume sample was collected starting on July 27 and ending on July 28, 2015 and submitted for analysis of dioxins/dibenzofurans. The sample was collected at the Grassy Knoll lower level location. Table 7 presents the detailed analytical results for the ambient air samples that were analyzed for dioxins/dibenzofurans. The three isomers detected in the upwind/background sample, 1, 2, 3, 4, 6, 7, 8-HpCDD, OCDD and 1, 2, 3, 4, 6, 7, 8-HpCDF were converted to 2, 3, 7, 8-TCDD equivalents and added together to yield a total TCDD equivalent (TEQ) concentration of  $6.37E-10 \mu\text{g}/\text{m}^3$ .

### 5.1.1.2 Analytical Results for Ambient Air on the Landfill on July 28, 2015

#### Ambient Air at the Flare Station

**Constituents analyzed for but not detected:** Hydrogen cyanide, amines, mercury, ammonia, carboxylic acids, reduced sulfur compounds, hydrogen, carbon monoxide, methane and carbon dioxide.

**Aldehydes:** Acetaldehyde, benzaldehyde, butyraldehyde and formaldehyde were detected.

**VOCs:** The following VOCs were detected: 1,2-dichloroethane, 1,4-dioxane, 2-butanone, isopropyl alcohol, acetone, acetonitrile, benzene, acrolein, carbon tetrachloride, chloromethane, dichlorodifluoromethane (Freon 12), d-limonene, ethanol, ethyl acetate, m,p-xylenes, methylene chloride, n-hexane, propene, styrene, toluene, trichlorofluoromethane, trichlorotrifluoroethane and vinyl acetate.

**TICs:** The following TICs were detected in the July 28, 2015 on site flare sample: acetaldehyde, trimethylsilanol, 1,1-dimethoxyethane, 1,3-dioxolane, dimethylsilanediol, hexamethylcyclotrisiloxane, 1,3-butanediol, (E,E)-2,4-hexadienal, 1,2,3-trichloropropane, bis(2-chloroethoxy)methane, unknown, unknown, unknown, bis(2-chloroethyl) ether and unknown.

**PAHs:** A twenty-four (24) hour high-volume sample was collected from the Flare Station starting on July 30 and ending on July 31 and submitted for analysis of PAHs. Low concentrations of the following PAHs were detected: acenaphthene, fluoranthene, fluorene, naphthalene, phenanthrene and pyrene.

**Dioxins/Dibenzofurans:** A twenty-four (24) hour high-volume sample was collected from the Flare Station starting on July 27 and ending on July 28, 2015 and submitted for analysis of dioxins/dibenzofurans. Table 7 presents the detailed analytical results for the ambient air samples that were analyzed for dioxins/dibenzofurans. The following isomers were detected: 1, 2, 3, 7, 8-PeCDD; 1, 2, 3, 4, 6, 7, 8-HpCDD; OCDD 1, 2, 3, 4, 7, 8-HxCDF; 1, 2, 3, 6, 7, 8-HxCDF; 2, 3, 4, 6, 7, 8-HxCDF; 1, 2, 3, 4, 6, 7, 8-HpCDF and OCDF were converted to 2, 3, 7, 8-TCDD equivalents and added together to yield a total TCDD equivalent (TEQ) concentration of  $1.58E-08 \mu\text{g}/\text{m}^3$ .

#### Ambient Air at the South Quarry



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**Constituents analyzed for but not detected:** Hydrogen cyanide, amines, mercury, ammonia, reduced sulfur compounds, hydrogen, carbon monoxide, methane and carbon dioxide.

**Aldehydes:** Acetaldehyde, benzaldehyde, butyraldehyde and formaldehyde were detected.

**Carboxylic acids:** Acetic acid and butanoic acid were detected.

**VOCs:** The following VOCs were detected: 1,4-dichlorobenzene, 1,4-dioxane, 2-butanone, isopropyl alcohol, acetone, acetonitrile, benzene, acrolein, carbon tetrachloride, chloromethane, dichlorodifluoromethane (Freon 12), ethanol, ethyl acetate, methylene chloride, naphthalene, n-butyl acetate, n-hexane, propene, tetrahydrofuran (THF), toluene, trichlorofluoromethane, trichlorotrifluoroethane and vinyl acetate.

**TICs:** unknown (9.48), trimethylsilanol, 1-butanol, dimethylsilanediol, hexamethylcyclotrisiloxane, unknown siloxane, 2-ethyl-1-hexanol, n-nonanal, unknown siloxane, n-decanal, unknown siloxane, unknown siloxane.

### 5.1.1.3 Analytical Results for Ambient Air at Downwind Locations on July 28, 2015

**Downwind:** Fence by Republic Parking Lot and Upper Road by Neck (Figure 1). An intermittent low level odor was present at these locations throughout the sampling event.

#### Fence by Republic Parking Lot

**Constituents analyzed for but not detected:** Hydrogen cyanide, amines, mercury, ammonia, reduced sulfur compounds, hydrogen, carbon monoxide, methane and carbon dioxide.

**Aldehydes:** Acetaldehyde, benzaldehyde, butyraldehyde, formaldehyde and propionaldehyde were detected.

**Carboxylic acids:** Acetic acid was detected.

**VOCs:** The following VOCs were detected: 1, 2, 4-trimethylbenzene, 2-butanone (MEK), isopropyl alcohol, 4-ethyltoluene, 4-methyl-2-pentanone, acetone, acetonitrile, acrolein, benzene, carbon tetrachloride, chloromethane, dichlorodifluoromethane (CFC 12), ethanol, ethyl acetate, ethylbenzene, m, p-xylenes, methylene chloride, naphthalene, n-hexane, o-xylene, propene, toluene, trichlorofluoromethane, trichlorotrifluoroethane and vinyl acetate.

**TICs:** unknown, trimethylsilanol, acetic acid, dimethylsilanediol, unknown, hexamethylcyclotrisiloxane, unknown siloxane, n-nonanal, 2-ethylhexylacetate, unknown siloxane and n-decanal.

**PAHs:** A twenty-four (24) hour high-volume sample was collected from the East Fence starting on July 30 and ending on July 31, 2015 and submitted for analysis of PAHs. Low concentrations of



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the following PAHs were detected: acenaphthene, fluoranthene, fluorene, naphthalene, phenanthrene and pyrene.

**Dioxins/Dibenzofurans:** A twenty-four (24) hour high-volume sample was collected starting on July 27 and ending on July 28, 2015 and submitted for analysis of dioxins/dibenzofurans. Table 7 presents the detailed analytical results for the ambient air samples that were analyzed for dioxins/dibenzofurans. The isomers detected in the downwind sample: 1, 2, 3, 6, 7, 8-HxCDD; 1, 2, 3, 4, 6, 7, 8-HpCDD; OCDD; 1, 2, 3, 4, 6, 7, 8-HpCDF; and OCDF were converted to 2,3,7,8-TCDD equivalents and added together to yield a total TCDD equivalent (TEQ) concentration of  $1.14\text{E-}09 \mu\text{g}/\text{m}^3$ .

### Upper Road by Neck

**Constituents analyzed for but not detected:** Amines, ammonia, carboxylic acids and reduced sulfur compounds were not detected.

**Aldehydes:** Acetaldehyde, benzaldehyde, butyraldehyde and formaldehyde were detected.

**VOCs:** The following VOCs were detected: 2-butanone (MEK), acetone, acetonitrile, acrolein, benzene, carbon tetrachloride, chloromethane, dichlorodifluoromethane (CFC 12), ethanol, ethyl acetate, methylene chloride, naphthalene, n-hexane, propene, tetrahydrofuran (THF), toluene, trichlorofluoromethane, trichlorotrifluoroethane and vinyl acetate.

**TICs:** Chlorodifluoromethane, unknown, trimethylsilanol, dimethylsilanediol, hexamethylcyclotrisiloxane, unknown siloxane, n-nonanal, unknown siloxane, n-decanal, unknown siloxane and unknown siloxane.

### 5.1.2 Constituents of Concern in Ambient Air on July 29, 2015

**Climate summary for Wednesday July 29:** Low temperature 73 deg. F, high temperature 91 deg. F; no precipitation; variable cloudiness; winds were out of west and northwest.

Slight intermittent odors were present at the downwind locations when sampling was initiated in the morning of July 29.

**Analytical results for all ambient samples collected on July 29 are presented in Table 3.**

#### 5.1.2.1 Analytical Results for Upwind Ambient Air on July 29, 2015

**Upwind:** The Grassy Knoll Upper Level

**Constituents analyzed for but not detected:** Amines, ammonia, carboxylic acids, and reduced sulfur compounds were not detected.

**Aldehydes:** Acetaldehyde, benzaldehyde, butyraldehyde and formaldehyde were detected.



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**VOCs:** Low concentrations of the following VOCs were detected: 1,2,4-trimethylbenzene, 1,2-dichloroethane, 1,4-dioxane, 2-butanone (MEK), isopropyl alcohol, 4-methyl-2-pentanone, acetone, acetonitrile, acrolein, carbon disulfide, carbon tetrachloride, chloromethane, dichlorodifluoromethane (CFC 12), ethanol, ethyl acetate, methylene chloride, n-butyl acetate, n-hexane, n-nonane, n-octane, propene, toluene, trichlorofluoromethane and trichlorotrifluoroethane.

**TICs:** Chlorodifluoromethane, propane, n-butane, isoprene, unknown, trimethylsilanol, acetic acid and hexamethylcyclotrisiloxane.

### 5.1.2.2 Analytical Results for Ambient Air on the Landfill on July 29, 2015

**On-Landfill:** Samples were collected at the Neck and the North Quarry within ten feet of the source gas flux-box at each location.

#### Ambient Air at the Neck

**Constituents analyzed for but not detected:** Hydrogen cyanide, amines, mercury, ammonia, carboxylic acids, reduced sulfur compounds, hydrogen, carbon monoxide, methane and carbon dioxide.

**Aldehydes:** Acetaldehyde, butyraldehyde, formaldehyde and n-hexaldehyde were detected.

**VOCs:** The following VOCs were detected: 2-butanone (MEK), isopropyl alcohol, acetone, acetonitrile, acrolein, benzene, carbon disulfide, carbon tetrachloride, chloromethane, dichlorodifluoromethane (CFC 12), d-limonene, ethanol, ethyl acetate, methylene chloride, n-butyl acetate, n-hexane, n-nonane, propene, toluene, trichlorofluoromethane, trichlorotrifluoroethane and vinyl acetate.

**TICs:** Hexamethylcyclotrisiloxane, n-Nonanal and n-Decanal.

#### Ambient Air at the North Quarry

**Constituents analyzed for but not detected:** Hydrogen cyanide, amines, mercury, ammonia, reduced sulfur compounds, hydrogen, carbon monoxide, methane and carbon dioxide.

**Aldehydes:** Acetaldehyde, butyraldehyde, formaldehyde and n-hexaldehyde were detected.

**Carboxylic acids:** Acetic acid was detected.

**VOCs:** The following VOCs were detected: 2-Butanone (MEK), isopropyl alcohol, acetone, acetonitrile, carbon tetrachloride, dichlorodifluoromethane (CFC 12), ethanol, ethyl acetate, methylene chloride, propene, toluene, trichlorofluoromethane and trichlorotrifluoroethane.

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**TICs:** Chlorodifluoromethane, unknown, trimethylsilanol, hexamethylcyclotrisiloxane and unknown siloxane.

### Analytical Results for Ambient Air at Downwind Locations on July 29, 2015

**Downwind:** Two downwind samples were collected on July 29, 2015: 1) Samples were collected from the East Fence Near the Flare and 2) the Fence by Retention Pond (Figure 1).

#### East Fence Near Flare

**Constituents analyzed for but not detected:** Amines, ammonia, carboxylic acids, and reduced sulfur compounds.

**Aldehydes:** Acetaldehyde, benzaldehyde, butyraldehyde and formaldehyde were detected.

**VOCs:** The following VOCs were detected: 2-Butanone (MEK), isopropyl alcohol, acetone, acetonitrile, acrolein, benzene, carbon tetrachloride, chloromethane, dichlorodifluoromethane (CFC 12), ethanol, ethyl acetate, methylene chloride, n-butyl acetate, n-hexane, propene, toluene, trichlorofluoromethane and trichlorotrifluoroethane

**TICs:** Trimethylsilanol, hexamethylcyclotrisiloxane and n-nonanal.

#### Fence by Retention Pond

**Constituents analyzed for but not detected:** Amines, ammonia and carboxylic acids.

**Aldehydes:** Acetaldehyde, butyraldehyde and formaldehyde were detected.

## 5.2 LANDFILL SOURCE GAS

Table 4 presents the analytical results and laboratory method detection limits (for constituents analyzed for but not detected) for all samples of landfill source gas collected in July 2015. Figure 1 shows the locations of the four source gas sample locations: The Flare Inlet, Neck, North Quarry and South Quarry as specified by MDNR in the June 19, 2014 Orders.

The subsurface reaction is thought to be well-controlled south of the Neck; and no subsurface reaction was or is known to be occurring in the North Quarry. The reaction in the South Quarry was still active at the time of the July 2015 sampling event. Samples from the Neck, North Quarry and South Quarry locations represent gas that has migrated upward through the waste mass and accumulated between the surface of the landfill and the EVOH cover. Samples from the Flare Inlet represent contributions from all locations within the waste mass that are serviced by the gas collection system. Although the composition is related, gas from the Flare Inlet is not directly comparable to the gas collected from immediately beneath the EVOH.

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### 5.2.1 Analytical Results for Source Gas from the Neck

**Constituents analyzed for but not detected:** Hydrogen cyanide, amines, mercury, ammonia, carboxylic acids, hydrogen and carbon monoxide (Table 6).

**Aldehydes:** Acetaldehyde was the only aldehyde detected.

**VOCs:** The following VOCs were detected: 1,2,4-Trimethylbenzene, 1,2-dichloro-1,1,2,2-tetrafluoroethane, 1,3,5-trimethylbenzene, 1,3-butadiene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 2-butanone (MEK), 4-ethyltoluene, acetone, alpha-pinene, benzene, carbon disulfide, chlorobenzene, cumene, cyclohexane, dichlorodifluoromethane (CFC 12), ethylbenzene, m,p-xylenes, methyl tert-butyl ether, methylene chloride, n-heptane, n-hexane, n-nonane, o-xylene, propene, tetrachloroethene, tetrahydrofuran (THF), toluene and vinyl chloride.

**TICs:** 2-Methylpropene, n-butane, C<sub>4</sub>H<sub>8</sub> alkene, C<sub>4</sub>H<sub>8</sub> alkene, C<sub>5</sub>H<sub>10</sub> alkene, cyclopentene, C<sub>6</sub>H<sub>12</sub> alkene, C<sub>8</sub>H<sub>16</sub> alkene, unknown, C<sub>10</sub>H<sub>20</sub> compound, unknown, (C<sub>12</sub>H<sub>26</sub>) alkane: straight-chain, (C<sub>12</sub>H<sub>26</sub>) alkane: straight-chain, decahydronaphthalene isomer and unknown.

**Reduced sulfur compounds:** The following reduced sulfur compounds were detected: Carbon disulfide, dimethyl disulfide and dimethyl sulfide. **Total Reduced Sulfur:** 140 µg/m<sup>3</sup>

**Fixed Gases:** Oxygen + Argon, nitrogen, methane and carbon dioxide were detected.

**PAHs:** Naphthalene and phenanthrene were detected.

**Dioxins/Dibenzofurans:** A two hour high-volume sample was collected July 31, 2015 and submitted for analysis of dioxins/dibenzofurans. Table 8 presents the detailed analytical results for the source gas samples that were analyzed for dioxins/dibenzofurans. The isomers detected in the sample from the neck location, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF were converted to 2,3,7,8-TCDD equivalents and added together to yield a total TCDD equivalent (TEQ) concentration of 1.38E-09 µg/m<sup>3</sup>.

### 5.2.2 Analytical Results for Source Gas from the North Quarry

**Constituents analyzed for but not detected:** Aldehydes, hydrogen cyanide, amines, mercury, ammonia, carboxylic acids, carbon monoxide, hydrogen and dioxins/dibenzofurans (Table 6).

**VOCs:** The following VOCs were detected: 1,2,4-Trimethylbenzene, 1,2-Dichloro-1,1,2,2-tetrafluoroethane, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2-Butanone (MEK), 4-Ethyltoluene, 4-Methyl-2-pentanone, alpha-Pinene, Benzene, Chloroethane, Chloroform, cis-1,2-Dichloroethene, Cyclohexane, Dichlorodifluoromethane (CFC 12), d-Limonene, Ethanol, Ethylbenzene, m,p-Xylenes, Naphthalene, n-Butyl Acetate, n-Heptane, n-Hexane, n-Nonane, n-Octane, o-Xylene, Propene, Tetrachloroethene, Tetrahydrofuran (THF), Toluene, Trichlorofluoromethane, Vinyl Chloride.

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**TICs:** 2-Methylpropene, n-Butane, 1-Butene, 1-Chloro-1-Fluoroethane, 2-Methylbutane, n-Pentane, 2-Methyl-2-butene, 2, 2-Dimethylbutane, 2-Methylpentane and 3-Methylpentane

**Reduced Sulfurs:** Dimethyl sulfide was detected. **Total Reduced Sulfur:** 14 µg/m<sup>3</sup>

**Fixed Gases:** Oxygen + Argon, nitrogen, methane and carbon dioxide were detected.

**PAHs:** A two (2) hour high-volume sample was collected on July 31 and submitted for analysis of PAHs. Naphthalene was detected.

### 5.2.3 Analytical Results for Source Gas from the South Quarry

**Constituents analyzed for but not detected:** Hydrogen cyanide, amines, mercury, ammonia and carbon monoxide (Table 6).

**Aldehydes:** Acetaldehyde, benzaldehyde, butyraldehyde and propionaldehyde were detected.

**Carboxylic acids:** The following carboxylic acids were detected: 2-Ethylhexanoic acid, 2-methylbutanoic acid, 2-methylpentanoic acid, 2-methylpropanoic acid (isobutyric), 3-methylbutanoic acid (isovaleric), 3-methylpentanoic acid, 4-methylpentanoic acid (isocaproic), acetic acid, butanoic acid (butyric), heptanoic acid (enantioic), hexanoic acid (caproic), pentanoic acid (valeric) and propionic acid (propanoic)

**VOCs:** The following VOCs were detected: 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 1,3-Butadiene, 1,4-Dichlorobenzene, 1,4-Dioxane, 2-Butanone (MEK), 2-Hexanone, 2-Propanol, Isopropyl Alcohol), 4-Ethyltoluene, 4-Methyl-2-pentanone, Acetone, alpha-Pinene, Benzene, Carbon Disulfide, Chlorobenzene, chloromethane, cumene, d-limonene, ethanol, ethyl acetate, ethylbenzene, m,p-xylenes, methyl tert-butyl ether, n-butyl acetate, n-heptane, n-hexane, n-nonane, n-octane, n-propylbenzene, o-xylene, propene, styrene, tetrahydrofuran (THF), toluene and trichloroethene

**TICs:** Dimethyl Ether, 2-Methylpropene, Furan, Dimethyl Sulfide, Methyl Acetate, Cyclopentene, 2-Butanol, 2-Methylfuran, Methyl Propionate, 2-Pentanone, Methyl Butyrate, Dimethyl disulfide, 2-Methylcyclopentanone, n-Decane and p-Isopropyltoluene.

**Reduced sulfur compounds:** The following reduced sulfur compounds were detected: 3-Methylthiophene, Carbon Disulfide, Dimethyl Disulfide, Dimethyl Sulfide, Ethyl Methyl Sulfide, Methyl Mercaptan, n-Butyl Mercaptan, Tetrahydrothiophene, Thiophene. **Total Reduced Sulfur:** 350,000 µg/m<sup>3</sup>.

**Fixed gases:** Hydrogen, Oxygen + Argon, Nitrogen, Methane and Carbon Dioxide were detected in source gas from the South Quarry.

## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

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**PAHs:** A two (2) hour high-volume sample was collected on July 31 and submitted for analysis of PAHs. Naphthalene and acenaphthene were detected in source gas from the South Quarry.

**Dioxins/Dibenzofurans:** A two hour high-volume sample was collected July 31 and submitted for analysis of dioxins/dibenzofurans. Table 8 presents the detailed analytical results for the source gas samples that were analyzed for dioxins/dibenzofurans. The isomers detected in the sample from the south quarry location, 1,2,3,4,6,7,8-HpCDD and OCDD were converted to 2,3,7,8-TCDD equivalents and added together to yield a total TCDD equivalent (TEQ) concentration of 8.71E-10  $\mu\text{g}/\text{m}^3$ .

### 5.2.4 Analytical Results for Source Gas from the Flare Inlet

**Constituents analyzed for but not detected:** Hydrogen cyanide, amines, ammonia and carbon monoxide (Table 6).

**Aldehydes:** Acetaldehyde, Benzaldehyde, Butyraldehyde and Propionaldehyde were detected.

**Mercury:** Mercury was detected at the Flare Inlet. Mercury was also detected in the flare gas sample during the July 2014 and January 2015 sampling events. Mercury has not been detected in any ambient air sample or from any source gas samples collected from the North Quarry, South Quarry or Neck during the four previous comprehensive sampling events.

**Carboxylic acids:** The following carboxylic acids were detected: 2-Ethylhexanoic Acid, 2-Methylbutanoic Acid, 2-Methylpentanoic Acid, 2-Methylpropanoic Acid (Isobutyric), 3-Methylbutanoic Acid (Isovaleric), 3-Methylpentanoic Acid, Acetic Acid, Butanoic Acid (Butyric), Heptanoic Acid (Enanthoic), Hexanoic Acid (Caproic), Nonanoic Acid (Pelargonic), Octanoic Acid (Caprylic), Pentanoic Acid (Valeric) and Propionic Acid (Propanoic)

**VOCs:** The following VOCs were detected: 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 1,3-Butadiene, 1,4-Dichlorobenzene, 1,4-Dioxane, 2-Butanone (MEK), 2-Hexanone, 2-Propanol (Isopropyl Alcohol), 4-Ethyltoluene, 4-Methyl-2-pentanone, Acetone, alpha-Pinene, Benzene, Carbon Disulfide, Chlorobenzene, Chloroethane, Chloromethane, Cumene, d-Limonene, Ethanol, Ethyl Acetate, Ethylbenzene, m,p-Xylenes, Naphthalene, n-Butyl Acetate, n-Heptane, n-Hexane, n-Nonane, n-Octane, n-Propylbenzene, o-Xylene, Propene, Styrene, Tetrahydrofuran (THF), Toluene, Trichloroethene and Vinyl Acetate.

**TICs:** Dimethyl Ether, 2-Methylpropene, Dimethyl Sulfide, Methyl Acetate, 1-Propanol, 2-Butanol, 2-Methylfuran, Methyl Propionate, 2-Pentanone, Methyl isobutyrate, Methyl Butyrate, Dimethyl disulfide, Methyl isovalerate, Methyl valerate, 2-Methylcyclopentanone, Methyl hexanoate and p-Isopropyltoluene.

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**Reduced sulfur compounds:** The following reduced sulfur compounds were detected: Dimethyl Disulfide, Dimethyl Sulfide, Ethyl Methyl Sulfide, Methyl Mercaptan, Tetrahydrothiophene and Thiophene. **Total Reduced Sulfur:** Summa A - 440,000, Summa B - 870,000

**Fixed gases:** *Hydrogen, Oxygen + Argon, Nitrogen, Methane, Carbon Dioxide* were detected in source gas from the Flare inlet.

No high volume samples for PAH or dioxin/furan analysis were collected from the gas stream entering the Flare Inlet.

### 5.3 DISCUSSION OF SAMPLING RESULTS FOR JULY 2015

#### 5.3.1 Public Health and Occupational Screening Levels for Ambient Air

Along with the analytical results and laboratory minimum reporting limits (MRLs), health based screening levels are provided in four columns on the left-hand side of the ambient air results tables as a "point of reference" for the concentrations. Two general categories of screening levels are presented and discussed: risk-based screening levels and occupational exposure limits.

US EPA risk-based Regional Screening Levels (RSL) are concentrations of constituents in ambient air in residential (Residential RSL) and industrial settings (Industrial RSL) that are considered to be protective of individuals who are exposed to those concentrations over many years. RSLs for carcinogenic chemicals are derived to correspond to an excess lifetime cancer risk of 1 in 1,000,000 (1 in 1 million or 1E-06) for a person 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). US EPA updates the RSL tables two times a year. The most recent RSL concentrations (June 2015) were used in this report.

Although the EPA RSLs for carcinogenic chemicals were derived to correspond to a cancer risk of 1 in 1 million, many States and other jurisdictions consider a cancer risk of 1 in 100,000 to be a point of departure for regulating chemicals in the environment and mitigating potential risks. For carcinogenic chemicals such as benzene, the RSL concentrations for ambient air would be ten times higher for a target cancer risk of 1 in 100,000. We have conservatively chosen to present the lower concentrations.

RSLs for chemicals that produce adverse non-cancer effects (and are not considered to be carcinogens) are concentrations that are very unlikely to produce adverse health effects in people who are exposed to those concentrations over many years. Non-cancer RSL concentrations were derived to correspond to a non-cancer hazard index (HI) of 1. For most States and jurisdictions an estimated hazard index greater than 1 for non-cancer health effects from potential exposures to chemicals in the ambient environment is the point of departure for further evaluation and consideration of actions to mitigate the exposure.

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Concentrations of constituents below applicable RSL concentrations are not a concern for public health. Concentrations above RSLs do not mean that adverse health effects will occur, but indicate that additional evaluation may be appropriate. RSLs are extremely conservative and do not account for other (non-environmental) sources of exposure to the same chemicals or personal risk factors for developing disease.

Many of the individuals with regular job duties on the landfill are covered by OSHA Hazard Communication requirements. Occupational Exposure Limits (OELs) published as OSHA PELs (Permissible Exposure Limits) and ACGIH TLVs (Threshold Limit Values) are applicable to this category of worker and are presented for perspective. ACGIH TLVs are health-based values, and refer to concentrations of chemical substances and represent conditions under which it is believed nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse health effects. OSHA PELs are based on 1969 TLVs with the exception that some have been updated as substance specific standards to reflect more current toxicological data and research.

### 5.3.2 Ambient Air

Analytical results for all ambient air samples collected during the July 2015 event can be found in Tables 2 and 3. Table 5 summarizes the compounds that were detected above laboratory detection limits in all time weighted ambient samples collected on July 28 through July 31, 2015. Table 7 provides the analytical results for ambient dioxin/dibenzofuran samples and presents the conversions of the detected isomers to 2, 3, 7, 8-TCDD equivalents which were then summed to yield a total TCDD equivalent (TEQ) concentration. All Silonite® canister samples were analyzed for fixed gases by method EPA 3cm. Only oxygen + argon and nitrogen, the normal constituents of ambient air, were detected in ambient samples. Hydrogen, carbon monoxide, methane, and carbon dioxide were not detected in any of the ambient air samples. In addition, hydrogen cyanide, mercury and amine compounds were not detected in any ambient air sample.

#### Volatile Organic Compounds

The analytical results from 8-hour samples collected in 6-liter Silonite® canisters can be compared for upwind, on-landfill, and downwind locations. These samples were collected on July 28 & July 29, 2015 and results are presented in tables 2, 3 and 5.

Low concentrations of 2-Butanone (MEK), Isopropyl Alcohol, Acetone, Acetonitrile, Acrolein, Benzene, Carbon Tetrachloride, Chloromethane, Dichlorodifluoromethane (CFC 12), Ethanol, Ethyl Acetate, Methylene Chloride, n-Hexane, Propene, Toluene, Trichlorofluoromethane, Trichlorotrifluoroethane and Vinyl Acetate were found in the upwind sample locations on July 28 & 29, 2015.



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With a few exceptions, the same compounds were detected in ambient air from on-site landfill locations on the Neck, North Quarry, South Quarry and Flare Station and from the downwind sample locations.

The concentrations of VOCs detected in 8-hour ambient air samples from the on-site landfill locations were similar (within one order of magnitude) to the concentrations detected at the downwind locations and to the concentrations detected in the upwind samples collected on the same day. There were no clear patterns by compound or by location.

With the exceptions discussed below, the concentrations of all VOCs detected in 8-hour samples of ambient air (regardless of location) were less than the conservative risk-based industrial and residential RSLs. The laboratory sample MDLs were sufficiently low for all VOCs to allow meaningful comparisons of the detected concentrations to the risk-based RSL concentrations and occupational exposure limits. The concentrations of all VOCs (including benzene) detected in 8-hour samples of ambient air on the landfill were thousands of times less than the corresponding OSHA PEL and ACGIH TLV concentrations for workplace exposures.

Five VOCs were detected in one or more 8-hour ambient air samples at concentrations higher than the corresponding risk-based EPA RSLs; 1,2-dichloroethane (1,2-DCA), 1,4-dioxane, acrolein, benzene and naphthalene

- **1,2-Dichloroethane**

- On July 28, 1,2-DCA was detected in the ambient sample from the Flare Station (728F-Summa) at a concentration ( $170 \mu\text{g}/\text{m}^3$ ) which exceeded the industrial RSL ( $0.47 \mu\text{g}/\text{m}^3$ ). The detected concentration did not exceed or approach the OSHA PEL or ACGIH TLV,  $200,000 \mu\text{g}/\text{m}^3$  and  $40,000 \mu\text{g}/\text{m}^3$ , respectively.
- 1, 2-DCA was not detected in any other on-site, upwind or downwind sample on July 28, 2015.
- On July 29, 2015, 1, 2-DCA was detected at a much lower concentration,  $0.61 \mu\text{g}/\text{m}^3$  in one upwind sample (729U1-Summa), which exceeded the residential RSL,  $0.11 \mu\text{g}/\text{m}^3$ .
- This is the only comprehensive sampling event where 1, 2-DCA has been detected in ambient air. In fact, 1, 2-DCA has only been detected during one other comprehensive sampling event (event #3 – July 2014). 1, 2-DCA was detected in a source gas sample collected at the South Quarry,  $4,200 \mu\text{g}/\text{m}^3$ .
- The source of 1, 2-DCA in ambient air is not known but cannot be attributed to the landfill.

- **1,4-Dioxane**



## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

Analytical Results  
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- On July 28, 1, 4-dioxane was detected in the ambient sample from the Flare Station (728F-Summa) at a concentration ( $700 \mu\text{g}/\text{m}^3$ ) which exceeded the industrial RSL ( $2.5 \mu\text{g}/\text{m}^3$ ). The detected concentration did not exceed or approach the OSHA PEL or ACGIH TLV,  $360,000 \mu\text{g}/\text{m}^3$  and  $72,000 \mu\text{g}/\text{m}^3$ , respectively. Also, on this date, 1, 4-dioxane was detected in ambient air at the South Quarry at an estimated concentration ( $0.26 \mu\text{g}/\text{m}^3$ ), which was below RSLs.
  - On July 29, 2015, 1, 4-dioxane was detected at a much lower concentration,  $13 \mu\text{g}/\text{m}^3$  in one upwind sample (729U1-Summa), which exceeded the residential RSL,  $0.56 \mu\text{g}/\text{m}^3$ .
  - This is the only comprehensive sampling event where 1,4-dioxane has been detected in ambient air.
  - 1,4-Dioxane was detected in source gas from the Flare Inlet (729sF-Summa (A),  $21,000 \mu\text{g}/\text{m}^3$  and in source gas from the South Quarry (729sSQ-Summa,  $2,600 \mu\text{g}/\text{m}^3$ ).
  - Given that 1, 4-dioxane is present in source gas, the landfill could be a potential source of 1, 4-dioxane in ambient air. However the compound was also detected in an upwind/background sample, suggesting the presence of other local/regional sources contributing to the concentration of 1, 4-dioxane in ambient air.
- **Acrolein**
    - Acrolein was detected in ambient air at the 3 of the 4 on-site locations (Flare Station, South Quarry and Neck) at estimated concentrations ranging from  $0.38 \mu\text{g}/\text{m}^3$  to  $1.7 \mu\text{g}/\text{m}^3$ . Acrolein was also detected in daily (July 28 and July 29) upwind samples,  $0.47 \mu\text{g}/\text{m}^3$  and  $0.71 \mu\text{g}/\text{m}^3$ , and in all 3 downwind samples ranging from  $0.38 \mu\text{g}/\text{m}^3$  to  $0.58 \mu\text{g}/\text{m}^3$ .
    - The detected concentrations of acrolein were higher than both the residential and industrial RSLs of  $0.021$  and  $0.088 \mu\text{g}/\text{m}^3$ , respectively, but well below the OSHA PEL and ACGIH TLV of  $250 \mu\text{g}/\text{m}^3$ .
    - Acrolein has not been detected in any source gas samples from the 5 comprehensive sampling events from 2012 through July 2015.
    - The range of concentrations was similar in all sample locations (on-site, downwind and upwind) and represents local/regional background conditions at the time the samples were collected.
    - The presence of acrolein in ambient air cannot be attributed solely to the landfill.

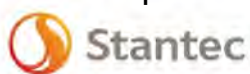
## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

Analytical Results  
October 27, 2015

- **Benzene**

- Benzene was detected in ambient air at the 3 of the 4 on-site locations (Flare Station, South Quarry and Neck) at concentrations ranging from 0.37  $\mu\text{g}/\text{m}^3$  to 0.52  $\mu\text{g}/\text{m}^3$ . All on-site benzene concentrations were below the industrial RSL of 1.6  $\mu\text{g}/\text{m}^3$ .
- Benzene was detected in the upwind sample on July 28, 2015 at a concentration of 0.95  $\mu\text{g}/\text{m}^3$ . On that date benzene was detected in both of the downwind samples, 0.53  $\mu\text{g}/\text{m}^3$  and 0.38  $\mu\text{g}/\text{m}^3$ , respectively, slightly exceeding the residential RSL of 0.36  $\mu\text{g}/\text{m}^3$ .
- On July 29, 2015 benzene was not detected in the upwind sample but was detected in the downwind sample with an estimated concentration of 0.55  $\mu\text{g}/\text{m}^3$ , slightly exceeding the residential RSL of 0.36  $\mu\text{g}/\text{m}^3$ .
- Both the industrial and residential RSL concentrations correspond to a target cancer risk of 1 in 1 million for individuals who are exposed on a daily basis over many years.
  - As mentioned in Section 5.3.2, the risk-based RSLs corresponding to a 1 in 100,000 cancer risk would be 16  $\mu\text{g}/\text{m}^3$  for industrial exposure and 3.6  $\mu\text{g}/\text{m}^3$  for residential exposure.
  - All concentrations of benzene detected in ambient air on the landfill and at upwind/downwind locations in January 2015 were lower than the RSL concentrations corresponding to a 1 in 100,000 cancer risk.
- By comparison, the occupational standards for benzene are thousands of times higher than the industrial RSL, e.g. OSHA PEL = 32,000  $\mu\text{g}/\text{m}^3$ , and the ACGIH TLV = 1,600  $\mu\text{g}/\text{m}^3$ .
- All detections of benzene exceeding the residential RSL were inside the fence-line, on-site and are not representative of offsite concentrations since they do not account for anticipated dilution in the air mass moving off of the landfill boundaries, or for contributions from other non-landfill sources in the surrounding community.
- To put the concentrations of benzene detected in ambient air into context, the annual average benzene concentration reported by the St. Louis Community Air Project (US EPA 2005) was 1.5  $\mu\text{g}/\text{m}^3$ . According to US EPA (2010), for the US as a whole, the mean and 90<sup>th</sup> percentile concentrations of benzene in ambient air in 2009 were 0.85  $\mu\text{g}/\text{m}^3$  and 1.39  $\mu\text{g}/\text{m}^3$ , respectively.

- **Naphthalene**



## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

Analytical Results  
October 27, 2015

- Naphthalene was detected by EPA Method TO-15 at the South Quarry location with an estimated concentration of  $0.52 \mu\text{g}/\text{m}^3$ , which slightly exceeded the industrial RSL of  $0.36 \mu\text{g}/\text{m}^3$ . However the detected concentration was orders of magnitude below the OSHA PEL and ACGIH TLV,  $50,000 \mu\text{g}/\text{m}^3$ .
- Naphthalene was detected in the two downwind samples collected on July 28, 2015;  $1.3 \mu\text{g}/\text{m}^3$  in 728-Dup10 and  $0.57 \mu\text{g}/\text{m}^3$  in 728D2-Summa. The detected concentrations exceed the conservative residential RSL of  $0.083 \mu\text{g}/\text{m}^3$ .
- The downwind locations lie along landfill service roads with constant vehicle traffic. Vehicle exhaust from traffic on July 28 may have contributed to concentrations of naphthalene in ambient air in these two samples.
- Naphthalene is a target analyte for analysis using USEPA EPA method TO-13 and 24 hour high volume PUF sampling. Naphthalene was detected in the upwind, downwind and on-site (flare) samples at similar low concentrations ranging from  $0.023 \mu\text{g}/\text{m}^3$  to  $0.04 \mu\text{g}/\text{m}^3$ . The detected concentrations did not exceed the industrial or residential RSLs,  $0.36 \mu\text{g}/\text{m}^3$  and  $0.083 \mu\text{g}/\text{m}^3$ , respectively.

### Aldehydes

Acetaldehyde, benzaldehyde, butyraldehyde and formaldehyde were detected at similar low concentrations in upwind, on-landfill, and downwind fence-line locations on both July 28 and 29, 2015.

- For samples collected on the landfill (South Quarry, Neck, North Quarry and Flare Station) the concentrations of acetaldehyde ranged from  $1.2$  to  $2.3 \mu\text{g}/\text{m}^3$ . The detected concentrations in ambient air were below the USEPA industrial RSL ( $5.6 \mu\text{g}/\text{m}^3$ ) and well below OSHA PELs ( $360,000 \mu\text{g}/\text{m}^3$ ) and ACGIH TLVs ( $45,000 \mu\text{g}/\text{m}^3$ ).
- Acetaldehyde concentrations were low and similar in magnitude across upwind, downwind and on landfill locations (range  $1.2 \mu\text{g}/\text{m}^3$  to  $3.0 \mu\text{g}/\text{m}^3$ ). Detected concentrations of acetaldehyde, including the concentrations in the upwind samples were close to, or higher than the residential RSL ( $1.3 \mu\text{g}/\text{m}^3$ ) but less than the industrial RSL ( $5.6 \mu\text{g}/\text{m}^3$ ).
  - The concentrations of acetaldehyde were similar in all sample locations and represent local/regional background conditions at the time the samples were collected.
- All detected concentrations of formaldehyde, including the concentrations in the upwind samples were higher than both the residential ( $0.22 \mu\text{g}/\text{m}^3$ ) and industrial RSLs ( $0.94 \mu\text{g}/\text{m}^3$ ).
- On July 28, 2015 formaldehyde concentrations ranged from  $12 \mu\text{g}/\text{m}^3$  to  $14 \mu\text{g}/\text{m}^3$ . On July 29, 2015 the detected concentrations ranged from  $4.2 \mu\text{g}/\text{m}^3$  to  $5 \mu\text{g}/\text{m}^3$ .

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Concentrations were similar regardless of sample location (on landfill and perimeter) and relative wind direction (on-site, upwind and downwind).

- The concentrations of formaldehyde were similar in all sample locations and represent local/regional background conditions at the time the samples were collected.
- To put the concentrations of aldehydes detected in ambient air into context, the annual average acetaldehyde and formaldehyde concentrations reported by the St. Louis Community Air Project (US EPA 2005) were  $4.8 \mu\text{g}/\text{m}^3$  and  $4.6 \mu\text{g}/\text{m}^3$ , respectively.

The presence of acetaldehyde and formaldehyde in ambient air cannot be attributed to the landfill. Furthermore, formaldehyde has only been detected in one source gas sample above method detection limits over the course of the five sampling events ( $78 \mu\text{g}/\text{m}^3$  - Flare Inlet 2014).

### Reduced Sulfur Compounds

No reduced sulfur compounds were detected in any ambient air sample. A number of reduced sulfur compounds were detected in source gas, particularly from the South Quarry and the Flare Inlet. However, as will be discussed in section 6.3, the laboratory MDLs are higher than the odor threshold for many of these compounds.

### Carboxylic Acids

Acetic acid and butanoic acid were the only carboxylic compounds detected in ambient air samples during the 5<sup>th</sup> comprehensive sampling event.

- Acetic acid was detected in two onsite landfill locations, the South Quarry ( $25 \mu\text{g}/\text{m}^3$ ) and North Quarry ( $23 \mu\text{g}/\text{m}^3$ ). Similar concentrations were detected in the upwind and downwind samples collected on July 28, 2015 ( $22 \mu\text{g}/\text{m}^3$ ).
  - The concentrations of acetic acid were similar in all sample locations and represent local/regional background conditions at the time the samples were collected.
  - No risk-based screening levels have been derived for the carboxylic acids. However, acetic acid is the only carboxylic acid with occupational exposure levels. The laboratory sample MRLs for acetic acid were lower than the OSHA PEL ( $25,000 \mu\text{g}/\text{m}^3$ ) and ACGIH TLV ( $27,000 \mu\text{g}/\text{m}^3$ ).
- Butanoic acid was detected at a low concentration ( $2.7 \mu\text{g}/\text{m}^3$ ) at the South Quarry on July 28, 2015.
- Carboxylic acids were detected in source gas from both the South Quarry and the Flare Inlet. Many of these compounds have odor thresholds below the laboratory MRLs.

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### PAHs

Six PAHs were detected in ambient air: acenaphthene (range 0.0061  $\mu\text{g}/\text{m}^3$  to 0.0076  $\mu\text{g}/\text{m}^3$ ); fluoranthene (range 0.0055  $\mu\text{g}/\text{m}^3$  to 0.0061  $\mu\text{g}/\text{m}^3$ ); fluorene (range 0.0086  $\mu\text{g}/\text{m}^3$  to 0.01  $\mu\text{g}/\text{m}^3$ ); naphthalene (range 0.023  $\mu\text{g}/\text{m}^3$  to 0.04  $\mu\text{g}/\text{m}^3$ ); phenanthrene (range 0.021  $\mu\text{g}/\text{m}^3$  to 0.024  $\mu\text{g}/\text{m}^3$ ); and pyrene (range 0.0023  $\mu\text{g}/\text{m}^3$  to 0.0026  $\mu\text{g}/\text{m}^3$ ). All detections were at similar low concentrations in upwind, on-landfill and downwind ambient air.

- Benzo[a]pyrene and related carcinogenic PAHs commonly associated with incomplete combustion of organic matter were not detected in ambient air or in any of the source gas samples (Table 5).
- The concentrations of all PAHs detected in ambient air from the upwind, on-landfill, and downwind fence-line were lower than the OSHA PEL and ACGIH TLV for naphthalene (50,000  $\mu\text{g}/\text{m}^3$ ). This occupational exposure limit is applicable to naphthalene and associated "coal tar-pitch volatile" PAHs.
- All detected concentrations of naphthalene were lower than the residential (0.083  $\mu\text{g}/\text{m}^3$ ) and industrial (0.36  $\mu\text{g}/\text{m}^3$ ) RSLs.
- The concentrations of naphthalene and associated PAHs detected in ambient air represent local/regional background conditions at the time the samples were collected.
- The presence of naphthalene and associated PAHs in ambient air cannot be attributed to the landfill.

### Dioxins/Dibenzofurans

Several dioxin/dibenzofuran isomers were detected at similar low amounts (mass) in upwind, on-landfill and downwind ambient air (Table 7).

- There are no OSHA PELs or ACGIH TLVs for dioxin/dibenzofurans isomers, therefore 2, 3, 7, 8-TCDD TEQs were calculated.
- All detected concentrations of 2, 3, 7, 8-TCDD TEQs (range from 1.58E-08 to 6.37E-10) in ambient air were lower than the residential (7.4E-08  $\mu\text{g}/\text{m}^3$ ) and 100 times lower than the industrial (3.2E-07  $\mu\text{g}/\text{m}^3$ ) RSLs.
- The low concentrations of 2, 3, 7, 8-TCDD TEQs detected in ambient air represent local/regional background conditions at the time the samples were collected. The average TCDD TEQ concentration in ambient air in the US is 1.11E-08  $\mu\text{g}/\text{m}^3$ , and the average in urban areas is 1.5911E-08  $\mu\text{g}/\text{m}^3$  (US EPA 2013).
- The presence of low concentrations of 2, 3, 7, 8-TCDD TEQs in ambient air cannot be attributed to the landfill.

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### 5.3.3 Source Gas

Analytical results for the source gas samples are provided in Tables 4, 6 and 8. As noted in section 3.4, the Silonite® canister source gas sample from the North Quarry was invalidated due to the fact that the canister was received by the lab with insufficient sample volume collected (e.g. the canister was pressurized upon receipt at the lab). It is possible that the valve on the Silonite® canister was defective or the canister valve was not opened for a sufficient period of time for sample collection. Bridgeton landfill personnel re-sampled this location on October 8, 2015 (**NQ Source 523**); the laboratory analytical results for VOCs, reduced sulfur compounds and fixed gases from this sample are presented in this report.

There are striking differences in the numbers of constituents and the concentrations detected in the three source gas locations. The relatively lower number of constituents detected and lower concentrations of those constituents in source gas from the Neck and North Quarry locations suggests that the subsurface reaction is not occurring or is well-controlled in these areas.

The sample results confirm that the subsurface reaction in the South Quarry is still active; and the results from the Flare Inlet reflect all contributions from the gas collection system. Although not directly comparable for reasons explained previously, the composition of the gas collected from the Flare Inlet is similar to the gas collected from under the EVOH at the South Quarry location. This indicates that the South Quarry is the largest contributor to the gases entering the Flare. The facility managers estimate that the South Quarry represents approximately 80% of the gas flow in the collection system entering the Flare.

Hydrogen cyanide, ammonia and amines were not detected in any of the source gas samples.

VOCs, reduced sulfur compounds and carboxylic acids are the constituents of concern detected at the highest concentrations in the South Quarry and the Flare Inlet.

Naphthalene was detected in source gas from the North Quarry, South Quarry and Neck. Benzo[a]pyrene and related cPAHs commonly associated with incomplete combustion of organic matter were not detected in any of the source gas samples. The reaction in the landfill is not producing cPAHs.

No dioxin/dibenzofuran isomers were detected in the source gas sample collected from the North Quarry. Only two isomers were detected in the Neck and South Quarry source gas samples.

The reaction in the landfill is not contributing dioxins/dibenzofurans to the ambient air on the landfill or in the surrounding community.

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## 6.0 HISTORICAL COMPARISON OF AIR SAMPLING RESULTS – COMPREHENSIVE SAMPLING 2012 TO 2015

### 6.1 AMBIENT AIR

Tables D1, D2, D3 and D4 in appendix D present a summary of all constituents of concern detected in one or more samples of upwind, downwind and on-site ambient air in 2012, 2013, 2014 and July 2015. Historical comparisons are used to identify trends in compounds detected over the five comprehensive sampling events conducted during the 4 year study. Due to the observed temporal variability of the individual compounds detected in source gas samples, indicator compounds have been selected and will be used for year to year comparisons. The specified indicator compounds were selected based on the representativeness of the individual compound to the class of compounds, frequency of detection, and public health significance.

- VOCs: Benzene
- Aldehydes: Acetaldehyde and Formaldehyde
- PAHs: Naphthalene and carcinogenic PAHs
- Dioxin/Dibenzofurans: 2, 3, 7, 8-TCDD TEQ concentrations

#### VOCs: Benzene

Benzene is the constituent of greatest potential concern for public health that is present in landfill source gas and could be released to ambient air. Low concentrations of benzene are frequently detected in ambient air, especially in urban areas. Benzene is a common constituent of gas in sanitary landfills, but at lower concentrations than are being produced in the subsurface reaction at Bridgeton Landfill.

The benzene concentrations detected in upwind, on-site and downwind ambient air samples collected in 2012 through 2015 are presented in the table below. Mean (arithmetic average) concentrations of benzene in ambient air at upwind, on-site locations and downwind fence-line locations are shown graphically below for the five comprehensive monitoring events conducted as of the date of this report. Mean concentrations were calculated using reported concentrations and laboratory method detection limits for non-detected values.

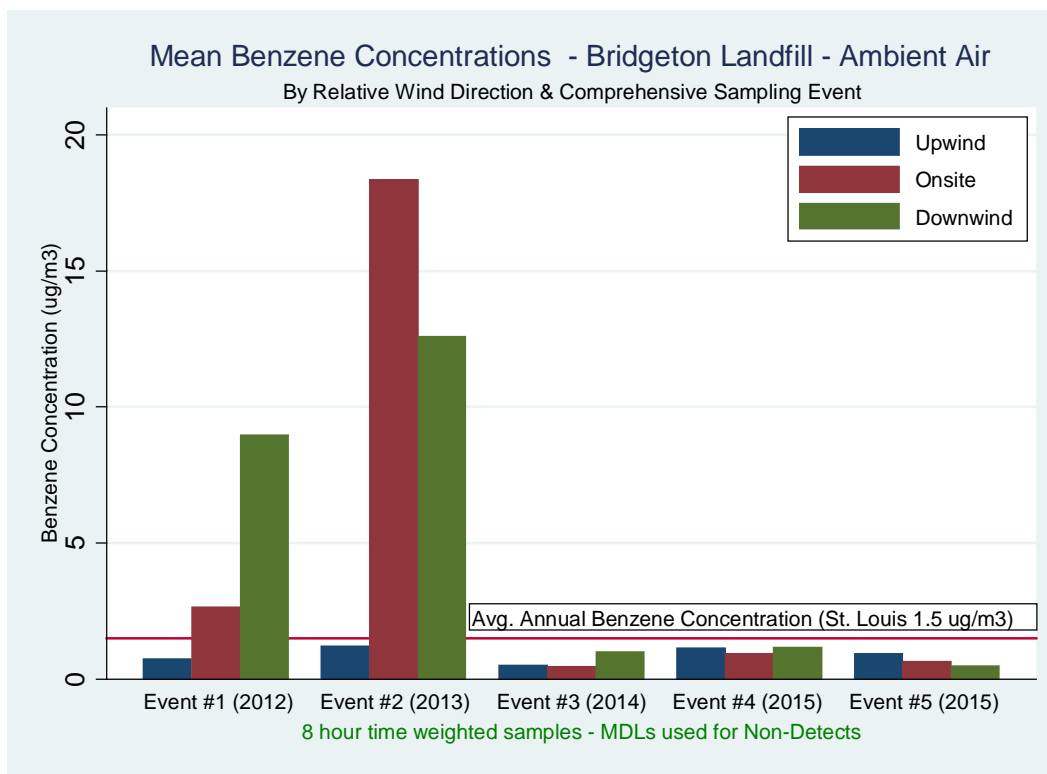


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Benzene Concentrations in Ambient Air by Relative Wind Direction					
Comprehensive Sampling Event #1 - August 2012					
Upwind		Downwind		Onsite	
F Grassy Knoll Center	<0.79	A Pond Center	<b>10</b>	E Amphitheater	<b>1.1</b>
G Grassy Knoll West	<0.77	B Pond East	<b>10</b>	D Summit	<0.67
H Grassy Knoll North	<0.77	C Pond West	<b>16</b>	L Summitt Valley	<b>6.2</b>
M Grassy Knoll Center 2	<0.7	I East Fenceline 1	<b>11</b>		
N Grassy Knoll West 2	<0.75	J East Fenceline 2	<0.76		
O Grassy Knoll North 2	<0.72	K South Fenceline i	<b>6.1</b>		
Comprehensive Sampling Event #2 - April and May, 2013					
Grassy Knoll Lower Level	<1.3	MSD Lift Station	<b>25</b>	Amphitheater	<b>27</b>
Grassy Knoll Upper Level	<1.7	Materiologic East	<b>12</b>	Second Tier	<b>9.7</b>
Pond	<0.64	Northwest Auto Repair	<b>0.79</b>		
Comprehensive Sampling Event #3 - July 2014					
Grassy Knoll Lower Level	<b>0.23</b>	Southeast Corner	<b>1.7</b>	Flare	<b>0.42</b>
Grassy Knoll Upper Level	<0.8	Retention Pond	<b>0.35</b>	Neck	<b>0.47</b>
		East Fence	<b>1.6</b>	North Quarry	<b>0.28</b>
		Republic Fueling	<0.36	South Quarry	<b>0.71</b>
Comprehensive Sampling Event #4 - January 2015					
Grassy Knoll Lower Level	<b>0.38</b>	Retention Pond	<b>2.3</b>	Flare	<b>0.6</b>
Retention Pond	<b>1.9</b>	East Fence	<b>0.52</b>	Neck	<b>1.8</b>
		Grassy Knoll - Pipe Staging	<b>0.98</b>	North Quarry	<b>0.8</b>
				South Quarry	<b>0.55</b>
Comprehensive Sampling Event #5 - July 2015					
South Fence	<b>0.95</b>	Republic Fueling	<b>0.53</b>	Flare	<b>0.49</b>
Grassy Knoll Upper Level	<0.92	Upper Road by Neck	<b>0.38</b>	Neck	<b>0.37</b>
		East Fence	<b>0.55</b>	North Quarry	<1.2
				South Quarry	<b>0.52</b>

" < " = Benzene not detected above method detection limit (MDL).  
 All units are  $\mu\text{g}/\text{m}^3$   
 Bold indicates detection above Laboratory Detection Limit



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- Regardless of relative wind direction, the VOC concentrations exhibit a high degree of daily and yearly variability, which is likely due to temporal variability in the local and regional air mass, and the multitude of sources of VOCs in an urban environment (e.g. vehicle traffic, industrial processes).
- Upwind:
  - Benzene was detected in four of fifteen upwind samples during the five comprehensive sampling events (range 0.23 to 1.9  $\mu\text{g}/\text{m}^3$ ). Upwind samples represent the local/regional ambient air mass moving onto the landfill before passing over the landfill (upwind or background). Low concentrations of benzene are frequently detected in ambient air in urban areas; the annual mean benzene concentrations in upwind ambient air (range 0.52 – 1.21  $\mu\text{g}/\text{m}^3$ ) have remained below the annual average benzene concentration of 1.5  $\mu\text{g}/\text{m}^3$  (St. Louis Community Air Project - US EPA 2005) during the five comprehensive sampling events.
- On-site landfill locations:
  - Benzene was detected in 15 of 17 on-site landfill samples (range from 0.28 to 27  $\mu\text{g}/\text{m}^3$ ). On-site benzene concentrations have decreased dramatically from 2012 and 2013 (range <0.67 to 27  $\mu\text{g}/\text{m}^3$ ) to 2014 and 2015 where the benzene concentrations (range from 0.28 to 1.8  $\mu\text{g}/\text{m}^3$ ) in on-site ambient samples.
  - Throughout the three comprehensive sampling events conducted in 2014 and 2015, on-site benzene concentrations have consistently remained below the industrial RSL (1.6  $\mu\text{g}/\text{m}^3$ ) and the annual mean ambient benzene concentrations in on-site landfill locations (range 0.47 – 0.94  $\mu\text{g}/\text{m}^3$ ) have remained below the annual average benzene concentration of 1.5  $\mu\text{g}/\text{m}^3$  (St. Louis Community Air Project - US EPA 2005). This time period represents a period where the EVOH liner has been installed and is intact, the gas collection system has been upgraded and expanded and there has been little invasive landfill excavation.
- Downwind:
  - Benzene was detected in 17 of 19 downwind samples (range 0.35 to 25  $\mu\text{g}/\text{m}^3$ ). Consistent with the on-site landfill results, downwind benzene concentrations have decreased dramatically from 2012 and 2013 (0.79 to 25  $\mu\text{g}/\text{m}^3$ ) to 2014 and 2015 (range 0.35 to 2.3  $\mu\text{g}/\text{m}^3$ ) in downwind ambient samples.
  - These results of the last three sampling events have been generally equal to the industrial RSL (1.6  $\mu\text{g}/\text{m}^3$ ). The annual mean ambient benzene concentrations in downwind locations (range 0.49 – 1.17  $\mu\text{g}/\text{m}^3$ ) have remained below the annual average benzene concentration of 1.5  $\mu\text{g}/\text{m}^3$  for the St. Louis area (St. Louis

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Community Air Project - US EPA 2005) during the last three comprehensive sampling events.

- Regardless of sample location (on-site, upwind or downwind) benzene concentrations have remained orders of magnitude lower than ACGIH TLVs and OSHA PELs over the five comprehensive sampling events spanning a four year period.

### Aldehydes

Like the VOCs, there is considerable temporal variability in the concentrations of aldehydes detected in ambient air. Acetaldehyde and formaldehyde were the individual compounds most frequently detected in ambient air samples in 2012, 2013, 2014 and 2015. It should be noted that the conservative RSLs for acetaldehyde and especially for formaldehyde are close to the laboratory method detection limits for these compounds. Consequently, almost any detected concentration of formaldehyde will be higher than the RSL concentrations. Formaldehyde has only been detected in one source gas sample above method detection limits over the course of the five sampling events (78  $\mu\text{g}/\text{m}^3$  - Flare Inlet 2014). The concentrations of formaldehyde detected in ambient air represent contributions from local/regional background sources and are not related to the landfill.

- Upwind
  - Acetaldehyde was detected in 15 of 15 upwind samples (range from 0.92 to 19  $\mu\text{g}/\text{m}^3$ ). Concentrations have declined when comparing results from 2012 to samples collected in 2013, 2014 and 2015. After 2012 acetaldehyde concentrations have remained below industrial RSLs and generally equal to or lower than residential RSLs.
  - Formaldehyde was detected in 12 of 15 upwind samples (range from 0.92 to 12  $\mu\text{g}/\text{m}^3$ ). With the exception of ambient samples collected on July 28, 2015 (fifth comprehensive sampling event), the concentrations have remained relatively consistent over the five comprehensive sampling events. Samples collected on this date regardless of location (upwind, on-site and downwind) were elevated as compared to historical sampling events. Formaldehyde was not detected above method detection limits in source gas during the fifth comprehensive sampling event, suggesting other regional/background sources of formaldehyde in ambient air. All detected concentrations of formaldehyde in upwind ambient air were higher than the industrial (0.94  $\mu\text{g}/\text{m}^3$ ) and/or residential (0.22  $\mu\text{g}/\text{m}^3$ ) RSLs.
- On-site Landfill
  - Acetaldehyde was detected in 17 of 17 on-site landfill samples (range from 0.78 to 19  $\mu\text{g}/\text{m}^3$ ). Concentrations have declined when comparing results from 2012

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to samples collected in 2013, 2014 and 2015. Throughout 2013, 2014 and 2015 acetaldehyde concentrations (range from 0.78 to 4.4  $\mu\text{g}/\text{m}^3$ ) have remained below industrial RSLs (5.6  $\mu\text{g}/\text{m}^3$ ) and generally comparable to or lower than residential RSLs (1.3  $\mu\text{g}/\text{m}^3$ ).

- o Formaldehyde was detected in 16 of 17 on-site landfill samples (range from 1.1 to 13  $\mu\text{g}/\text{m}^3$ ). With the exception of ambient samples collected on July 28, 2015, concentrations have remained relatively consistent over the five comprehensive sampling events. All detected concentrations of formaldehyde in on-site landfill samples were higher than the industrial (0.94  $\mu\text{g}/\text{m}^3$ ) and/or residential (0.22  $\mu\text{g}/\text{m}^3$ ) RSLs.
- Downwind
  - o Acetaldehyde was detected in 21 of 21 downwind samples (range from 0.82 to 10  $\mu\text{g}/\text{m}^3$ ). Concentrations have declined when comparing results from 2012 to samples collected in 2013, 2014 and 2015. Throughout 2013, 2014 and 2015 acetaldehyde concentrations (range from 0.82 to 3  $\mu\text{g}/\text{m}^3$ ) have remained below industrial RSLs (5.6  $\mu\text{g}/\text{m}^3$ ) and generally equal to or lower than residential RSLs (1.3  $\mu\text{g}/\text{m}^3$ ).
  - o Formaldehyde was detected in 19 of 21 downwind samples (range from 1.1 to 14  $\mu\text{g}/\text{m}^3$ ). With the exception of ambient samples collected on July 28, 2015, concentrations have remained relatively consistent over the five comprehensive sampling events. All detected concentrations of formaldehyde in downwind samples were higher than the industrial (0.94  $\mu\text{g}/\text{m}^3$ ) and/or residential (0.22  $\mu\text{g}/\text{m}^3$ ) RSLs.
- Regardless of sample location the concentration of acetaldehyde or formaldehyde did not approach or exceed their respective OSHA PELs or ACGIH TLVs.
- Acetaldehyde and formaldehyde are ubiquitous in ambient air, particularly in urban areas. The presence of these compounds in ambient air cannot be attributed to the landfill.

### PAHs

Historically, acenaphthene, fluoranthene, fluorene, naphthalene, phenanthrene and pyrene have been detected at similar low concentrations in ambient air samples collected upwind, downwind and on-site.

- Naphthalene is the only PAH detected in ambient air for which risk-based RSLs have been derived. All naphthalene concentrations have been below both the industrial and residential RSLs, regardless of sample location and relative wind direction.

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- Benzo[a]pyrene and related carcinogenic PAHs associated with incomplete combustion of organic matter were not detected in any sample of ambient air in 2012, 2013, 2014 and 2015.

### Dioxins/Dibenzofurans

- 2, 3, 7, 8-TCDD TEQ concentrations were very low and similar in 2012, 2013, 2014 and 2015. All 2, 3, 7, 8-TCDD TEQ concentrations in ambient air were less than both the industrial and residential RSLs.
- The presence of low concentrations of TCDD TEQs in ambient air at downwind locations was consistent with upwind/background samples and cannot be attributed to the landfill.
- The detected low concentrations of TCDD TEQs were not a health concern for the surrounding community in 2012, 2013, 2014 and 2015.

## 6.2 SOURCE GAS

In 2012 and 2013, samples of landfill source gas were collected under the FML from three locations referred to as the Amphitheater, the Second Tier and the East Face or Backside (Figures 4 and 5). In July 2014, January 2015 and July 2015, samples of source gas from under the EVOH were collected from the North Quarry, Neck and South Quarry and from the source gas entering the Flare Inlet (Figure 1). The exothermic reaction is not believed to involve waste in the North Quarry area of the landfill.

For comparison purposes the Second Tier location (2012 & 2013) was near the current Neck location (2014 & 2015). Although the Second Tier and Neck are not directly comparable because the topography of the landfill has changed both of these locations represent source gas at the closest point to the North Quarry at the time the samples were collected. Under current conditions (2104 & 2015), conditions at the Neck act as a “sentinel” for potential movement of the reaction from the South Quarry into the North Quarry.

The Amphitheater and East Face samples represent source gas from the South Quarry.

Tables 4 and 6 summarize all constituents of concern that were detected in the landfill source gas in July 2015. Table D4 in appendix D summarizes the detected compounds in source gas from 2012, 2013, 2014 and January 2015.

Historical comparisons are used to identify trends in compounds detected in source gas with regards to the composition of compounds and their respective concentrations over five comprehensive sampling events conducted over a four year period. Due to the observed temporal variability of the numerous individual compounds detected in source gas samples, for illustrative purposes the following indicator compounds have been selected and will be used for

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year to year comparison of concentrations. The specified indicator compounds were selected based on the fact that they were commonly detected in source gas over time at concentrations which reflect temporal patterns for the analyte group as a whole, they may have potential public health significance if released to ambient air or they have low odor thresholds and may be associated with odor (reduced sulfur compounds and carboxylic acids).

- VOCs: Benzene
- Aldehydes: Acetaldehyde and Formaldehyde
- PAHs: Naphthalene and carcinogenic PAHs
- Dioxin/Dibenzofurans: 2, 3, 7, 8-TCDD TEQ concentrations
- Reduced Sulfur Compounds: Dimethylsulfide
- Carboxylic Acids: Butanoic Acid (Butyric Acid)

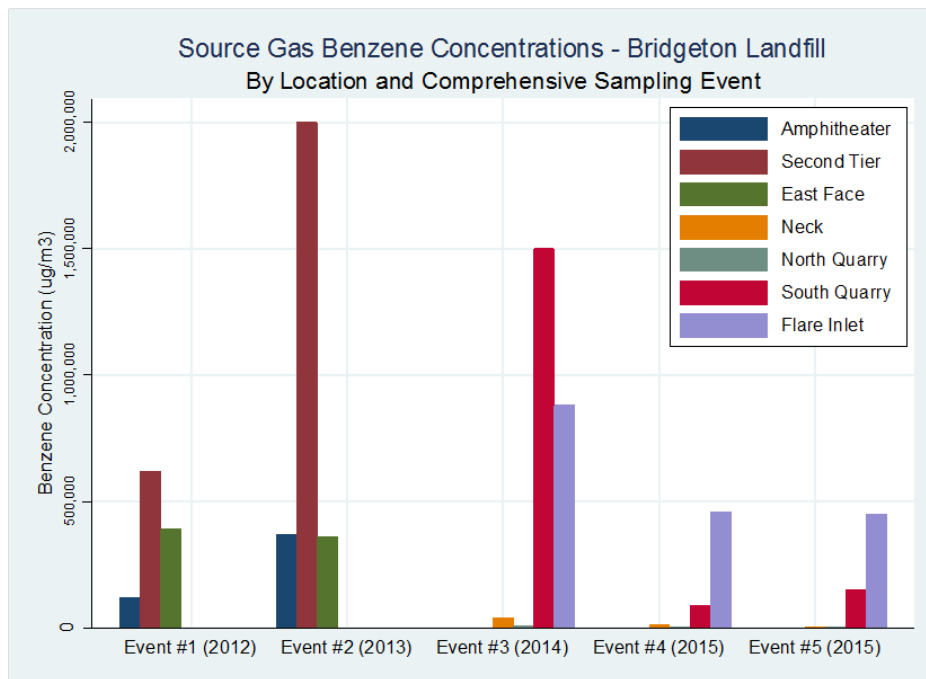
### VOCs: Benzene

The benzene concentrations detected in source gas samples collected in 2012 through 2015 are presented in the table below. The same data is also presented graphically for the five comprehensive monitoring events conducted as of the date of this report.

Benzene Concentrations in Source Gas by On-Site Location	
Location	Benzene
<b>Comprehensive Sampling Event #1 - August 2012</b>	
Amphitheater	120,000
Second Tier	620,000
East Face	390,000
<b>Comprehensive Sampling Event #2 - April and May, 2013</b>	
Amphitheater	370,000
Second Tier	2,000,000
East Face	360,000
<b>Comprehensive Sampling Event #3 - July 2014</b>	
Neck	40,000
North Quarry	9,200
South Quarry	1,500,000
Flare Inlet	880,000
<b>Comprehensive Sampling Event #4 - January 2015</b>	
Neck	12,000
North Quarry	12
South Quarry	87,000
Flare Inlet	460,000
<b>Comprehensive Sampling Event #5 - July 2015</b>	
Neck	1,200
North Quarry	28
South Quarry	150,000
Flare Inlet	320,000 / 450,000
All units are $\mu\text{g}/\text{m}^3$	
Bold indicates detection above Laboratory Detection Limit	

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- In 2012, the three reaction areas were producing similar amounts of benzene; the highest concentration of benzene was detected in the Second Tier.
- Benzene concentrations in source gas from all three locations had increased in 2013 relative to 2012; with the largest increase in benzene concentrations occurring in the Second Tier.
- Since 2013, benzene concentrations have been declining at all three source gas sampling locations.

Neck:

- The concentration of benzene in source gas from the Neck decreased by an order of magnitude from July 2014 ( $40,000 \mu\text{g}/\text{m}^3$ ) to July 2015 ( $1,200 \mu\text{g}/\text{m}^3$ ).

North Quarry:

- Benzene concentrations in source gas from the North Quarry have consistently been at least an order of a magnitude lower than concentrations observed at the Neck.
- The concentration of benzene in source gas from the North Quarry also decreased from July 2014 ( $9,200 \mu\text{g}/\text{m}^3$ ) to July 2015 ( $28 \mu\text{g}/\text{m}^3$ ).

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South Quarry:

- Benzene concentrations in source gas from the South Quarry decreased by an order of magnitude between July 2014 and January 2015, 1,500,000 and 87,000  $\mu\text{g}/\text{m}^3$ , respectively.
- Benzene concentrations in source gas from the South Quarry were similar in January 2015 and July 2015.

The decreasing concentrations of benzene in source gas from the Neck and North Quarry over the past year (July 2014 to July 2015) suggests that the reaction is not moving from the South Quarry toward the North Quarry.

Flare Inlet

- The source gas from the Flare Inlet represents VOCs from all areas of the gas collection system, which draws from deep within the waste mass. The sample results for the Flare Inlet cannot be directly compared to any of the individual source gas samples collected from beneath the FML in 2012 or 2013 or to the samples collected from beneath the EVOH in 2014 and 2015.
  - Concentrations of benzene at the Flare Inlet have decreased in 2015 relative to 2014.
  - The South Quarry contributes the largest amount of benzene entering the Flare.

### ***Aldehydes: Acetaldehyde and Formaldehyde***

Acetaldehyde and formaldehyde concentrations detected in source gas samples from 2012, 2013, 2014 and 2015 are summarized in the table below.



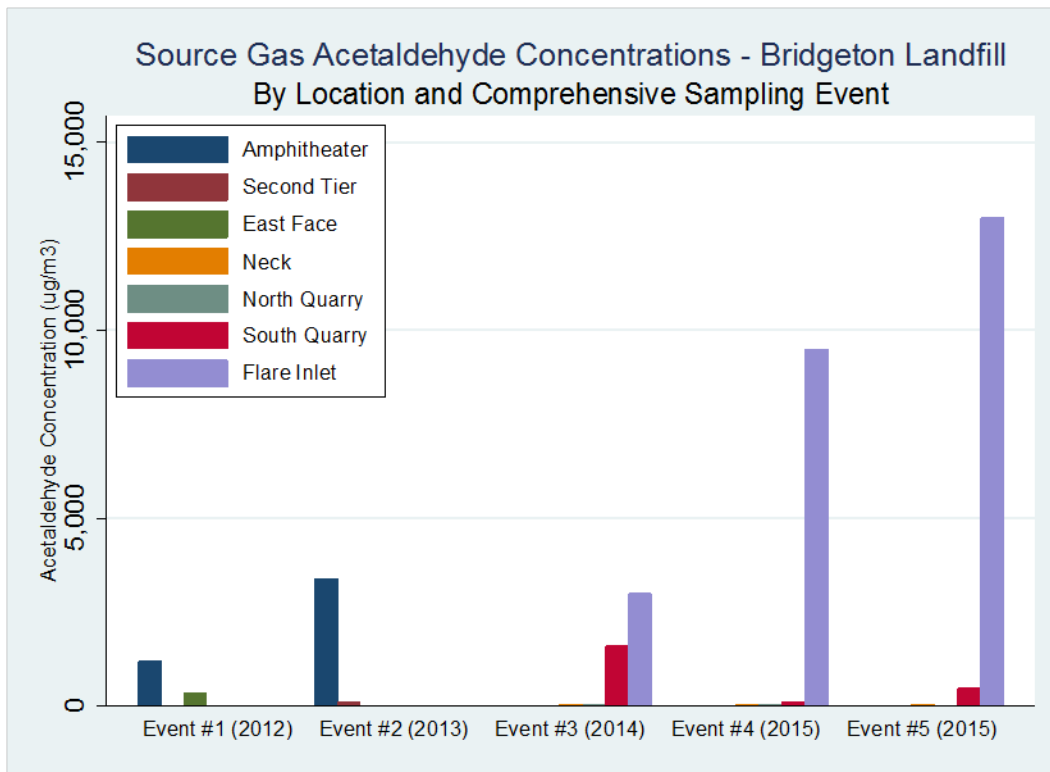
**BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015**

historical comparison of air sampling results – comprehensive sampling 2012 to 2015  
 October 27, 2015

<b>Acetaldehyde and Formaldehyde Concentrations in Source Gas by On-Site Location</b>	
<b>Comprehensive Sampling Event #1 - August 2012</b>	
<b>Location</b>	<b>Acetaldehyde / Formaldehyde</b>
Amphitheater	<b>1,200</b> / <83
Second Tier	<83 / <83
East Face	<b>350</b> / < 83
<b>Comprehensive Sampling Event #2 - April and May, 2013</b>	
Amphitheater	<b>3,400</b> / <81
Second Tier	<b>120</b> / <81
East Face	<81 / <81
<b>Comprehensive Sampling Event #3 - July 2014</b>	
Neck	<b>64</b> / <36
North Quarry	<b>49</b> / <41
South Quarry	<b>1,600</b> / <32
Flare Inlet	<b>3,000</b> / <b>78</b>
<b>Comprehensive Sampling Event #4 - January 2015</b>	
Neck	<b>64</b> / <43
North Quarry	<b>45</b> / <43
South Quarry	<b>130</b> / <43
Flare Inlet	<b>9,500</b> / <87
<b>Comprehensive Sampling Event #5 - July 2015</b>	
Neck	<b>51</b> / <44
North Quarry	<44 / <44
South Quarry	<b>490J</b> / <44
Flare Inlet	<b>13,000J</b> / <44
All units are µg/m <sup>3</sup> Bold indicates detection above Laboratory Detection Limit "<": compound not detected above MRL "J": Qualifier: Result is between MDL and MRL, concentration is estimated	

## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

historical comparison of air sampling results – comprehensive sampling 2012 to 2015  
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- Formaldehyde has only been detected in one source gas sample (Flare Inlet - 2014). This indicates that the landfill is not a source of formaldehyde in ambient air.
- Acetaldehyde was the only aldehyde detected in source gas from the North Quarry and Neck in 2014 and 2015. Concentrations of acetaldehyde have remained low (slightly above laboratory reporting limits) and stable from July 2014 to July 2015 at the Neck and North Quarry.
- Multiple aldehyde compounds have been detected in source gas from the Flare Inlet and South Quarry.
- Acetaldehyde concentrations decreased by an order of magnitude at the South Quarry between July 2014 and July 2015.
- There is an increasing trend in acetaldehyde concentrations in gas from the Flare Inlet.

### **Reduced sulfur compounds**

Dimethylsulfide has been selected as the indicator compound to illustrate year to year comparisons. Dimethylsulfide concentrations in source gas samples from 2012, 2013, 2014 and 2015 are summarized below in tabular and graphical format.

**BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015**

historical comparison of air sampling results – comprehensive sampling 2012 to 2015  
 October 27, 2015

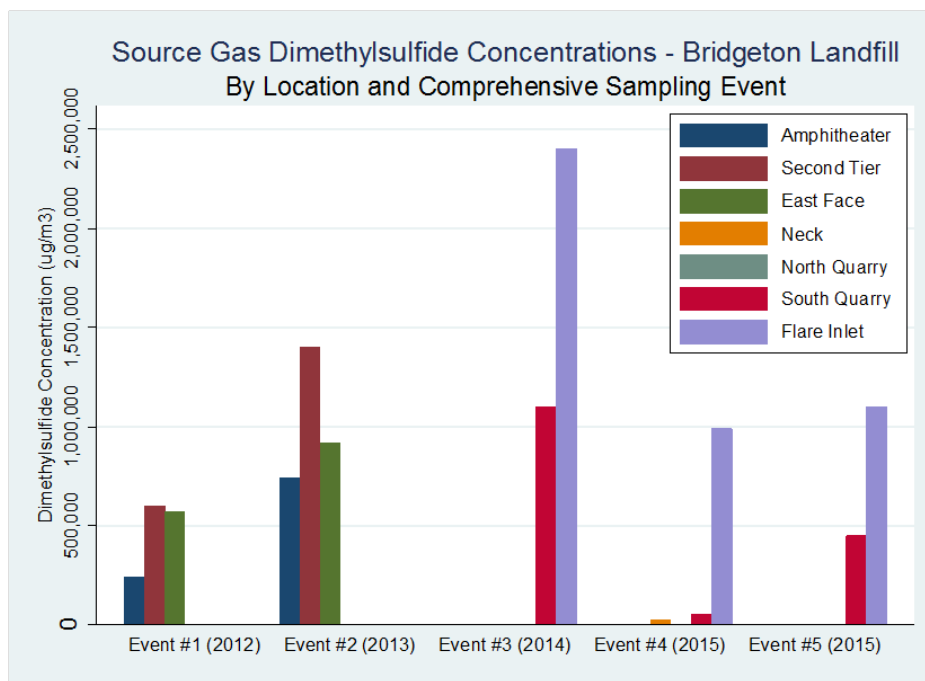
MDNR’s ambient air monitoring program includes hydrogen sulfide as a specific constituent of concern; however this compound has never been a major contributor to the total reduced sulfur concentrations in source gas. Dimethylsulfide is the indicator compound for all total reduced sulfur compounds because it has consistently been detected at the highest concentrations in source gas.

<b>Dimethylsulfide in Source Gas by On-Site Location</b>	
<b>Location</b>	<b>Dimethylsulfide</b>
<b>Comprehensive Sampling Event #1 - August 2012</b>	
Amphitheater	240,000
Second Tier	600,000
East Face	570,000
<b>Comprehensive Sampling Event #2 - April and May, 2013</b>	
Amphitheater	740,000
Second Tier	1,400,000
East Face	920,000
<b>Comprehensive Sampling Event #3 - July 2014</b>	
Neck	2,100
North Quarry	4,900
South Quarry	1,100,000
Flare Inlet	2,400,000
<b>Comprehensive Sampling Event #4 - January 2015</b>	
Neck	28,000
North Quarry	ND
South Quarry	51,000
Flare Inlet	990,000
<b>Comprehensive Sampling Event #5 - July 2015</b>	
Neck	77
North Quarry	28
South Quarry	450,000
Flare Inlet	1,100,000
All units are $\mu\text{g}/\text{m}^3$ Bold indicates detection above Laboratory Detection Limit "ND": Not detected above laboratory detection limit	



## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

historical comparison of air sampling results – comprehensive sampling 2012 to 2015  
October 27, 2015



- Dimethylsulfide concentrations increased between 2012 and 2013 regardless of location.
- The concentration of dimethylsulfide detected in South Quarry source gas in January 2015 was two orders of magnitude lower than detected in July 2014. The concentration of dimethylsulfide detected in July 2015 had increased by an order of magnitude compared to January 2015.
- The concentrations of dimethylsulfide from the Flare Inlet have remained within the same order of magnitude from July 2014 to July 2015.
- Concentrations of dimethylsulfide have been consistently higher in source gas from the South Quarry location as compared to the Neck and North Quarry. Dimethylsulfide was not detected at the North Quarry location in either the January 2015 or July 2015 sampling events.

### **Carboxylic acids**

Butanoic (butyric acid) has been selected as indicator compound for carboxylic acids.

Carboxylic acids do not pose a threat to public health when released to ambient air, but they do tend to have low odor thresholds and therefore may be associated with landfill related odor.

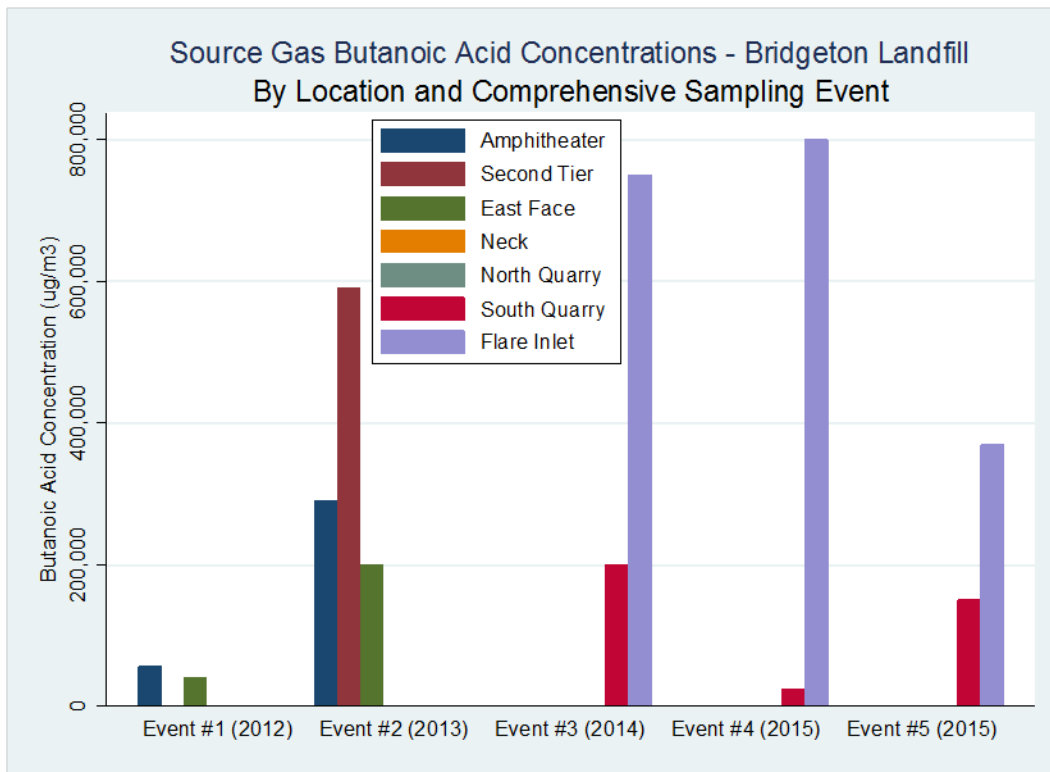
## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

historical comparison of air sampling results – comprehensive sampling 2012 to 2015  
October 27, 2015

<b>Butanoic Acid (butyric) in Source Gas by On-Site Location</b>	
<b>Location</b>	<b>Butanoic Acid (butyric)</b>
<b>Comprehensive Sampling Event #1 - August 2012</b>	
Amphitheater	<b>56,000</b>
Second Tier	ND
East Face	<b>41,000</b>
<b>Comprehensive Sampling Event #2 - April and May, 2013</b>	
Amphitheater	<b>290,000</b>
Second Tier	<b>590,000</b>
East Face	<b>200,000</b>
<b>Comprehensive Sampling Event #3 - July 2014</b>	
Neck	ND
North Quarry	ND
South Quarry	<b>200,000</b>
Flare Inlet	<b>750,000</b>
<b>Comprehensive Sampling Event #4 - January 2015</b>	
Neck	ND
North Quarry	<b>170</b>
South Quarry	<b>24,000</b>
Flare Inlet	<b>800,000</b>
<b>Comprehensive Sampling Event #5 - July 2015</b>	
Neck	ND
North Quarry	ND
South Quarry	<b>150,000J</b>
Flare Inlet	<b>370,000J</b>
All units are $\mu\text{g}/\text{m}^3$	
Bold indicates detection above Laboratory Detection Limit	
"ND": Not detected above laboratory detection limit	

## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

historical comparison of air sampling results – comprehensive sampling 2012 to 2015  
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- Total concentrations of carboxylic acids increased in all three source gas areas from 2012 to 2013.
- Butanoic acid was only detected on one occasion in source gas from Second Tier (2013).
- Concentrations are consistently higher in source gas from the South Quarry as compared to the Neck and North Quarry.
- Butanoic acid was detected in source gas from the North Quarry at a low concentration ( $170 \mu\text{g}/\text{m}^3$ ) in January 2015.
- Butanoic acid concentrations have fluctuated at the South Quarry, East Face and Amphitheater locations, but have remained within one order of magnitude since 2012 (range  $24,000$  to  $290,000 \mu\text{g}/\text{m}^3$ ).
- Between July 2014 and July 2015, butanoic acid concentrations in source gas from the Flare Inlet have fluctuated, but have remained within the same order of magnitude ( $370,000$  to  $800,000 \mu\text{g}/\text{m}^3$ ).

## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

historical comparison of air sampling results – comprehensive sampling 2012 to 2015  
October 27, 2015

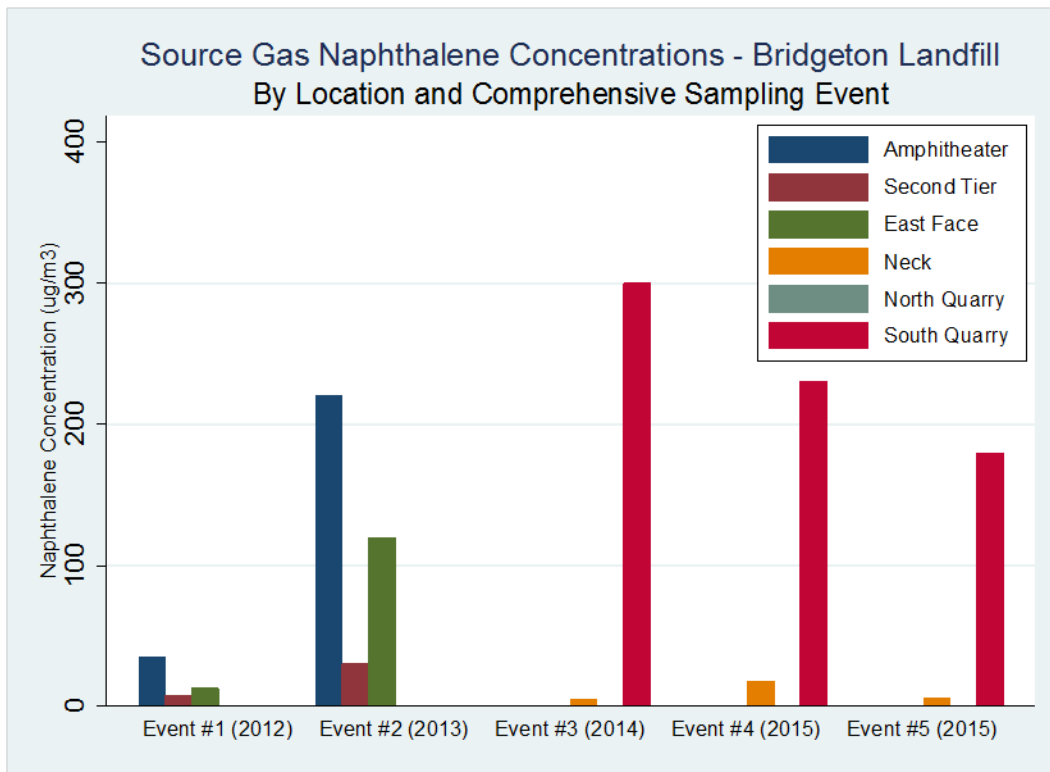
### PAHs

Naphthalene has been consistently detected in source gas at higher concentrations than other individual PAHs. Therefore naphthalene is the indicator compound for PAH trends across the five comprehensive sampling events. The detected concentrations of naphthalene in source gas are presented below.

Naphthalene in Source Gas by On-Site Location	
Location	Naphthalene
<b>Comprehensive Sampling Event #1 - August 2012</b>	
Amphitheater	35
Second Tier	7.9
East Face	13
<b>Comprehensive Sampling Event #2 - April and May, 2013</b>	
Amphitheater	220
Second Tier	30
East Face	120
<b>Comprehensive Sampling Event #3 - July 2014</b>	
Neck	5.1
North Quarry	ND
South Quarry	300
Flare Inlet	NS
<b>Comprehensive Sampling Event #4 - January 2015</b>	
Neck	18
North Quarry	0.19
South Quarry	230
Flare Inlet	NS
<b>Comprehensive Sampling Event #5 - July 2015</b>	
Neck	5.9
North Quarry	0.7
South Quarry	180
Flare Inlet	NS
All units are $\mu\text{g}/\text{m}^3$ Bold indicates detection above Laboratory Detection Limit "ND": Not detected above laboratory detection limit "NS": Location not sampled	

## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

historical comparison of air sampling results – comprehensive sampling 2012 to 2015  
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- Similar low concentrations of naphthalene were detected in all three source gas locations in 2012.
- The concentrations of naphthalene increased from 2012 to 2013 at all three source gas locations.
- The concentration of naphthalene in source gas from the South Quarry location decreased from July 2014 to July 2015, with concentrations remaining low and stable at the Neck and North Quarry.
- *Benzo[a]pyrene and other carcinogenic PAHs commonly associated with incomplete combustion of organic matter were not detected in any sample of source gas in 2012, 2013, 2014 and 2015.*



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### Dioxins/Dibenzofurans

Dioxins/Dibenzofurans as 2,3,7,8-TCDD TEQ in Source Gas by On-Site Location	
Location	2,3,7,8-TCDD TEQ
<b>Comprehensive Sampling Event #1 - August 2012</b>	
Amphitheater	1.52E-08
Second Tier	1.03E-08
East Face	3.00E-08
<b>Comprehensive Sampling Event #2 - April and May, 2013</b>	
Amphitheater	8.68E-08
Second Tier	1.49E-07
East Face	1.05E-07
<b>Comprehensive Sampling Event #3 - July 2014</b>	
Neck	0.00E+00
North Quarry	5.13E-11
South Quarry	3.36E-11
Flare Inlet	NS
<b>Comprehensive Sampling Event #4 - January 2015</b>	
Neck	0.00E+00
North Quarry	0.00E+00
South Quarry	0.00E+00
Flare Inlet	NS
<b>Comprehensive Sampling Event #5 - July 2015</b>	
Neck	1.38E-09
North Quarry	0.00E+00
South Quarry	8.71E-10
Flare Inlet	NS
All units are $\mu\text{g}/\text{m}^3$ Bold indicates detection above Laboratory Detection Limit "ND": Not detected above laboratory detection limit "NS": Location not sampled	

- 2, 3, 7, 8-TCDD TEQ concentrations in source gas have remained extremely low over the five comprehensive sampling events.
- Landfill source gas is not a source of dioxins/dibenzofurans in ambient air.

### 6.3 ODOR THRESHOLDS AND THE RELATIONSHIP BETWEEN ODOR AND EXPOSURE TO CONSTITUENTS OF CONCERN

Table 9 presents the lowest published odor threshold for constituents found in source gas and ambient air along with the range of laboratory minimum reporting limits (MRL) or laboratory minimum detection limits (MDL) for samples collected in July 2015. The odor threshold concentrations were obtained from US EPA (1992), Ruth (1986), and AIHA (1997). The characterization of the odor for each individual compound is the description used in the source reference for the odor concentration. The range of concentrations at which people can begin to recognize the distinctive odor of a chemical are frequently associated with occupational environments. For the majority of chemicals, most people can recognize a characteristic odor at

## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

historical comparison of air sampling results – comprehensive sampling 2012 to 2015  
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concentrations well below concentrations that are of concern for health. The odor descriptions for the individual compounds are not intended to describe the odor associated with Bridgeton Landfill.

The reduced sulfur compounds as a group have odors that are commonly described as “rotten eggs”, “decayed cabbage”, “sulfide-like”, and “disagreeable”. Mercaptans can be perceived at such low concentrations that they are added to natural gas as odorants to warn of gas-leaks. Dimethyl sulfide and dimethyl disulfide were the two sulfur compounds consistently detected at the highest concentrations in the source gas samples from 2012, 2013, 2014 and 2015. Because the odor thresholds for many of the reduced sulfur compounds are below laboratory MDLs, it is reasonable to assume that some of these compounds may be present in ambient air and contribute to odors.

The carboxylic acids as a group have odors that are commonly described as “sour”, “perspiration”, “body odor”, and “cheesy”. Because the odor thresholds for many of the carboxylic acid compounds are below laboratory MRLs, it is reasonable to assume that some of these compounds may be present in ambient air and contribute to odors.

The concentrations of the individual VOCs found in ambient air samples from locations on the landfill and downwind at the fence line are lower than the range of corresponding odor thresholds. However, the aggregate of VOCs present in the downwind locations may contribute to the perception of odor.

It should also be noted that a number of the TICs reported by Method TO-15 were present at high concentrations in the source gas from the South Quarry (and the gas from the Flare Inlet) in January 2015. Of particular interest from an odor perspective are compounds related to butanoic acid (e.g. 2-butanol and methylbutyrate). Butanoic acid has the odor of human vomit.

The very low concentrations of naphthalene, related coal-tar pitch volatile PAHs, and dioxins/dibenzofurans found in the ambient air samples are not contributors to the odor. The low concentrations of aldehydes are consistent with background and are not related to the odor.

Odors from the landfill are not continuously present and are not present at the same intensity at any given location in the surrounding community. Although odors have been most frequently observed along the east, southeast corner and south border of the landfill, the odors are not continuous. A review of the MDNR daily odor monitoring reports supports this conclusion.

The presence of an odor is not synonymous with exposure to constituents associated with the reaction gas at concentrations of toxicological concern for public health. As discussed in the immediately preceding section, the groups of compounds that are the major contributors to the odor are the carboxylic acid and reduced sulfur compounds. These compounds have very low odor thresholds, but are also of a very low order of toxicity.

## 7.0 SUMMARY AND CONCLUSIONS

The comprehensive sampling characterized chemical constituents of concern present in the landfill source gas and ambient air that may contribute to the odors and/or are of potential concern for public health.

The following conclusions are based on the findings of the five comprehensive sampling events conducted in August 2012, April/May 2013, July 2014, January 2015 and July 2015.

- Low concentrations of aldehydes, PAHs and dioxins/dibenzofurans were detected in ambient air. The following evidence indicates that the landfill is not the source of these compounds.
  - Concentrations of aldehydes, PAHs and dioxins/dibenzofurans in ambient air on the landfill and at downwind locations were similar to the concentrations in upwind ambient air for all samples collected in 2012, 2013, 2014 and 2015.
  - The concentrations of aldehydes detected in ambient air are within the background range for urban areas, including St. Louis.
  - Benzo[a]pyrene and related carcinogenic PAHs (cPAHs) associated with incomplete combustion of organic matter have not been detected in any sample of source gas or ambient air collected in 2012, 2013, 2014 and 2015.
  - The concentrations of dioxins/dibenzofurans in landfill source gas were similar to ambient background in 2012, 2013, 2014 and 2015.
  - The concentrations of dioxins/dibenzofurans detected in ambient air are within the background range for urban areas.
- The landfill is not a source of ammonia or hydrogen cyanide.
  - Ammonia was detected in ambient air at the Flare Station in 2014, but not in any other sample of ambient air. Ammonia has not been detected in any landfill source gas sample from 2012, 2013, 2014 and 2015.
  - Hydrogen cyanide has not been detected in any sample of ambient air or in any landfill source gas sample from 2012, 2013, 2014 and 2015.
- Mercury has not been detected in any sample of ambient air. Mercury was detected in source gas from the Flare Inlet in 2014 and 2015, but has not been detected in any other landfill source gas sample from 2012, 2013, 2014 and 2015.

## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

Summary and Conclusions  
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- Benzene is the constituent of greatest potential concern for public health that is present in landfill source gas and could be released to ambient air. Low concentrations of benzene are frequently detected in ambient air, especially in urban areas. Benzene is a common constituent of gas in sanitary landfills, but at lower concentrations than are being produced in the subsurface reaction at Bridgeton Landfill.
- Concentrations of benzene detected in ambient air from locations on the landfill and at downwind fence-line locations have decreased significantly in 2014 and 2015 as compared to 2012 and 2013.
  - Downwind benzene concentrations have decreased dramatically from 2012 and 2013 (max – 25  $\mu\text{g}/\text{m}^3$ ) to 2014 and 2015; where the benzene concentrations ranged from 0.35 – 2.3  $\mu\text{g}/\text{m}^3$  in downwind ambient samples. These results are generally equal to industrial RSLs and consistent with the annual average benzene concentration (1.5  $\mu\text{g}/\text{m}^3$ ) reported by the St. Louis Community Air Project (US EPA 2005).
  - The highest concentrations of benzene in ambient air on the landfill and at downwind fence-line locations were detected during a period of intense remedial activity (upgrading of the leachate and gas collection systems, removal of the Reinforced Concrete Pipe structures).
  - The decrease in ambient concentrations of benzene in 2014 and 2015 coincides with completion of the EVOH liner over the reaction area, operation of the new leachate treatment system and enhanced gas collection system and flare; and is evidence that these measures have been effective in minimizing or eliminating releases of reaction gas to the environment.
- In 2012, 2013, 2014 and 2015 benzene concentrations were below occupational exposure standards, which apply to trained landfill employees, in all samples of ambient air from locations on the landfill. The source gas samples from the Neck support the conclusion that the reaction is not moving towards the North Quarry. The Neck represents the transition between the South Quarry and the North Quarry and is a “sentinel” for potential movement of the reaction towards the North Quarry.
- In 2012/2013, the source gas sampling location designated as the Second Tier was the northern-most sample point in the South Quarry. The topography of the landfill has changed significantly over the past three years, such that results from the Second Tier cannot be directly compared to results from the Neck. However, both locations represent the characteristics of the source gas at the closest point to the North Quarry at the time the samples were collected.
- Benzo[a]pyrene and other related carcinogenic PAHs associated with incomplete combustion of organic matter were not detected in any sample of source gas in 2012, 2013, 2014 and 2015.

## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

Summary and Conclusions  
October 27, 2015

- Based on the constituents of concern detected in source gas from the South Quarry and the gas entering the Flare in 2014 and 2015, the major groups of compounds contributing to the occasional odors are VOCs, reduced sulfur compounds (e.g. dimethyl sulfide and mercaptans), and carboxylic acids (e.g. butanoic and hexanoic acids).
  - It should be noted that hydrogen sulfide is, and has been a very minor constituent in source gas. Dimethyl sulfide is the reduced sulfur compound present at the highest concentrations.
- The constituents of concern contributing to occasional odors in the community are of low order of toxicity and do not pose a health threat to members of the community.
- The totality of the evidence from the five comprehensive sampling events demonstrates that the remedial measures have been effective in reducing releases of landfill reaction gas to ambient air and have prevented movement of the reaction into the North Quarry

### Recommendations

The findings from the five comprehensive sampling events conducted in August 2012, April/May 2013, July 2014, January 2015 and July 2015 support the following recommendations.

Continued sampling for the following constituents in ambient air and source gas should be discontinued:

- Ammonia
- Mercury and Compounds
- Hydrogen Cyanide
- Aldehydes
- Amines
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans (Dioxins/Dibenzofurans)

Any future sampling of ambient air and source gas should focus on the following constituents of concern present in the landfill source gas that are likely to be associated with the odor and are of greatest potential concern for public health (benzene):

- VOCs (particularly benzene) and TICs



## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

Summary and Conclusions

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- Reduced sulfur compounds, and
- Carboxylic acids

## BRIDGETON LANDFILL AMBIENT AIR AND LANDFILL SOURCE GAS SAMPLING-JULY 2015

References  
October 27, 2015

### 8.0 REFERENCES

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## TABLES

Table 1. Comprehensive Sampling Event #5 - Bridgeton Landfill  
 Summary of Sampling Activities  
 July 28 through July 31, 2015

Date	Sample Locations						
	Onsite				Perimeter		
	Flare	South Quarry	Neck	North Quarry	Upwind	Downwind	
<b>Aldehydes/Carbonyl Compounds – Method: EPA TO-11a (Lab Report - P1503123) - Field Blank - 730FB-Ald<sup>1</sup></b>							
7/28/2015 Sample IDs	728F-Ald	728SQ-Ald	-- <sup>2</sup>	--	728U1-Ald (728-Dup01) <sup>3</sup>	728D1-Ald	728D2-Ald
7/29/2015 Sample IDs	<b>729sF-Ald<sup>4</sup></b>	<b>729sSQ-Ald</b>	729N-Ald / <b>729sN-Ald</b>	729NQ-Ald / <b>729sNQ-Ald</b>	729U1-Ald	729D1-Ald	729D2-Ald
<b>Hydrogen Cyanide – Method: NIOSH 6010 (Lab Report - P1503123) - Field Blank - 730FB-Cn</b>							
7/28/2015 Sample IDs	728F-HCn	728SQ-HCn	--	--	728U1-HCn	728D1-HCn (728-Dup02)	--
7/29/2015 Sample IDs	<b>729sF-HCn (729-Dup04)</b>	<b>729sSQ-HCn</b>	729N-HCn / <b>729sN-HCn</b>	729NQ-HCn / <b>729sNQ-HCn</b>	--	--	--
<b>Amine Compounds – AQL 101 (Lab Report - P1503123) - Field Blank - 730TB-Amine</b>							
7/28/2015 Sample IDs	728F-Amine	728SQ-Amine	--	--	728U1-Amine	728D1-Amine	728D2-Amine
7/29/2015 Sample IDs	<b>729sF-Amine</b>	<b>729sSQ-Amine</b>	729N-Amine / <b>729sN-Amine (729-Dup05)</b>	729NQ-Amine / <b>729sNQ-Amine</b>	729U1-Amine	729D1-Amine	729D2-Amine
<b>Mercury – Method: NIOSH 6009 (Lab Report - P1503123) - Field Blank - 730FB-Hg</b>							
7/28/2015 Sample IDs	728F-Hg	728SQ-Hg	--	--	728U1-Hg	728D1-Hg	--
7/29/2015 Sample IDs	<b>729sF-Hg</b>	<b>729sSQ-Hg</b>	729N-Hg / <b>729sN-Hg</b>	729NQ-Hg / <b>729sNQ-Hg</b>	--	--	--
<b>Ammonia – Method: OSHA ID 188 (Lab Report - P1503123) - Field Blank - 730FB-NH3</b>							
7/28/2015 Sample IDs	728F-NH3	728SQ-NH3	--	--	728U1-NH3	728D1-NH3	728D2-NH3
7/29/2015 Sample IDs	<b>729sF-NH3</b>	<b>729sSQ-NH3</b>	729N-NH3 / <b>729sN-NH3</b>	729NQ-NH3 / <b>729sNQ-NH3(729-Dup06)</b>	729U1-NH3	729D1-NH3	729D2-NH3
<b>Carboxylic Acid Compounds – Method: CAS AQL 102 (Lab Report - P1503123) - Field Blank - 730FB-Carbox</b>							
7/28/2015 Sample IDs	728F-Carbox	728SQ-Carbox (728-Dup03)	--	--	728U1-Carbox	728D1-Carbox	728D2-Carbox
7/29/2015 Sample IDs	<b>729sF-Carbox</b>	<b>729sSQ-Carbox</b>	729N-Carbox / <b>729sN-Carbox</b>	729NQ-Carbox / <b>729sNQ-Carbox</b>	729U1-Carbox	729D1-Carbox	729D2-Carbox
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs – Standard Analyte List (Lab Report - P1503125) - Trip Blank - 730TB-Summa<sup>(4)</sup> / 730TB-GSumma</b>							
7/28/2015 Sample IDs	728F-Summa	728SQ-Summa	--	--	728U1-Summa	728D1-Summa(728-Dupe10)	728D2-Summa
7/29/2015 Sample IDs	<b>729sF-Summa (A) / 729sF-Summa (B)</b>	<b>729sSQ-Summa</b>	729N-Summa / <b>729sN-Summa</b>	729NQ-Summa / <b>729sNQ-Summa<sup>(5)</sup></b>	729U1-Summa (729-Dupe11)	729D1-Summa	--
<b>Reduced Sulfur Compound – ASTM D5504 (Lab Report - P1503125) - Trip Blank - 730TB-Summa<sup>(4)</sup> / 730TB-Gsumma</b>							
7/28/2015 Sample IDs	728F-Summa	728SQ-Summa	--	--	728U1-Summa	728D1-Summa(728-Dupe10)	728D2-Summa
7/29/2015 Sample IDs	<b>729sF-Summa (A) / 729sF-Summa (B)</b>	<b>729sSQ-Summa</b>	729N-Summa / <b>729sN-Summa</b>	729NQ-Summa / <b>729sNQ-Summa<sup>(5)</sup></b>	729U1-Summa (729-Dupe11)	729D1-Summa	--
<b>Fixed Gases – EPA Method 3Cm 16 (Lab Report - P1503125) - Trip Blank - 730TB-Summa<sup>(4)</sup> / 730TB-GSumma</b>							
7/28/2015 Sample IDs	728F-Summa	728SQ-Summa	--	--	728U1-Summa	728D1-Summa(728-Dupe10)	728D2-Summa
7/29/2015 Sample IDs	<b>729sF-Summa (A) / 729sF-Summa (B)</b>	<b>729sSQ-Summa</b>	729N-Summa / <b>729sN-Summa</b>	729NQ-Summa / <b>729sNQ-Summa<sup>(5)</sup></b>	729U1-Summa (729-Dupe11)	729D1-Summa	--
<b>Polynuclear Aromatic Hydrocarbons (PAHs) – EPA Method TO-13A (Lab Report - P1503133) - Trip Blank - 731Blank-PAH</b>							
7/31/2015 Sample IDs	731F-PAH	<b>731sSQ-PAH</b>	<b>731sN-PAH</b>	<b>731sNQ-PAH</b>	731U1-PAH	731D1-PAH	--
<b>Polychlorinated Dibenzo-p-Dioxins, Dibenzofurans – EPA Method TO-9A (Lab Report - P1503139) - Trip Blank - 728Blank-DF</b>							
7/28/2015 Sample IDs	728F-DF	--	--	--	728U1-DF	728D1-DF	--
7/31/2015 Sample IDs	--	<b>731sSQ-DF</b>	<b>731sN-DF</b>	<b>731sNQ-DF</b>	--	--	--

1. Trip blanks/field blanks were analyzed for each laboratory analytical procedure.  
 2. "--": Not sampled on the given sampling date  
 3. "Dup" in Sample ID denotes a duplicate sample  
 4. Sample IDs in Bold Red Font denote a source gas sample  
 4. A Trip Blank was collected for both 6-Liter and 1-Liter Summas. The 6-Liter Trip Blank (730TB-Summa) arrived at the lab depressurized; therefore sample results of the canister were deemed invalid.  
 5. 729sNQ-Summa was a source gas Summa sample collected on July 29, 2015 at the North Quarry location. The canister valve seemed to not open entirely as the can arrived at the lab virtually fully pressurized. Consequently the canister did not collect enough sample volume, thus the results were deemed invalid. The North Quarry location was resampled on October 8, 2015. Sample ID: NQ Source 523.

**Table 2. Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Air Sampling Summary July 28, 2015**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Flare Station	South Quarry	South Fence	Fence by Republic Parking Lot (728-Dup10)	Upper Road by Neck
<b>Aldehydes/Carbonyl Compounds – Method: EPA TO-11a (Lab Report - P1503123)</b>									
				Sample ID	728F-Ald	728SQ-Ald	728U1-Ald (728-Dup01)	728D1-Ald	728D2-Ald
2,5-Dimethylbenzaldehyde	NA <sup>5</sup>	NA	NA	NA	<0.34 <sup>6</sup>	<0.35	<0.35 (<0.35)	<0.35	<0.34
Acetaldehyde	5.6	1.3	360,000	45,000	2.3J <sup>7,8</sup>	2.3J	2.4 J(2.3J) <sup>9,10</sup>	3J	2.6J
Benzaldehyde	NA	NA	NA	NA	0.43	0.36	0.46 (0.44)	0.6	0.44
Butyraldehyde	NA	NA	NA	NA	2.0J	2.3J	<0.35UJ (1.8UJ) <sup>11</sup>	1.8	2.4J
Crotonaldehyde, Total	NA	NA	100	100	<0.34	<0.35	<0.35 (<0.35)	<0.35	<0.34
Formaldehyde	0.94	0.22	1,000	400	12 <sup>12</sup>	13	12 (12)	12	14
Isovaleraldehyde	NA	NA	NA	NA	<0.34	<0.35	<0.35 (<0.35)	<0.35	<0.34
m,p-Tolualdehyde	NA	NA	NA	NA	<0.68	<0.7	<0.7 (<0.7)	<0.7	<0.68
n-Hexaldehyde	NA	NA	NA	NA	<0.34	<0.35	<0.35 (<0.35)	<0.35	<0.34
o-Tolualdehyde	NA	NA	NA	NA	<0.34	<0.35	<0.35 (<0.35)	<0.35	<0.34
Propionaldehyde	35	8.3	NA	NA	<0.34	<0.35	<0.35 (<0.35)	0.67	<0.34
Valeraldehyde	NA	NA	NA	NA	<0.34	<0.35	<0.35 (<0.35)	<0.35	<0.34
<b>Hydrogen Cyanide – Method: NIOSH 6010 (Lab Report - P1503123)</b>									
				Sample ID	728F-HCn	728SQ-HCn	728U1-HCn	728D1-HCn	--
Hydrogen Cyanide	3.5	0.83	11,000	5,000	<13	<14	<13	<14	NS <sup>13</sup>
<b>Amine Compounds – AQL 101 (Lab Report - P1503123)</b>									
				Sample ID	728F-Amine	728SQ-Amine	728U1-Amine	728D1-Amine	728D2-Amine
Diethylamine	NA	NA	75,000	15,000	<71	<69	<71	<67	<24
Diisopropylamine	NA	NA	20,000	20,000	<71	<69	<71	<67	<24
Dimethylamine	NA	NA	18,000	10,000	<71UJ	<69UJ	<71UJ	<67UJ	<24UJ
Dipropylamine	NA	NA	NA	NA	<72	<70	<72	<68	<25
Ethylamine	NA	NA	18,000	10,000	<75	<73	<75	<71	<26
Isobutylamine	NA	NA	NA	NA	<73	<71	<73	<69	<25
Isopropylamine	NA	NA	12,000	12,000	<72	<70	<72	<68	<25
n-Butylamine	NA	NA	15,000	15,000	<76	<74	<76	<72	<26
n-Propylamine	NA	NA	NA	NA	<74	<72	<74	<70	<25
sec-Butylamine	NA	NA	NA	NA	<72	<70	<72	<68	<25
tert-Butylamine	NA	NA	NA	NA	<71	<69	<71	<67	<25
Triethylamine	31	7.3	100,000	4,000	<71	<69	<71	<67	<24
Trimethylamine	NA	NA	NA	NA	<68	<67	<68	<64	<24
<b>Mercury – Method: NIOSH 6009 (Lab Report - P1503123)</b>									
				Sample ID	728F-Hg	728SQ-Hg	728U1-Hg	728D1-Hg (728-Dup02)	--
Mercury	1.3	0.31	100	25	<0.20	<0.21	<0.20	<0.21 (<0.21)	NS

**Table 2. Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Air Sampling Summary July 28, 2015**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Flare Station	South Quarry	South Fence	Fence by Republic Parking Lot (728-Dup10)	Upper Road by Neck
<b>Ammonia – Method: OSHA ID 188 (Lab Report - P1503123) <sup>11</sup></b>									
				<i>Sample ID</i>	728F-NH3	728SQ-NH3	728U1-NH3	728D1-NH3	728D2-NH3
Ammonia	440	100	35,000	17,500	<94	<96	<91	<97	<95
<b>Carboxylic Acid Compounds – Method: CAS AQL 102 (Lab Report - P1503123) <sup>12</sup></b>									
				<i>Sample ID</i>	728F-Carbox	728SQ-Carbox(728Dup03)	728U1-Carbox	728D1-Carbox	728D2-Carbox
2-Ethylhexanoic Acid	NA	NA	NA	NA	<2.9	<3 (<2.9)	<2.8	<2.9	<3.0
2-Methylbutanoic Acid	NA	NA	NA	NA	<2.6	<2.7 (<2.6)	<2.6	<2.7	<2.7
2-Methylpentanoic Acid	NA	NA	NA	NA	<2.6	<2.7 (<2.6)	<2.6	<2.7	<2.7
2-Methylpropanoic Acid (Isobutyric)	NA	NA	NA	NA	<2.7	<2.8 (<2.6)	<2.6	<2.7	<2.8
3-Methylbutanoic Acid (Isovaleric)	NA	NA	NA	NA	<2.6	<2.7 (<2.6)	<2.5	<2.6	<2.7
3-Methylpentanoic Acid	NA	NA	NA	NA	<2.7	<2.8 (<2.6)	<2.6	<2.7	<2.7
4-Methylpentanoic Acid (Isocaproic)	NA	NA	NA	NA	<2.7	<2.8 (<2.6)	<2.6	<2.7	<2.7
Acetic Acid	NA	NA	25000	27000	<21UJ	<22 (25J)	22	22	<22
Benzoic Acid	NA	NA	NA	NA	<3.2	<3.3 (<3.2)	<3.1	<3.2	<3.3
Butanoic Acid (Butyric)	NA	NA	NA	NA	<2.7UJ	<2.8 (2.7J)	<2.6	<2.7	<2.8
Cyclohexanecarboxylic Acid	NA	NA	NA	NA	<2.6	<2.7 (<2.6)	<2.5	<2.6	<2.7
Heptanoic Acid (Enanthoic)	NA	NA	NA	NA	<2.6	<2.7 (<2.6)	<2.6	<2.7	<2.7
Hexanoic Acid (Caproic)	NA	NA	NA	NA	<2.7	<2.8 (<2.6)	<2.6	<2.7	<2.7
Nonanoic Acid (Pelargonic)	NA	NA	NA	NA	<2.7	<2.8 (<2.6)	<2.6	<2.7	<2.7
Octanoic Acid (Caprylic)	NA	NA	NA	NA	<2.7	<2.8 (<2.6)	<2.6	<2.7	<2.7
Pentanoic Acid (Valeric)	NA	NA	NA	NA	<2.7	<2.8 (<2.6)	<2.6	<2.7	<2.8
Propionic Acid (Propanoic)	NA	NA	NA	NA	<2.8	<2.9 (<2.8)	<2.7	<2.8	<2.9
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs – Standard Analyte List (Lab Report - P1503125)</b>									
				<i>Sample ID</i>	728F-Summa	728SQ-Summa	728U1-Summa	728D1-Summa(728-Dup10)	728D2-Summa
1,1,1-Trichloroethane	22000	5200	1900000	630000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,1,2,2-Tetrachloroethane	0.21	0.048	35000	7000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,1,2-Trichloroethane	0.77	0.18	45000	45000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,1-Dichloroethane	7.7	1.8	400000	400000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,1-Dichloroethene	880	210	NA <sup>6</sup>	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,2,4-Trichlorobenzene	8.8	2.1	NA	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,2,4-Trimethylbenzene	31	7.3	NA	NA	<0.74	<0.74	<0.92	<0.85UJ (0.9J)	<0.75
1,2-Dibromo-3-chloropropane	0.002	0.00017	10	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,2-Dibromoethane	0.02	0.0047	150000	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75

**Table 2. Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Air Sampling Summary July 28, 2015**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Flare Station	South Quarry	South Fence	Fence by Republic Parking Lot (728-Dup10)	Upper Road by Neck
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	NA	NA	7000000	7000000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,2-Dichlorobenzene	880	210	300000	150000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,2-Dichloroethane	0.47	0.11	200000	40000	<b>170D</b> <sup>14</sup>	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,2-Dichloropropane	1.2	0.28	350000	47000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,3,5-Trimethylbenzene	NA	NA	NA	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,3-Butadiene	0.41	0.094	2000	4000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,3-Dichlorobenzene	NA	NA	NA	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
1,4-Dichlorobenzene	1.1	0.26	450000	60000	<0.74	<b>0.27J</b>	<0.92	<0.85 (<0.8)	<0.75
1,4-Dioxane	2.5	0.56	360000	72000	<b>700D</b>	<b>0.26J</b>	<0.92	<0.85 (<0.8)	<0.75
2-Butanone (MEK)	22000	5200	590000	590000	<b>2.1J</b>	<b>3.0J</b>	<b>1.8J</b>	<b>2.1J (2.2J)</b>	<b>2.1J</b>
2-Hexanone	130	31	410000	20500	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Isopropyl Alcohol	880	210	980000	490000	<b>2.6J</b>	<b>0.92J</b>	<b>7.0J</b>	<b>1.4J (1.9J)</b>	<7.5
3-Chloro-1-propene	2	0.47	3000	3000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
4-Ethyltoluene	NA	NA	NA	NA	<0.74	<0.74	<0.92	<0.85 ( <b>0.46J</b> )	<0.75
4-Methyl-2-pentanone	13000	3100	410000	80000	<0.74	<0.74	<0.92	<b>0.54J</b> (<0.8)	<0.75
Acetone	140000	32000	2400000	1200000	<b>15</b>	<b>17</b>	<b>14</b>	<b>16 (17)</b>	<b>15</b>
Acetonitrile	260	63	70000	35000	<b>1.1</b>	<b>1.8</b>	<b>0.64J</b>	<b>0.5J (0.43J)</b>	<b>7.1</b>
Acrolein	0.088	0.021	250	250	<b>1.7J</b>	<b>0.42J</b>	<b>0.47J</b>	<b>0.58J (0.56J)</b>	<b>0.38J</b>
Acrylonitrile	0.18	0.041	4000	4000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
alpha-Pinene	NA	NA	NA	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Benzene	1.6	0.36	32000	1600	<b>0.49J</b>	<b>0.52J</b>	<b>0.95</b>	<b>0.53J (0.55J)</b>	<b>0.38J</b>
Benzyl Chloride	0.25	0.057	5000	5000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Bromodichloromethane	0.33	0.076	NA	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Bromoform	11	2.6	5000	5000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Bromomethane	22	5.2	80,000c	4000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Carbon Disulfide	3100	730	60000	3000	<7.4	<7.4	<9.2	<8.5 (<8)	<7.5
Carbon Tetrachloride	2	0.47	30000	15000	<b>0.44J</b>	<b>0.45J</b>	<b>0.39J</b>	<b>0.45J (0.45J)</b>	<b>0.45J</b>
Chlorobenzene	220	52	350000	46000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Chloroethane	44000	10000	2600000	260000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Chloroform	0.53	0.12	240,000c	48000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Chloromethane	390	94	200000	100000	<b>0.24J</b>	<b>0.27J</b>	<0.92	<b>0.26J (0.26J)</b>	<b>0.26J</b>
cis-1,2-Dichloroethene	NA	NA	800000	800000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
cis-1,3-Dichloropropene	NA	NA	NA	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Cumene	1800	420	245000	245000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Cyclohexane	26000	6300	1050000	350000	<1.5	<1.5	<1.8	<1.7 (<1.6)	<1.5
Dibromochloromethane	0.45	0.1	NA	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Dichlorodifluoromethane (CFC 12)	440	100	4950000	4950000	<b>2.3</b>	<b>2.3</b>	<b>2.0</b>	<b>2.3 (2.3)</b>	<b>2.3</b>

**Table 2. Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Air Sampling Summary July 28, 2015**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Flare Station	South Quarry	South Fence	Fence by Republic Parking Lot (728-Dup10)	Upper Road by Neck
d-Limonene	NA	NA	NA	NA	0.37J	<0.74	0.35J	<0.85 (<0.8)	<0.75
Ethanol	NA	NA	1900000	1900000	6.8J	8.0	5.7J	6.7J (7.2J)	5.9J
Ethyl Acetate	310	73	1400000	1400000	4.6	4.2	2.5	9.4 (10)	6.2
Ethylbenzene	4.9	1.1	435000	87000	<0.74	<0.74	<0.92	<0.85UJ (0.83J)	<0.75
Hexachlorobutadiene	0.56	0.13	NA	200	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
m,p-Xylenes	880	200	870000	870000	0.48J	<1.5	<1.8	<1.7UJ (3.3J)	<1.5
Methyl Methacrylate	3100	730	410000	205000	<1.5	<1.5	<1.8	<1.7 (<1.6)	<1.5
Methyl tert-Butyl Ether	47	11	NA	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Methylene Chloride	1200	100	85000	170000	0.44J	0.43J	0.54J	0.48J (0.5J)	0.49J
Naphthalene	0.36	0.083	50000	50000	<0.74	0.52J	<0.92	<0.85UJ (1.3J)	0.57J
n-Butyl Acetate	NA	NA	710000	710000	<0.74	0.39J	<0.92	<0.85 (<0.8)	<0.75
n-Heptane	NA	NA	2000000	1600000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
n-Hexane	3100	730	1800000	180000	0.43J	0.43J	0.76J	0.62J (0.59J)	0.45J
n-Nonane	88	21	NA	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
n-Octane	NA	NA	2350000	1400000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
n-Propylbenzene	4400	1000	NA	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
o-Xylene	440	100	435000	435000	<0.74	<0.74	<0.92	<0.85 (0.63J)	<0.75
Propene	13000	3100	NA	NA	1.8	0.87	4.7	1.1 (1.3)	0.56J
Styrene	4400	1000	400000	85000	0.26J	<0.74	<0.92	<0.85 (<0.8)	<0.75
Tetrachloroethene	47	11	680000	170000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Tetrahydrofuran (THF)	8800	2100	590000	147500	<0.74	0.97	<0.92	<0.85 (<0.8)	0.43J
Toluene	22000	5200	750000	75000	1.4	1.1	1.2	1.7J (4.9J)	1.3
trans-1,2-Dichloroethene	NA	NA	800000	800000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
trans-1,3-Dichloropropene	NA	NA	NA	NA	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Trichloroethene	3	0.48	500000	50000	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Trichlorofluoromethane	3100	730	5600000	5600000	1.2	1.2	1.1	1.2 (1.2)	1.2
Trichlorotrifluoroethane	130000	31000	7600000	7600000	0.51J	0.5J	0.45J	0.51J (0.5J)	0.5J
Vinyl Acetate	880	210	NA	35000	2.0J	1.7J	1.3J	2.3J (1.7J)	1.6J
Vinyl Chloride	2.8	0.17	2500	2500	<0.74	<0.74	<0.92	<0.85 (<0.8)	<0.75
Volatile Organic Compounds (VOCs) –Method: EPA TO15 + TICs - Tentatively Identified Compounds <sup>15</sup> (Lab Report - P1503125)									
				<i>Sample ID</i>	728F-Summa	728SQ-Summa	728U1-Summa	728D1-Summa (728-Dup10)	728D2-Summa
Chlorodifluoromethane	220000	52000	NA	3500000	--	--	--	--	4.1
Acetaldehyde	5.6	1.3	360000	45000	4.8	--	--	--	--
unknown (9.48)	NA	NA	NA	NA	--	4.7	4.2	7.3 (5.8)	3.3
Trimethylsilanol	NA	NA	NA	NA	8.5	5.1	16	26 (5.9)	4.3

Table 2. Comprehensive Sampling Event #5 –Bridgeton Landfill  
 Ambient Air Sampling Summary July 28, 2015  
 Concentration in Ambient Air – All Units µg/m<sup>3</sup>

Analyte	Screening Levels				Sample Locations					
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter			
					Landfill		Upwind	Downwind		
					Flare Station	South Quarry	South Fence	Fence by Republic Parking Lot (728-Dup10)	Upper Road by Neck	
Acetic Acid	NA	NA	25000	27000	--	--	6.7	4.4 (--)	--	
1,1-Dimethoxyethane	NA	NA	NA	NA	9.6	--	--	--	--	
1,3-Dioxolane	NA	NA	NA	60000	10	--	--	--	--	
1-Butanol	NA	NA	300000	60000	--	4.3	--	--	--	
Dimethylsilanediol	NA	NA	NA	NA	5.1	7.1	--	4.8 (5.6)	4.7	
unknown (16.42)	NA	NA	NA	NA	--	--	--	3.8 (--)	--	
Hexamethylcyclotrisiloxane	NA	NA	NA	NA	5.5UJB <sup>16</sup>	10UJB	86UJB	34UJB (5.5 ND UJB) <sup>17</sup>	11UJB	
1,3-Butanediol	NA	NA	NA	NA	39	--	--	--	--	
(E,E)-2,4-hexadienal	NA	NA	NA	NA	9.5	--	--	--	--	
1,2,3-Trichloropropane	1.3	0.31	300000	30	270	--	--	--	--	
Bis(2-Chloroethoxy)Methane	NA	NA	NA	NA	190	--	--	--	--	
unknown siloxane (20.11)	NA	NA	NA	NA	--	4.4	21	6.4 (--)	4.3	
unknown (20.24)	NA	NA	NA	NA	13	--	--	--	--	
2-Ethyl-1-hexanol	NA	NA	NA	NA	--	4.4	--	--	--	
unknown (20.91)	NA	NA	NA	NA	6.5	--	--	--	--	
unknown (21.16)	NA	NA	NA	NA	6.2	--	--	--	--	
n-Nonanal	NA	NA	NA	NA	--	11	3.8	3.7 (8.7)	7.4	
2-Ethylhexylacetate	NA	NA	NA	NA	--	--	--	4.7 (--)	--	
Bis(2-chloroethyl) ether	0.037	0.0085	90000	30000	28	--	--	--	--	
unknown siloxane (21.82)	NA	NA	NA	NA	--	48	13	6.7 (--)	43	
n-Decanal	NA	NA	NA	NA	--	9.2	--	-- (8.0)	8.4	
unknown (22.62)	NA	NA	NA	NA	13	--	--	--	--	
unknown (23.04)	NA	NA	NA	NA	--	--	3.6	--	--	
unknown siloxane (23.32)	NA	NA	NA	NA	--	49	--	--	51	
unknown siloxane (24.93)	NA	NA	NA	NA	--	14	--	--	20	
<b>Reduced Sulfur Compound – ASTM D5504 (Lab Report - P1503125)</b>										
					<i>Sample ID</i>	728F-Summa	728SQ-Summa	728U1-Summa	728D1-Summa(728-Dup10)	728D2-Summa
2,5-Dimethylthiophene	NA	NA	NA	NA		<38	<38	<42	<39 (<36)	<39
2-Ethylthiophene	NA	NA	NA	NA		<38	<38	<42	<39 (<36)	<39
3-Methylthiophene	NA	NA	NA	NA		<33	<33	<37	<34 (<32)	<34
Carbon Disulfide	3,100	730	60,000	3,000		<13	<13	<14	<13 (<12)	<13
Carbonyl Sulfide	NA	NA	NA	NA		<20	<20	<23	<21 (<20)	<21
Diethyl Disulfide	NA	NA	NA	NA		<20	<21	<23	<21 (<20)	<21
Diethyl Sulfide	NA	NA	NA	NA		<30	<31	<34	<31 (<29)	<31
Dimethyl Disulfide	NA	NA	NA	NA		<16	<16	<18	<16 (<15)	<16

**Table 2. Comprehensive Sampling Event #5 –Bridgeton Landfill  
Ambient Air Sampling Summary July 28, 2015  
Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Flare Station	South Quarry	South Fence	Fence by Republic Parking Lot (728-Dup10)	Upper Road by Neck
Dimethyl Sulfide	NA	NA	NA	NA	<21	<21	<23	<22 (<20)	<21
Ethyl Mercaptan	NA	NA	25,000c	1,270	<21	<21	<23	<22 (<20)	<21
Ethyl Methyl Sulfide	NA	NA	NA	NA	<26	<26	<29	<26 (<25)	<26
Hydrogen Sulfide	8.8	2.1	28,000c	1,400	<11	<12	<13	<12 (<11)	<12
Isobutyl Mercaptan	NA	NA	NA	NA	<30	<31	<34	<31 (<29)	<31
Isopropyl Mercaptan	NA	NA	NA	NA	<26	<26	<29	<26 (<25)	<26
Methyl Mercaptan	NA	NA	20,000c	1,000	<16	<16	<18	<17 (<16)	<17
n-Butyl Mercaptan	NA	NA	35,000	1,750	<30	<31	<34	<31 (<29)	<31
n-Propyl Mercaptan	NA	NA	NA	NA	<26	<26	<29	<26 (<25)	<26
tert-Butyl Mercaptan	NA	NA	NA	NA	<30	<31	<34	<31 (<29)	<31
Tetrahydrothiophene	NA	NA	NA	NA	<30	<30	<33	<31 (<29)	<30
Thiophene	NA	NA	NA	NA	<28	<29	<32	<29 (<27)	<29
<b>Total Sulfur – ASTM D 5504-12 (Lab Report - P1503125)</b>									
				<i>Sample ID</i>	728F-Summa	728SQ-Summa	728U1-Summa	728D1-Summa(728-Dup10)	728D2-Summa
Total Sulfur	NA	NA	NA	NA	<11	<12	<13	<12 (<11)	<12
<b>Fixed Gases – EPA Method 3Cm <sup>18</sup> (Lab Report - P1503125)</b>									
				<i>Sample ID</i>	728F-Summa	728SQ-Summa	728U1-Summa	728D1-Summa(728-Dup10)	728D2-Summa
Hydrogen	NA	NA	NA	NA	<0.16	<0.17	<0.18	<0.17 (<0.16)	<0.17
Oxygen + Argon	NA	NA	NA	NA	22.3	22.3	22.3	22.3 (22.3)	22.3
Nitrogen	NA	NA	0.005	0.0025	77.7	77.7	77.6	77.6 (77.7)	77.7
Carbon Monoxide	NA	NA	NA	NA	<0.16	<0.17	<0.18	<0.17 (<0.16)	<0.17
Methane	NA	NA	0.5	0.5	<0.16	<0.17	<0.18	<0.17 (<0.16)	<0.17
Carbon Dioxide	NA	NA	NA	NA	<0.16	<0.17	<0.18	<0.17 (<0.16)	<0.17
<b>Polynuclear Aromatic Hydrocarbons (PAHs) – EPA Method TO-13A (Lab Report - P1503133)</b>									
				<i>Sample ID</i>	731F-PAH	--	731U1-PAH	731D1-PAH	--
Acenaphthene	NA	NA	NA	NA	0.0062 J	NS	0.0076 J	0.0061 J	NS
Acenaphthylene	NA	NA	NA	NA	<0.0014 UJ	NS	<0.0016 UJ	<0.0015 UJ	NS
Anthracene	NA	NA	NA	NA	<0.0014	NS	<0.0016	<0.0015	NS
Benzo(a)anthracene	0.11	0.0092	NA	Lowest <sup>19</sup>	<0.0014	NS	<0.0016	<0.0015	NS
Benzo(a)pyrene	0.011	0.00092	NA	Lowest	<0.0014	NS	<0.0016	<0.0015	NS
Benzo(b)fluoranthene	0.11	0.0092	NA	Lowest	<0.0014	NS	<0.0016	<0.0015	NS
Benzo(g,h,i)perylene	NA	NA	NA	NA	<0.0014	NS	<0.0016	<0.0015	NS
Benzo(k)fluoranthene	0.11	0.0092	NA	Lowest	<0.0014	NS	<0.0016	<0.0015	NS
Chrysene	1.1	0.092	NA	Lowest	<0.0014	NS	<0.0016	<0.0015	NS



**Table 2. Comprehensive Sampling Event #5 –Bridgeton Landfill  
Ambient Air Sampling Summary July 28, 2015  
Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Flare Station	South Quarry	South Fence	Fence by Republic Parking Lot (728-Dup10)	Upper Road by Neck
Dibenz(a,h)anthracene	0.01	0.00084	NA	Lowest	<0.0014	NS	<0.0016	<0.0015	NS
Fluoranthene	NA	NA	NA	NA	<b>0.006</b>	NS	<b>0.0061</b>	<b>0.0055</b>	NS
Fluorene	NA	NA	NA	NA	<b>0.0086</b>	NS	<b>0.01</b>	<b>0.0097</b>	NS
Indeno(1,2,3-cd)pyrene	0.11	0.0092	NA	Lowest	<0.0014	NS	<0.0016	<0.0015	NS
Naphthalene	0.36	0.083	50,000	50,000	<b>0.023 J</b>	NS	<b>0.04 J</b>	<b>0.023 J</b>	NS
Phenanthrene	NA	NA	NA	NA	<b>0.021</b>	NS	<b>0.024</b>	<b>0.023</b>	NS
Pyrene	NA	NA	NA	NA	<b>0.0026</b>	NS	<b>0.0026</b>	<b>0.0023</b>	NS
<b>Polychlorinated Dibenzo-p-Dioxins, Dibenzofurans – EPA Method TO-9A (Lab Report - P1503139)</b>									
				<i>Sample ID</i>	728F-DF	--	728U1-DF	728D1-DF	--
2,3,7,8-TCDD	3.20E-07	7.40E-08	NA	NA	<b>1.58E-08</b>	NS	<b>6.37E-10</b>	<b>1.14E-09</b>	NS

1. United States Environmental Protection Agency Regional Screening Levels (RSL) for Industrial Air (RSL). (USEPA: June 2015, TR=1E-06, HQ=1).
2. United States Environmental Protection Agency Regional Screening Levels for Residential Air. (USEPA: June 2015, TR=1E-06, HQ=1)
3. Occupational Safety & Health Administration (OSHA) Permissible Exposure Limit
4. American Conference of Governmental Industrial Hygienists- Threshold Limit Value
5. "NA" = Not Available
6. "<": Compound concentration not detected above Method Detection Limit (MRL).
7. **Bold** indicates that compound was detected above Method Detection Limits (MDL).
8. J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
9. Shading for perimeter sampling locations indicates that the detected concentration exceeds the United States Environmental Protection Agency Regional Screening Level for *Residential Air*.
10. Values in parenthesis are the results of the duplicate sample.
11. UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
12. Shading for onsite sampling locations indicates that the detected concentration exceeds the United States Environmental Protection Agency Regional Screening Level for *Industrial Air*.
13. "NS" = Not Sampled
14. D=The reported result is from a dilution
15. Tentatively Identified Compounds – under Method: EPA TO15 + TICs. The reported concentrations for TICs are estimated. Retention time is located in parentheses next to Unknown compounds and identical compounds with different retention times.
16. B = Compound detected in Trip Blank or Laboratory Method Blank
17. ND UJB - The analyte is considered a non-detect as it was detected in the method , field, and/or trip blank but also indicated that the analyte was "tentatively identified" and the associated numerical value represents its approximate concentration.
18. Units for fixed gases are volume analyte/volume of air %.
19. Lowest = Exposures should be kept to the lowest possible level.

NOTE: Trip Blanks were analyzed for each analyte . Analytical results for compounds detected in any trip blank have been amended with applicable data qualifiers.

**Table 3: Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Air Sampling Summary - July 29, 2015**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Neck	North Quarry	Grassy Knoll Upper Level	East Fence Near Flare Station	Fence by Retention Pond
<b>Aldehydes/Carbonyl Compounds – Method: EPA TO-11a (Lab Report - P1503123)</b>									
				Sample ID	729N-Ald	729NQ-Ald	729U1-Ald	729D1-Ald	729D2-Ald
2,5-Dimethylbenzaldehyde	NA <sup>5</sup>	NA	NA	NA	<0.36 <sup>6</sup>	<0.35	<0.36	<0.35	<0.34
Acetaldehyde	5.6	1.3	360,000	45,000	1.7J	1.2	1.4J <sup>7,8,9</sup>	1.2	1.4J
Benzaldehyde	NA	NA	NA	NA	<0.36	<0.35	0.70	1.1	<0.34
Butyraldehyde	NA	NA	NA	NA	1.7	1.8	1.2	1.3	1.7J
Crotonaldehyde, Total	NA	NA	100	100	<0.36	<0.35	<0.36	<0.35	<0.34
Formaldehyde	0.94	0.22	1,000	400	4.9 <sup>10</sup>	4.7	4.2	4.4	5.0
Isovaleraldehyde	NA	NA	NA	NA	<0.36	<0.35	<0.36	<0.35	<0.34
m,p-Tolualdehyde	NA	NA	NA	NA	<0.72	<0.71	<0.72	<0.71	<0.69
n-Hexaldehyde	NA	NA	NA	NA	0.55	0.38	<0.36	<0.35	<0.34
o-Tolualdehyde	NA	NA	NA	NA	<0.36	<0.35	<0.36	<0.35	<0.34
Propionaldehyde	35	8.3	NA	NA	<0.36	<0.35	<0.36	<0.35	<0.34
Valeraldehyde	NA	NA	NA	NA	<0.36	<0.35	<0.36	<0.35	<0.34
<b>Hydrogen Cyanide – Method: NIOSH 6010 (Lab Report - P1503123)</b>									
				Sample ID	729N-HCn	729NQ-HCn	--	--	--
Hydrogen Cyanide	3.5	0.83	11,000	5,000	<14	<14	NS <sup>11</sup>	NS	NS
<b>Amine Compounds – AQL 101 (Lab Report - P1503123)</b>									
				Sample ID	729N-Amine	729NQ-Amine	729U1-Amine	729D1-Amine	729D2-Amine
Diethylamine	NA	NA	75,000	15,000	<69	<73	<73	<76	<74
Diisopropylamine	NA	NA	20,000	20,000	<69	<73	<73	<76	<74
Dimethylamine	NA	NA	18,000	10,000	<70	<74	<74	<76	<75
Dipropylamine	NA	NA	NA	NA	<70	<74	<74	<77	<75
Ethylamine	NA	NA	18,000	10,000	<74	<78	<78	<81	<79
Isobutylamine	NA	NA	NA	NA	<72	<76	<76	<79	<77
Isopropylamine	NA	NA	12,000	12,000	<70	<74	<74	<77	<75
n-Butylamine	NA	NA	15,000	15,000	<75	<79	<79	<82	<80
n-Propylamine	NA	NA	NA	NA	<73	<77	<77	<80	<78
sec-Butylamine	NA	NA	NA	NA	<71	<75	<75	<77	<76
tert-Butylamine	NA	NA	NA	NA	<70	<74	<74	<77	<75
Triethylamine	31	7.3	100,000	4,000	<69	<73	<73	<76	<74
Trimethylamine	NA	NA	NA	NA	<67	<71	<71	<73	<72
<b>Mercury – Method: NIOSH 6009 (Lab Report - P1503123)</b>									

**Table 3: Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Air Sampling Summary - July 29, 2015**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Neck	North Quarry	Grassy Knoll Upper Level	East Fence Near Flare Station	Fence by Retention Pond
Mercury	1.3	0.31	100	25	729N-Hg <0.22	729NQ-Hg <0.22	-- NS	-- NS	-- NS
<b>Ammonia – Method: OSHA ID 188 (Lab Report - P1503123)</b>									
				Sample ID	729N-NH3	729NQ-NH3	729U1-NH3	729D1-NH3	729D2-NH3
Ammonia	440	100	35,000	17,500	<97	<98	<98	<97	<97
<b>Carboxylic Acid Compounds – Method: CAS AQL 102 (Lab Report - P1503123)</b>									
				Sample ID	729N-Carbox	729NQ-Carbox	729U1-Carbox	729D1-Carbox	729D2-Carbox
2-Ethylhexanoic Acid	NA	NA	NA	NA	<3.0	<3.0	<2.9	<2.9	<3.0
2-Methylbutanoic Acid	NA	NA	NA	NA	<2.8	<2.7	<2.6	<2.7	<2.8
2-Methylpentanoic Acid	NA	NA	NA	NA	<2.8	<2.7	<2.6	<2.7	<2.8
2-Methylpropanoic Acid (Isobutyric)	NA	NA	NA	NA	<2.8	<2.7	<2.7	<2.7	<2.8
3-Methylbutanoic Acid (Isovaleric)	NA	NA	NA	NA	<2.7	<2.7	<2.6	<2.7	<2.7
3-Methylpentanoic Acid	NA	NA	NA	NA	<2.8	<2.7	<2.6	<2.7	<2.8
4-Methylpentanoic Acid (Isocaproic)	NA	NA	NA	NA	<2.8	<2.7	<2.7	<2.7	<2.8
Acetic Acid	NA	NA	25,000	27,000	<22	23	<21	<22	<22
Benzoic Acid	NA	NA	NA	NA	<3.3	<3.3	<3.2	<3.2	<3.3
Butanoic Acid (Butyric)	NA	NA	NA	NA	<2.8	<2.7	<2.7	<2.7	<2.8
Cyclohexanecarboxylic Acid	NA	NA	NA	NA	<2.7	<2.7	<2.6	<2.6	<2.7
Heptanoic Acid (Enanthoic)	NA	NA	NA	NA	<2.8	<2.7	<2.6	<2.7	<2.7
Hexanoic Acid (Caproic)	NA	NA	NA	NA	<2.8	<2.7	<2.7	<2.7	<2.8
Nonanoic Acid (Pelargonic)	NA	NA	NA	NA	<2.8	<2.7	<2.6	<2.7	<2.8
Octanoic Acid (Caprylic)	NA	NA	NA	NA	<2.8	<2.7	<2.6	<2.7	<2.8
Pentanoic Acid (Valeric)	NA	NA	NA	NA	<2.8	<2.7	<2.7	<2.7	<2.8
Propionic Acid (Propanoic)	NA	NA	NA	NA	<2.9	<2.8	<2.8	<2.8	<2.9
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 Standard Analyte List (Lab Report - P1503125)</b>									
				Sample ID	729N-Summa	729NQ-Summa	729U1-Summa (729-Dup11)	729D1-Summa	--
1,1,1-Trichloroethane	22000	5200	1900000	630000	<0.83	<1.2	<0.92 (<0.78) <sup>12</sup>	<0.88	NS
1,1,2,2-Tetrachloroethane	0.21	0.048	35000	7000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,1,2-Trichloroethane	0.77	0.18	45000	45000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,1-Dichloroethane	7.7	1.8	400000	400000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,1-Dichloroethene	880	210	NA <sup>6</sup>	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,2,4-Trichlorobenzene	8.8	2.1	NA	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,2,4-Trimethylbenzene	31	7.3	NA	NA	<0.83	<1.2	0.42J (<0.78)	<0.88	NS

**Table 3: Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Air Sampling Summary - July 29, 2015**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Neck	North Quarry	Grassy Knoll Upper Level	East Fence Near Flare Station	Fence by Retention Pond
1,2-Dibromo-3-chloropropane	0.002	0.00017	10	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,2-Dibromoethane	0.02	0.0047	150000	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	NA	NA	7000000	7000000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,2-Dichlorobenzene	880	210	300000	150000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,2-Dichloroethane	0.47	0.11	200000	40000	<0.83	<1.2	<b>0.61J (&lt;0.78)</b>	<0.88	NS
1,2-Dichloropropane	1.2	0.28	350000	47000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,3,5-Trimethylbenzene	NA	NA	NA	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,3-Butadiene	0.41	0.094	2000	4000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,3-Dichlorobenzene	NA	NA	NA	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,4-Dichlorobenzene	1.1	0.26	450000	60000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
1,4-Dioxane	2.5	0.56	360000	72000	<0.83	<1.2	<b>13J (&lt;0.78UJ) <sup>13</sup></b>	<0.88	NS
2-Butanone (MEK)	22000	5200	590000	590000	<b>1.5J</b>	<b>1.1J</b>	<b>1.3J (0.91J)</b>	<b>1.3J</b>	NS
2-Hexanone	130	31	410000	20500	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Isopropyl Alcohol	880	210	980000	490000	<b>4.2J</b>	<b>1.2J</b>	<b>1.1J (0.73J)</b>	<b>0.84J</b>	NS
3-Chloro-1-propene	2	0.47	3000	3000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
4-Ethyltoluene	NA	NA	NA	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
4-Methyl-2-pentanone	13000	3100	410000	80000	<0.83	<1.2	<0.92 ( <b>0.48J</b> )	<0.88	NS
Acetone	140000	32000	2400000	1200000	<b>14</b>	<b>9.5J</b>	<b>34J (9.3J)</b>	<b>10</b>	NS
Acetonitrile	260	63	70000	35000	<b>7.0</b>	<b>0.43J</b>	<b>0.52J (0.34J)</b>	<b>0.96</b>	NS
Acrolein	0.088	0.021	250	250	<b>0.38J</b>	<4.7	<b>0.71J (0.29J)</b>	<b>0.46J</b>	NS
Acrylonitrile	0.18	0.041	4000	4000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
alpha-Pinene	NA	NA	NA	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Benzene	1.6	0.36	32000	1600	<b>0.37J</b>	<1.2	<0.92 (<0.78)	<b>0.55J</b>	NS
Benzyl Chloride	0.25	0.057	5000	5000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Bromodichloromethane	0.33	0.076	NA	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Bromoform	11	2.6	5000	5000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Bromomethane	22	5.2	80,000c	4000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Carbon Disulfide	3100	730	60000	3000	<b>0.31J</b>	<12	<b>0.29J (&lt;7.8)</b>	<8.8	NS
Carbon Tetrachloride	2	0.47	30000	15000	<b>0.44J</b>	<b>0.46J</b>	<b>0.47J (0.45J)</b>	<b>0.45J</b>	NS
Chlorobenzene	220	52	350000	46000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Chloroethane	44000	10000	2600000	260000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Chloroform	0.53	0.12	240,000c	48000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Chloromethane	390	94	200000	100000	<b>0.27J</b>	<1.2	<0.92 ( <b>0.25J</b> )	<b>0.3J</b>	NS
cis-1,2-Dichloroethene	NA	NA	800000	800000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS

**Table 3: Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Air Sampling Summary - July 29, 2015**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Neck	North Quarry	Grassy Knoll Upper Level	East Fence Near Flare Station	Fence by Retention Pond
cis-1,3-Dichloropropene	NA	NA	NA	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Cumene	1800	420	245000	245000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Cyclohexane	26000	6300	1050000	350000	<1.7	<2.4	<1.8 (<1.6)	<1.8	NS
Dibromochloromethane	0.45	0.1	NA	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Dichlorodifluoromethane (CFC 12)	440	100	4950000	4950000	2.3	2.4	2.4 (2.3)	2.3	NS
d-Limonene	NA	NA	NA	NA	0.66J	<1.2	<0.92 (<0.78)	<0.88	NS
Ethanol	NA	NA	1900000	1900000	27	10J	4.4J (3.5J)	6.0J	NS
Ethyl Acetate	310	73	1400000	1400000	3.2	3.3	5.2J (3.0J)	3.7	NS
Ethylbenzene	4.9	1.1	435000	87000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Hexachlorobutadiene	0.56	0.13	NA	200	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
m,p-Xylenes	880	200	870000	870000	<1.7	<2.4	<1.8 (<1.6)	<1.8	NS
Methyl Methacrylate	3100	730	410000	205000	<1.7	<2.4	<1.8 (<1.6)	<1.8	NS
Methyl tert-Butyl Ether	47	11	NA	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Methylene Chloride	1200	100	85000	170000	0.90	0.72J	0.76J (0.37J)	0.48J	NS
Naphthalene	0.36	0.083	50000	50000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
n-Butyl Acetate	NA	NA	710000	710000	0.3J	<1.2	1.5J (<0.78J)	0.29J	NS
n-Heptane	NA	NA	2000000	1600000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
n-Hexane	3100	730	1800000	180000	0.59J	<1.2	0.45J (<0.78)	0.29J	NS
n-Nonane	88	21	NA	NA	0.27J	<1.2	0.33J (<0.78)	<0.88	NS
n-Octane	NA	NA	2350000	1400000	<0.83	<1.2	0.40J (<0.78)	<0.88	NS
n-Propylbenzene	4400	1000	NA	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
o-Xylene	440	100	435000	435000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Propene	13000	3100	NA	NA	2.6	1.0J	<0.92 (0.52J)	0.49J	NS
Styrene	4400	1000	400000	85000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Tetrachloroethene	47	11	680000	170000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Tetrahydrofuran (THF)	8800	2100	590000	147500	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Toluene	22000	5200	750000	75000	1.2	0.81J	14J (0.57J)	1.1	NS
trans-1,2-Dichloroethene	NA	NA	800000	800000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
trans-1,3-Dichloropropene	NA	NA	NA	NA	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Trichloroethene	3	0.48	500000	50000	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS
Trichlorofluoromethane	3100	730	5600000	5600000	1.1	1.1J	1.1 (1.1)	1.1	NS
Trichlorotrifluoroethane	130000	31000	7600000	7600000	0.51J	0.49J	0.54J (0.49J)	0.51J	NS
Vinyl Acetate	880	210	NA	35000	1.1J	<12	<9.2 (<7.8)	<8.8	NS
Vinyl Chloride	2.8	0.17	2500	2500	<0.83	<1.2	<0.92 (<0.78)	<0.88	NS

**Table 3: Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Air Sampling Summary - July 29, 2015**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Neck	North Quarry	Grassy Knoll Upper Level	East Fence Near Flare Station	Fence by Retention Pond
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs – Tentatively Identified Compounds<sup>14</sup> (Lab Report - P1503125)</b>									
				Sample ID	729N-Summa	729NQ-Summa	729U1-Summa (729-Dup11)	729D1-Summa	--
Chlorodifluoromethane	220000	52000	NA	3500000	-- <sup>15</sup>	5.1	-- (4.2)	--	NS
Propane	NA	NA	1800000	NA	--	--	12 (--)	--	NS
n-Butane	NA	NA	NA	2380000	--	--	7.1 (--)	--	NS
Isoprene	NA	NA	NA	NA	--	--	3.9 (3.5)	--	NS
unknown (9.48)	NA	NA	NA	NA	--	5.8	-- (4.0)	--	NS
Trimethylsilanol	NA	NA	NA	NA	--	12	17 (3.1)	13	NS
Acetic Acid	NA	NA	25000	27000	--	--	-- (5.1)	--	NS
Hexamethylcyclotrisiloxane	NA	NA	NA	NA	5.1UJB <sup>16</sup>	7.4UJB	4.4UJB (7.6 UJB)	6.1UJB	NS
n-Nonanal	NA	NA	NA	NA	4.0	--	--	3.4	NS
n-Decanal	NA	NA	NA	NA	3.9	--	--	--	NS
unknown siloxane (21.81)	NA	NA	NA	NA	--	4.8	--	--	NS
<b>Reduced Sulfur Compound – ASTM D5504 (Lab Report - P1503125)</b>									
				Sample ID	729N-Summa	729NQ-Summa	729U1-Summa(729-Dup11)	729D1-Summa	--
2,5-Dimethylthiophene	NA	NA	NA	NA	<38	<54	<42 (<36)	<40	NS
2-Ethylthiophene	NA	NA	NA	NA	<38	<54	<42 (<36)	<40	NS
3-Methylthiophene	NA	NA	NA	NA	<33	<47	<37 (<31)	<35	NS
Carbon Disulfide	3,100	730	60,000	3,000	<13	<18	<14 (<12)	<14	NS
Carbonyl Sulfide	NA	NA	NA	NA	<20	<29	<22 (<19)	<22	NS
Diethyl Disulfide	NA	NA	NA	NA	<21	<29	<23 (<19)	<22	NS
Diethyl Sulfide	NA	NA	NA	NA	<30	<44	<34 (<29)	<32	NS
Dimethyl Disulfide	NA	NA	NA	NA	<16	<23	<18 (<15)	<17	NS
Dimethyl Sulfide	NA	NA	NA	NA	<21	<30	<23 (<20)	<22	NS
Ethyl Mercaptan	NA	NA	25,000c	1,270	<21	<30	<23 (<20)	<22	NS
Ethyl Methyl Sulfide	NA	NA	NA	NA	<26	<37	<28 (<24)	<27	NS
Hydrogen Sulfide	8.8	2.1	28,000c	1,400	<11	<16	<13 (<11)	<12	NS
Isobutyl Mercaptan	NA	NA	NA	NA	<30	<44	<34 (<29)	<32	NS
Isopropyl Mercaptan	NA	NA	NA	NA	<26	<37	<28 (<24)	<27	NS
Methyl Mercaptan	NA	NA	20,000c	1,000	<16	<23	<18 (<15)	<17	NS
n-Butyl Mercaptan	NA	NA	35,000	1,750	<30	<44	<34 (<29)	<32	NS
n-Propyl Mercaptan	NA	NA	NA	NA	<26	<37	<28 (<24)	<27	NS

**Table 3: Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Air Sampling Summary - July 29, 2015**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels				Sample Locations				
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite		Perimeter		
					Landfill		Upwind	Downwind	
					Neck	North Quarry		Grassy Knoll Upper Level	East Fence Near Flare Station
tert-Butyl Mercaptan	NA	NA	NA	NA	<30	<44	<34 (<29)	<32	NS
Tetrahydrothiophene	NA	NA	NA	NA	<30	<43	<33 (<28)	<32	NS
Thiophene	NA	NA	NA	NA	<28	<41	<31 (<27)	<30	NS
<b>Total Sulfur – ASTM D 5504-12 (Lab Report - P1503125)</b>									
				<i>Sample ID</i>	729N-Summa	729NQ-Summa	729U1-Summa(729-Dup11)	729D1-Summa	--
Total Sulfur	NA	NA	NA	NA	<11	<16	<13 (<11)	<12	NS
<b>Fixed Gases – EPA 3Cm <sup>17</sup> (Lab Report - P1503125)</b>									
				<i>Sample ID</i>	729N-Summa	729NQ-Summa	729U1-Summa (729-Dup11)	729D1-Summa	--
Hydrogen	NA	NA	NA	NA	<0.17	<0.24	<0.18 (<0.16)	<0.18	NS
Oxygen + Argon	NA	NA	NA	NA	<b>22.3</b>	<b>22.3</b>	<b>22.3 (22.3)</b>	<b>22.3</b>	NS
Nitrogen	NA	NA	0.005	0.0025	<b>77.7</b>	<b>77.7</b>	<b>77.6 (77.7)</b>	<b>77.7</b>	NS
Carbon Monoxide	NA	NA	NA	NA	<0.17	<0.24	<0.18 (<0.16)	<0.18	NS
Methane	NA	NA	0.5	0.5	<0.17	<0.24	<0.18 (<0.16)	<0.18	NS
Carbon Dioxide	NA	NA	NA	NA	<0.17	<0.24	<0.18 (<0.16)	<0.18	NS

1. United States Environmental Protection Agency Regional Screening Levels (RSL) for Industrial Air (RSL). (USEPA: June 2015, TR=1E-06, HQ=1).
2. United States Environmental Protection Agency Regional Screening Levels for Residential Air. (USEPA: June 2015, TR=1E-06, HQ=1)
3. Occupational Safety & Health Administration (OSHA) Permissible Exposure Limit
4. American Conference of Governmental Industrial Hygienists- Threshold Limit Value
5. "NA" = Not Available
6. "<": Compound concentration not detected above Method Reporting Limit (MRL).
7. **Bold** indicates that compound was detected above Method Detection Limits (MDL).
8. J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
9. Shading for perimeter sampling locations indicates that the detected concentration exceeds the United States Environmental Protection Agency Regional Screening Level for *Residential Air*.
10. Shading for onsite sampling locations indicates that the detected concentration exceeds the United States Environmental Protection Agency Regional Screening Level for *Industrial Air*.
11. "NS" = Not Sampled
12. Values in parenthesis are the results of the duplicate sample.
13. UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
14. Tentatively Identified Compounds – under Method: EPA TO15 + TICs. The reported concentrations for TICs are estimated. Retention time is located in parentheses next to Unknown compounds and identical compounds with different retention times.
15. "--" = The tentatively identified compound (TIC) was not detected in the sample
16. B = Compound detected in Trip Blank or Laboratory Method Blank

**Table 4. Comprehensive Sampling Event #5 – Bridgeton Landfill Source Gas Sampling Summary**  
**Compound Concentration in Source Gas – All Units µg/m<sup>3</sup>**  
**– All Units µg/m<sup>3</sup>**

Analyte	Sample Locations			
	South Quarry	Neck	North Quarry	Flare Inlet
<b>Aldehydes/Carbonyl Compounds – Method: EPA TO-11a (Lab Report - P1503123)</b>				
Sample ID	729sSQ-Ald	729sN-Ald	729sNQ-Ald	729sF-Ald
2,5-Dimethylbenzaldehyde	<44	<44	<44	<88
Acetaldehyde	490J	51	<44	13,000J
Benzaldehyde	1,500	<44	<44	3,000
Butyraldehyde	5,000J	<44	<44	24,000J
Crotonaldehyde, Total	<44	<44	<44	<88
Formaldehyde	<44	<44	<44	<88
Isovaleraldehyde	<44	<44	<44	<88
m,p-Tolualdehyde	<88	<88	<88	<180
n-Hexaldehyde	<44	<44	<44	<88
o-Tolualdehyde	<44	<44	<44	<88
Propionaldehyde	660J	<44	<44	6,100J
Valeraldehyde	<44	<44	<44	<88
<b>Hydrogen Cyanide – Method: NIOSH 6010 (Lab Report - P1503123)</b>				
Sample ID	729sSQ-HCn	729sN-HCn	729sNQ-HCn	729sF-HCn (729F-Dup04)
Hydrogen Cyanide	<600	<590	<600	<1,200 (<1,200)
<b>Amine Compounds – AQL 101 (Lab Report - P1503123)</b>				
Sample ID	729sSQ-AMINE	729sN-AMINE(729-Dup05)	729sNQ-AMINE	729sF-AMINE
Diethylamine	<2300	<2300 (<2100)	<2300	<4500
Diisopropylamine	<2300	<2300 (<2300)	<2300	<4500
Dimethylamine	<2300	<2300 (<2000)	<2300	<4600
Dipropylamine	<2300	<2300 (<2100)	<2300	<4600
Ethylamine	<2400	<2400 (<2100)	<2400	<4800
Isobutylamine	<2400	<2400 (<2200)	<2400	<4700
Isopropylamine	<2300	<2300 (<2100)	<2300	<4600
n-Butylamine	<2400	<2400 (<2200)	<2400	<4900
n-Propylamine	<2400	<2400 (<2200)	<2400	<4700
sec-Butylamine	<2300	<2300 (<2300)	<2300	<4600
tert-Butylamine	<2300	<2300 (<2100)	<2300	<4600
Triethylamine	<2300	<2300 (<2100)	<2300	<4500
Trimethylamine	<2200	<2200 (<2100)	<2200	<4400
<b>Mercury – Method: NIOSH 6009 (Lab Report - P1503123)</b>				
Sample ID	729sSQ-Hg	729sN-Hg	729sNQ-Hg	729sF-Hg
Mercury	<8.6	<8.6	<8.6	63
<b>Ammonia – Method: OSHA ID 188 (Lab Report - P1503123)</b>				
Sample ID	729sSQ-NH3	729sN-NH3	729sNQ-NH3(729-Dup06)	729sF-NH3
Ammonia	<5,800	<5,800	<5,800 (<3,900)	<12000
<b>Carboxylic Acid Compounds – Method: CAS AQL 102 (Lab Report - P1503123)</b>				
Sample ID	729sSQ-Carbox	729sN-Carbox	729sNQ-Carbox	729sF-Carbox
2-Ethylhexanoic Acid	2,000J	<120	<120	5,900J
2-Methylbutanoic Acid	17,000J	<110	<110	23,000J
2-Methylpentanoic Acid	3,100J	<110	<110	3,200J
2-Methylpropanoic Acid (Isobutyric)	39,000J	<110	<110	51,000J
3-Methylbutanoic Acid (Isovaleric)	29,000J	<110	<110	36,000J
3-Methylpentanoic Acid	720J	<110	<110	800J
4-Methylpentanoic Acid (Isocaproic)	1,400J	<110	<110	<220
Acetic Acid	37,000J	<880	<880	83,000J
Benzoic Acid	<130	<130	<130	<260
Butanoic Acid (Butyric)	150,000J	<110	<110	370,000J
Cyclohexanecarboxylic Acid	<110	<110	<110	<220
Heptanoic Acid (Enanthoic)	260	<110	<110	6,500J
Hexanoic Acid (Caproic)	23,000J	<110	<110	120,000J
Nonanoic Acid (Pelargonic)	<110	<110	<110	220
Octanoic Acid (Caprylic)	<110	<110	<110	2,600
Pentanoic Acid (Valeric)	33,000J	<110	<110	110,000J
Propionic Acid (Propanoic)	34,000J	<120	<120	95,000J
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 – Standard Analyte List (Lab Report - P1503125)</b>				



**Table 4. Comprehensive Sampling Event #5 – Bridgeton Landfill Source Gas Sampling Summary**  
**Compound Concentration in Source Gas – All Units µg/m3**  
**– All Units µg/m3**

Analyte	Sample Locations			
	South Quarry	Neck	North Quarry	Flare Inlet
Sample ID	729sSQ-Summa	729sN-Summa	NQ Source 523 <sup>5</sup>	729sF-Summa (A) / 729sF-Summa (B) <sup>6</sup>
1,1,1-Trichloroethane	<1700	<63	<8	<4,000 / <4,500
1,1,2,2-Tetrachloroethane	<1700	<63	<8	<4,000 / <4,500
1,1,2-Trichloroethane	<1700	<63	<8	<4,000 / <4,500
1,1-Dichloroethane	<1700	<63	<8	<4,000 / <4,500
1,1-Dichloroethene	<1700	<63	<8	<4,000 / <4,500
1,2,4-Trichlorobenzene	<1700	<63	<8	<4,000 / <4,500
1,2,4-Trimethylbenzene	<b>28,000</b>	<b>82</b>	<b>13</b>	<b>26,000 / 35,000</b>
1,2-Dibromo-3-chloropropane	<1700	<63	<8	<4,000 / <4,500
1,2-Dibromoethane	<1700	<63	<8	<4,000 / <4,500
1,2-Dichloro-1,1,2,2-tetrafluoroethane	<1700	<b>67</b>	<b>130</b>	<4,000 / <4,500
1,2-Dichlorobenzene	<1700	<63	<8	<4,000 / <4,500
1,2-Dichloroethane	<1700	<63	<8	<4,000 / <4,500
1,2-Dichloropropane	<1700	<63	<8	<4,000 / <4,500
1,3,5-Trimethylbenzene	<b>8,800</b>	<b>360</b>	<b>3.8</b>	<b>7,900 / 10,000</b>
1,3-Butadiene	<b>1200J</b>	<b>66</b>	<8	<b>2,100J / 3,200J</b>
1,3-Dichlorobenzene	<1700	<b>19J</b>	<b>2.5</b>	<4,000 / <4,500
1,4-Dichlorobenzene	<b>14,000</b>	<b>3,300</b>	<b>2.4</b>	<b>22,000 / 31,000</b>
1,4-Dioxane	<b>2600</b>	<63	<8	<b>21,000 / 26,000</b>
2-Butanone (MEK)	<b>260,000</b>	<b>77J</b>	<b>19</b>	<b>660,000 / 930,000</b>
2-Hexanone	<b>13,000</b>	<63	<8	<b>20,000 / 26,000</b>
2-Propanol (Isopropyl Alcohol)	<b>31,000</b>	<630	<80	<b>320,000 / 400,000</b>
3-Chloro-1-propene (Allyl Chloride)	<1700	<63	<8	<4,000 / <4,500
4-Ethyltoluene	<b>8,500</b>	<b>150</b>	<b>3.4</b>	<b>7,600 / 10,000</b>
4-Methyl-2-pentanone	<b>30,000</b>	<63	<b>9.4</b>	<b>31,000 / 42,000</b>
Acetone	<b>260,000</b>	<b>2,500</b>	<80	<b>1,100,000 / 1,500,000</b>
Acetonitrile	<1700	<63	<8	<4,000 / <4,500
Acrolein	<6700	<250	<32	<16,000 / <18,000
Acrylonitrile	<1700	<63	<8	<4,000 / <4,500
alpha-Pinene	<b>44,000</b>	<b>1,200</b>	<b>15</b>	<b>19,000 / 25,000</b>
Benzene	<b>150,000</b>	<b>1,200</b>	<b>28</b>	<b>320,000 / 450,000</b>
Benzyl Chloride	<1700	<63	<8	<4,000 / <4,500
Bromodichloromethane	<1700	<63	<8	<4,000 / <4,500
Bromoform	<1700	<63	<8	<4,000 / <4,500
Bromomethane	<1700	<63	<8	<4,000 / <4,500
Carbon Disulfide	<b>760J</b>	<b>38J</b>	<80	<b>1,200J / 1,700J</b>
Carbon Tetrachloride	<1700	<63	<8	<4,000 / <4,500
Chlorobenzene	<b>1,800</b>	<b>92</b>	<8	<b>2,400J / 3,400J</b>
Chloroethane	<1700	<63	<b>10</b>	<b>1,600J / 2,300J</b>
Chloroform	<1700	<63	<b>38</b>	<4,000 / <4,500
Chloromethane	<b>4,100</b>	<63	<8	<b>6,100 / 8,400</b>
cis-1,2-Dichloroethene	<1700	<63	<b>27</b>	<4,000 / <4,500
cis-1,3-Dichloropropene	<1700	<63	<8	<4,000 / <4,500
Cumene	<b>11,000</b>	<b>280</b>	<8	<b>8,500 / 11,000</b>
Cyclohexane	<3300	<b>400</b>	<b>100</b>	<7,900 / <8,900
Dibromochloromethane	<1700	<63	<8	<4,000 / <4,500
Dichlorodifluoromethane (CFC 12)	<1700	<b>190</b>	<b>1,400</b>	<4,000 / <4,500
d-Limonene	<b>81,000</b>	<63	<b>9</b>	<b>50,000 / 67,000</b>
Ethanol	<b>5,200J</b>	<630	<b>19</b>	<b>1,200,000 / 1,500,000</b>
Ethyl Acetate	<b>38,000 M1<sup>7</sup></b>	<130	<16	<b>120,000 / 180,000</b>
Ethylbenzene	<b>38,000</b>	<b>150</b>	<b>11</b>	<b>38,000 / 51,000</b>
Hexachlorobutadiene	<1700	<63	<8	<4,000 / <4,500
m,p-Xylenes	<b>62,000</b>	<b>410</b>	<b>27</b>	<b>66,000 / 88,000</b>
Methyl Methacrylate	<3300	<130	<16	<7,900 / <8,900
Methyl tert-Butyl Ether	<b>1,300J</b>	<b>100</b>	<8	<4,000 / <4,500
Methylene Chloride	<1700	<b>56J</b>	<8	<4,000 / <4,500
Naphthalene	<1700	<63	<b>5.1</b>	<b>2,200J / 2,600J</b>
n-Butyl Acetate	<b>27,000</b>	<63	<b>11</b>	<b>81,000 / 110,000</b>

**Table 4. Comprehensive Sampling Event #5 – Bridgeton Landfill Source Gas Sampling Summary**  
**Compound Concentration in Source Gas – All Units µg/m3**  
**– All Units µg/m3**

Analyte	Sample Locations			
	South Quarry	Neck	North Quarry	Flare Inlet
n-Heptane	3,400	460	85	3,800J / 5,800
n-Hexane	3,600	1,100	260	4,400 / 6,000
n-Nonane	17,000	220	7	16,000 / 20,000
n-Octane	9,200	<63	16	12000 / 17,000
n-Propylbenzene	6,300	<63	<8	5,500 / 7,300
o-Xylene	28,000	210	9.7	25,000 / 33,000
Propene	55,000	11,000	1,300	83,000 / 130,000
Styrene	960J	<63	<8	1,900J / 2,500J
Tetrachloroethene	<1700	20J	2.8	<4,000 / <4,500
Tetrahydrofuran (THF)	300,000	31J	170	430,000 / 610,000
Toluene	53,000	61J	20	79,000 / 110,000
trans-1,2-Dichloroethene	<1700	<63	<8	<4,000 / <4,500
trans-1,3-Dichloropropene	<1700	<63	<8	<4,000 / <4,500
Trichloroethene	580J	<63	<8	<4,000 / 1,400J
Trichlorofluoromethane	<1700	<63	2.8	<4,000 / <4,500
Trichlorotrifluoroethane	<1700	<63	<8	<4,000 / <4,500
Vinyl Acetate	<17000	<630	<80	6,100J / <45,000
Vinyl Chloride	<1700	26J	590	<4,000 / <4,500
<b>Volatile Organic Compounds (VOCs) – Method: EPA 1015 – Tentatively Identified Compounds** (Lab Report - P1503125)</b>				
Sample ID	729sQ-Summa	729sN-Summa	NQ Source 523	729sF-Summa (A) / 729sF-Summa (B)
Dimethyl Ether	100,000	--	--	-- / 180,000
2-Methylpropene	85,000	11,000	1,300	-- / 110,000
n-Butane	--	11,000	3,100	--
1-Butene	--	--	270	--
1-Chloro-1-Fluoroethane	--	--	210	--
C4H8 Alkene (5.53)	--	8,900	--	--
2-Methylbutane	--	--	930	--
C4H8 Alkene (5.81)	--	5,300	--	--
Furan	250,000	--	--	--
Dimethyl Sulfide	570,000	--	--	1,200,000 / 1,700,000
Methyl Acetate	69,000	--	--	520,000 / 750,000
C5H10 Alkene	--	3,400	--	--
n-Pentane	--	--	1,200	--
2-Methyl-2-butene	--	--	410	--
2,2-Dimethylbutane	--	--	390	--
2-Methylpentane	--	--	550	--
3-Methylpentane	--	--	290	--
1-Propanol	--	--	--	230,000 / 290,000
Cyclopentene	50,000	2,300	--	--
Trimethylsilanol	--	--	--	--
C6H12 Alkene	--	2,500	--	--
2-Butanol	40,000	--	--	240,000 / 320,000
2-Methylfuran	250,000	--	--	330,000 / 480,000
Methyl Propionate	62,000	--	--	420,000 / 600,000
2-Pentanone	47,000	--	--	89,000 / 120,000
Methyl isobutyrate	--	--	--	99,000 / 140,000
Methyl Butyrate	140,000	--	--	630,000 / 870,000
Dimethyl disulfide	94,000	--	--	150,000 / 310,000
Methyl isovalerate	--	--	--	76,000 / --
C8H16 Alkene	--	2,500	--	--
Methyl valerate	--	--	--	79,000 / --
2-Methylcyclopentanone	46,000	--	--	140,000 / 180,000
Methyl hexanoate	--	--	--	130,000 / 170,000
unknown (19.89)	--	3,800	--	--
C10H20 Compound	--	2,600	--	--
unknown (20.11)	--	--	--	--
n-Decane	46,000	--	--	--
p-Isopropyltoluene	140,000	--	--	130,000 / 180,000

**Table 4. Comprehensive Sampling Event #5 – Bridgeton Landfill Source Gas Sampling Summary**  
**Compound Concentration in Source Gas – All Units µg/m<sup>3</sup>**  
**– All Units µg/m<sup>3</sup>**

Analyte	Sample Locations			
	South Quarry	Neck	North Quarry	Flare Inlet
unknown (20.72)	--	2,800	--	--
(C12H26) Alkane: Straight-Chain (20.82)	--	5,300	--	--
(C12H26) Alkane: Straight-Chain (21.04)	--	4,300	--	--
decahydronaphthalene isomer	--	2,700	--	--
unknown (21.22)	--	2,700	--	--
<b>Reduced Sulfur Compound – ASTM D5504 (Lab Report - P1503125)</b>				
Sample ID	729sSQ-Summa	729sN-Summa	NQ Source 523	729sF-Summa (A) / 729sF-Summa (B)
2,5-Dimethylthiophene	<380	<43	<43	<1,400 / <1,600
2-Ethylthiophene	<380	<43	<43	<1,400 / <1,600
3-Methylthiophene	840	<38	<38	<1,300 / <1,400
Carbon Disulfide	450	24	<15	<490 / <550
Carbonyl Sulfide	<210	<23	<23	<780 / <870
Diethyl Disulfide	<210	<24	<23	<790 / <890
Diethyl Sulfide	<310	<35	<35	<1,200 / <1,300
Dimethyl Disulfide	110,000	120	<18	140,000 / 320,000
Dimethyl Sulfide	450,000	77	28	580,000 / 1,100,000
Ethyl Mercaptan	<210	<24	<24	<800 / <900
Ethyl Methyl Sulfide	4,900	<29	<29	5,200 / 10,000
Hydrogen Sulfide	<120	<13	<13	<440 / <500
Isobutyl Mercaptan	<310	<35	<35	<1,200 / <1,300
Isopropyl Mercaptan	<260	<29	<29	<980 / <1,100
Methyl Mercaptan	11,000	<19	<18	1,300 / 1,400
n-Butyl Mercaptan	1,800	<35	<35	<1,200 / <1,300
n-Propyl Mercaptan	<260	<29	<29	<980 / <1,100
tert-Butyl Mercaptan	<310	<35	<35	<1,200 / <1,300
Tetrahydrothiophene	4,700	<34	<34	<1,100 / 6,200
Thiophene	9,300	<33	<32	9,100 / 20,000
<b>Total Sulfur – ASTM D 5504-12 (Lab Report - P1503125)</b>				
Sample ID	729sSQ-Summa	729sN-Summa	NQ Source 523	729sF-Summa (A) / 729sF-Summa (B)
Total Sulfur	350,000	140	14	440,000 / 870,00
<b>Fixed Gases – EPA 3Cm (Lab Report - P1503125)</b>				
Sample ID	729sSQ-Summa	729sN-Summa	NQ Source 523	729sF-Summa (A) / 729sF-Summa (B)
Hydrogen	2.08	<0.19	<0.19	8.61 / 9.77
Oxygen + Argon	14.8	1.09 JB <sup>11</sup>	1.12	10.4 / 8.99
Nitrogen	61.8	47.8	53.8	39.9 / 35.5
Carbon Monoxide	<1.7	<0.19	<0.19	<0.16 / <0.18
Methane	3.95	21.7	22	8.75 / 9.45
Carbon Dioxide	17.4	29.4	23.1	32.3 / 36.2
<b>Polynuclear Aromatic Hydrocarbons - Method: EPA TO13a Modified (Lab Report - P1503133)</b>				
Sample ID	731sSQ-PAH	731sN-PAH	731sNQ-PAH	NS
Naphthalene	180 D,J <sup>12</sup>	5.9 D,J	0.70 D,J	NS <sup>12</sup>
Acenaphthylene	<3.2 D,R <sup>12</sup>	<0.21 D,UJ <sup>12</sup>	<0.24 D,UJ	NS
Acenaphthene	4.5 D,J	<0.21 D,UJ	<0.24 D,UJ	NS
Fluorene	<3.2 D,R	<0.21 D	<0.24 D	NS
Phenanthrene	<0.16 R	0.023	<0.024	NS
Anthracene	<0.16 R	<0.021	<0.024	NS
Fluoranthene	<0.16 R	<0.021	<0.024	NS
Pyrene	<0.16 R	<0.021	<0.024	NS
Benz(a)anthracene	<0.16 R	<0.021	<0.024	NS
Chrysene	<0.16 R	<0.021	<0.024	NS
Benzo(b)fluoranthene	<0.16 R	<0.021	<0.024	NS
Benzo(k)fluoranthene	<0.16 R	<0.021	<0.024	NS
Benzo(a)pyrene	<0.16 R	<0.021	<0.024	NS
Indeno(1,2,3-cd)pyrene	<0.16 R	<0.021	<0.024	NS
Dibenz(a,h)anthracene	<0.16 R	<0.021	<0.024	NS

**Table 4. Comprehensive Sampling Event #5 – Bridgeton Landfill Source Gas Sampling Summary**  
**Compound Concentration in Source Gas – All Units µg/m3**  
**– All Units µg/m3**

Analyte	Sample Locations				
	South Quarry	Neck	North Quarry	Flare Inlet	
Benzo(g,h,i)perylene	<0.16 R	<0.021	<0.024	NS	
<b>Polychlorinated Dibenzo-p-Dioxins, Dibenzofurans – EPA Method TO-9A (Lab Report - P1503139)</b>					
	<b>Sample ID</b>	<b>731sSQ-DF</b>	<b>731sN-DF</b>	<b>731sNQ-DF</b>	<b>NS</b>
2,3,7,8-TCDD	8.70E-10	1.38E-09	0.00E+00	NS	

1. "<": Compound concentration not detected above Method Reporting Limit (MRL).
2. **Bold** indicates that compound was detected above Method Detection Limits (MDL).
3. J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
4. Values in parenthesis are the results of the duplicate sample.
5. 729sNQ-Summa was a source gas Summa sample collected on 7/29/15 at the North Quarry location. The canister valve seemed to not open entirely as the can arrived at the lab virtually fully pressurized. Consequently the canister did not collect enough sample volume, thus the results were deemed invalid. The North Quarry location was resampled on October 8, 2015. Sample ID: NQ Source 523.
6. Two samples were sequentially at Flare Inlet location, designated sample A and B.
7. M1 = Matrix interference due to coelution with a non-target compound; results may be biased high.
8. Tentatively Identified Compounds – under Method: EPA TO15 + TICs. The reported concentrations for TICs are estimated. Retention time is located in parentheses next to Unknown compounds and identical compounds with different retention times.
9. "--" = The tentatively identified compound (TIC) was not detected in the sample
10. Units for fixed gases are volume analyte/volume of air %.
10. "NS" = Not Sampled
11. B = Compound detected in Trip Blank or Laboratory Method Blank
12. D = The reported result is from a dilution
13. "NS": Not Sampled
14. R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The percent recovery for 3 of 4 surrogates was below 10%. The 4th surrogate was below 60 to 120% limits at 11%. Associated results flagged "J" (as an estimated concentration) if positive or "R" if non-detect for 731sSQ-PAH only.
15. UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
14. Trip Blanks were analyzed for each analyte . Analytical results for compounds detected in any trip blank have been amended with applicable data qualifiers.

Table 5: Comprehensive Sampling Event #5 –Bridgeton Landfill  
Ambient Air 8 Hour TWA Summary of Detected Compounds  
Concentration in Ambient Air – All Units µg/m3

Analyte	Screening Levels				Sample Locations									
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite				Perimeter					
					Landfill				Upwind		Downwind			
					Flare Station	South Quarry	Neck	North Quarry	South Fence	Grassy Knoll Upper Level	Fence by Republic Parking Lot	Upper Road by Neck	East Fence Near Flare Station	Fence by Retention Pond
Aldehydes/Carbonyl Compounds – Method: EPA TO-11a (Lab Report - P1503123)														
				Sample ID	728F-Ald	728SQ-Ald	729N-Ald	729NQ-Ald	728U1-Ald (728-Dup01)	729U1-Ald	728D1-Ald	728D2-Ald	729D1-Ald	729D2-Ald
Acetaldehyde	5.6	1.3	360,000	45,000	2.3J <sup>5,6</sup>	2.3J	1.7J	1.2	2.4J (2.3J) <sup>7,8</sup>	1.4J	3.0J	2.6J	1.2	1.4J
Benzaldehyde	NA <sup>9</sup>	NA	NA	NA	0.43	0.36	-- <sup>10</sup>	--	0.46 (0.44)	0.7	0.6	0.44	1.1	--
Butyraldehyde	NA	NA	NA	NA	2.0J	2.3J	1.7	1.8	-- (1.8UJ) <sup>11</sup>	1.2	1.8	2.4J	1.3	1.7J
Formaldehyde	0.94	0.22	1,000	400	12 <sup>12</sup>	13	4.9	4.7	12 (12)	4.2	12	14	4.4	5
n-Hexaldehyde	NA	NA	NA	NA	--	--	0.55	0.38	--	--	--	--	--	--
Propionaldehyde	35	8.3	NA	NA	--	--	--	--	--	--	0.67	--	--	--
Carboxylic Acid Compounds – Method: CAS AQL 102 (Lab Report - P1503123)														
				Sample ID	728F-Carbox	728SQ-Carbox (728Dup-03)	729N-Carbox	729NQ-Carbox	728U1-Carbox	729U1-Carbox	728D1-Carbox	728D2-Carbox	729D1-Carbox	729D2-Carbox
Acetic Acid	NA	NA	25,000	27,000	--	-- (25J)	--	23	22	--	22	--	--	--
Butanoic Acid (Butyric)	NA	NA	NA	NA	--	-- (2.7J)	--	--	--	--	--	--	--	--
Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs – Standard Analyte List (Lab Report - P1503125)														
				Sample ID	728F-Summa	728SQ-Summa	729N-Summa	729NQ-Summa	728U1-Summa	729U1-Summa (729-Dup11)	728D1-Summa (728-Dup10)	728D2-Summa	729D1-Summa	--
1,2,4-Trimethylbenzene	31	7.3	NA	NA	--	--	--	--	--	0.42J (--)	-- (0.9J)	--	--	NS <sup>13</sup>
1,2-Dichloroethane	0.47	0.11	200,000	40,000	170 D <sup>14</sup>	--	--	--	--	0.61J (--)	--	--	--	NS
1,4-Dichlorobenzene	1.1	0.26	450,000	60,000	--	0.27J	--	--	--	--	--	--	--	NS
1,4-Dioxane	2.5	0.56	360,000	72,000	700 D	0.26J	--	--	--	13 (--)	--	--	--	NS
2-Butanone (MEK)	22,000	5,200	590,000	590,000	2.1J	3.0J	1.5J	1.1J	1.8J	1.3J (0.91J)	2.1J (2.2J)	2.1J	1.3J	NS
Isopropyl Alcohol	880	210	980,000	490,000	2.6J	0.92J	4.2J	1.2J	7.0J	1.1J (0.73J)	1.4J (1.9J)	--	0.84J	NS
4-Ethyltoluene	NA	NA	NA	NA	--	--	--	--	--	--	-- (0.46J)	--	--	NS
4-Methyl-2-pentanone	13,000	3,100	410,000	80,000	--	--	--	--	--	-- (0.48J)	0.54J (--)	--	--	NS
Acetone	140,000	32,000	2,400,000	1,200,000	15	17	14	9.5J	14	34J (9.3J)	16 (17)	15	10	NS
Acetonitrile	260	63	70,000	35,000	1.1	1.8	7.0	0.43J	0.64J	0.52J (0.34J)	0.5J (0.43J)	7.1	0.96	NS
Acrolein	0.088	0.021	250	250	1.7J	0.42J	0.38J	--	0.47J	0.71J (0.29J)	0.58J (0.56J)	0.38J	0.46J	NS
Benzene	1.6	0.36	32,000	1,600	0.49J	0.52J	0.37J	--	0.95	--	0.53J (0.55J)	0.38J	0.55J	NS
Carbon Disulfide	3,100	730	60,000	3,000	--	--	0.31J	--	--	0.29J (--)	--	--	--	NS
Carbon Tetrachloride	2	0.47	30,000	15,000	0.44J	0.45J	0.44J	0.46J	0.39J	0.47J (0.45J)	0.45J (0.45J)	0.45J	0.45J	NS
Chloromethane	390	94	200,000	100,000	0.24J	0.27J	0.27J	--	--	-- (0.25J)	0.26J (0.26J)	0.26J	0.3J	NS
Dichlorodifluoromethane (CFC 12)	440	100	4,950,000	4,950,000	2.3	2.3	2.3	2.4	2.0	2.4 (2.3)	2.3 (2.3)	2.3	2.3	NS
d-Limonene	NA	NA	NA	NA	0.37J	--	0.66J	--	0.35J	--	--	--	--	NS
Ethanol	NA	NA	1,900,000	1,900,000	6.8J	8.0	27	10J	5.7J	4.4J (3.5J)	6.7J (7.2J)	5.9J	6.0J	NS
Ethyl Acetate	310	73	1,400,000	1,400,000	4.6	4.2	3.2	3.3	2.5	5.2J (3.0J)	9.4 (10)	6.2	3.7	NS
Ethylbenzene	4.9	1.1	435,000	87,000	--	--	--	--	--	--	-- (0.83J)	--	--	NS

Table 5: Comprehensive Sampling Event #5 –Bridgeton Landfill  
Ambient Air 8 Hour TWA Summary of Detected Compounds  
Concentration in Ambient Air – All Units µg/m3

Analyte	Screening Levels				Sample Locations									
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite				Perimeter					
					Landfill				Upwind		Downwind			
					Flare Station	South Quarry	Neck	North Quarry	South Fence	Grassy Knoll Upper Level	Fence by Republic Parking Lot	Upper Road by Neck	East Fence Near Flare Station	Fence by Retention Pond
m,p-Xylenes	880	200	870,000	870,000	0.48J	--	--	--	--	--	-- (3.3J)	--	--	NS
Methylene Chloride	1,200	100	85,000	170,000	0.44J	0.43J	0.90	0.72J	0.54J	0.76J (0.37J)	0.48J (0.5J)	0.49J	0.48J	NS
Naphthalene	0.36	0.083	50,000	50,000	--	0.52J	--	--	--	--	-- (1.3J)	0.57J	--	NS
n-Butyl Acetate	NA	NA	710,000	710,000	--	0.39J	0.3J	--	--	1.5J (--)	--	--	0.29J	NS
n-Hexane	3100	730	1,800,000	180,000	0.43J	0.43J	0.59J	--	0.76J	0.45J (--)	0.62J (0.59J)	0.45J	0.29J	NS
n-Nonane	88	21	NA	NA	--	--	0.27J	--	--	0.33J (--)	--	--	--	NS
n-Octane	NA	NA	2,350,000	1,400,000	--	--	--	--	--	0.40J (--)	--	--	--	NS
o-Xylene	440	100	435,000	435,000	--	--	--	--	--	--	-- (0.63J)	--	--	NS
Propene	13000	3100	NA	NA	1.8	0.87	2.6	1.0J	4.7	-- (0.52J)	1.1 (1.3)	0.56J	0.49J	NS
Styrene	4400	1000	400,000	85,000	0.26J	--	--	--	--	--	--	--	--	NS
Tetrahydrofuran (THF)	8800	2100	590,000	147,500	--	0.97	--	--	--	--	--	0.43J	--	NS
Toluene	22000	5200	750,000	75,000	1.4	1.1	1.2	0.81J	1.2	14 (0.57J)	1.7J (4.9J)	1.3	1.1	NS
Trichlorofluoromethane	3100	730	5,600,000	5,600,000	1.2	1.2	1.1	1.1J	1.1	1.1 (1.1)	1.2 (1.2)	1.2	1.1	NS
Trichlorotrifluoroethane	130000	31000	7,600,000	7,600,000	0.51J	0.5J	0.51J	0.49J	0.45J	0.54J (0.49J)	0.51J (0.5J)	0.5J	0.51J	NS
Vinyl Acetate	880	210	NA	35,000	2.0J	1.7J	1.1J	--	1.3J	--	2.3J (1.7J)	1.6J	--	NS
<b>Volatile Organic Compounds (VOCs) –Method: EPA TO15 + TICs - Tentatively Identified Compounds<sup>15</sup> (Lab Report - P1500365)</b>														
Chlorodifluoromethane	220000	52000	NA	3,500,000	--	--	--	5.1	--	-- (4.2)	--	4.1	--	NS
Propane	NA	NA	1,800,000	NA	--	--	--	--	--	12 (--)	--	--	--	NS
Acetaldehyde	5.6	1.3	360,000	45,000	4.8	--	--	--	--	--	--	--	--	NS
n-Butane	NA	NA	NA	2,380,000	--	--	--	--	--	7.1 (--)	--	--	--	NS
Isoprene	NA	NA	NA	NA	--	--	--	--	--	3.9 (3.5)	--	--	--	NS
unknown (9.48)	NA	NA	NA	NA	--	4.7	--	5.8	4.2	-- (4.0)	7.3 (5.8)	3.3	--	NS
Trimethylsilanol	NA	NA	NA	NA	8.5	5.1	--	12	16	17 (3.1)	26 (5.9)	4.3	13	NS
Acetic Acid	NA	NA	25,000	27,000	--	--	--	--	6.7	-- (5.1)	4.4 (--)	--	--	NS
1,1-Dimethoxyethane	NA	NA	NA	NA	9.6	--	--	--	--	--	--	--	--	NS
1,3-Dioxolane	NA	NA	NA	60,000	10	--	--	--	--	--	--	--	--	NS
1-Butanol	NA	NA	300,000	60,000	--	4.3	--	--	--	--	--	--	--	NS
Dimethylsilanediol	NA	NA	NA	NA	5.1	7.1	--	--	--	--	4.8 (5.6)	4.7	--	NS
unknown (16.42)	NA	NA	NA	NA	--	--	--	--	--	--	3.8 (--)	--	--	NS
Hexamethylcyclotrisiloxane	NA	NA	NA	NA	5.5UJB <sup>16</sup>	10UJB	5.1UJB	7.4UJB	86UJB	4.4UJB (7.6UJB)	34UJB (5.5 ND UJB) <sup>17</sup>	11UJB	6.1UJB	NS
1,3-Butanediol	NA	NA	NA	NA	39	--	--	--	--	--	--	--	--	NS
(E,E)-2,4-hexadienal	NA	NA	NA	NA	9.5	--	--	--	--	--	--	--	--	NS
1,2,3-Trichloropropane	1.3	0.31	300,000	30	270	--	--	--	--	--	--	--	--	NS
Bis(2-Chloroethoxy)Methane	NA	NA	NA	NA	190	--	--	--	--	--	--	--	--	NS
unknown siloxane (20.11)	NA	NA	NA	NA	--	4.4	--	--	21	--	6.4 (--)	4.3	--	NS
unknown (20.24)	NA	NA	NA	NA	13	--	--	--	--	--	--	--	--	NS
2-Ethyl-1-hexanol	NA	NA	NA	NA	--	4.4	--	--	--	--	--	--	--	NS
unknown (20.91)	NA	NA	NA	NA	6.5	--	--	--	--	--	--	--	--	NS
unknown (21.16)	NA	NA	NA	NA	6.2	--	--	--	--	--	--	--	--	NS
n-Nonanal	NA	NA	NA	NA	--	11	4.0	--	3.8	--	3.7 (8.7)	7.4	3.4	NS

**Table 5: Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Air 8 Hour TWA Summary of Detected Compounds**  
**Concentration in Ambient Air – All Units µg/m3**

Analyte	Screening Levels				Sample Locations									
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite				Perimeter					
					Landfill				Upwind		Downwind			
					Flare Station	South Quarry	Neck	North Quarry	South Fence	Grassy Knoll Upper Level	Fence by Republic Parking Lot	Upper Road by Neck	East Fence Near Flare Station	Fence by Retention Pond
2-Ethylhexylacetate	NA	NA	NA	NA	--	--	--	--	--	--	4.7 (--)	--	--	NS
Bis(2-chloroethyl) ether	0.037	0.0085	90,000	30,000	<b>28</b>	--	--	--	--	--	--	--	--	NS
unknown siloxane (21.82)	NA	NA	NA	NA	--	48	--	4.8	13	--	6.7 (--)	43	--	NS
n-Decanal	NA	NA	NA	NA	--	9.2	3.9	--	--	--	-- (8.0)	8.4	--	NS
unknown (22.62)	NA	NA	NA	NA	13	--	--	--	--	--	--	--	--	NS
unknown (23.04)	NA	NA	NA	NA	--	--	--	--	3.6	--	--	--	--	NS
unknown siloxane (23.32)	NA	NA	NA	NA	--	49	--	--	--	--	--	51	--	NS
unknown siloxane (24.93)	NA	NA	NA	NA	--	14	--	--	--	--	--	20	--	NS
<b>Fixed Gases – EPA Method 3Cm<sup>18</sup> (Lab Report - P1503125)</b>														
				<i>Sample ID</i>	728F-Summa	728SQ-Summa	729N-Summa	729NQ-Summa	728U1-Summa	729U1-Summa (729-Dup11)	728D1-Summa (728-Dup10)	728D2-Summa	729D1-Summa	--
Oxygen + Argon	NA	NA	NA	NA	22.3	22.3	22.3	22.3	22.3	22.3 (22.3)	22.3 (22.3)	22.3	22.3	NS
Nitrogen	NA	NA	NA	NA	77.7	77.7	77.7	77.7	77.6	77.6 (77.7)	77.6 (77.7)	77.7	77.7	NS
<b>Polynuclear Aromatic Hydrocarbons (PAHs) – EPA Method TO-13A (Lab Report - P1503133)</b>														
				<i>Sample ID</i>	731F-PAH	--	--	--	731U1-PAH	--	731D1-PAH	--	--	--
Acenaphthene	NA	NA	NA	NA	0.0062 J	NS	NS	NS	0.0076 J	NS	0.0061 J	NS	NS	NS
Fluoranthene	NA	NA	NA	NA	0.006	NS	NS	NS	0.0061	NS	0.0055	NS	NS	NS
Fluorene	NA	NA	NA	NA	0.0086	NS	NS	NS	0.01	NS	0.0097	NS	NS	NS
Naphthalene	0.36	0.083	50,000	50,000	0.023 J	NS	NS	NS	0.04 J	NS	0.023 J	NS	NS	NS
Phenanthrene	NA	NA	NA	NA	0.021	NS	NS	NS	0.024	NS	0.023	NS	NS	NS
Pyrene	NA	NA	NA	NA	0.0026	NS	NS	NS	0.0026	NS	0.0023	NS	NS	NS
<b>Polychlorinated Dibenzo-p-Dioxins, Dibenzofurans – EPA Method TO-9A (Lab Report - P1503139)</b>														
				<i>Sample ID</i>	728F-DF	--	--	--	728U1-DF	--	728D1-DF	--	--	--
2,3,7,8-TCDD	3.20E-07	7.40E-08	NA	NA	1.58E-08	NS	NS	NS	6.37E-10	NS	1.41E-09	NS	NS	NS

- United States Environmental Protection Agency Regional Screening Levels (RSL) for Industrial Air (RSL). (USEPA: June 2015, TR=1E-06, HQ=1).
- United States Environmental Protection Agency Regional Screening Levels for Residential Air. (USEPA: June 2015, TR=1E-06, HQ=1)
- Occupational Safety & Health Administration (OSHA) Permissible Exposure Limit
- American Conference of Governmental Industrial Hygienists- Threshold Limit Value
- Bold** indicates that compound was detected above Method Detection Limits (MDL).
- J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- Shading for perimeter sampling locations indicates that the detected concentration exceeds the United States Environmental Protection Agency Regional Screening Level for *Residential Air*.
- Values in parenthesis are the results of the duplicate sample.
- "NA" = Not Available
- "--" = The compound was not detected in the sample
- UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- Shading for onsite sampling locations indicates that the detected concentration exceeds the United States Environmental Protection Agency Regional Screening Level for *Industrial Air*.
- "NS" = Not Sampled
- D=The reported result is from a dilution
- Tentatively Identified Compounds – under Method: EPA TO15 + TICs. The reported concentrations for TICs are estimated. Retention time is located in parentheses next to Unknown compounds and identical compounds with different retention times.

Table 5: Comprehensive Sampling Event #5 -Bridgeton Landfill  
 Ambient Air 8 Hour TWA Summary of Detected Compounds  
 Concentration in Ambient Air - All Units µg/m3

Analyte	Screening Levels				Sample Locations									
	USEPA Industrial RSL <sup>1</sup>	USEPA Residential RSL <sup>2</sup>	OSHA PEL <sup>3</sup>	ACGIH TLV <sup>4</sup>	Onsite				Perimeter					
					Landfill				Upwind		Downwind			
					Flare Station	South Quarry	Neck	North Quarry	South Fence	Grassy Knoll Upper Level	Fence by Republic Parking Lot	Upper Road by Neck	East Fence Near Flare Station	Fence by Retention Pond

16. B = Compound detected in Trip Blank or Laboratory Method Blank

17. ND UJB - The analyte is considered a non-detect as it was detected in the method, field, and/or trip blank but also indicated that the analyte was "tentatively identified" and the associated numerical value represents its approximate concentration.

18. Units for fixed gases are volume analyte/volume of air %.

NOTE: Trip Blanks were analyzed for each analyte. Analytical results for compounds detected in any trip blank have been amended with applicable data qualifiers.



**Table 6. Comprehensive Sampling Event #5 – Bridgeton Landfill**  
**Source Gas - Summary of Detected Compounds Collected July 29 Through July 31, 2015**  
**Compound Concentration in Source Gas – All Units µg/m<sup>3</sup>**

Analyte	Sample Locations			
	Neck	North Quarry	South Quarry	Flare Inlet
<b>Aldehydes/Carbonyl Compounds – Method: EPA TO-11a (Lab Report - P1503123)</b>				
Sample ID	729sN-Ald	729sNQ-Ald	729sSQ-Ald	729sF-Ald
Acetaldehyde	51 <sup>1</sup>	-- <sup>2</sup>	490J <sup>3</sup>	13,000J
Benzaldehyde	--	--	1,500	3,000
Butyraldehyde	--	--	5,000J	24,000J
Propionaldehyde	--	--	660J	6,100J
<b>Mercury – Method: NIOSH 6009 (Lab Report - P1503123)</b>				
Sample ID	729sN-Hg	729sNQ-Hg	729sSQ-Hg	729sF-Hg
Mercury	--	--	--	63
<b>Carboxylic Acid Compounds – Method: CAS AQL 102 (Lab Report - P1503123)</b>				
Sample ID	729sN-Carbox	729sNQ-Carbox	729sSQ-Carbox	729sF-Carbox
2-Ethylhexanoic Acid	--	--	2,000J	5,900J
2-Methylbutanoic Acid	--	--	17,000J	23,000J
2-Methylpentanoic Acid	--	--	3,100J	3,200J
2-Methylpropanoic Acid (Isobutyric)	--	--	39,000J	51,000J
3-Methylbutanoic Acid (Isovaleric)	--	--	29,000J	36,000J
3-Methylpentanoic Acid	--	--	720J	800J
4-Methylpentanoic Acid (Isocaproic)	--	--	1,400J	--
Acetic Acid	--	--	37,000J	83,000J
Butanoic Acid (Butyric)	--	--	150,000J	370,000J
Heptanoic Acid (Enanthoic)	--	--	260	6,500J
Hexanoic Acid (Caproic)	--	--	23,000J	120,000J
Nonanoic Acid (Pelargonic)	--	--	--	220
Octanoic Acid (Caprylic)	--	--	--	2,600
Pentanoic Acid (Valeric)	--	--	33,000J	110,000J
Propionic Acid (Propanoic)	--	--	34,000J	95,000J
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 – Standard Analyte List (Lab Report - P1503125)</b>				
Sample ID	729sN-Summa	NQ Source 523 <sup>4</sup>	729sSQ-Summa	729sF-Summa (A) / 729sF-Summa (B) <sup>5</sup>
1,2,4-Trimethylbenzene	82	13	28,000	26,000 / 35,000
1,2-Dichloro-1,1,2,2-tetrafluoroethane	67	130	--	--
1,3,5-Trimethylbenzene	360	3.8	8,800	7,900 / 10,000
1,3-Butadiene	66	--	1,200J	2,100J / 3,200J
1,3-Dichlorobenzene	19J	2.5	--	--
1,4-Dichlorobenzene	3,300	2.4	14,000	22,000 / 31,000
1,4-Dioxane	--	--	2,600	21,000 / 26,000
2-Butanone (MEK)	77J	19	260,000	660,000 / 930,000
2-Hexanone	--	--	13,000	20,000 / 26,000
2-Propanol (Isopropyl Alcohol)	--	--	31,000	320,000 / 400,000
4-Ethyltoluene	150	3.4	8,500	7,600 / 10,000
4-Methyl-2-pentanone	--	9.4	30,000	31,000 / 42,000
Acetone	2,500	--	260,000	1,100,000 / 1,500,000

**Table 6. Comprehensive Sampling Event #5 – Bridgeton Landfill**  
**Source Gas - Summary of Detected Compounds Collected July 29 Through July 31, 2015**  
**Compound Concentration in Source Gas – All Units µg/m<sup>3</sup>**

Analyte	Sample Locations			
	Neck	North Quarry	South Quarry	Flare Inlet
alpha-Pinene	1,200	15	44,000	19,000 / 25,000
Benzene	1,200	28	150,000	320,000 / 450,000
Carbon Disulfide	38J	--	760J	1,200J / 1,700J
Chlorobenzene	92	--	1,800	2,400J / 3,400J
Chloroethane	--	10	--	1,600J / 2,300J
Chloroform	--	38	--	--
Chloromethane	--	--	4,100	6,100 / 8,400
cis-1,2-Dichloroethene	--	27	--	--
Cumene	280	--	11,000	8,500 / 11,000
Cyclohexane	400	100	--	--
Dichlorodifluoromethane (CFC 12)	190	1,400	--	--
d-Limonene	--	9	81,000	50,000 / 67,000
Ethanol	--	19	5,200J	1,200,000 / 1,500,000
Ethyl Acetate	--	--	38,000 M1 <sup>o</sup>	120,000 / 180,000
Ethylbenzene	150	11	38,000	38,000 / 51,000
m,p-Xylenes	410	12	62,000	66,000 / 88,000
Methyl tert-Butyl Ether	100	--	1,300J	--
Methylene Chloride	56J	--	--	--
Naphthalene	--	5.1	--	2,200J / 2,600J
n-Butyl Acetate	--	11	27,000	81,000 / 110,000
n-Heptane	460	85	3,400	3,800J / 5,800
n-Hexane	1,100	260	3,600	4,400 / 6,000
n-Nonane	220	7	17,000	16,000 / 20,000
n-Octane	--	16	9,200	12,000 / 17,000
n-Propylbenzene	--	--	6,300	5,500 / 7,300
o-Xylene	210	9.7	28,000	25,000 / 33,000
Propene	11,000	1,300	55,000	83,000 / 130,000
Styrene	--	--	960J	1,900J / 2,500J
Tetrachloroethene	20J	2.8	--	--
Tetrahydrofuran (THF)	31J	170	300,000	430,000 / 610,000
Toluene	61J	20	53,000	79,000 / 110,000
Trichloroethene	--	--	580J	-- / 1,400J
Trichlorofluoromethane	--	2.8	--	--
Vinyl Acetate	--	--	--	6,100J / --
Vinyl Chloride	26J	--	--	--
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 – Tentatively Identified Compounds * (Lab Report - P1503125)</b>				
Sample ID	729sN-Summa	NQ Source 523	729sSQ-Summa	729sF-Summa (A) / 729sF-Summa (B)
Dimethyl Ether	-- <sup>o</sup>	--	100,000	-- / 180,000
2-Methylpropene	11,000	1,300	85,000	-- / 110,000
n-Butane	11,000	3,100	--	--
1-Butene	--	270	--	--

**Table 6. Comprehensive Sampling Event #5 – Bridgeton Landfill**  
**Source Gas - Summary of Detected Compounds Collected July 29 Through July 31, 2015**  
**Compound Concentration in Source Gas – All Units µg/m<sup>3</sup>**

Analyte	Sample Locations			
	Neck	North Quarry	South Quarry	Flare Inlet
1-Chloro-1-Fluoroethane	--	210	--	--
C4H8 Alkene (5.53)	8,900	--	--	--
2-Methylbutane	--	930	--	--
C4H8 Alkene (5.81)	5,300	--	--	--
Furan	--	--	250,000	--
Dimethyl Sulfide	--	--	570,000	1,200,000 / 1,700,000
Methyl Acetate	--	--	69,000	520,000 / 750,000
C5H10 Alkene	3,400	--	--	--
n-Pentane	--	1,200	--	--
2-Methyl-2-butene	--	410	--	--
2,2-Dimethylbutane	--	390	--	--
2-Methylpentane	--	550	--	--
3-Methylpentane	--	290	--	--
1-Propanol	--	--	--	230,000 / 290,000
Cyclopentene	2,300	--	50,000	--
Trimethylsilanol	--	--	--	--
C6H12 Alkene	2,500	--	--	--
2-Butanol	--	--	40,000	240,000 / 320,000
2-Methylfuran	--	--	250,000	330,000 / 480,000
Methyl Propionate	--	--	62,000	420,000 / 600,000
2-Pentanone	--	--	47,000	89,000 / 120,000
Methyl isobutyrate	--	--	--	99,000 / 140,000
Methyl Butyrate	--	--	140,000	630,000 / 870,000
Dimethyl disulfide	--	--	94,000	150,000 / 310,000
Methyl isovalerate	--	--	--	76,000 / --
C8H16 Alkene	2,500	--	--	--
Methyl valerate	--	--	--	79,000 / --
2-Methylcyclopentanone	--	--	46,000	140,000 / 180,000
Methyl hexanoate	--	--	--	130,000 / 170,000
unknown (19.89)	3,800	--	--	--
C10H20 Compound	2,600	--	--	--
unknown (20.11)	--	--	--	--
n-Decane	--	--	46,000	--
p-Isopropyltoluene	--	--	140,000	130,000 / 180,000
unknown (20.72)	2,800	--	--	--
(C12H26) Alkane: Straight-Chain (20.82)	5,300	--	--	--
(C12H26) Alkane: Straight-Chain (21.04)	4,300	--	--	--
decahydronaphthalene isomer	2,700	--	--	--
unknown (21.22)	2,700	--	--	--
<b>Reduced Sulfur Compound – ASTM D5504 (Lab Report - P1503125)</b>				
Sample ID	729sN-Summa	NQ Source 523	729sSQ-Summa	729sF-Summa (A) / 729sF-Summa (B)

**Table 6. Comprehensive Sampling Event #5 – Bridgeton Landfill**  
**Source Gas - Summary of Detected Compounds Collected July 29 Through July 31, 2015**  
**Compound Concentration in Source Gas – All Units µg/m<sup>3</sup>**

Analyte	Sample Locations			
	Neck	North Quarry	South Quarry	Flare Inlet
3-Methylthiophene	--	--	840	--
Carbon Disulfide	24	--	450	--
Dimethyl Disulfide	120	--	110,000	140,000 / 320,000
Dimethyl Sulfide	77	28	450,000	580,000 / 1,100,000
Ethyl Methyl Sulfide	--	--	4,900	5,200 / 10,000
Methyl Mercaptan	--	--	11,000	1,300 / 1,400
n-Butyl Mercaptan	--	--	1,800	--
Tetrahydrothiophene	--	--	4,700	-- / 6,200
Thiophene	--	--	9,300	9,100 / 20,000
<b>Total Sulfur – ASTM D 5504-12 (Lab Report - P1503125)</b>				
Sample ID	729sN-Summa	NQ Source 523	729sSQ-Summa	729sF-Summa (A) / 729sF-Summa (B)
Total Sulfur	140	14	350,000	440,000 / 870,00
<b>Fixed Gases – EPA 3Cm<sup>o</sup> (Lab Report - P1503125)</b>				
Sample ID	729sN-Summa	NQ Source 523	729sSQ-Summa	729sF-Summa (A) / 729sF-Summa (B)
Hydrogen	--	--	2.08	8.61 / 9.77
Oxygen + Argon	1.09 JB <sup>7</sup>	1.12	14.8	10.4 / 8.99
Nitrogen	47.8	53.8	61.8	39.9 / 35.5
Methane	21.7	22	3.95	8.75 / 9.45
Carbon Dioxide	29.4	23.1	17.4	32.3 / 36.2
<b>Polynuclear Aromatic Hydrocarbons - Method: EPA TO13a Modified (Lab Report - P1503133)</b>				
Sample ID	731sN-PAH	731sNQ-PAH	731sSQ-PAH	NS
Naphthalene	5.9 D,J <sup>6</sup>	0.70 D,J	180 D,J	NS <sup>6</sup>
Acenaphthene	--	--	4.5 D,J	NS
Phenanthrene	0.023	--	--	NS
<b>Polychlorinated Dibenzo-p-Dioxins, Dibenzofurans – EPA Method TO-9A (Lab Report - P1503139)</b>				
Sample ID	731sN-DF	731sNQ-DF	731sSQ-DF	NS
2,3,7,8-TCDD	1.38E-09	0.00E+00	8.71E-10	NS

- Bold** indicates that compound was detected above Method Detection Limits (MDL).
- "--" = The compound was not detected in the sample
- J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- 729sNQ-Summa was a source gas Summa sample collected on 7/29/15 at the North Quarry location. The canister valve seemed to not open entirely as the can arrived at the lab virtually fully pressurized. Consequently the canister did not collect enough sample volume, thus the results were deemed invalid. The North Quarry location was resampled on October 8, 2015. Sample ID: NQ Source 523.
- Two samples were sequentially at Flare Inlet location, designated sample A and B.
- M1 = Matrix interference due to coelution with a non-target compound; results may be biased high.
- Tentatively Identified Compounds – under Method: EPA TO15 + TICs. The reported concentrations for TICs are estimated. Retention time is located in parentheses next to Unknown compounds and identical compounds with different retention times.

**Table 6. Comprehensive Sampling Event #5 – Bridgeton Landfill**  
**Source Gas - Summary of Detected Compounds Collected July 29 Through July 31, 2015**  
**Compound Concentration in Source Gas – All Units µg/m<sup>3</sup>**

Analyte	Sample Locations			
	Neck	North Quarry	South Quarry	Flare Inlet

- 8. Units for fixed gases are volume analyte/volume of air %.
- 9. B = Compound detected in Trip Blank or Laboratory Method Blank
- 10. D = The reported result is from a dilution
- 11. "NS" = Not Sampled

**Table 7: Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Ambient Dioxin/Dibenzofuran Sampling Results and 2,3,7,8-TCDD Equivalent Concentration**  
 All Units µg/m<sup>3</sup>

Ambient Upwind Sample (Sample ID - 728U1-DF) - Grassy Knoll Upper Level						
Name	TEF <sup>1</sup>	Mass (pg) <sup>2</sup>	Data Validation Qualifier	TEQ <sup>3</sup>	Air volume (L)	TCDD Concentration (µg/m <sup>3</sup> ) <sup>4</sup>
2,3,7,8-TCDD	1	<3.66 <sup>5</sup>	-- <sup>6</sup>	--	3.52E+05	--
1,2,3,7,8-PeCDD	1	<4.96	--	--	3.52E+05	--
1,2,3,4,7,8-HxCDD	0.1	<3.76	--	--	3.52E+05	--
1,2,3,6,7,8-HxCDD	0.1	<3.78	--	--	3.52E+05	--
1,2,3,7,8,9-HxCDD	0.1	<3.43	--	--	3.52E+05	--
1,2,3,4,6,7,8-HpCDD	0.01	9.72	NJB <sup>7,8</sup>	0.097	3.52E+05	2.76E-10
OCDD	0.0003	40.2	NJB	0.012	3.52E+05	3.42E-11
2,3,7,8-TCDF	0.1	<5.73	--	--	3.52E+05	--
1,2,3,7,8-PeCDF	0.03	<16.5	--	--	3.52E+05	--
2,3,4,7,8-PeCDF	0.3	<17.6	--	--	3.52E+05	--
1,2,3,4,7,8-HxCDF	0.1	<3.45	--	--	3.52E+05	--
1,2,3,6,7,8-HxCDF	0.1	<3.24	--	--	3.52E+05	--
1,2,3,7,8,9-HxCDF	0.1	<3.63	UJ <sup>9</sup>	--	3.52E+05	--
2,3,4,6,7,8-HxCDF	0.1	<3.56	--	--	3.52E+05	--
1,2,3,4,6,7,8-HpCDF	0.01	11	NJB	0.110	3.52E+05	3.12E-10
1,2,3,4,7,8,9-HpCDF	0.01	<4.5	UJ	--	3.52E+05	--
OCDF	0.0003	17.4	NJB	0.005	3.52E+05	1.48E-11
<b>Total TCDD TEQ</b>				<b>0.224</b>		<b>6.37E-10</b>
Ambient Downwind Sample (Sample ID - 728D1-DF) - Midline of East Fence						
2,3,7,8-TCDD	1	<2.97	--	--	3.54E+05	--
1,2,3,7,8-PeCDD	1	<3.13	--	--	3.54E+05	--
1,2,3,4,7,8-HxCDD	0.1	<1.78	--	--	3.54E+05	--
1,2,3,6,7,8-HxCDD	0.1	2.16	NJ	0.216	3.54E+05	6.10E-10
1,2,3,7,8,9-HxCDD	0.1	<1.62	--	--	3.54E+05	--
1,2,3,4,6,7,8-HpCDD	0.01	7.51	NJB	0.075	3.54E+05	2.12E-10
OCDD	0.0003	27.7	NJB	0.008	3.54E+05	2.35E-11
2,3,7,8-TCDF	0.1	<4.87	--	--	3.54E+05	--
1,2,3,7,8-PeCDF	0.03	<2.51	--	--	3.54E+05	--
2,3,4,7,8-PeCDF	0.3	<2.69	--	--	3.54E+05	--
1,2,3,4,7,8-HxCDF	0.1	<2.74	--	--	3.54E+05	--
1,2,3,6,7,8-HxCDF	0.1	<2.57	--	--	3.54E+05	--
1,2,3,7,8,9-HxCDF	0.1	<2.88	UJ	--	3.54E+05	--
2,3,4,6,7,8-HxCDF	0.1	<2.83	--	--	3.54E+05	--
1,2,3,4,6,7,8-HpCDF	0.01	10.1	NJB	0.101	3.54E+05	2.85E-10
1,2,3,4,7,8,9-HpCDF	0.01	<2.99	UJ	--	3.54E+05	--
OCDF	0.0003	11.7	NJB	0.004	3.54E+05	9.91E-12
<b>Total TCDD TEQ</b>				<b>0.404</b>		<b>1.14E-09</b>
Ambient Sample by Flare (Sample ID - 728F-DF) - Flare Station						
2,3,7,8-TCDD	1	<2.76	--	--	3.62E+05	--
1,2,3,7,8-PeCDD	1	4.54	NJ	4.540	3.62E+05	1.25E-08
1,2,3,4,7,8-HxCDD	0.1	<2.24	--	--	3.62E+05	--
1,2,3,6,7,8-HxCDD	0.1	<2.25	--	--	3.62E+05	--
1,2,3,7,8,9-HxCDD	0.1	<2.04	--	--	3.62E+05	--
1,2,3,4,6,7,8-HpCDD	0.01	12.9	NJB	0.129	3.62E+05	3.56E-10
OCDD	0.0003	48.6	NJB	0.015	3.62E+05	4.02E-11
2,3,7,8-TCDF	0.1	<4.04	--	--	3.62E+05	--
1,2,3,7,8-PeCDF	0.03	<2.96	--	--	3.62E+05	--
2,3,4,7,8-PeCDF	0.3	<3.16	--	--	3.62E+05	--
1,2,3,4,7,8-HxCDF	0.1	2.35	NJB	0.235	3.62E+05	6.49E-10
1,2,3,6,7,8-HxCDF	0.1	3.77	NJB	0.377	3.62E+05	1.04E-09
1,2,3,7,8,9-HxCDF	0.1	<2.03	UJ	--	3.62E+05	--
2,3,4,6,7,8-HxCDF	0.1	2.69	NJB	0.269	3.62E+05	7.43E-10
1,2,3,4,6,7,8-HpCDF	0.01	13.9	NJB	0.139	3.62E+05	3.84E-10
1,2,3,4,7,8,9-HpCDF	0.01	<2.35	UJ	--	3.62E+05	--
OCDF	0.0003	15.8	NJB	0.005	3.62E+05	1.31E-11
<b>Total TCDD TEQ</b>				<b>5.708</b>		<b>1.58E-08</b>

1. TEF: World Health Organization Toxicity Equivalence Factor, Non-Detects coded to 0.  
 2. pg: Picograms  
 3. TEQ: TCDD Toxicity Equivalent Mass, TEF Adjusted Mass (Equation: Mass \* TEF)  
 4. 2,3,7,8-TCDD Equivalent Concentration (Equation: ((TEQ (pg)/Volume of Air (L)) \* 1000 L/m<sup>3</sup>) / 1,000,000 pg/ug)  
 5. "<": Not Detected  
 6. "--": Not Applicable  
 7. "NJ" = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate  
 8. "B" = The analyte was detected in the method, field, and/or trip blank.  
 9. "UJ" = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

**Table 8: Comprehensive Sampling Event #5 -Bridgeton Landfill Source**  
**Gas Dioxin/Dibenzofuran Sampling Results and 2,3,7,8-TCDD Equivalent Concentration**  
 All Units µg/m<sup>3</sup>

Source Gas Sample - (Sample ID - 731sNQ-DF) - North Quarry						
Name	TEF <sup>1</sup>	Mass (pg) <sup>2</sup>	Data Validation Qualifier	TEQ <sup>3</sup>	Air volume (L)	TCDD Concentration (µg/m <sup>3</sup> ) <sup>4</sup>
2,3,7,8-TCDD	1	<3.81 <sup>5</sup>	-- <sup>6</sup>	--	2.94E+04	--
1,2,3,7,8-PeCDD	1	<4.03	--	--	2.94E+04	--
1,2,3,4,7,8-HxCDD	0.1	<2.54	--	--	2.94E+04	--
1,2,3,6,7,8-HxCDD	0.1	<2.55	--	--	2.94E+04	--
1,2,3,7,8,9-HxCDD	0.1	<2.32	--	--	2.94E+04	--
1,2,3,4,6,7,8-HpCDD	0.01	<2.41	--	--	2.94E+04	--
OCDD	0.0003	<6.91	--	--	2.94E+04	--
2,3,7,8-TCDF	0.1	<3.81	--	--	2.94E+04	--
1,2,3,7,8-PeCDF	0.03	<2.85	--	--	2.94E+04	--
2,3,4,7,8-PeCDF	0.3	<3.04	--	--	2.94E+04	--
1,2,3,4,7,8-HxCDF	0.1	<1.43	--	--	2.94E+04	--
1,2,3,6,7,8-HxCDF	0.1	<1.34	--	--	2.94E+04	--
1,2,3,7,8,9-HxCDF	0.1	<1.5	UJ <sup>7</sup>	--	2.94E+04	--
2,3,4,6,7,8-HxCDF	0.1	<1.47	--	--	2.94E+04	--
1,2,3,4,6,7,8-HpCDF	0.01	<1.99	--	--	2.94E+04	--
1,2,3,4,7,8,9-HpCDF	0.01	<2.33	UJ	--	2.94E+04	--
OCDF	0.0003	<11	UJ	--	2.94E+04	--
<b>Total TCDD TEQ</b>	--	--	--	0.000	--	0.00E+00
Source Gas Sample - (Sample ID - 731sN-DF) - Neck						
2,3,7,8-TCDD	1	<3.24	--	--	2.97E+04	--
1,2,3,7,8-PeCDD	1	<3.04	--	--	2.97E+04	--
1,2,3,4,7,8-HxCDD	0.1	<3.12	--	--	2.97E+04	--
1,2,3,6,7,8-HxCDD	0.1	<3.14	--	--	2.97E+04	--
1,2,3,7,8,9-HxCDD	0.1	<2.85	--	--	2.97E+04	--
1,2,3,4,6,7,8-HpCDD	0.01	2.24	NJB <sup>8,9</sup>	0.022	2.97E+04	7.54E-10
OCDD	0.0003	<6.75	--	--	2.97E+04	--
2,3,7,8-TCDF	0.1	<6.17	--	--	2.97E+04	--
1,2,3,7,8-PeCDF	0.03	<2.3	--	--	2.97E+04	--
2,3,4,7,8-PeCDF	0.3	<2.46	--	--	2.97E+04	--
1,2,3,4,7,8-HxCDF	0.1	<1.4	--	--	2.97E+04	--
1,2,3,6,7,8-HxCDF	0.1	<1.31	--	--	2.97E+04	--
1,2,3,7,8,9-HxCDF	0.1	<1.47	UJ	--	2.97E+04	--
2,3,4,6,7,8-HxCDF	0.1	<1.44	--	--	2.97E+04	--
1,2,3,4,6,7,8-HpCDF	0.01	1.86	NJB	0.019	2.97E+04	6.26E-10
1,2,3,4,7,8,9-HpCDF	0.01	<1.87	UJ	--	2.97E+04	--
OCDF	0.0003	<8.93	UJ	--	2.97E+04	--
<b>Total TCDD TEQ</b>	--	--	--	0.041	--	1.38E-09
Source Gas Sample - (Sample ID - 731sSQ-DF) - South Quarry						
2,3,7,8-TCDD	1	<3.81	--	--	3.67E+04	--
1,2,3,7,8-PeCDD	1	<3.59	--	--	3.67E+04	--
1,2,3,4,7,8-HxCDD	0.1	<2.39	--	--	3.67E+04	--
1,2,3,6,7,8-HxCDD	0.1	<2.4	--	--	3.67E+04	--
1,2,3,7,8,9-HxCDD	0.1	<2.18	--	--	3.67E+04	--
1,2,3,4,6,7,8-HpCDD	0.01	2.87	NJB	0.029	3.67E+04	7.83E-10
OCDD	0.0003	10.8	NJB	0.003	3.67E+04	8.84E-11
2,3,7,8-TCDF	0.1	<4.66	--	--	3.67E+04	--
1,2,3,7,8-PeCDF	0.03	<2.9	--	--	3.67E+04	--
2,3,4,7,8-PeCDF	0.3	<3.1	--	--	3.67E+04	--
1,2,3,4,7,8-HxCDF	0.1	<1.03	--	--	3.67E+04	--
1,2,3,6,7,8-HxCDF	0.1	<0.966	--	--	3.67E+04	--
1,2,3,7,8,9-HxCDF	0.1	<1.09	UJ	--	3.67E+04	--
2,3,4,6,7,8-HxCDF	0.1	<1.07	--	--	3.67E+04	--
1,2,3,4,6,7,8-HpCDF	0.01	<1.64	--	--	3.67E+04	--
1,2,3,4,7,8,9-HpCDF	0.01	<1.91	UJ	--	3.67E+04	--
OCDF	0.0003	<6.95	UJ	--	3.67E+04	--
<b>Total TCDD TEQ</b>	--	--	--	0.032	--	8.71E-10

1. TEF: World Health Organization Toxicity Equivalence Factor. Non-Detects coded to 0.  
 2. pg: Picograms  
 3. TEQ: TCDD Toxicity Equivalent Mass, TEF Adjusted Mass (Equation: Mass \* TEF)  
 4. 2,3,7,8-TCDD Equivalent Concentration (Equation: ((TEQ (pg)/Volume of Air (L)) \* 1000 L/m<sup>3</sup>) / 1,000,000 pg/ug)  
 5. "<": Not Detected  
 6. "--": Not Applicable  
 7. "UJ" = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.  
 8. "NJB" = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.  
 9. "B" = The analyte was detected in the method, field, and/or trip blank.

Table 9. Comprehensive Sampling Event #5 –Bridgeton Landfill  
Odor Thresholds for Select Analytes in Ambient and Source Gas Air Samples  
July 28 through July 31, 2015

Analyte	Odor Threshold	Laboratory Limits (range)	Characterization of Odor
<b>Volatile Organic Compounds - Method Detection Limits</b>			
1,2,4-Trimethylbenzene	11,798 <sup>3</sup>	0.22 - 0.35	
1,3,5-Trimethylbenzene	10,815 <sup>3</sup>	0.24 - 0.38	
1,3-Butadiene	220 <sup>1</sup>	0.33 - 0.52	Aromatic, rubber
1,4-Dichlorobenzene	722 <sup>3</sup>	0.21 - 0.33	Mothballs
1,4-Dioxane	10.8 <sup>2</sup>	0.24 - 2.6	Ether-like
2-Butanone (MEK)	750 <sup>1</sup>	0.31 - 0.5	Sweet
2-Propanol	105,697 <sup>3</sup>	0.62 - 0.99	Rubbing alcohol
4-methyl-2-pentanone	410 <sup>2</sup>	0.24 - 0.38	Sweet, sharp
Acetone	47,500 <sup>2</sup>	1.1 - 1.8	Sweet minty, chemical
Benzene	4,500 <sup>2</sup>	0.24 - 0.38	Sweet solvent
Chlorobenzene	980 <sup>2</sup>	0.24 - 0.38	Almond-like, shoe polish
Cumene	39.2 <sup>2</sup>	0.22 - 0.35	Sharp
Cyclohexane	1,435 <sup>2</sup>	0.43 - 0.68	Sweet aromatic
Ethanol	342 <sup>2</sup>	1.2 - 1.9	Sweet alcohol
Ethyl acetate	1.0 <sup>1</sup>	0.52 - 0.83	Fruity, pleasant
Ethylbenzene	400 <sup>1</sup>	0.24 - 0.38	Oily solvent
m,p-Xylenes	1,000 <sup>1</sup>	0.44 - 0.71	
Naphthalene	50 <sup>1</sup>	0.27 - 0.42	Mothballs
n-Butyl acetate	2,993 <sup>3</sup>	0.24 - 0.38	Sweet banana
n-Heptane	200,000 <sup>2</sup>	0.25 - 0.4	Gasoline
n-Nonane	3,412,500 <sup>2</sup>	0.22 - 0.35	
n-Octane	725,000 <sup>2</sup>	0.27 - 0.42	Gasoline
o-Xylene	1,000 <sup>1</sup>	0.22 - 0.35	
Propene	39,584 <sup>3</sup>	0.21 - 0.33	Grassy, aromatic
Styrene	430 <sup>2</sup>	0.22 - 0.35	Solvent, rubbery
Tetrahydrofuran	7,375 <sup>2</sup>	0.3 - 0.47	Ether-like
Toluene	1,000 <sup>1</sup>	0.25 - 0.4	Rubbery mothballs
<b>Aldehydes - Method Reporting Limit</b>			
Acetaldehyde	0.2 <sup>2</sup>	0.34 - 0.36	
Butyraldehyde	13.6 <sup>2</sup>	0.34 - 0.36	
m,p-Tolualdehyde	13.6 <sup>2</sup>	0.68 - 0.72	
Propionaldehyde	10 <sup>1</sup>	0.34 - 0.36	
<b>Reduced Sulfur Compounds - Method Detection Limits</b>			
Dimethyl disulfide	0.1 <sup>2</sup>	6.6 - 10	
Dimethyl sulfide	2.5 <sup>2</sup>	8.7 - 13	Decayed cabbage
Ethyl mercaptan	0.0032 <sup>2</sup>	8.7 - 13	Garlic
Ethyl methyl sulfide	48.7 <sup>2</sup>	11 - 16	
Hydrogen sulfide	0.7 <sup>2</sup>	3.7 - 5.6	Rotten eggs
Methyl mercaptan	0.04 <sup>2</sup>	6.8 - 10	Sulfide-like
n-Butyl mercaptan	1.6 <sup>2</sup>	13 - 19	
Thiophene	2.6 <sup>2</sup>	12 - 18	Aromatic
<b>Carboxylic Acid Compounds - Method Reporting Limit</b>			
2-Methylbutanoic Acid	52.8 <sup>2</sup>	2.6 - 2.8	
3-Methylbutanoic Acid	52.8 <sup>2</sup>	2.5 - 2.7	Body odor
Acetic Acid	2,500 <sup>2</sup>	21 - 22	Sour, vinegar



**Table 9. Comprehensive Sampling Event #5 –Bridgeton Landfill**  
**Odor Thresholds for Select Analytes in Ambient and Source Gas Air Samples**  
 July 28 through July 31, 2015

<b>Analyte</b>	<b>Odor Threshold</b>	<b>Laboratory Limits (range)</b>	<b>Characterization of Odor</b>
Butanoic Acid	1.0 <sup>2</sup>	2.6 - 2.8	Sour, perspiration, human vomit
Pentanoic (Valeric) Acid	2.6 <sup>2</sup>	2.6 - 2.8	Pungent, sweaty
Propionic Acid	200 <sup>3</sup>	2.7 - 2.9	Sour
<b>PAHs - Method Reporting Limits</b>			
Naphthalene	50 <sup>1</sup>	0.0029 - 0.0032	Mothballs
Acenaphthene	505 <sup>2</sup>	0.0014 - 0.0016	
Fluorene	6,000 <sup>2</sup>	0.0014 - 0.0016	

1. US EPA, Reference Guide to Odor Thresholds for Hazardous Air Pollutants Listed in the Clean Air Act Amendments of 1990, EPA/600/R-92/047, March 1992
2. Ruth, J.H., Odor Thresholds and Irritation Levels of Several Chemical Substances: A Review, Am. Ind. Hyg. Assoc. J. 47:A-142 through A-151, March 1986
3. American Industrial Hygiene Association, Odor Thresholds for Chemicals with Established Occupational Health Standards, 1997 edition


## FIGURES

W:\0-GIS\182608020 - Bridgeton Landfill LLC\Figure 1 (July 2015 Bridgeton Landfill LLC Sampling Locations) (2015-09-04)11x17 Portrait.mxd




**Legend**

- ✚ Ambient Air Sample
- ⬠ Ambient Flare Sample
- Downwind Ambient Air Sample
- ◆ Source Gas Flare Inlet Sample
- ▲ Source Gas Sample
- Upwind Ambient Air Sample


 <p><b>Stantec</b></p> <p>1500 LAKE SHORE DRIVE, SUITE 100 COLUMBUS, OHIO 43204 PHONE: (614) 486-4383</p>	FOR: BRIDGETON LANDFILL, LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044		<b>JULY 2015 AIR AND SOURCE GAS SAMPLING LOCATIONS</b>		FIGURE: <p style="font-size: 2em; text-align: center;">1</p>
	JOB NUMBER: 182608020	DRAWN BY: AI	CHECKED BY: NI	APPROVED BY: DG	DATE: 09/04/15

W:\0-GIS\182608020 - Bridgeton Landfill, LLC\Figure 2 (Jan 2015 Bridgeton Landfill, LLC Sampling Locations) (2015-04-15)11x17 Portrait.mxd




 <b>Stantec</b> 1500 LAKE SHORE DRIVE, SUITE 100 COLUMBUS, OHIO 43204 PHONE: (614) 486-4383	FOR: BRIDGETON LANDFILL, LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044		<b>JANUARY 2015          AIR AND SOURCE          GAS SAMPLING LOCATIONS</b>		FIGURE: <div style="font-size: 2em; text-align: center;">2</div>
	JOB NUMBER: 182608020	DRAWN BY: AI	CHECKED BY: NI	APPROVED BY: DG	DATE: 09/04/15

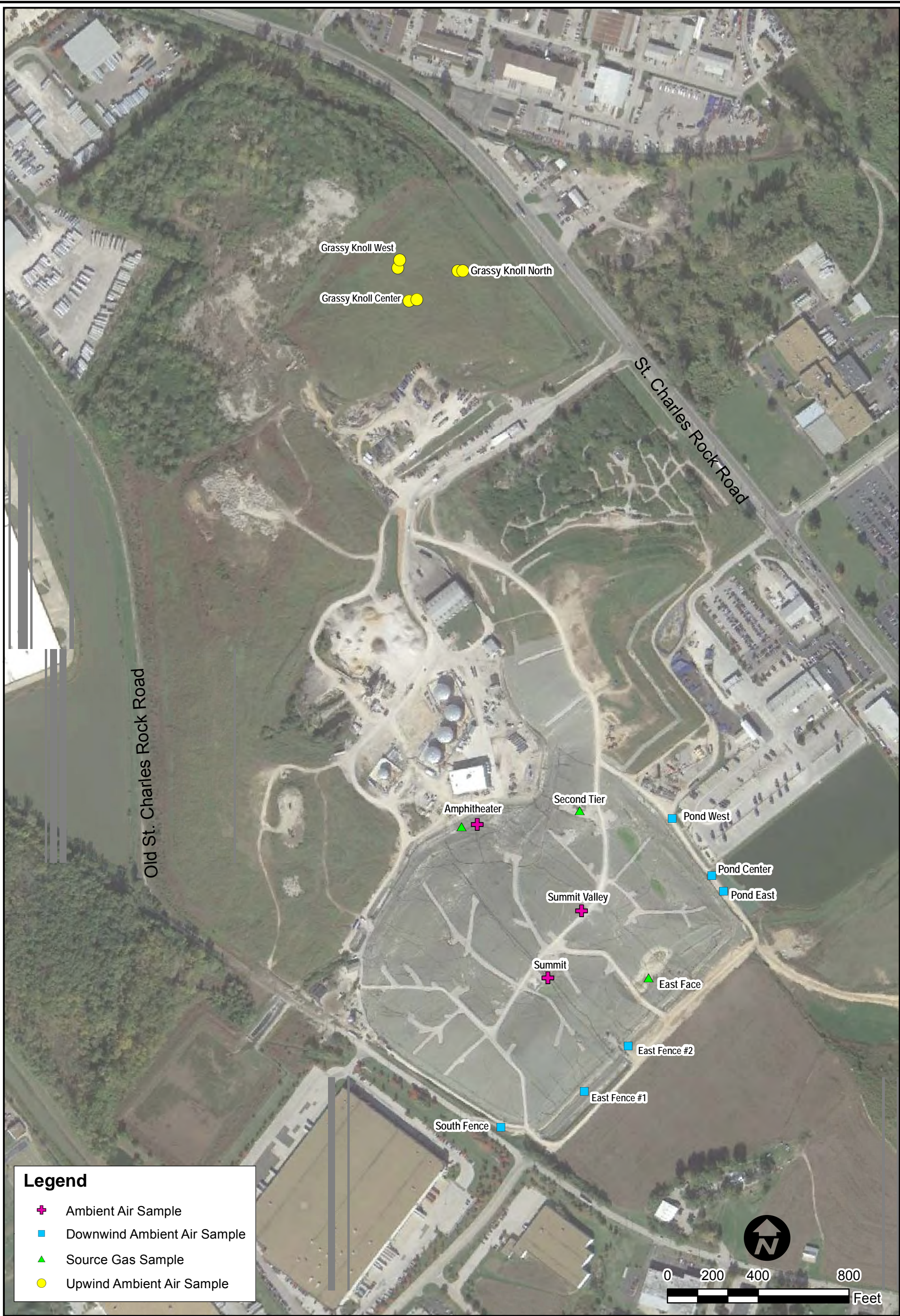


 <p><b>Stantec</b></p> <p>1500 LAKE SHORE DRIVE, SUITE 100 COLUMBUS, OHIO 43204 PHONE: (614) 486-4383</p>	FOR: BRIDGETON LANDFILL, LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044		<b>JULY 2014 AIR AND SOURCE GAS SAMPLING LOCATIONS</b>		FIGURE: <p style="font-size: 2em; text-align: center;">3</p>
	JOB NUMBER: 182608020	DRAWN BY: AI	CHECKED BY: NI	APPROVED BY: DG	DATE: 10/13/14

W:\0-GIS\182608020 - Bridgeton Landfill, LLC\Figure 4 (April-May 2013 Bridgeton Landfill, LLC Sampling Locations) (2014-9-26)1X17 Portrait.mxd



 <b>Stantec</b> 1500 LAKE SHORE DRIVE, SUITE 100 COLUMBUS, OHIO 43204 PHONE: (614) 486-4383	FOR: BRIDGETON LANDFILL, LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044		<b>APRIL - MAY 2013          AIR AND SOURCE          GAS SAMPLING LOCATIONS</b>		FIGURE: <div style="font-size: 2em; text-align: center;">4</div>
	JOB NUMBER: 182608020	DRAWN BY: AI	CHECKED BY: NI	APPROVED BY: DG	DATE: 10/14/14



**Legend**

- + Ambient Air Sample
- Downwind Ambient Air Sample
- ▲ Source Gas Sample
- Upwind Ambient Air Sample



**Stantec**  
 1500 LAKE SHORE DRIVE, SUITE 100  
 COLUMBUS, OHIO 43204  
 PHONE: (614) 486-4383

FOR:  
 BRIDGETON LANDFILL, LLC  
 13570 ST. CHARLES ROCK ROAD  
 BRIDGETON, MISSOURI 63044

JOB NUMBER: 182608020      DRAWN BY: AI

**AUGUST 2012  
 AIR AND SOURCE  
 GAS SAMPLING LOCATIONS**

CHECKED BY: NI      APPROVED BY: DG

FIGURE:  
5

DATE: 10/13/14



**Photo #1** Source Gas Sampling Flux-box.



**Photo #2** Collection of samples from the sampling port on the flux-box.



**Photo #3** High volume sampling of source gas from under the EVOH.



**Photo #4** Benzene monitoring of High volume source gas exhaust at the south quarry location.





**Photo #5** Collection of source gas PAH/Dioxin samples with MDNR oversight.



**Photo #6** Ambient Sample Pumps Setup at Flare Station.



**Photo #7** Setup of Ambient Sample Pumps with MDNR oversight.



**Photo #8** Setup of Ambient Flare Dioxin Sample.

**APPENDIX A – SAMPLE SUMMARY TABLES**  
**JULY 28 - July 31, 2015**

Table A1 - 3rd Comprehensive Bridgeton Landfill Sampling Event (July 28, 2015) Summary of Sampling Procedures/Calibration/Methods

Upwind Location 1 - South Fence

Sample ID	Sample Date	Start Time	Stop Time	Duration	Compound	Analytical Method	Canister ID	Regulator ID	Start Pres	End Pres	Pump ID	Pre-Cal	Post-Cal	mean flow	PD	Total Volume	Total Volume COC
				Minutes					psi	psi		ml/min	ml/min	ml/min	%	ml	liters
728U1-Summa	7/28/2015	9:32	17:10	458	VOCs	TO-15 + TICs	as00819	sfc00029	-30	-9	NA	NA	NA	NA	NA	NA	NA
					Reduced Sulfur	ASTM D5504											
					Fixed Gases	EPA 3C m											
728U1-Ald	7/28/2015	9:29	13:33	244	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b18736b	1206	1140	1173.0	-5.8%	286,212	286.2
728U1-HCn	7/28/2015	9:29	13:33	244	Hydrogen Cyanide	NIOSH 6010	NA	NA	NA	NA	b20073b	63.4	72.5	68.0	12.6%	16,580	16.6
728U1-Amine	7/28/2015	9:29	13:33	244	Amines	AQL 101	NA	NA	NA	NA	b20582b	60.3	59.3	59.8	-1.7%	14,591	14.6
728U1-Hg	7/28/2015	9:29	13:33	244	Mercury	NIOSH 6009	NA	NA	NA	NA	b20585b	200.1	202.4	201.3	1.1%	49,105	49.1
728U1-NH3	7/28/2015	9:29	13:33	244	Ammonia	OSHA ID 188	NA	NA	NA	NA	b20578b	454	470.5	462.3	3.5%	112,789	112.8
728U1-Carbox	7/28/2015	9:29	13:33	244	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b18074b	402.8	406.1	404.5	0.8%	98,686	98.7
728-Dup01	7/28/2015	9:29	13:33	244	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b20303b	1210	1140	1175.0	-6.1%	286,700	286.7
728U1-DF	7/28/2015	17:46	17:46	1440	Dioxins/furans	EPA TO 9a	1075	302-58-013	NA	NA		54	55	54.5	1.8%	352,199	
731U1-PAH	7/30/2015	9:22	9:41	1459	PAHs	EPA TO 13	1075	hx176	NA	NA		40	40	40.0	0.0%	310,812	

High Flow: Pre and Post readings for high flow PUF samples were magnehlic readings, mean flow rates were determined from calibration curves. Mean flow units = L/min, Total Volume Units = Liters

Downwind Location 1 - Fence by Republic Parking Lot

Sample ID	Sample Date	Start Time	Stop Time	Duration	Compound	Analytical Method	Canister ID	Regulator ID	Start Pres	End Pres	Pump ID	Pre-Cal	Post-Cal	mean flow	PD	Total Volume	Total Volume COC
				Minutes					psi	psi		ml/min	ml/min	ml/min	%		
728D1-Summa	7/28/2015	9:20	17:00	460	VOCs	TO-15 + TICs	as00300	sfc00021	-30	-10	NA	NA	NA	NA	NA	NA	NA
					Reduced Sulfur	ASTM D5504											
					Fixed Gases	EPA 3C m											
728-Dupe10	7/28/2015	9:47	17:00	433	VOCs	TO-15 + TICs	as00113	sfc00032	-30	-5	NA	NA	NA	NA	NA	NA	NA
					Reduced Sulfur	ASTM D5504											
					Fixed Gases	EPA 3C m											
728D1-Ald	7/28/2015	9:16	13:15	239	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b18730b	1224	1160	1192.0	-5.5%	284,888	284.9
728D1-HCn	7/28/2015	9:16	13:15	239	Hydrogen Cyanide	NIOSH 6010	NA	NA	NA	NA	b20062b	60	63.1	61.6	4.9%	14,710	14.7
728D1-Amine	7/28/2015	9:16	13:15	239	Amines	AQL 101	NA	NA	NA	NA	b20071b	65.1	65	65.1	-0.2%	15,547	15.5
728D1-Hg	7/28/2015	9:16	13:15	239	Mercury	NIOSH 6009	NA	NA	NA	NA	b19876b	200.1	202.3	201.2	1.1%	48,087	48.1
728D1-NH3	7/28/2015	9:16	13:15	239	Ammonia	OSHA ID 188	NA	NA	NA	NA	b19883b	445	445.4	445.2	0.1%	106,403	106.4
728D1-Carbox	7/28/2015	9:16	13:15	239	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b18732b	402.2	390.9	396.6	-2.9%	94,775	94.8
728-Dup02	7/28/2015	9:16	13:15	239	Mercury	NIOSH 6009	NA	NA	NA	NA	b20074b	203.4	204.4	203.9	0.5%	48,732	48.7
728D1-DF	7/28/2015	19:13	19:13	1440	Dioxins/furans	EPA TO 9a	1085	302-58-014	NA	NA		52	54	53	3.7%	354,330	
731D1-PAH	7/30/2015	8:34	8:34	1440	PAHs	EPA TO 13	1085	hx016	NA	NA		50	46	48	-8.7%	339,055	

High Flow: Pre and Post readings for high flow PUF samples were magnehlic readings, mean flow rates were determined from calibration curves. Mean flow units = L/min, Total Volume Units = Liters

PUF Collected on East Fence

Downwind Location 2 -Upper Road by Neck

Sample ID	Sample Date	Start Time	Stop Time	Duration	Compound	Analytical Method	Canister ID	Regulator ID	Start Pres	End Pres	Pump ID	Pre-Cal	Post-Cal	mean flow	PD	Total Volume	Total Volume COC
				Minutes					psi	psi		ml/min	ml/min	ml/min	%		
728D2-Summa	7/28/2015	9:44	17:17	453	VOCs	TO-15 + TICs	as00655	sfc00061	-30	-6	NA	NA	NA	NA	NA	NA	NA
					Reduced Sulfur	ASTM D5504											
					Fixed Gases	EPA 3C m											
728D2-Ald	7/28/2015	9:44	13:47	243	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b20296b	1228	1210	1219.0	-1.5%	296,217	296.2

**Table A1 - 3rd Comprehensive Bridgeton Landfill Sampling Event (July 28, 2015) Summary of Sampling Procedures/Calibration/Methods**

728D2-Amine	7/28/2015	9:44	13:47	243	Amines	AQL 101	NA	NA	NA	NA	b19874b	59.9	290	175.0	79.3%	42,513	42.5
728D2-NH3	7/28/2015	9:44	13:47	243	Ammonia	OSHA ID 188	NA	NA	NA	NA	b19875b	449	447	448.0	-0.4%	108,864	108.9
728D2-Carbox	7/28/2015	9:44	13:47	243	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b20065b	395.1	365.8	380.5	-8.0%	92,449	92.4
<i>Landfill - Flare</i>																	
Sample ID	Sample Date	Start Time	Stop Time	Duration	Compound	Analytical Method	Canister ID	Regulator ID	Start Pres	End Pres	Pump ID	Pre-Cal	Post-Cal	mean flow	PD	Total Volume	Total Volume COC
				Minutes					psi	psi		ml/min	ml/min	ml/min	%	ml	liters
728F-Summa	7/28/2015	9:03	16:50	467	VOCs	TO-15 + TICs	as00846	sfc00046	-30	-8	NA	NA	NA	NA	NA	NA	NA
					Reduced Sulfur	ASTM D5504											
					Fixed Gases	EPA 3C m											
728F-Ald	7/28/2015	8:57	13:04	247	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b19904b	1217	1150	1183.5	-5.8%	292,325	292.3
728F-HCn	7/28/2015	8:57	13:04	247	Hydrogen Cyanide	NIOSH 6010	NA	NA	NA	NA	b19877b	62	74	68.0	16.2%	16,796	16.8
728F-Amine	7/28/2015	8:57	13:04	247	Amines	AQL 101	NA	NA	NA	NA	b20064b	58.8	59.6	59.2	1.3%	14,622	14.6
728F-Hg	7/28/2015	8:57	13:04	247	Mercury	NIOSH 6009	NA	NA	NA	NA	b19862b	198.4	198.4	198.4	0.0%	49,005	49.0
728F-NH3	7/28/2015	8:57	13:04	247	Ammonia	OSHA ID 188	NA	NA	NA	NA	b20063b	445	444	444.5	-0.2%	109,792	109.8
728F-Carbox	7/28/2015	8:57	13:04	247	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b20586b	400	370.9	385.5	-7.8%	95,206	95.2
728-Dup03	7/28/2015	8:57	13:04	247	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b20256b	400.2	380	390.1	-5.3%	96,355	96.4
728F-DF	7/28/2015	17:00	17:00	1440	Dioxins/furans	EPA TO 9a	1068	302-58-015	NA	NA		64	72	68.0	11.1%	362,249	
731F-PAH	7/30/2015	8:22	8:22	1440	PAHs	EPA TO 13	1068	hx056	NA	NA		64	60	62.0	-6.7%	346,630	

*High Flow: Pre and Post readings for high flow PUF samples were magnetic readings, mean flow rates were determined from calibration curves. Mean flow units = L/min, Total Volume Units = Liters*

*Landfill - South Quarry*

Sample ID	Sample Date	Start Time	Stop Time	Duration	Compound	Analytical Method	Canister ID	Regulator ID	Start Pres	End Pres	Pump ID	Pre-Cal	Post-Cal	mean flow	PD	Total Volume	Total Volume COC
				Minutes					psi	psi		ml/min	ml/min	ml/min	%		
728SQ-Summa	7/28/2015	9:55	17:40	465	VOCs	TO-15 + TICs	as00582	sfc00066	-30	-9	NA	NA	NA	NA	NA	NA	NA
					Reduced Sulfur	ASTM D5504											
					Fixed Gases	EPA 3C m											
728SQ-Ald	7/28/2015	9:55	13:56	241	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b20298b	1205	1179	1192.0	-2.2%	287,272	287.3
728SQ-HCn	7/28/2015	9:55	13:56	241	Hydrogen Cyanide	NIOSH 6010	NA	NA	NA	NA	b19863b	63	60	61.5	-5.0%	14,822	14.8
728SQ-Amine	7/28/2015	9:55	13:56	241	Amines	AQL 101	NA	NA	NA	NA	b19878b	62.8	61.4	62.1	-2.3%	14,966	15.0
728SQ-Hg	7/28/2015	9:55	13:56	241	Mercury	NIOSH 6009	NA	NA	NA	NA	b20254b	199.3	199.4	199.4	0.1%	48,043	48.0
728SQ-NH3	7/28/2015	9:55	13:56	241	Ammonia	OSHA ID 188	NA	NA	NA	NA	b20068b	449	440	444.5	-2.0%	107,125	107.1
728SQ-Carbox	7/28/2015	9:55	13:56	241	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b19879b	396.3	365.9	381.1	-8.3%	91,845	91.8

Table A2 - 3rd Comprehensive Bridgeton Landfill Sampling Event (July 29, 2015) Summary of Sampling Procedures/Calibration/Methods

Uplwind Location 1 -Grassy Knoll Upper Level

Sample ID	Sample Date	Start Time	Stop Time	Duration	Compound	Analytical Method	Canister ID	Regulator ID	Start Pres	End Pres	Pump ID	Pre-Cal	Post-Cal	mean flow	PD	Total Volume	Total Volume COC
				Minutes					psi	psi		ml/min	ml/min	ml/min	%	ml	liters
729U1-Summa	7/29/2015	9:15	17:09	474	VOCs	TO-15 + TICs	as00417	sfc00024	-28.5	-8	NA	NA	NA	NA	NA	NA	NA
					Reduced Sulfur	ASTM D5504											
					Fixed Gases	EPA 3C m											
729-Dupe11	7/29/2015	9:15	--	--	VOCs	TO-15 + TICs	ssc00247	sfc00059	-30	-7.5	NA	NA	NA	NA	NA	NA	NA
					Reduced Sulfur	ASTM D5504											
					Fixed Gases	EPA 3C m											
729U1-Ald	7/29/2015	11:45	15:45	240	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b18736b	1180	1150	1165.0	-2.6%	279,600	279.6
729U1-Amine	7/29/2015	11:45	15:45	240	Amines	AQL 101	NA	NA	NA	NA	b20582b	60.8	56.5	58.7	-7.6%	14,076	14.1
729U1-NH3	7/29/2015	11:45	15:45	240	Ammonia	OSHA ID 188	NA	NA	NA	NA	b20578b	449.2	430.8	440.0	-4.3%	105,600	105.6
729U1-Carbox	7/29/2015	11:45	15:45	240	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b18074b	405.5	391.5	398.5	-3.6%	95,640	95.6

High Flow: Pre and Post readings for high flow PUF samples were magnehlic readings, mean flow rates were determined from calibration curves. Mean flow units = L/min, Total Volume Units = Liters

Downwind Location 1 - East Fence Near New Flare

Sample ID	Sample Date	Start Time	Stop Time	Duration	Compound	Analytical Method	Canister ID	Regulator ID	Start Pres	End Pres	Pump ID	Pre-Cal	Post-Cal	mean flow	PD	Total Volume	Total Volume COC
				Minutes					psi	psi		ml/min	ml/min	ml/min	%		
729D1-Summa	7/29/2015	9:40	17:38	478	VOCs	TO-15 + TICs	ssc00149	sfc00033	-28	-7.5	NA	NA	NA	NA	NA	NA	NA
					Reduced Sulfur	ASTM D5504											
					Fixed Gases	EPA 3C m											
729D1-Ald	7/29/2015	12:02	16:03	241	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b18730b	1200	1150	1175.0	-4.3%	283,175	283.2
729D1-Amine	7/29/2015	12:02	16:03	241	Amines	AQL 101	NA	NA	NA	NA	b20062b	58.3	54.7	56.5	-6.6%	13,617	13.6
729D1-NH3	7/29/2015	12:02	16:03	241	Ammonia	OSHA ID 188	NA	NA	NA	NA	b19883b	445.4	436.8	441.1	-2.0%	106,305	106.3
729D1-Carbox	7/29/2015	12:02	16:03	241	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b18732b	399.1	385.7	392.4	-3.5%	94,568	94.6

High Flow: Pre and Post readings for high flow PUF samples were magnehlic readings, mean flow rates were determined from calibration curves. Mean flow units = L/min, Total Volume Units = Liters

Downwind Location 2 -Road heading toward East Fence by Retention Ponds

Sample ID	Sample Date	Start Time	Stop Time	Duration	Compound	Analytical Method	Canister ID	Regulator ID	Start Pres	End Pres	Pump ID	Pre-Cal	Post-Cal	mean flow	PD	Total Volume	Total Volume COC
				Minutes					psi	psi		ml/min	ml/min	ml/min	%		
729D2-Ald	7/29/2015	11:55	15:55	240	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b20296b	1210	1220	1215.0	0.8%	291,600	291.6
729D2-Amine	7/29/2015	11:55	15:55	240	Amines	AQL 101	NA	NA	NA	NA	b20585b	60.1	56.1	58.1	-7.1%	13,944	13.9
729D2-NH3	7/29/2015	11:55	15:55	240	Ammonia	OSHA ID 188	NA	NA	NA	NA	b20254b	442.6	437.9	440.3	-1.1%	105,660	105.7
729D2-Carbox	7/29/2015	11:55	15:55	240	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b20065b	396.6	367.1	381.9	-8.0%	91,644	91.6

Landfill - Neck

Sample ID	Sample Date	Start Time	Stop Time	Duration	Compound	Analytical Method	Canister ID	Regulator ID	Start Pres	End Pres	Pump ID	Pre-Cal	Post-Cal	mean flow	PD	Total Volume	Total Volume COC
				Minutes					psi	psi		ml/min	ml/min	ml/min	%	ml	liters
729N-Summa	7/29/2015	9:35	18:17	467	VOCs	TO-15 + TICs	ssc00056	sfc00025	-30	-12	NA	NA	NA	NA	NA	NA	NA
					Reduced Sulfur	ASTM D5504											
					Fixed Gases	EPA 3C m											
729N-Ald	7/29/2015	13:12	17:12	240	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b19904b	1160	1155	1157.5	-0.4%	277,800	277.8
729N-HCN	7/29/2015	13:12	17:12	240	Hydrogen Cyanide	NIOSH 6010	NA	NA	NA	NA	b19877b	62.6	60	61.3	-4.3%	14,712	14.7
729N-Amine	7/29/2015	13:12	17:12	240	Amines	AQL 101	NA	NA	NA	NA	b20073b	63.7	60.7	62.2	-4.9%	14,928	14.9
729N-Hg	7/29/2015	13:12	17:12	240	Mercury	NIOSH 6009	NA	NA	NA	NA	b20074b	200.6	181.68	191.1	-10.4%	45,874	45.9
729N-NH3	7/29/2015	13:12	17:12	240	Ammonia	OSHA ID 188	NA	NA	NA	NA	b20063b	460.9	421	441.0	-9.5%	105,828	105.8

**Table A2 - 3rd Comprehensive Bridgeton Landfill Sampling Event (July 29, 2015) Summary of Sampling Procedures/Calibration/Methods**

729N-Carbox	7/29/2015	13:12	17:12	240	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b20586b	398.3	364.4	381.4	-9.3%	91,524	91.5
<i>High Flow: Pre and Post readings for high flow PUF samples were magnehlic readings, mean flow rates were determined from calibration curves. Mean flow units = L/min, Total Volume Units = Liters</i>																	
<b>Landfill - North Quarry</b>																	
Sample ID	Sample Date	Start Time	Stop Time	Duration	Compound	Analytical Method	Canister ID	Regulator ID	Start Pres	End Pres	Pump ID	Pre-Cal	Post-Cal	mean flow	PD	Total Volume	Total Volume COC
				Minutes					psi	psi		ml/min	ml/min	ml/min	%		
729NQ-Summa	7/29/2015	9:25	18:08	473	VOCs	TO-15 + TICs	as00199	sfc00047	-28	-12	NA	NA	NA	NA	NA	NA	NA
					Reduced Sulfur	ASTM D5504											
					Fixed Gases	EPA 3C m											
729NQ-Ald	7/29/2015	14:25	18:24	239	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b20298b	1180	1180	1180.0	0.0%	282,020	282.0
729NQ-HCN	7/29/2015	14:25	18:24	239	Hydrogen Cyanide	NIOSH 6010	NA	NA	NA	NA	b19874b	63.2	60.1	61.7	-5.2%	14,734	14.7
729NQ-Amine	7/29/2015	14:25	18:24	239	Amines	AQL 101	NA	NA	NA	NA	b19878b	60.2	57.7	59.0	-4.3%	14,089	14.1
729NQ-Hg	7/29/2015	14:25	18:24	239	Mercury	NIOSH 6009	NA	NA	NA	NA	b19876b	195.9	182	189.0	-7.6%	45,159	45.2
729NQ-NH3	7/29/2015	14:25	18:24	239	Ammonia	OSHA ID 188	NA	NA	NA	NA	b19875b	447.9	428.5	438.2	-4.5%	104,730	104.7
729NQ-Carbox	7/29/2015	14:25	18:24	239	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b20256b	403.2	379.4	391.3	-6.3%	93,521	93.5



Table A3 - 3rd Comprehensive Bridgeton Landfill Sampling Event (July 29, 2015) Summary of Sampling Procedures/Calibration/Methods

729sF-Ald	7/29/2015	9:46	9:47	1	Aldehydes	EPA TO 11a	NA	NA	NA	NA	b20303b	1170	1110	1140.0	-5.4%	1,140	1.140
729sF-HCn	7/29/2015	10:18	10:21	3	Hydrogen Cyanide	NIOSH 6010	NA	NA	NA	NA	b19863b	61.8	55.7	58.8	-11.0%	176	0.176
729sF-Amine	7/29/2015	9:57	10:01	4	Amines	AQL 101	NA	NA	NA	NA	b20064b	59	55.1	57.1	-7.1%	228	0.228
729sF-Hg	7/29/2015	10:23	10:26	3	Mercury	NIOSH 6009	NA	NA	NA	NA	b19862b	198.9	187.2	193.1	-6.3%	579	0.579
729sF-NH3	7/29/2015	10:09	10:11	2	Ammonia	OSHA ID 188	NA	NA	NA	NA	b20068b	457.5	432.6	445.1	-5.8%	890	0.890
729sF-Carbox	7/29/2015	10:04	10:07	3	Carboxylic Acids	AQL 102	NA	NA	NA	NA	b19879b	394.9	376.1	385.5	-5.0%	1,157	1.157
729-Dup04	7/29/2015	10:14	10:17	3	Hydrogen Cyanide	NIOSH 6010	NA	NA	NA	NA	b19863b	61.8	55.7	58.8	-11.0%	176	0.176



**Table A4-3rd Comprehensive Bridgeton Landfill Sampling Event (July 31, 2015) Summary of Sampling Procedures/Calibration/Methods**

Sample ID	Sample Date	Start Time	Stop Time	Duration	Compound	Analytical Method	Canister ID	Regulator ID	Start Pres	End Pres	Can Vol	Pre-Cal	Post-Cal	mean flow	PD	Total Volume	Location
				Minutes					psi	psi	L	ml/min	ml/min	ml/min	%		
731sN-DF	7/31/2015	11:40	13:40	120	Dioxins/furans	EPA TO 9a	302-58-004	1060	NA	NA	NA	42	45	43.5		29,708	NECK
731sN-PAH	7/31/2015	11:40	13:40	120	PAHs	EPA TO 13	h-001	1068	NA	NA	NA	58	28	43.0		24,282	NECK
731sNQ-DF	7/31/2015	10:04	12:07	123	Dioxins/furans	EPA TO 9a	302-58-007	1075	NA	NA	NA	54	50	52.0		29,455	NORTH QUARRY
731sNQ-PAH	7/31/2015	10:04	12:07	123	PAHs	EPA TO 13	h-013	1085	NA	NA	NA	40	5	22.5		20,861	NORTH QUARRY
731sSQ-DF	7/31/2015	9:13	11:46	153	Dioxins/furans	EPA TO 9a	302-58-001	1113	NA	NA	NA	53	48	50.5		36,669	SOUTH QUARRY
731sSQ-PAH	7/31/2015	9:13	11:46	153	PAHs	EPA TO 13	hx003	1095	NA	NA	NA	45	5	25.0		30,994	SOUTH QUARRY

*High Flow: Pre and Post readings for high flow PUF samples were magnehlic readings, mean flow rates were determined from calibration curves. Mean flow units = L/min, Total Volume Units = Liters*

# APPENDIX B – LABORATORY ANALYTICAL RESULTS



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[www.alsglobal.com](http://www.alsglobal.com)

## LABORATORY REPORT

August 14, 2015

Deborah Gray  
Stantec Consulting Services, Inc.  
1500 Lake Shore Drive Suite 100  
Columbus, OH 43204

**RE: Bridgeton / 182608020**

Dear Deborah:

Enclosed are the results of the samples submitted to our laboratory on July 31, 2015. The NIOSH 6009 and NIOSH 6010 samples were submitted for analysis to the ALS Environmental location in Salt Lake City, UT. Please find their report 34-1521703 attached at the end of this report. For your reference, these analyses have been assigned our service request number P1503123.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**ALS | Environmental**

By Samantha Henningsen at 4:29 pm, Aug 14, 2015

Samantha Henningsen  
Project Manager



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Simi Valley, CA 93065  
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[www.alsglobal.com](http://www.alsglobal.com)

Client: Stantec Consulting Services, Inc.  
Project: Bridgeton / 182608020

Service Request No: P1503123

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## CASE NARRATIVE

The samples were received intact under chain of custody on July 31, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

### Aldehyde Analysis

The DNPH silica gel tube samples were analyzed for aldehydes according to EPA Method TO-11A using high performance liquid chromatography (HPLC). This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

### Ammonia Analysis

The Anasorb 747 tube samples were prepared in accordance with OSHA ID-188 and analyzed for ammonia in air by Ion Selective Electrode per OSHA ID-164. This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

### Amine Analysis

The Alumina tube samples were analyzed for amines using a gas chromatograph equipped with a nitrogen phosphorus detector (NPD). This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

The minimum criterion for Dimethylamine was not met in the Continuing Calibration Verification (CCV) analyzed on August 3, 2015. In accordance with ALS standard operating procedures, a Method Reporting Limit (MRL) check standard containing the analyte of concern was analyzed each day of analysis. The MRL check standard verified that instrument sensitivity was adequate to detect the compound at the MRL on the day of analysis. Because the sensitivity was shown to be adequate to detect the analyte in question and the compound was not detected in the field samples, the data quality has not been significantly affected. This procedure is a quantitative confirmation of non-detect results at or below the MRL. No further corrective action was necessary.

### Carboxylic Acids Analysis

The Silica gel tube samples were analyzed for carboxylic acids using combined gas chromatography/mass spectrometry (GC/MS) in accordance with laboratory operating



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Client: Stantec Consulting Services, Inc.  
Project: Bridgeton / 182608020

Service Request No: P1503123

---

## CASE NARRATIVE

procedures. This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

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*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*



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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>	101661
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0694
DoD ELAP	<a href="http://www.pjlabs.com/search-accredited-labs">http://www.pjlabs.com/search-accredited-labs</a>	L14-2
Florida DOH (NELAP)	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E871020
Maine DHHS	<a href="http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm">http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm</a>	2014025
Minnesota DOH (NELAP)	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	876241
New Jersey DEP (NELAP)	<a href="http://www.nj.gov/dep/oqa/">http://www.nj.gov/dep/oqa/</a>	CA009
New York DOH (NELAP)	<a href="http://www.wadsworth.org/labcert/elap/elap.html">http://www.wadsworth.org/labcert/elap/elap.html</a>	11221
Oregon PHD (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	4068-001
Pennsylvania DEP	<a href="http://www.depweb.state.pa.us/labs">http://www.depweb.state.pa.us/labs</a>	68-03307 (Registration)
Texas CEQ (NELAP)	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704413-15-6
Utah DOH (NELAP)	<a href="http://www.health.utah.gov/lab/labimp/certification/index.html">http://www.health.utah.gov/lab/labimp/certification/index.html</a>	CA01627201 5-5
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at [www.alsglobal.com](http://www.alsglobal.com), or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

# ALS ENVIRONMENTAL

## DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: Bridgeton / 182608020

Service Request: P1503123

Date Received: 7/31/2015  
 Time Received: 10:00

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	TO-11A - Carbonyls	Amines - Amines	OSHA ID-164 Modified - Ammonia	Carbox Acids - Carboxy Acids
728U1-Ald	P1503123-001	Air	7/28/2015	13:33	X			
728U1-Amine	P1503123-003	Air	7/28/2015	13:33		X		
728U1-NH3	P1503123-005	Air	7/28/2015	13:33			X	
728U1-Carbox	P1503123-006	Air	7/28/2015	13:33				X
728D1-Ald	P1503123-007	Air	7/28/2015	13:15	X			
728D1-Amine	P1503123-009	Air	7/28/2015	13:15		X		
728D1-NH3	P1503123-011	Air	7/28/2015	13:15			X	
728D1-Carbox	P1503123-012	Air	7/28/2015	13:15				X
728D2-Ald	P1503123-013	Air	7/28/2015	13:47	X			
728D2-Amine	P1503123-014	Air	7/28/2015	13:47		X		
728D2-NH3	P1503123-015	Air	7/28/2015	13:47			X	
728D2-Carbox	P1503123-016	Air	7/28/2015	13:47				X
728F-Ald	P1503123-017	Air	7/28/2015	13:04	X			
728F-Amine	P1503123-019	Air	7/28/2015	13:04		X		
728F-NH3	P1503123-021	Air	7/28/2015	13:04			X	
728F-Carbox	P1503123-022	Air	7/28/2015	13:04				X
728SQ-Ald	P1503123-023	Air	7/28/2015	13:56	X			
728SQ-Amine	P1503123-025	Air	7/28/2015	13:56		X		
728SQ-NH3	P1503123-027	Air	7/28/2015	13:56			X	
728SQ-Carbox	P1503123-028	Air	7/28/2015	13:56				X
729U1-Ald	P1503123-029	Air	7/29/2015	15:45	X			
729U1-Amine	P1503123-030	Air	7/29/2015	15:45		X		
729U1-NH3	P1503123-031	Air	7/29/2015	15:45			X	
729U1-Carbox	P1503123-032	Air	7/29/2015	15:45				X
729D1-Ald	P1503123-033	Air	7/29/2015	16:03	X			
729D1-Amine	P1503123-034	Air	7/29/2015	16:03		X		
729D1-NH3	P1503123-035	Air	7/29/2015	16:03			X	
729D1-Carbox	P1503123-036	Air	7/29/2015	16:03				X
729D2-Ald	P1503123-037	Air	7/29/2015	15:55	X			
729D2-Amine	P1503123-038	Air	7/29/2015	15:55		X		
729D2-NH3	P1503123-039	Air	7/29/2015	15:55			X	
729D2-Carbox	P1503123-040	Air	7/29/2015	15:55				X
729N-Ald	P1503123-041	Air	7/29/2015	17:12	X			
729N-Amine	P1503123-043	Air	7/29/2015	17:12		X		
729N-NH3	P1503123-045	Air	7/29/2015	17:12			X	
729N-Carbox	P1503123-046	Air	7/29/2015	17:12				X
729NQ-Ald	P1503123-047	Air	7/29/2015	18:24	X			
729NQ-Amine	P1503123-049	Air	7/29/2015	18:24		X		
729NQ-NH3	P1503123-051	Air	7/29/2015	18:24			X	
729NQ-Carbox	P1503123-052	Air	7/29/2015	18:24				X

# ALS ENVIRONMENTAL

## DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: Bridgeton / 182608020

Service Request: P1503123

Date Received: 7/31/2015  
 Time Received: 10:00

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	TO-11A - Carbonyls	Amines - Amines	OSHA ID-164 Modified - Ammonia	Carbox Acids - Carboxy Acids
729sN-Ald	P1503123-053	Air	7/29/2015	12:52	X			
729sN-Amine	P1503123-055	Air	7/29/2015	12:23		X		
729sN-NH3	P1503123-057	Air	7/29/2015	12:57			X	
729sN-Carbox	P1503123-058	Air	7/29/2015	12:49				X
729sNQ-Ald	P1503123-059	Air	7/29/2015	14:10	X			
729sNQ-Amine	P1503123-061	Air	7/29/2015	13:47		X		
729sNQ-NH3	P1503123-063	Air	7/29/2015	14:01			X	
729sNQ-Carbox	P1503123-064	Air	7/29/2015	14:24				X
729sSQ-Ald	P1503123-065	Air	7/29/2015	11:38	X			
729sSQ-Amine	P1503123-067	Air	7/29/2015	11:25		X		
729sSQ-NH3	P1503123-069	Air	7/29/2015	11:51			X	
729sSQ-Carbox	P1503123-070	Air	7/29/2015	11:33				X
729sF-Ald	P1503123-071	Air	7/29/2015	09:47	X			
729sF-Amine	P1503123-073	Air	7/29/2015	10:01		X		
729sF-NH3	P1503123-075	Air	7/29/2015	10:11			X	
729sF-Carbox	P1503123-076	Air	7/29/2015	10:07				X
728-Dup01	P1503123-077	Air	7/28/2015	00:00	X			
728-Dup03	P1503123-079	Air	7/28/2015	00:00				X
729-Dup05	P1503123-081	Air	7/29/2015	00:00		X		
729-Dup06	P1503123-082	Air	7/29/2015	00:00			X	
730FB-Ald	P1503123-083	Air	7/30/2015	16:00	X			
730FB-Amine	P1503123-085	Air	7/30/2015	16:00		X		
730FB-NH3	P1503123-087	Air	7/30/2015	16:00			X	
730FB-Carbox	P1503123-088	Air	7/30/2015	16:00				X





# Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A  
 Simi Valley, California 93065  
 Phone: (805) 528-7161 Fax: (805) 528-7270

Company Name & Address (Reporting Information)  
 Stantec Consulting  
 1500 Lake Shore Drive  
 Columbus Ohio

Project Manager  
 Deb.Gray@Stantec.com  
 Phone 614-643-4362  
 Email Address for Result Reporting  
 Deb.Gray@Stantec.com

Sampler (Print & Sign)  
 NI/CJL  
 Chris.lalonde@stantec.com

Requested Turnaround Time in Business Days (Surcharges) Please Circle:  
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day (Standard)

ALS Project No. **P1583123**

Project Name  
 Bridgeton  
 Project Number  
 182608020  
 ALS Contact:  
 Samantha Henningsen

P.O. # / Billing Information  
 Amy Hargrove/Bridgeton LF

Client Sample ID	Laboratory ID #	Tube ID	Date Collected	Sampling Pump Flow (mL/min)	Sampling Start Time	Sampling End Time	Sample Volume (L)	Analysis Method/Analytes				Comments e.g. Actual Preservative or specific instructions	
								EPA TO 116	NIOSH 6010	AQI 101	NIOSH 6009		OSHA ID 188
728U1-Ald	1		7/28/2015	1173.0	9:29	13:33	286.2	X					244
728U1-HCn	2		7/28/2015	68.0	9:29	13:33	16.6		X				244
728U1-Amine	3		7/28/2015	59.8	9:29	13:33	14.6			X			244
728U1-Hg	4		7/28/2015	201.3	9:29	13:33	48.1				X		244
728U1-NH3	5		7/28/2015	482.3	9:29	13:33	112.8				X		244
728U1-Carbox	6		7/28/2015	404.5	9:29	13:33	98.7					X	244
728D1-Ald	7		7/28/2015	1192.0	9:16	13:15	284.9	X					239
728D1-HCn	8		7/28/2015	61.6	9:16	13:15	14.7		X				239
728D1-Amine	9		7/28/2015	65.1	9:16	13:15	15.5			X			239
728D1-Hg	10		7/28/2015	201.2	9:16	13:15	48.1				X		239
728D1-NH3	11		7/28/2015	445.2	9:16	13:15	106.4					X	239
728D1-Carbox	12		7/28/2015	386.6	9:16	13:15	94.8					X	239
Intentionally Blank													

Report Tier Levels - please select  
 Tier I - (Results/Default if not specified)  
 Tier II (Results + QC) \_\_\_\_\_  
 Tier III (Data Validation Package) 10% Surcharge  X  
 Tier IV (client specified) \_\_\_\_\_

EDD required Yes Type: \_\_\_\_\_

Relinquished by: (Signature) <i>[Signature]</i>	Time: 7/30/15 12:00	Received by: (Signature) <i>[Signature]</i>	Time: 7/30/15 7:00
Relinquished by: (Signature) <i>[Signature]</i>	Time: _____	Received by: (Signature)	Time: _____
Relinquished by: (Signature) <i>[Signature]</i>	Time: _____	Received by: (Signature) <i>[Signature]</i>	Time: 7/30/15 7:00

Project Requirements (MRLs, QAPP) \_\_\_\_\_  
 Cooler / Blank Temperature \_\_\_\_\_ °C



# Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A  
 Simi Valley, California 93065  
 Phone: (805) 526-7161 Fax: (805) 526-7270

Company Name & Address (Reporting Information)

Stantec Consulting  
 1500 Lake Shore Drive  
 Columbus Ohio

Project Manager  
 Deb.Gray@stantec.com

Phone 614-843-4362 Fax

Email Address for Result Reporting  
 Deb.Gray@stantec.com

Chris.lalonde@stantec.com

Requested Turnaround Time in Business Days (Surcharges) Please Circle:  
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day (Standard)

ALS Project No.

P1583123

Project Name: Bridgton ALS Contact: Samantha Henningsen  
 Project Number: 182608020

P.O. # / Billing Information: Amy Hangrove/Bridgton LF

Sampler (Print & Sign): NI/CJL

Client Sample ID	Laboratory ID #	Tube ID	Date Collected	Sampling Pump Flow (mL/min)	Sampling Start Time	Sampling End Time	Sample Volume (L)	Analysis Method/Analytes				Comments e.g. Actual Preservative or specific instructions	
								EPA TO 114	NIOSH 6010	AQL 101	NIOSH 6009		OSHA ID 188
728D2-Ald	13		7/28/2015	1219.0	9:44	13:47	296.2	X					243
728D2-Amine	14		7/28/2015	175.0	9:44	13:47	42.5		X				243
728D2-NH3	15		7/28/2015	448.0	9:44	13:47	108.9				X		243
728D2-Carbox	16		7/28/2015	380.5	9:44	13:47	92.4					X	243
728F-Ald	17		7/28/2015	1183.5	8:57	13:04	292.3	X					247
728F-HCn	18		7/28/2015	68.0	8:57	13:04	16.8		X				247
728F-Amine	19		7/28/2015	59.2	8:57	13:04	14.6		X				247
728F-Hg	20		7/28/2015	198.4	8:57	13:04	49.0			X			247
728F-NH3	21		7/28/2015	444.5	8:57	13:04	109.8				X		247
728F-Carbox	22		7/28/2015	385.5	8:57	13:04	95.2					X	247
728SQ-Ald	23		7/28/2015	1192.0	9:55	13:56	287.3	X					241
728SQ-HCn	24		7/28/2015	61.5	9:55	13:56	14.8		X				241
728SQ-Amine	25		7/28/2015	62.1	9:55	13:56	15.0			X			241

Report Tier Levels - please select  
 Tier I - (Results/Default if not specified) \_\_\_\_\_  
 Tier II (Results + QC) \_\_\_\_\_  
 Tier III (Data Validation Package) 10% Surcharge \_\_\_\_\_ X  
 Tier IV (client specified) \_\_\_\_\_

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:	Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
<i>[Signature]</i>	7/28/15	17:06	<i>[Signature]</i>	7/28/15	17:06	<i>[Signature]</i>	7/28/15	17:06	<i>[Signature]</i>	7/28/15	17:06
<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>		
<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>		

Project Requirements (MRLs, QAPP) \_\_\_\_\_  
 Cooler / Blank Temperature \_\_\_\_\_ °C



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 Simi Valley, California 93065  
 Phone: (805) 526-7161 Fax: (805) 526-7270

### Chain of Custody Record & Analytical Service Request

Company Name & Address (Reporting Information) Stantec Consulting 1500 Lake Shore Drive Columbus Ohio Project Manager Deb.Gray@Stantec.com Phone 814-643-4362 Fax Email Address for Result Reporting Deb.Gray@Stantec.com		Project Name Bridgeton Project Number 182608020 P.O. # / Billing Information Amy Hargrove/Bridgeton LF Sampler (Print & Sign) N/C-JL		ALS Project No. 91503123 ALS Contact: Samantha Henningsen											
Requested Turnaround Time in Business Days (Surcharges) Please Circle: 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day (Standard)															
Client Sample ID	Laboratory ID #	Tube ID	Date Collected	Sampling Pump Flow (mL/min)	Sampling Start Time	Sampling End Time	Sample Volume (L)	EPA TO 116	NIOSH 6070	AQL 101	NIOSH 6009	OSHA ID 188	AQL 102	Comments e.g. Actual Preservative or specific instructions	
728SQ-Hg	26		7/28/2015	199.4	9:55	13:58	48.0				X			241	
728SQ-NH3	27		7/28/2015	444.5	9:55	13:56	107.1					X		241	
728SQ-Carbox	28		7/28/2015	381.1	9:55	13:56	91.8						X	241	
728D1-Ald	29		7/29/2015	1165.0	11:45	15:45	279.6	X						240	
729U1-Amine	30		7/29/2015	58.7	11:45	15:45	14.1			X				240	
729U1-NH3	31		7/29/2015	440.0	11:45	15:45	105.6					X		240	
729U1-Carbox	32		7/29/2015	398.5	11:45	15:45	95.6					X		240	
729D1-Ald	33		7/29/2015	1175.0	12:02	16:03	283.2	X					X	241	
729D1-Amine	34		7/29/2015	56.5	12:02	16:03	13.6			X				241	
729D1-NH3	35		7/29/2015	441.1	12:02	16:03	106.3					X		241	
729D1-Carbox	36		7/29/2015	392.4	12:02	16:03	94.6						X	241	
729D2-Ald	37		7/29/2015	1215.0	11:55	15:55	291.6	X						240	
729D2-Amine	38		7/29/2015	58.1	11:55	15:55	13.9			X				240	
Report Tier Levels - please select Tier I - (Results/Default if not specified) Tier II (Results + QC) Tier III (Data Validation Package) 10% Surcharge <input checked="" type="checkbox"/> X Tier IV (client specified)															
Relinquished by: (Signature)			Date: 7/30/15	Time: 17:00	Received by: (Signature)			Time: 17:00	EDD required Yes						
Relinquished by: (Signature)			Date: 7/30/15	Time: 17:00	Received by: (Signature)			Time: 17:00	Type:						
Relinquished by: (Signature)			Date: 7/30/15	Time: 17:00	Received by: (Signature)			Time: 17:00	Cooler / Blank Temperature °C						



# Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A  
 Simi Valley, California 93065  
 Phone: (805) 526-7181 Fax: (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) Please Circle:  
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day (Standard)

ALS Project No. P1503123

Company Name & Address (Reporting Information)

Stantec Consulting  
 1500 Lake Shore Drive  
 Columbus Ohio

Project Manager  
 Deb.Gray@stantec.com

Phone 614-643-4362 Fax

Email Address for Result Reporting  
 Deb.Gray@stantec.com

Chris.lalonde@stantec.com

Project Name

Bridgeton  
 Project Number 182808020

P.O. # / Billing Information  
 Amy Hargrove/Bridgeton LF

Sampler (Print & Sign)  
 NI/CJL

ALS Contact:  
 Samantha Henningsen

## Analysis Method/Analytes

Client Sample ID	Laboratory ID #	Tube ID	Date Collected	Sampler (Print & Sign)				Sample Volume (L)	Analysis Method/Analytes				Comments e.g. Actual Preservative or specific instructions	
				Sampling Pump Flow (mL/min)	Sampling Start Time	Sampling End Time	NI/CJL		EPA TO 11a	NIOSH 6010	AQL 101	NIOSH 6009		OSHA ID 188
729D2-NH3	39		7/29/2015	440.3	11:55	15:55	105.7							240
729D2-Carbox	40		7/29/2015	381.9	11:55	15:55	91.6						X	240
729D2-Aid	41		7/29/2015	1157.5	13:12	17:12	277.8	X						240
729N-HCN	42		7/29/2015	61.3	13:12	17:12	14.7		X					240
729N-Amine	43		7/29/2015	62.2	13:12	17:12	14.9			X				240
729N-Hg	44		7/29/2015	191.1	13:12	17:12	45.9				X			240
729N-NH3	45		7/29/2015	441.0	13:12	17:12	105.8				X			240
729N-Carbox	46		7/29/2015	381.4	13:12	17:12	91.5					X		240
729NQ-Aid	47		7/29/2015	1180.0	14:25	18:24	282.0	X						239
729NQ-HCN	48		7/29/2015	61.7	14:25	18:24	14.7		X					239
729NQ-Amine	49		7/29/2015	59.0	14:25	18:24	14.1				X			239
729NQ-Hg	50		7/29/2015	189.0	14:25	18:24	45.2				X			239
729NQ-NH3	51		7/29/2015	498.2	14:25	18:24	104.7					X		239

Report Tier Levels - please select  
 Tier I - (Results/Default if not specified)  
 Tier II (Results + QC)  
 Tier III (Data Validation Package) 10% Surcharge  X  
 Tier IV (client specified)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:	Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
<i>[Signature]</i>	7/30/15	17:00	<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>		
<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>		
<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>		

EDD required Yes  
 Type: *[Handwritten]*

Project Requirements (MRLs, QAPP)  
 Cooler / Blankys Temperature °C *[Handwritten]*



# Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A  
 Simi Valley, California 93065  
 Phone: (805) 528-7181 Fax: (805) 528-7270

Requested Turnaround Time in Business Days (Surcharges) Please Circle:  
 1 Day (100%)    2 Day (75%)    3 Day (50%)    4 Day (35%)    5 Day (25%)    **10 Day (Standard)**

ALS Project No. 9150312

Company Name & Address (Reporting Information)

Stantec Consulting  
 1500 Lake Shore Drive  
 Columbus Ohio

Project Manager  
Deb.Gray@Stantec.com

Phone 614-843-4362  
 Fax

Email Address for Result Reporting  
Deb.Gray@Stantec.com

Chris.lalonde@stantec.com

Project Name

Bridgeton  
 Project Number  
 182608020

P.O. # / Billing Information  
 Amy Hargrove/Bridgeton LF

ALS Contact:

Samantha Henningsen

### Analysis Method/Analytes

Client Sample ID	Laboratory ID #	Tube ID	Date Collected	Sampler (Print & Sign)				Sample Volume (L)	Analysis Method/Analytes				Comments e.g. Actual Preservative or specific instructions		
				Sampling Pump Flow (mL/min)	Sampling Start Time	Sampling End Time	N/C/J/L		EPA TO 118	NIOSH 6010	AQL 101	NIOSH 6009		OSHA ID 188	AQL 102
729sNQ-Carbox	52		7/29/2015	391.3	14:25	18:24		93.5							239
729sN-Ald	53		7/29/2015	1140.0	12:50	12:52		2.280	X						2
729sN-HCn	54		7/29/2015	58.8	12:59	13:05		0.353		X					6
729sN-Amine	55		7/29/2015	57.1	12:15	12:23		0.456			X				8
729sN-Hg	56		7/29/2015	193.1	12:25	12:31		1.158				X			6
729sN-NH3	57		7/29/2015	445.1	12:53	12:57		1.780					X		4
729sN-Carbox	58		7/29/2015	385.5	12:43	12:49		2.313						X	6
729sN-Q-Ald	59		7/29/2015	1140.0	14:08	14:10		2.280	X						2
729sN-Q-HCn	60		7/29/2015	58.8	14:11	14:17		0.352		X					6
729sN-Q-Amine	61		7/29/2015	57.1	13:39	13:47		0.456			X				8
729sN-Q-Hg	62		7/29/2015	193.1	13:50	13:56		1.158				X			6
729sN-Q-NH3	63		7/29/2015	445.1	13:57	14:01		1.780					X		4
729sN-Q-Carbox	64		7/29/2015	385.5	14:18	14:24		2.313						X	6

Report Tier Levels - please select  
 Tier I - (Results/Default if not specified)  
 Tier II (Results + QC)  
 Tier III (Data Validation Package) 10% Surcharge  X  
 Tier IV (client specified)

EDD required Yes  
 Type: \_\_\_\_\_

Relinquished by (Signature)	Date:	Time:	Received by (Signature)	Date:	Time:
<i>[Signature]</i>	7/29/15	14:00	<i>[Signature]</i>	7/29/15	14:00
<i>[Signature]</i>			<i>[Signature]</i>		
<i>[Signature]</i>			<i>[Signature]</i>		

Project Requirements (MRLs, OAPP)

Cooler / Blanket Temperature °C 6



# Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A  
 Simi Valley, California 93065  
 Phone: (805) 526-7181 Fax: (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) Please Circle:  
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day (Standard)

ALS Project No.

P1503123

Company Name & Address (Reporting Information)

Stantec Consulting  
 1500 Lake Shore Drive  
 Columbus Ohio

Project Manager  
 Deb.Gray@stantec.com

Phone  
 614-643-4362

Fax

Chris.lalonde@stantec.com

Project Name

Bridgeton  
 Project Number  
 182608020

P.O. # / Billing Information  
 Amy Hangrove/Bridgeton LF

Sampler (Print & Sign)  
 N/C-JL

ALS Contact:

Samantha Henningsen

### Analysis Method/Analytes

Client Sample ID	Laboratory ID #	Tube ID	Date Collected	Sampling Pump Flow (mL/min)	Sampling Start Time	Sampling End Time	Sample Volume (L)	Analysis Method/Analytes				Comments e.g. Actual Preservative or specific instructions	
								EPA TO 11a	NIOSH 6010	AQL 101	NIOSH 6000		OSHA ID 168
729sSQ-Ald	65		7/29/2015	1140.0	11:36	11:38	2.280	X					2
729sSQ-HCn	66		7/29/2015	58.8	11:39	11:45	0.352		X				6
729sSQ-Amine	67		7/29/2015	57.1	11:17	11:25	0.456			X			8
729sSQ-Hg	68		7/29/2015	193.1	11:53	11:59	1.158				X		6
729sSQ-NH3	69		7/29/2015	445.1	11:47	11:51	1.780				X		4
729sSQ-Carbox	70		7/29/2015	385.5	11:27	11:33	2.313					X	6
729sF-Ald	71		7/29/2015	1140.0	9:46	9:47	1.140	X					1
729sF-HCn	72		7/29/2015	58.8	10:18	10:21	0.176		X				3
729sF-Amine	73		7/29/2015	57.1	9:57	10:01	0.228			X			4
729sF-Hg	74		7/29/2015	193.1	10:23	10:26	0.579				X		3
729sF-NH3	75		7/29/2015	445.1	10:09	10:11	0.880					X	2
729sF-Carbox	76		7/29/2015	385.5	10:04	10:07	1.157					X	3

Intentionally Left Blank

Report Tier Levels - please select

Tier I - (Results/Default if not specified)

Tier II (Results + GC)

Tier III (Data Validation Package) 10% Surcharge  X

Tier IV (client specified)

EDD required Yes

Type:

Relinquished by: (Signature)	Time: 7/30/15 17:20	Received by: (Signature)	Time: FED EX
Relinquished by: (Signature)	Time:	Received by: (Signature)	Time:
Relinquished by: (Signature)	Time:	Received by: (Signature)	Time: K. Goyne 7/31/15 10:00

Project Requirements (MRLs, QAPP)

Cooler / Blank Temperature 9 °C



# Chain of Custody Record & Analytical Service Request

Requested Turnaround Time in Business Days (Surcharges) Please Circle: 10 Day (Standard)

1 Day (100%)    2 Day (75%)    3 Day (50%)    4 Day (35%)    5 Day (25%)

Company Name & Address (Reporting Information)  
 Stantec Consulting  
 1500 Lake Shore Drive  
 Columbus Ohio  
 Project Manager: Deb.Gray@Stantec.com  
 Phone: (605) 526-7161 Fax: (605) 526-7270

Project Name: Bridgeport  
 Project Number: 182608020  
 P.O. # / Billing Information: Amy Hargrove/Bridgeport LF  
 ALS Project No.: 715712

ALS Contact: Samantha Henningsen  
 Sampler (Print & Sign): N/C/JL

Client Sample ID	Laboratory ID #	Tube ID	Date Collected	Sampling Pump Flow (mL/min)	Sampling Start Time	Sampling End Time	Sample Volume (L)	Analysis Method/Analytes				Comments e.g. Actual Preservative or specific instructions	
								EPA TO 114-Aid	NIOSH 6010 - HCH	NIOSH 6009	OSHA ID 188		AQL 102
728-Dup01	77		7/28/2015	1175	--	--	286.7	X					244
728-Dup02	78		7/28/2015	203.9	--	--	48.7			X			241
728-Dup03	79		7/28/2015	390.1	--	--	98.4					X	247
728-Dup04	80		7/29/2015	58.75	--	--	0.176	X					3
729-Dup05	81		7/29/2015	57.05	--	--	0.488			X			8
729-Dup06	82		7/29/2015	445.05	--	--	2.670				X		6
730FB-Aid	83		7/30/2015	--	--	16:00	--	X					Field Blank
730FB-CN	84		7/30/2015	--	--	16:00	--		X				Field Blank
730FB-Amine	85		7/30/2015	--	--	16:00	--			X			Field Blank
730FB-Hg	86		7/30/2015	--	--	16:00	--				X		Field Blank
730FB-NH3	87		7/30/2015	--	--	16:00	--				X		Field Blank
730FB-Carbox	88		7/30/2015	--	--	16:00	--					X	Field Blank
Intentionally Left Blank													

Report Tier Levels - please select  
 Tier I - (Results/Default if not specified)  
 Tier II (Results + QC) \_\_\_\_\_  
 Tier III (Data Validation Package) 10% Surcharge X  
 Tier IV (client specified) \_\_\_\_\_

Relinquished by (Signature)	Date:	Time:	Received by (Signature)	Date:	Time:	Relinquished by (Signature)	Date:	Time:	Received by (Signature)	Date:	Time:
<i>[Signature]</i>		7:50	<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>		
<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>		
<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>		

Project Requirements (MRLs, QAPP)  
 Cooler / Blank 90 °C  
 Temperature 1000

**ALS Environmental  
Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc.

Work order: P1503123

Project: Bridgeton / 182608020

Sample(s) received on: 7/31/15

Date opened: 7/31/15

by: KKELPE

**Note:** This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- |  | Yes                                 | No                                  | N/A                                 |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were <b>sample containers</b> properly marked with client sample ID?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by ALS</b> ?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?                          | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Cooler Temperature: 9° C    Blank Temperature: ° C   |                                     |                                     |                                     |
|  |                                     | <b>Wet Ice</b>                      |                                     |
| 9 Was a <b>trip blank</b> received?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 10 Were <b>custody seals</b> on outside of cooler/Box?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Location of seal(s)? <u>sealing cooler</u>   |                                     |                                     |                                     |
| Sealing Lid?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Were signature and date included?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Were seals intact?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Were custody seals on outside of sample container?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____   |                                     |                                     |                                     |
| Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information? | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?                                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Do they contain moisture?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 13 <b>Badges:</b> Are the badges properly capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1503123-001.01	Silica Gel DNPH Tube					
P1503123-002.01	Solid Sorbent (Custom) Tube					
P1503123-003.01	Treated Alumina Tube					
P1503123-004.01	Solid Sorbent (Custom) Tube					
P1503123-005.01	Anasorb 747 Tube					
P1503123-006.01	Silica Gel (C. Acids)					
P1503123-007.01	Silica Gel DNPH Tube					
P1503123-008.01	Solid Sorbent (Custom) Tube					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 out of temperature range, ice melted \_\_\_\_\_  
 \_\_\_\_\_



**ALS Environmental  
Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc.

Work order: P1503123

Project: Bridgeton / 182608020

Sample(s) received on: 7/31/15

Date opened: 7/31/15

by: KKELPE

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1503123-009.01	Treated Alumina Tube					
P1503123-010.01	Solid Sorbent (Custom) Tube					
P1503123-011.01	Anasorb 747 Tube					
P1503123-012.01	Silica Gel (C. Acids)					
P1503123-013.01	Silica Gel DNPH Tube					
P1503123-014.01	Treated Alumina Tube					
P1503123-015.01	Anasorb 747 Tube					
P1503123-016.01	Silica Gel (C. Acids)					
P1503123-017.01	Silica Gel DNPH Tube					
P1503123-018.01	Solid Sorbent (Custom) Tube					
P1503123-019.01	Treated Alumina Tube					
P1503123-020.01	Solid Sorbent (Custom) Tube					
P1503123-021.01	Anasorb 747 Tube					
P1503123-022.01	Silica Gel (C. Acids)					
P1503123-023.01	Silica Gel DNPH Tube					
P1503123-024.01	Solid Sorbent (Custom) Tube					
P1503123-025.01	Treated Alumina Tube					
P1503123-026.01	Solid Sorbent (Custom) Tube					
P1503123-027.01	Anasorb 747 Tube					
P1503123-028.01	Silica Gel (C. Acids)					
P1503123-029.01	Silica Gel DNPH Tube					
P1503123-030.01	Treated Alumina Tube					
P1503123-031.01	Anasorb 747 Tube					
P1503123-032.01	Silica Gel (C. Acids)					
P1503123-033.01	Silica Gel DNPH Tube					
P1503123-034.01	Treated Alumina Tube					
P1503123-035.01	Anasorb 747 Tube					
P1503123-036.01	Silica Gel (C. Acids)					
P1503123-037.01	Silica Gel DNPH Tube					
P1503123-038.01	Treated Alumina Tube					
P1503123-039.01	Anasorb 747 Tube					
P1503123-040.01	Silica Gel (C. Acids)					
P1503123-041.01	Silica Gel DNPH Tube					
P1503123-042.01	Solid Sorbent (Custom) Tube					
P1503123-043.01	Treated Alumina Tube					
P1503123-044.01	Solid Sorbent (Custom) Tube					
P1503123-045.01	Anasorb 747 Tube					
P1503123-046.01	Silica Gel (C. Acids)					
P1503123-047.01	Silica Gel DNPH Tube					
P1503123-048.01	Solid Sorbent (Custom) Tube					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

**ALS Environmental  
Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc.

Work order: P1503123

Project: Bridgeton / 182608020

Sample(s) received on: 7/31/15

Date opened: 7/31/15

by: KKELPE

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1503123-049.01	Treated Alumina Tube					
P1503123-050.01	Solid Sorbent (Custom) Tube					
P1503123-051.01	Anasorb 747 Tube					
P1503123-052.01	Silica Gel (C. Acids)					
P1503123-053.01	Silica Gel DNPH Tube					
P1503123-054.01	Solid Sorbent (Custom) Tube					
P1503123-055.01	Treated Alumina Tube					
P1503123-056.01	Solid Sorbent (Custom) Tube					
P1503123-057.01	Anasorb 747 Tube					
P1503123-058.01	Silica Gel (C. Acids)					
P1503123-059.01	Silica Gel DNPH Tube					
P1503123-060.01	Solid Sorbent (Custom) Tube					
P1503123-061.01	Treated Alumina Tube					
P1503123-062.01	Solid Sorbent (Custom) Tube					
P1503123-063.01	Anasorb 747 Tube					
P1503123-064.01	Silica Gel (C. Acids)					
P1503123-065.01	Silica Gel DNPH Tube					
P1503123-066.01	Solid Sorbent (Custom) Tube					
P1503123-067.01	Treated Alumina Tube					
P1503123-068.01	Solid Sorbent (Custom) Tube					
P1503123-069.01	Anasorb 747 Tube					
P1503123-070.01	Silica Gel (C. Acids)					
P1503123-071.01	Silica Gel DNPH Tube					
P1503123-072.01	Solid Sorbent (Custom) Tube					
P1503123-073.01	Treated Alumina Tube					
P1503123-074.01	Solid Sorbent (Custom) Tube					
P1503123-075.01	Anasorb 747 Tube					
P1503123-076.01	Silica Gel (C. Acids)					
P1503123-077.01	Silica Gel DNPH Tube					
P1503123-078.01	Solid Sorbent (Custom) Tube					
P1503123-079.01	Silica Gel (C. Acids)					
P1503123-080.01	Solid Sorbent (Custom) Tube					
P1503123-081.01	Treated Alumina Tube					
P1503123-082.01	Anasorb 747 Tube					
P1503123-083.01	Silica Gel DNPH Tube					
P1503123-084.01	Solid Sorbent (Custom) Tube					
P1503123-085.01	Treated Alumina Tube					
P1503123-086.01	Solid Sorbent (Custom) Tube					
P1503123-087.01	Anasorb 747 Tube					
P1503123-088.01	Silica Gel (C. Acids)					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728U1-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-001

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 286.2 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	3,300	<b>12</b>	0.35	<b>9.4</b>	0.28	
75-07-0	Acetaldehyde	690	<b>2.4</b>	0.35	<b>1.3</b>	0.19	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.35	ND	0.15	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.35	ND	0.12	
123-72-8	Butyraldehyde	< 100	ND	0.35	ND	0.12	
100-52-7	Benzaldehyde	130	<b>0.46</b>	0.35	<b>0.11</b>	0.081	
590-86-3	Isovaleraldehyde	< 100	ND	0.35	ND	0.099	
110-62-3	Valeraldehyde	< 100	ND	0.35	ND	0.099	
529-20-4	o-Tolualdehyde	< 100	ND	0.35	ND	0.071	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.70	ND	0.14	
66-25-1	n-Hexaldehyde	< 100	ND	0.35	ND	0.085	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.35	ND	0.064	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

BT = Results indicated possible breakthrough; back section > 10% front section.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D1-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-007

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 284.9 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	3,500	<b>12</b>	0.35	<b>9.9</b>	0.29	
75-07-0	Acetaldehyde	840	<b>3.0</b>	0.35	<b>1.6</b>	0.19	<b>BT</b>
123-38-6	Propionaldehyde	190	<b>0.67</b>	0.35	<b>0.28</b>	0.15	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.35	ND	0.12	
123-72-8	Butyraldehyde	510	<b>1.8</b>	0.35	<b>0.61</b>	0.12	
100-52-7	Benzaldehyde	170	<b>0.60</b>	0.35	<b>0.14</b>	0.081	
590-86-3	Isovaleraldehyde	< 100	ND	0.35	ND	0.10	
110-62-3	Valeraldehyde	< 100	ND	0.35	ND	0.10	
529-20-4	o-Tolualdehyde	< 100	ND	0.35	ND	0.071	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.70	ND	0.14	
66-25-1	n-Hexaldehyde	< 100	ND	0.35	ND	0.086	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.35	ND	0.064	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

BT = Results indicated possible breakthrough; back section > 10% front section.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D2-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-013

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 296.2 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	4,000	<b>14</b>	0.34	<b>11</b>	0.27	
75-07-0	Acetaldehyde	760	<b>2.6</b>	0.34	<b>1.4</b>	0.19	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.34	ND	0.14	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.34	ND	0.12	
123-72-8	Butyraldehyde	710	<b>2.4</b>	0.34	<b>0.82</b>	0.11	<b>BT</b>
100-52-7	Benzaldehyde	130	<b>0.44</b>	0.34	<b>0.10</b>	0.078	
590-86-3	Isovaleraldehyde	< 100	ND	0.34	ND	0.096	
110-62-3	Valeraldehyde	< 100	ND	0.34	ND	0.096	
529-20-4	o-Tolualdehyde	< 100	ND	0.34	ND	0.069	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.68	ND	0.14	
66-25-1	n-Hexaldehyde	< 100	ND	0.34	ND	0.082	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.34	ND	0.062	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

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BT = Results indicated possible breakthrough; back section > 10% front section.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728F-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-017

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 292.3 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	3,400	<b>12</b>	0.34	<b>9.6</b>	0.28	
75-07-0	Acetaldehyde	670	<b>2.3</b>	0.34	<b>1.3</b>	0.19	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.34	ND	0.14	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.34	ND	0.12	
123-72-8	Butyraldehyde	600	<b>2.0</b>	0.34	<b>0.69</b>	0.12	<b>BT</b>
100-52-7	Benzaldehyde	130	<b>0.43</b>	0.34	<b>0.10</b>	0.079	
590-86-3	Isovaleraldehyde	< 100	ND	0.34	ND	0.097	
110-62-3	Valeraldehyde	< 100	ND	0.34	ND	0.097	
529-20-4	o-Tolualdehyde	< 100	ND	0.34	ND	0.070	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.68	ND	0.14	
66-25-1	n-Hexaldehyde	< 100	ND	0.34	ND	0.084	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.34	ND	0.062	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

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BC = Results reported are not blank corrected.

BT = Results indicated possible breakthrough; back section > 10% front section.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728SQ-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-023

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 287.3 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	3,800	<b>13</b>	0.35	<b>11</b>	0.28	
75-07-0	Acetaldehyde	670	<b>2.3</b>	0.35	<b>1.3</b>	0.19	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.35	ND	0.15	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.35	ND	0.12	
123-72-8	Butyraldehyde	650	<b>2.3</b>	0.35	<b>0.77</b>	0.12	<b>BT</b>
100-52-7	Benzaldehyde	100	<b>0.36</b>	0.35	<b>0.083</b>	0.080	
590-86-3	Isovaleraldehyde	< 100	ND	0.35	ND	0.099	
110-62-3	Valeraldehyde	< 100	ND	0.35	ND	0.099	
529-20-4	o-Tolualdehyde	< 100	ND	0.35	ND	0.071	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.70	ND	0.14	
66-25-1	n-Hexaldehyde	< 100	ND	0.35	ND	0.085	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.35	ND	0.063	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

BT = Results indicated possible breakthrough; back section > 10% front section.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729U1-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-029

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 279.6 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	1,200	<b>4.2</b>	0.36	<b>3.4</b>	0.29	
75-07-0	Acetaldehyde	380	<b>1.4</b>	0.36	<b>0.76</b>	0.20	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.36	ND	0.15	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.36	ND	0.12	
123-72-8	Butyraldehyde	340	<b>1.2</b>	0.36	<b>0.41</b>	0.12	
100-52-7	Benzaldehyde	200	<b>0.70</b>	0.36	<b>0.16</b>	0.082	
590-86-3	Isovaleraldehyde	< 100	ND	0.36	ND	0.10	
110-62-3	Valeraldehyde	< 100	ND	0.36	ND	0.10	
529-20-4	o-Tolualdehyde	< 100	ND	0.36	ND	0.073	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.72	ND	0.15	
66-25-1	n-Hexaldehyde	< 100	ND	0.36	ND	0.087	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.36	ND	0.065	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

BT = Results indicated possible breakthrough; back section > 10% front section.



**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729D1-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-033

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 283.2 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	1,200	<b>4.4</b>	0.35	<b>3.6</b>	0.29	
75-07-0	Acetaldehyde	330	<b>1.2</b>	0.35	<b>0.65</b>	0.20	
123-38-6	Propionaldehyde	< 100	ND	0.35	ND	0.15	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.35	ND	0.12	
123-72-8	Butyraldehyde	380	<b>1.3</b>	0.35	<b>0.45</b>	0.12	
100-52-7	Benzaldehyde	300	<b>1.1</b>	0.35	<b>0.24</b>	0.081	
590-86-3	Isovaleraldehyde	< 100	ND	0.35	ND	0.10	
110-62-3	Valeraldehyde	< 100	ND	0.35	ND	0.10	
529-20-4	o-Tolualdehyde	< 100	ND	0.35	ND	0.072	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.71	ND	0.14	
66-25-1	n-Hexaldehyde	< 100	ND	0.35	ND	0.086	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.35	ND	0.064	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729D2-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-037

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 291.6 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	1,500	<b>5.0</b>	0.34	<b>4.1</b>	0.28	
75-07-0	Acetaldehyde	420	<b>1.4</b>	0.34	<b>0.80</b>	0.19	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.34	ND	0.14	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.34	ND	0.12	
123-72-8	Butyraldehyde	480	<b>1.7</b>	0.34	<b>0.56</b>	0.12	<b>BT</b>
100-52-7	Benzaldehyde	< 100	ND	0.34	ND	0.079	
590-86-3	Isovaleraldehyde	< 100	ND	0.34	ND	0.097	
110-62-3	Valeraldehyde	< 100	ND	0.34	ND	0.097	
529-20-4	o-Tolualdehyde	< 100	ND	0.34	ND	0.070	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.69	ND	0.14	
66-25-1	n-Hexaldehyde	< 100	ND	0.34	ND	0.084	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.34	ND	0.063	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

BT = Results indicated possible breakthrough; back section > 10% front section.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729N-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-041

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 277.8 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	1,300	<b>4.9</b>	0.36	<b>4.0</b>	0.29	
75-07-0	Acetaldehyde	480	<b>1.7</b>	0.36	<b>0.97</b>	0.20	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.36	ND	0.15	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.36	ND	0.13	
123-72-8	Butyraldehyde	470	<b>1.7</b>	0.36	<b>0.57</b>	0.12	
100-52-7	Benzaldehyde	< 100	ND	0.36	ND	0.083	
590-86-3	Isovaleraldehyde	< 100	ND	0.36	ND	0.10	
110-62-3	Valeraldehyde	< 100	ND	0.36	ND	0.10	
529-20-4	o-Tolualdehyde	< 100	ND	0.36	ND	0.073	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.72	ND	0.15	
66-25-1	n-Hexaldehyde	150	<b>0.55</b>	0.36	<b>0.13</b>	0.088	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.36	ND	0.066	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

BT = Results indicated possible breakthrough; back section > 10% front section.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729NQ-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-047

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 282.0 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	1,300	<b>4.7</b>	0.35	<b>3.8</b>	0.29	
75-07-0	Acetaldehyde	320	<b>1.2</b>	0.35	<b>0.64</b>	0.20	
123-38-6	Propionaldehyde	< 100	ND	0.35	ND	0.15	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.35	ND	0.12	
123-72-8	Butyraldehyde	510	<b>1.8</b>	0.35	<b>0.61</b>	0.12	
100-52-7	Benzaldehyde	< 100	ND	0.35	ND	0.082	
590-86-3	Isovaleraldehyde	< 100	ND	0.35	ND	0.10	
110-62-3	Valeraldehyde	< 100	ND	0.35	ND	0.10	
529-20-4	o-Tolualdehyde	< 100	ND	0.35	ND	0.072	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.71	ND	0.14	
66-25-1	n-Hexaldehyde	110	<b>0.38</b>	0.35	<b>0.092</b>	0.087	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.35	ND	0.065	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sN-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-053

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 2.280 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	< 100	ND	44	ND	36	
75-07-0	Acetaldehyde	120	<b>51</b>	44	<b>28</b>	24	
123-38-6	Propionaldehyde	< 100	ND	44	ND	18	
4170-30-3	Crotonaldehyde, Total	< 100	ND	44	ND	15	
123-72-8	Butyraldehyde	< 100	ND	44	ND	15	
100-52-7	Benzaldehyde	< 100	ND	44	ND	10	
590-86-3	Isovaleraldehyde	< 100	ND	44	ND	12	
110-62-3	Valeraldehyde	< 100	ND	44	ND	12	
529-20-4	o-Tolualdehyde	< 100	ND	44	ND	8.9	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	88	ND	18	
66-25-1	n-Hexaldehyde	< 100	ND	44	ND	11	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	44	ND	8.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sNQ-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-059

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 2.280 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	< 100	ND	44	ND	36	
75-07-0	Acetaldehyde	< 100	ND	44	ND	24	
123-38-6	Propionaldehyde	< 100	ND	44	ND	18	
4170-30-3	Crotonaldehyde, Total	< 100	ND	44	ND	15	
123-72-8	Butyraldehyde	< 100	ND	44	ND	15	
100-52-7	Benzaldehyde	< 100	ND	44	ND	10	
590-86-3	Isovaleraldehyde	< 100	ND	44	ND	12	
110-62-3	Valeraldehyde	< 100	ND	44	ND	12	
529-20-4	o-Tolualdehyde	< 100	ND	44	ND	8.9	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	88	ND	18	
66-25-1	n-Hexaldehyde	< 100	ND	44	ND	11	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	44	ND	8.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sSQ-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-065

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4 - 8/5/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 2.280 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	< 100	ND	44	ND	36	
75-07-0	Acetaldehyde	1,100	<b>490</b>	44	<b>270</b>	24	<b>BT</b>
123-38-6	Propionaldehyde	1,500	<b>660</b>	44	<b>280</b>	18	<b>BT</b>
4170-30-3	Crotonaldehyde, Total	< 100	ND	44	ND	15	
123-72-8	Butyraldehyde	11,000	<b>5,000</b>	44	<b>1,700</b>	15	<b>BT</b>
100-52-7	Benzaldehyde	3,300	<b>1,500</b>	44	<b>340</b>	10	
590-86-3	Isovaleraldehyde	< 100	ND	44	ND	12	
110-62-3	Valeraldehyde	< 100	ND	44	ND	12	
529-20-4	o-Tolualdehyde	< 100	ND	44	ND	8.9	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	88	ND	18	
66-25-1	n-Hexaldehyde	< 100	ND	44	ND	11	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	44	ND	8.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

BT = Results indicated possible breakthrough; back section > 10% front section.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-071

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 1.140 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	< 100	ND	88	ND	71	
75-07-0	Acetaldehyde	15,000	<b>13,000</b>	88	<b>7,300</b>	49	<b>BT</b>
123-38-6	Propionaldehyde	6,900	<b>6,100</b>	88	<b>2,600</b>	37	<b>BT</b>
4170-30-3	Crotonaldehyde, Total	< 100	ND	88	ND	31	
123-72-8	Butyraldehyde	28,000	<b>24,000</b>	88	<b>8,300</b>	30	<b>BT</b>
100-52-7	Benzaldehyde	3,400	<b>3,000</b>	88	<b>690</b>	20	
590-86-3	Isovaleraldehyde	< 100	ND	88	ND	25	
110-62-3	Valeraldehyde	< 100	ND	88	ND	25	
529-20-4	o-Tolualdehyde	< 100	ND	88	ND	18	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	180	ND	36	
66-25-1	n-Hexaldehyde	< 100	ND	88	ND	21	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	88	ND	16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

BT = Results indicated possible breakthrough; back section > 10% front section.



**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728-Dup01  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-077

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 286.7 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	3,400	<b>12</b>	0.35	<b>9.7</b>	0.28	
75-07-0	Acetaldehyde	650	<b>2.3</b>	0.35	<b>1.3</b>	0.19	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.35	ND	0.15	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.35	ND	0.12	
123-72-8	Butyraldehyde	530	<b>1.8</b>	0.35	<b>0.62</b>	0.12	
100-52-7	Benzaldehyde	130	<b>0.44</b>	0.35	<b>0.10</b>	0.080	
590-86-3	Isovaleraldehyde	< 100	ND	0.35	ND	0.099	
110-62-3	Valeraldehyde	< 100	ND	0.35	ND	0.099	
529-20-4	o-Tolualdehyde	< 100	ND	0.35	ND	0.071	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.70	ND	0.14	
66-25-1	n-Hexaldehyde	< 100	ND	0.35	ND	0.085	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.35	ND	0.064	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

BT = Results indicated possible breakthrough; back section > 10% front section.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730FB-Ald  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-083

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: NA Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	< 100	NA	NA	NA	NA	
75-07-0	Acetaldehyde	< 100	NA	NA	NA	NA	
123-38-6	Propionaldehyde	< 100	NA	NA	NA	NA	
4170-30-3	Crotonaldehyde, Total	< 100	NA	NA	NA	NA	
123-72-8	Butyraldehyde	< 100	NA	NA	NA	NA	
100-52-7	Benzaldehyde	< 100	NA	NA	NA	NA	
590-86-3	Isovaleraldehyde	< 100	NA	NA	NA	NA	
110-62-3	Valeraldehyde	< 100	NA	NA	NA	NA	
529-20-4	o-Tolualdehyde	< 100	NA	NA	NA	NA	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	NA	NA	NA	NA	
66-25-1	n-Hexaldehyde	< 100	NA	NA	NA	NA	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	NA	NA	NA	NA	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

NA = Not applicable.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P150804-MB

Test Code: EPA Method TO-11A  
 Instrument ID: Agilent Infinity LC 1220/LC3  
 Analyst: Madeleine Dangazyan  
 Sample Type: Silica Gel DNPH Tube  
 Test Notes: **BC**

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 08/04/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: NA Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	< 100	NA	NA	NA	NA	
75-07-0	Acetaldehyde	< 100	NA	NA	NA	NA	
123-38-6	Propionaldehyde	< 100	NA	NA	NA	NA	
4170-30-3	Crotonaldehyde, Total	< 100	NA	NA	NA	NA	
123-72-8	Butyraldehyde	< 100	NA	NA	NA	NA	
100-52-7	Benzaldehyde	< 100	NA	NA	NA	NA	
590-86-3	Isovaleraldehyde	< 100	NA	NA	NA	NA	
110-62-3	Valeraldehyde	< 100	NA	NA	NA	NA	
529-20-4	o-Tolualdehyde	< 100	NA	NA	NA	NA	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	NA	NA	NA	NA	
66-25-1	n-Hexaldehyde	< 100	NA	NA	NA	NA	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	NA	NA	NA	NA	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

NA = Not applicable.

Method Path : J:\LC03\METHODS\  
 Method File : TO11A030615E.M  
 Title : TO-11A Method for Aldehydes/Ketones by HPLC  
 Last Update : Fri Mar 06 12:49:00 2015  
 Response Via : Initial Calibration

Calibration Files  
 50 =030615000011B.D 100 =030615000017B.D 500 =030615000020B.D  
 1500 =030615000023.D 5000 =030615000026.D 10 =030615000029.D

Compound	50	100	500	1500	5000	10	Avg	%RSD
1) Formaldehyde	2.006	2.010	2.179	2.184	2.233	2.295	2.151 E4	5.51
2) Acetaldehyde	1.494	1.507	1.632	1.636	1.679	1.743	1.615 E4	6.04
3) Acetone	1.225	1.170	1.208	1.200	1.227	1.274	1.217 E4	2.85
4) Acrolein	1.412	1.375	1.446	1.444	1.483	1.542	1.450 E4	3.97
5) Propionaldehyde	1.213	1.171	1.252	1.251	1.284	1.333	1.250 E4	4.46
6) Crotonaldehyde	0.962	0.925	1.021	1.028	1.060	1.103	1.017 E4	6.34
7) Butyraldehyde	0.926	0.922	0.983	0.987	1.019	1.056	0.982 E4	5.31
8) Benzaldehyde	5.713	5.774	6.232	6.465	6.647	6.926	6.293 E3	7.67
9) Isovaleraldehyde	8.094	7.478	8.186	8.208	8.458	8.808	8.205 E3	5.36
10) Valeraldehyde	7.433	7.771	8.038	8.104	8.403	8.738	8.081 E3	5.68
11) o-Tolualdehyde	4.845	4.846	4.831	4.887	5.092	5.355	4.976 E3	4.22
12) m,p-Tolualdehyde	5.354	5.303	5.684	5.722	5.889	6.122	5.679 E3	5.51
13) Hexaldehyde	6.762	6.412	6.908	6.940	7.210	7.499	6.955 E3	5.36
14) 2,5-Dimethylb...	3.850	4.450	4.643	4.716	4.974	5.196	4.638 E3	10.05

(#) = Out of Range

**ALS Environmental**

TO11A Aldehyde & Ketone DNPH Analysis by HPLC

Instrument : LC 03  
 Detector : UV-VIS 360  
 Analyst : MD  
 Client & Job# : Stantec Consulting Services, Inc. P1503123

Printed : 8/6/2015  
 Date Acquired : 8/4/2015  
 Sample Amount : 3.0uL

QC

Sample Information	MRL	TO-11A 1500ng/ml S28-08031501	% Diff	ACN blank lot DJ138	MB back 1.0ml lot 9277/9514	MB front 1.0ml lot 9277/9514	TO-11A 1500ng/ml S28-08031501	% Diff	TO-11A 1500ng/ml S28-08031501	% Diff	TO-11A 1500ng/ml S28-08031501	% Diff	TO-11A 1500ng/ml S28-08031501	% Diff
Dilution	1.0			1.0	1.0	1.0								
Sample Volume (L)	NA			NA	NA	NA								
Final Vol.(mL)	1.0			1.0	1.0	1.0								
Data File		08041500000 02.D		080415000003 .D	080415000005 .D	080415000004 .D	08051500000 02.D		08051500000 11.D		08041500000 14.D		08041500000 25.D	
	ng/sample	ng/sample		ng/sample	ng/sample	ng/sample	ng/sample		ng/sample		ng/sample		ng/sample	
Formaldehyde	100.00	1394.4	7.0%	ND	ND	ND	1382.1	7.9%	1381.9	7.9%	1374.4	8.4%	1388.8	7.4%
Acetaldehyde	100.00	1424.0	5.1%	ND	ND	ND	1433.6	4.4%	1437.6	4.2%	1413.2	5.8%	1424.8	5.0%
Propionaldehyde	100.00	1419.4	5.4%	ND	ND	ND	1434.5	4.4%	1431.8	4.5%	1404.6	6.4%	1426.6	4.9%
Crotonaldehyde	100.00	1444.8	3.7%	ND	ND	ND	1486.4	0.9%	1483.1	1.1%	1434.3	4.4%	1451.6	3.2%
Butyraldehyde	100.00	1446.2	3.6%	ND	ND	ND	1454.3	3.0%	1450.1	3.3%	1427.9	4.8%	1438.3	4.1%
Benzaldehyde	100.00	1580.5	5.4%	ND	ND	ND	1609.4	7.3%	1617.1	7.8%	1561.8	4.1%	1588.0	5.9%
Isovaleraldehyde	100.00	1507.8	0.5%	ND	ND	ND	1508.1	0.5%	1505.1	0.3%	1487.4	0.8%	1498.2	0.1%
Valeraldehyde	100.00	1490.3	0.6%	ND	ND	ND	1488.1	0.8%	1492.6	0.5%	1475.4	1.6%	1484.5	1.0%
o-Tolualdehyde	100.00	1631.5	8.8%	ND	ND	ND	1669.9	11.3%	1673.7	11.6%	1617.9	7.9%	1640.4	9.4%
m,p-Tolualdehyde	200.00	2925.0	2.5%	ND	ND	ND	3014.2	0.5%	3042.3	1.4%	2918.2	2.7%	2973.5	0.9%
Hexaldehyde	100.00	1416.9	5.5%	ND	ND	ND	1479.0	1.4%	1488.0	0.8%	1435.1	4.3%	1487.2	2.2%
2,5-Dimethylbenzaldehyde	100.00	1459.3	2.7%	ND	ND	ND	1621.4	8.1%	1614.7	7.6%	1543.7	2.9%	1512.9	0.9%

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 728U1-Amine

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123

ALS Sample ID: P1503123-003

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 14.6 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	71	ND	39	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	75	ND	41	
75-50-3	Trimethylamine	< 1.0	ND	68	ND	28	
75-31-0	Isopropylamine	< 1.0	ND	72	ND	30	
75-64-9	tert-Butylamine	< 1.0	ND	71	ND	24	
107-10-8	n-Propylamine	< 1.1	ND	74	ND	31	
109-89-7	Diethylamine	< 1.0	ND	71	ND	24	
13952-84-6	sec-Butylamine	< 1.1	ND	72	ND	24	
78-81-9	Isobutylamine	< 1.1	ND	73	ND	25	
109-73-9	n-Butylamine	< 1.1	ND	76	ND	25	
108-18-9	Diisopropylamine	< 1.0	ND	71	ND	17	
121-44-8	Triethylamine	< 1.0	ND	71	ND	17	
142-84-7	Dipropylamine	< 1.0	ND	72	ND	17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D1-Amine  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-009

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 15.5 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	67	ND	36	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	71	ND	38	
75-50-3	Trimethylamine	< 1.0	ND	64	ND	27	
75-31-0	Isopropylamine	< 1.0	ND	68	ND	28	
75-64-9	tert-Butylamine	< 1.0	ND	67	ND	22	
107-10-8	n-Propylamine	< 1.1	ND	70	ND	29	
109-89-7	Diethylamine	< 1.0	ND	67	ND	22	
13952-84-6	sec-Butylamine	< 1.1	ND	68	ND	23	
78-81-9	Isobutylamine	< 1.1	ND	69	ND	23	
109-73-9	n-Butylamine	< 1.1	ND	72	ND	24	
108-18-9	Diisopropylamine	< 1.0	ND	67	ND	16	
121-44-8	Triethylamine	< 1.0	ND	67	ND	16	
142-84-7	Dipropylamine	< 1.0	ND	68	ND	16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D2-Amine  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-014

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 42.5 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	24	ND	13	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	26	ND	14	
75-50-3	Trimethylamine	< 1.0	ND	24	ND	9.7	
75-31-0	Isopropylamine	< 1.0	ND	25	ND	10	
75-64-9	tert-Butylamine	< 1.0	ND	25	ND	8.2	
107-10-8	n-Propylamine	< 1.1	ND	25	ND	11	
109-89-7	Diethylamine	< 1.0	ND	24	ND	8.1	
13952-84-6	sec-Butylamine	< 1.1	ND	25	ND	8.3	
78-81-9	Isobutylamine	< 1.1	ND	25	ND	8.4	
109-73-9	n-Butylamine	< 1.1	ND	26	ND	8.8	
108-18-9	Diisopropylamine	< 1.0	ND	24	ND	5.9	
121-44-8	Triethylamine	< 1.0	ND	24	ND	5.9	
142-84-7	Dipropylamine	< 1.0	ND	25	ND	6.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 728F-Amine

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123

ALS Sample ID: P1503123-019

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 14.6 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	71	ND	39	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	75	ND	41	
75-50-3	Trimethylamine	< 1.0	ND	68	ND	28	
75-31-0	Isopropylamine	< 1.0	ND	72	ND	30	
75-64-9	tert-Butylamine	< 1.0	ND	71	ND	24	
107-10-8	n-Propylamine	< 1.1	ND	74	ND	31	
109-89-7	Diethylamine	< 1.0	ND	71	ND	24	
13952-84-6	sec-Butylamine	< 1.1	ND	72	ND	24	
78-81-9	Isobutylamine	< 1.1	ND	73	ND	25	
109-73-9	n-Butylamine	< 1.1	ND	76	ND	25	
108-18-9	Diisopropylamine	< 1.0	ND	71	ND	17	
121-44-8	Triethylamine	< 1.0	ND	71	ND	17	
142-84-7	Dipropylamine	< 1.0	ND	72	ND	17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728SQ-Amine  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-025

**Test Code:** GC/NPD  
**Instrument ID:** Agilent 6890N/GC14/NPD  
**Analyst:** Zheng Wang  
**Sampling Media:** Treated Alumina Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/28/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/3/15  
**Desorption Volume:** 2.0 ml  
**Volume Sampled:** 15.0 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	69	ND	38	V
75-04-7	Ethylamine	< 1.1	ND	73	ND	40	
75-50-3	Trimethylamine	< 1.0	ND	67	ND	28	
75-31-0	Isopropylamine	< 1.0	ND	70	ND	29	
75-64-9	tert-Butylamine	< 1.0	ND	69	ND	23	
107-10-8	n-Propylamine	< 1.1	ND	72	ND	30	
109-89-7	Diethylamine	< 1.0	ND	69	ND	23	
13952-84-6	sec-Butylamine	< 1.1	ND	70	ND	23	
78-81-9	Isobutylamine	< 1.1	ND	71	ND	24	
109-73-9	n-Butylamine	< 1.1	ND	74	ND	25	
108-18-9	Diisopropylamine	< 1.0	ND	69	ND	17	
121-44-8	Triethylamine	< 1.0	ND	69	ND	17	
142-84-7	Dipropylamine	< 1.0	ND	70	ND	17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729U1-Amine  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-030

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 14.1 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	74	ND	40	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	78	ND	42	
75-50-3	Trimethylamine	< 1.0	ND	71	ND	29	
75-31-0	Isopropylamine	< 1.0	ND	74	ND	31	
75-64-9	tert-Butylamine	< 1.0	ND	74	ND	25	
107-10-8	n-Propylamine	< 1.1	ND	77	ND	32	
109-89-7	Diethylamine	< 1.0	ND	73	ND	25	
13952-84-6	sec-Butylamine	< 1.1	ND	75	ND	25	
78-81-9	Isobutylamine	< 1.1	ND	76	ND	25	
109-73-9	n-Butylamine	< 1.1	ND	79	ND	26	
108-18-9	Diisopropylamine	< 1.0	ND	73	ND	18	
121-44-8	Triethylamine	< 1.0	ND	73	ND	18	
142-84-7	Dipropylamine	< 1.0	ND	74	ND	18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729D1-Amine  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 13.6 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	76	ND	41	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	81	ND	44	
75-50-3	Trimethylamine	< 1.0	ND	73	ND	30	
75-31-0	Isopropylamine	< 1.0	ND	77	ND	32	
75-64-9	tert-Butylamine	< 1.0	ND	77	ND	26	
107-10-8	n-Propylamine	< 1.1	ND	80	ND	33	
109-89-7	Diethylamine	< 1.0	ND	76	ND	25	
13952-84-6	sec-Butylamine	< 1.1	ND	77	ND	26	
78-81-9	Isobutylamine	< 1.1	ND	79	ND	26	
109-73-9	n-Butylamine	< 1.1	ND	82	ND	27	
108-18-9	Diisopropylamine	< 1.0	ND	76	ND	18	
121-44-8	Triethylamine	< 1.0	ND	76	ND	18	
142-84-7	Dipropylamine	< 1.0	ND	77	ND	19	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 729D2-Amine

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123

ALS Sample ID: P1503123-038

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 13.9 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	75	ND	41	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	79	ND	43	
75-50-3	Trimethylamine	< 1.0	ND	72	ND	30	
75-31-0	Isopropylamine	< 1.0	ND	75	ND	31	
75-64-9	tert-Butylamine	< 1.0	ND	75	ND	25	
107-10-8	n-Propylamine	< 1.1	ND	78	ND	32	
109-89-7	Diethylamine	< 1.0	ND	74	ND	25	
13952-84-6	sec-Butylamine	< 1.1	ND	76	ND	25	
78-81-9	Isobutylamine	< 1.1	ND	77	ND	26	
109-73-9	n-Butylamine	< 1.1	ND	80	ND	27	
108-18-9	Diisopropylamine	< 1.0	ND	74	ND	18	
121-44-8	Triethylamine	< 1.0	ND	74	ND	18	
142-84-7	Dipropylamine	< 1.0	ND	75	ND	18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729N-Amine  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-043

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 14.9 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	70	ND	38	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	74	ND	40	
75-50-3	Trimethylamine	< 1.0	ND	67	ND	28	
75-31-0	Isopropylamine	< 1.0	ND	70	ND	29	
75-64-9	tert-Butylamine	< 1.0	ND	70	ND	23	
107-10-8	n-Propylamine	< 1.1	ND	73	ND	30	
109-89-7	Diethylamine	< 1.0	ND	69	ND	23	
13952-84-6	sec-Butylamine	< 1.1	ND	71	ND	24	
78-81-9	Isobutylamine	< 1.1	ND	72	ND	24	
109-73-9	n-Butylamine	< 1.1	ND	75	ND	25	
108-18-9	Diisopropylamine	< 1.0	ND	69	ND	17	
121-44-8	Triethylamine	< 1.0	ND	69	ND	17	
142-84-7	Dipropylamine	< 1.0	ND	70	ND	17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729NQ-Amine  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-049

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 14.1 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	74	ND	40	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	78	ND	42	
75-50-3	Trimethylamine	< 1.0	ND	71	ND	29	
75-31-0	Isopropylamine	< 1.0	ND	74	ND	31	
75-64-9	tert-Butylamine	< 1.0	ND	74	ND	25	
107-10-8	n-Propylamine	< 1.1	ND	77	ND	32	
109-89-7	Diethylamine	< 1.0	ND	73	ND	25	
13952-84-6	sec-Butylamine	< 1.1	ND	75	ND	25	
78-81-9	Isobutylamine	< 1.1	ND	76	ND	25	
109-73-9	n-Butylamine	< 1.1	ND	79	ND	26	
108-18-9	Diisopropylamine	< 1.0	ND	73	ND	18	
121-44-8	Triethylamine	< 1.0	ND	73	ND	18	
142-84-7	Dipropylamine	< 1.0	ND	74	ND	18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sN-Amine  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-055

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 0.456 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	2,300	ND	1,200	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	2,400	ND	1,300	
75-50-3	Trimethylamine	< 1.0	ND	2,200	ND	910	
75-31-0	Isopropylamine	< 1.0	ND	2,300	ND	950	
75-64-9	tert-Butylamine	< 1.0	ND	2,300	ND	760	
107-10-8	n-Propylamine	< 1.1	ND	2,400	ND	980	
109-89-7	Diethylamine	< 1.0	ND	2,300	ND	760	
13952-84-6	sec-Butylamine	< 1.1	ND	2,300	ND	770	
78-81-9	Isobutylamine	< 1.1	ND	2,400	ND	790	
109-73-9	n-Butylamine	< 1.1	ND	2,400	ND	820	
108-18-9	Diisopropylamine	< 1.0	ND	2,300	ND	550	
121-44-8	Triethylamine	< 1.0	ND	2,300	ND	550	
142-84-7	Dipropylamine	< 1.0	ND	2,300	ND	560	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 729sNQ-Amine

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123

ALS Sample ID: P1503123-061

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 0.456 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	2,300	ND	1,200	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	2,400	ND	1,300	
75-50-3	Trimethylamine	< 1.0	ND	2,200	ND	910	
75-31-0	Isopropylamine	< 1.0	ND	2,300	ND	950	
75-64-9	tert-Butylamine	< 1.0	ND	2,300	ND	760	
107-10-8	n-Propylamine	< 1.1	ND	2,400	ND	980	
109-89-7	Diethylamine	< 1.0	ND	2,300	ND	760	
13952-84-6	sec-Butylamine	< 1.1	ND	2,300	ND	770	
78-81-9	Isobutylamine	< 1.1	ND	2,400	ND	790	
109-73-9	n-Butylamine	< 1.1	ND	2,400	ND	820	
108-18-9	Diisopropylamine	< 1.0	ND	2,300	ND	550	
121-44-8	Triethylamine	< 1.0	ND	2,300	ND	550	
142-84-7	Dipropylamine	< 1.0	ND	2,300	ND	560	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 729sSQ-Amine

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123

ALS Sample ID: P1503123-067

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 0.456 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	2,300	ND	1,200	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	2,400	ND	1,300	
75-50-3	Trimethylamine	< 1.0	ND	2,200	ND	910	
75-31-0	Isopropylamine	< 1.0	ND	2,300	ND	950	
75-64-9	tert-Butylamine	< 1.0	ND	2,300	ND	760	
107-10-8	n-Propylamine	< 1.1	ND	2,400	ND	980	
109-89-7	Diethylamine	< 1.0	ND	2,300	ND	760	
13952-84-6	sec-Butylamine	< 1.1	ND	2,300	ND	770	
78-81-9	Isobutylamine	< 1.1	ND	2,400	ND	790	
109-73-9	n-Butylamine	< 1.1	ND	2,400	ND	820	
108-18-9	Diisopropylamine	< 1.0	ND	2,300	ND	550	
121-44-8	Triethylamine	< 1.0	ND	2,300	ND	550	
142-84-7	Dipropylamine	< 1.0	ND	2,300	ND	560	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Amine  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-073

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 0.228 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	4,600	ND	2,500	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	4,800	ND	2,600	
75-50-3	Trimethylamine	< 1.0	ND	4,400	ND	1,800	
75-31-0	Isopropylamine	< 1.0	ND	4,600	ND	1,900	
75-64-9	tert-Butylamine	< 1.0	ND	4,600	ND	1,500	
107-10-8	n-Propylamine	< 1.1	ND	4,700	ND	2,000	
109-89-7	Diethylamine	< 1.0	ND	4,500	ND	1,500	
13952-84-6	sec-Butylamine	< 1.1	ND	4,600	ND	1,500	
78-81-9	Isobutylamine	< 1.1	ND	4,700	ND	1,600	
109-73-9	n-Butylamine	< 1.1	ND	4,900	ND	1,600	
108-18-9	Diisopropylamine	< 1.0	ND	4,500	ND	1,100	
121-44-8	Triethylamine	< 1.0	ND	4,500	ND	1,100	
142-84-7	Dipropylamine	< 1.0	ND	4,600	ND	1,100	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729-Dup05  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-081

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: 0.488 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	ND	2,100	ND	1,200	<b>V</b>
75-04-7	Ethylamine	< 1.1	ND	2,300	ND	1,200	
75-50-3	Trimethylamine	< 1.0	ND	2,000	ND	850	
75-31-0	Isopropylamine	< 1.0	ND	2,100	ND	890	
75-64-9	tert-Butylamine	< 1.0	ND	2,100	ND	710	
107-10-8	n-Propylamine	< 1.1	ND	2,200	ND	920	
109-89-7	Diethylamine	< 1.0	ND	2,100	ND	710	
13952-84-6	sec-Butylamine	< 1.1	ND	2,200	ND	720	
78-81-9	Isobutylamine	< 1.1	ND	2,200	ND	730	
109-73-9	n-Butylamine	< 1.1	ND	2,300	ND	760	
108-18-9	Diisopropylamine	< 1.0	ND	2,100	ND	510	
121-44-8	Triethylamine	< 1.0	ND	2,100	ND	510	
142-84-7	Dipropylamine	< 1.0	ND	2,100	ND	520	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730FB-Amine  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-085

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: NA Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	NA	NA	NA	NA	<b>V</b>
75-04-7	Ethylamine	< 1.1	NA	NA	NA	NA	
75-50-3	Trimethylamine	< 1.0	NA	NA	NA	NA	
75-31-0	Isopropylamine	< 1.0	NA	NA	NA	NA	
75-64-9	tert-Butylamine	< 1.0	NA	NA	NA	NA	
107-10-8	n-Propylamine	< 1.1	NA	NA	NA	NA	
109-89-7	Diethylamine	< 1.0	NA	NA	NA	NA	
13952-84-6	sec-Butylamine	< 1.1	NA	NA	NA	NA	
78-81-9	Isobutylamine	< 1.1	NA	NA	NA	NA	
109-73-9	n-Butylamine	< 1.1	NA	NA	NA	NA	
108-18-9	Diisopropylamine	< 1.0	NA	NA	NA	NA	
121-44-8	Triethylamine	< 1.0	NA	NA	NA	NA	
142-84-7	Dipropylamine	< 1.0	NA	NA	NA	NA	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

NA = Not applicable.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P150803-MB

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/3/15  
 Desorption Volume: 2.0 ml  
 Volume Sampled: NA Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
124-40-3	Dimethylamine	< 1.0	NA	NA	NA	NA	<b>V</b>
75-04-7	Ethylamine	< 1.1	NA	NA	NA	NA	
75-50-3	Trimethylamine	< 1.0	NA	NA	NA	NA	
75-31-0	Isopropylamine	< 1.0	NA	NA	NA	NA	
75-64-9	tert-Butylamine	< 1.0	NA	NA	NA	NA	
107-10-8	n-Propylamine	< 1.1	NA	NA	NA	NA	
109-89-7	Diethylamine	< 1.0	NA	NA	NA	NA	
13952-84-6	sec-Butylamine	< 1.1	NA	NA	NA	NA	
78-81-9	Isobutylamine	< 1.1	NA	NA	NA	NA	
109-73-9	n-Butylamine	< 1.1	NA	NA	NA	NA	
108-18-9	Diisopropylamine	< 1.0	NA	NA	NA	NA	
121-44-8	Triethylamine	< 1.0	NA	NA	NA	NA	
142-84-7	Dipropylamine	< 1.0	NA	NA	NA	NA	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

NA = Not applicable.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Duplicate Lab Control Sample  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P150803-DLCS

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC14/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/03/15  
 Volume(s) Analyzed: NA Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		ALS		Data Qualifier
		LCS / DLCS µg/ml	LCS µg/ml	DLCS µg/ml	LCS	DLCS	Acceptance Limits	RPD Limit		
124-40-3	Dimethylamine	8.10	6.73	7.63	<b>83</b>	<b>94</b>	63-117	12	21	
75-04-7	Ethylamine	7.56	5.38	5.84	<b>71</b>	<b>77</b>	55-112	8	28	
75-50-3	Trimethylamine	8.73	8.00	9.10	<b>92</b>	<b>104</b>	61-127	12	32	
75-31-0	Isopropylamine	8.73	7.26	8.41	<b>83</b>	<b>96</b>	48-132	15	17	
75-64-9	tert-Butylamine	7.85	7.32	8.18	<b>93</b>	<b>104</b>	70-122	11	18	
107-10-8	n-Propylamine	8.78	6.48	7.29	<b>74</b>	<b>83</b>	62-112	11	24	
109-89-7	Diethylamine	8.72	8.36	9.97	<b>96</b>	<b>114</b>	75-117	17	18	
13952-84-6	sec-Butylamine	8.79	7.36	8.65	<b>84</b>	<b>98</b>	73-116	15	17	
78-81-9	Isobutylamine	8.81	6.86	7.59	<b>78</b>	<b>86</b>	69-111	10	19	
109-73-9	n-Butylamine	8.56	5.82	6.69	<b>68</b>	<b>78</b>	64-113	14	23	
108-18-9	Diisopropylamine	8.66	8.42	9.71	<b>97</b>	<b>112</b>	74-118	14	20	
121-44-8	Triethylamine	8.83	8.66	10.2	<b>98</b>	<b>116</b>	70-122	17	22	
142-84-7	Dipropylamine	9.21	8.84	10.2	<b>96</b>	<b>111</b>	76-119	14	19	

Method Path : J:\GC14\METHODS\  
 Method File : AMINE050515E.M  
 Title : GC #15/ NPD Method For Volatile Amines  
 Last Update : Wed May 06 09:48:44 2015  
 Response Via : Initial Calibration

Calibration Files  
 0.5 =05051511.D 1.0 =05051512.D 5.0 =05051513.D 10 =05051514.  
 D 20 =05051518.D 50 =05051516.D

Compound	0.5	1.0	5.0	10	20	50	Avg	%RSD
-----								
1) I3-Chloropyridine	-----ISTD-----							
2) Dimethylamine	3.413	4.386	5.341	6.197	5.775	6.835	5.325	<del>23.43</del> *
3) Ethylamine	2.645	3.339	3.997	4.409	4.269	4.795	3.909	<del>20.13</del> *
4) Trimethylamine	4.204	4.428	3.961	4.184	3.730	3.951	4.076	6.01
5) Isopropylamine	1.813	2.132	2.245	2.372	2.231	2.432	2.204	9.95
6) t-Butylamine	0.990	1.005	1.032	1.001	0.944	1.024	0.999	3.11
7) Propylamine	1.866	2.266	2.543	2.714	2.689	2.956	2.506	15.44
8) Diethylamine	1.908	2.114	2.277	2.444	2.248	2.483	2.246	9.51
9) s-Butylamine	1.284	1.470	1.596	1.681	1.569	1.701	1.550	9.97
10) Isobutylamine	1.730	1.879	2.016	2.097	2.011	2.178	1.985	8.06
11) Butylamine	1.426	1.557	1.715	1.790	1.752	1.928	1.695	10.50
12) Diisopropylamine	1.336	1.322	1.392	1.419	1.285	1.383	1.356	3.70
13) Triethylamine	1.705	1.639	1.614	1.663	1.524	1.632	1.630	3.72
14) Pyridine	1.397	1.459	1.584	1.568	1.499	1.549	1.509	4.77
15) Dipropylamine	1.205	1.368	1.396	1.462	1.334	1.428	1.366	6.63

(#) = Out of Range

\* : Linear Regression was used for Dimethylamine and Ethylamine.



### Edit Integration Events

Possible Events:

Event	Value	Time
Initial Area Reject	0	Initial
Initial Peak Width	0.015	Initial
Shoulder Detection	OFF	Initial
Initial Threshold	4.0	Initial
Integrator OFF	5.0	0.010
Threshold	5.0	0.010
Integrator ON		3.450
Peak Width	0.020	4.000

Buttons: Apply Load Save Enter Delete **OK** Cancel Help

### Edit Compounds

Search by Retention Time Find Compound

Compound Database: 3-Chloropyridine, Dimethylamine, Ethylamine, Trimethylamine, Isopropylamine, t-Butylamine, Propylamine, Diethylamine, n-Butylamine, Isobutylamine, Butylamine, Diisopropylamine, Triethylamine, Pyridine, Dipropylamine

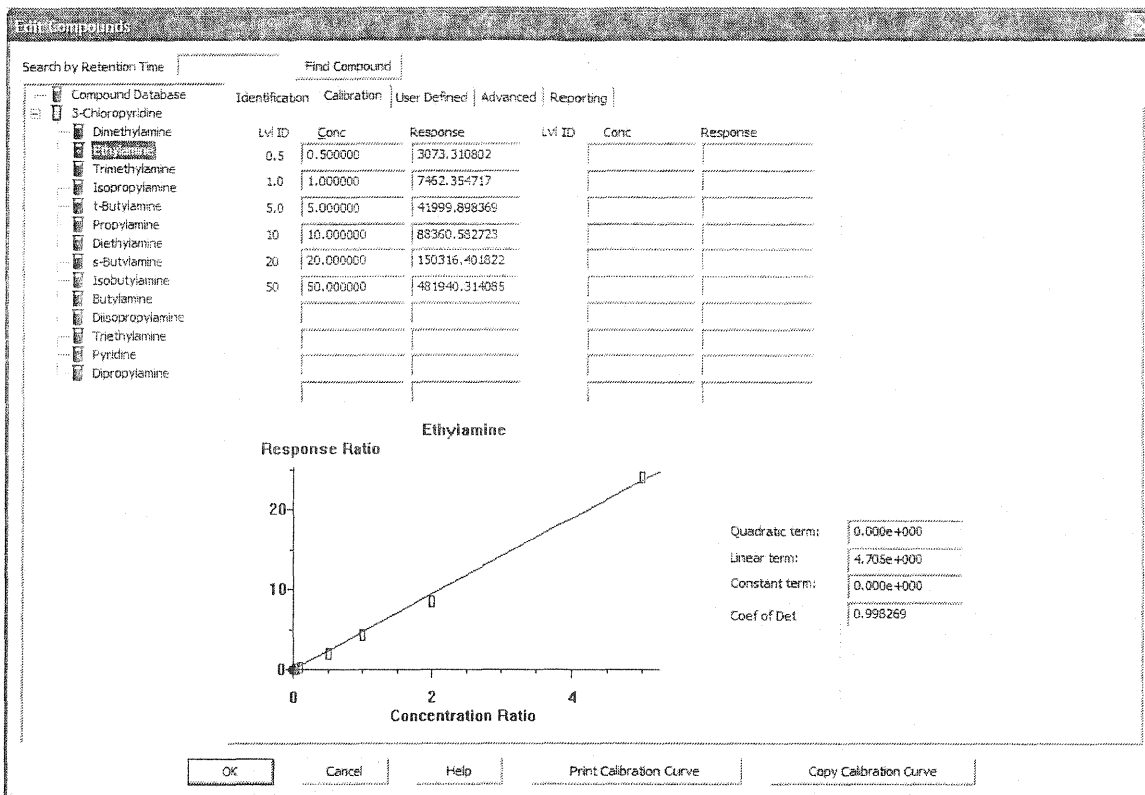
Identification	Calibration	User Defined	Advanced	Reporting	
Lvl ID	Conc	Response	Lvl ID	Conc	Response
0.5	0.500000	3966.091137			
1.0	1.000000	9800.826887			
5.0	5.000000	56121.816847			
10	10.000000	124196.911902			
20	20.000000	203351.626060			
50	50.000000	686963.769719			

**Dimethylamine**

Response Ratio vs Concentration Ratio

Quadratic term:	0.000e+000
Linear term:	6.660e+000
Constant term:	0.000e+000
Coef of Det	0.996453

Buttons: OK Cancel Help Print Calibration Curve Copy Calibration Curve



QC SAMPLE REPORT SUMMARY

Compounds	ug/ml	% Diff	Control Limits (%)	RB 0.01N NaOH/MeOH	ug/ml MB-2 Amine	ug/ml Amine Std	% Diff	ug/ml Amine Std	% Diff	ug/ml	% Diff	ug/ml	% Diff
Sample Information	10ug/ml Amine Std	10	Control Limits (%)	RB 0.01N NaOH/MeOH	ug/ml MB-2 Amine	10ug/ml Amine Std	% Diff	10ug/ml Amine Std	% Diff	10ug/ml Amine Std	% Diff	10ug/ml Amine Std	% Diff
Desorption Volume (mL)													
Dilution													
3-Chloropyridine IS % Relative to CCV	29773 100.0%	1.0	Pass	33269 111.7%	24045 80.8%	26123 87.7%	10	27419 92.1%	93.9%	27958 93.9%	1.0	27958 93.9%	1.0
Dimethylamine	7.862	Fail	Fail	ND	ND	7.180	Fail	6.953	Fail	7.377	Fail	7.377	Fail
Ethylamine	8.631	13.7%	Pass	ND	ND	8.494	15.1%	8.086	19.1%	8.594	14.1%	8.594	14.1%
Trimethylamine	11.365	13.7%	Pass	ND	ND	11.248	12.5%	11.259	12.6%	11.302	13.0%	11.302	13.0%
Isopropylamine	9.792	2.1%	Pass	ND	ND	9.833	1.7%	9.609	3.9%	10.001	0.0%	10.001	0.0%
t-Butylamine	9.363	6.4%	Pass	ND	ND	9.216	7.8%	8.911	10.9%	10.208	2.1%	10.208	2.1%
Propylamine	9.786	2.1%	Pass	ND	ND	9.663	3.4%	9.258	7.4%	9.937	0.6%	9.937	0.6%
Diethylamine	9.587	4.1%	Pass	ND	ND	9.927	0.7%	9.858	1.4%	10.475	4.8%	10.475	4.8%
s-Butylamine	9.470	5.3%	Pass	ND	ND	9.526	4.7%	9.186	8.1%	9.662	3.4%	9.662	3.4%
Isobutylamine	9.655	3.5%	Pass	ND	ND	9.365	6.4%	9.011	9.9%	9.568	4.3%	9.568	4.3%
Butylamine	9.006	9.9%	Pass	ND	ND	9.213	7.9%	9.172	8.3%	9.231	7.7%	9.231	7.7%
Diisopropylamine	10.057	0.6%	Pass	ND	ND	10.523	5.2%	9.977	0.2%	11.377	13.8%	11.377	13.8%
Triethylamine	10.096	1.0%	Pass	ND	ND	10.278	2.8%	10.197	2.0%	10.687	6.9%	10.687	6.9%
Dipropylamine	9.371	6.3%	Pass	ND	ND	9.742	2.6%	9.615	3.9%	10.166	1.7%	10.166	1.7%
Acquisition Time	14:35	ZW	ZW	11:49	14:20	16:35	ZW	19:05	ZW	21:50	ZW	21:50	ZW
Analyst													

MRL CHECK & LCS/ LCSD RESULT SUMMARIES

0	% recovery	%	recovery	%	Average Recovery	RPD	RPD (Control Limits)
Desorption Volume (mL)							
Dilution							
3-Chloropyridine IS % Relative to CCV	0.5ug/ml Amine MRL Check Std	Control Limits (%)	SS 10ug/ml Amine	LCS-2 10ug/ml Amine	LCSD-2 10ug/ml Amine		
Dimethylamine	2.0	P 25-101%	8.100	6.725	7.631	Pass	12.6%
Ethylamine	1.0	P 29-111%	7.559	5.380	5.836	Pass	8.1%
Trimethylamine	26874	P 52-146%	8.733	8.004	9.098	Pass	12.8%
Isopropylamine	90.3%	P 43-142%	8.726	7.261	8.409	Pass	14.7%
t-Butylamine		P 47-165%	7.848	7.321	8.178	Pass	11.1%
Propylamine		P 39-135%	8.783	6.482	7.292	Pass	11.8%
Diethylamine		P 61-136%	8.724	8.364	9.974	Pass	17.6%
s-Butylamine		P 57-144%	8.793	7.360	8.648	Pass	16.1%
Isobutylamine		P 44-152%	8.805	6.858	7.586	Pass	10.1%
Butylamine		P 26-156%	8.560	5.816	6.688	Pass	13.9%
Diisopropylamine		P 62-157%	8.663	8.421	9.710	Pass	14.2%
Triethylamine		P 71-147%	8.831	8.659	10.187	Pass	16.2%
Dipropylamine		P 42-188%	9.209	8.844	10.209	Pass	14.3%
Acquisition Time	14:50		12:19	13:49	14:04		
Analyst	ZW		ZW	ZW	ZW		

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Stantec Consulting Services, Inc.  
 Client Project ID: Bridgeton / 182608020

ALS Project ID: P1503123

Ammonia

Test Code: OSHA ID-188/ID-164  
 Instrument ID: PH01/Thermo Orion 920A+/Ammonia ISE  
 Analyst: Sue Anderson  
 Sampling Media: Anasorb 747 Tube(s) (Sulfuric Treated)  
 Test Notes: BC, DE

Date(s) Collected: 7/28 - 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/4 - 8/6/15  
 Desorption Volume: 0.10 Liter(s)

Client Sample ID	ALS Sample ID	Sample		Result mg/Tube	Result mg/m <sup>3</sup>	MRL mg/m <sup>3</sup>	Result ppmV	MRL ppmV	Data Qualifier
		Volume Liter(s)	Dilution Factor						
728U1-NH3	P1503123-005	112.8	1.0	< 0.010	ND	0.091	ND	0.13	
728D1-NH3	P1503123-011	106.4	1.0	< 0.010	ND	0.097	ND	0.14	
728D2-NH3	P1503123-015	108.9	1.0	< 0.010	ND	0.095	ND	0.14	
728F-NH3	P1503123-021	109.8	1.0	< 0.010	ND	0.094	ND	0.13	
728SQ-NH3	P1503123-027	107.1	1.0	< 0.010	ND	0.096	ND	0.14	
729U1-NH3	P1503123-031	105.6	1.0	< 0.010	ND	0.098	ND	0.14	
729D1-NH3	P1503123-035	106.3	1.0	< 0.010	ND	0.097	ND	0.14	
729D2-NH3	P1503123-039	105.7	1.0	< 0.010	ND	0.097	ND	0.14	
729N-NH3	P1503123-045	105.8	1.0	< 0.010	ND	0.097	ND	0.14	
729NQ-NH3	P1503123-051	104.7	1.0	< 0.010	ND	0.098	ND	0.14	
729sN-NH3	P1503123-057	1.780	1.0	< 0.010	ND	5.8	ND	8.3	
729sNQ-NH3	P1503123-063	1.780	1.0	< 0.010	ND	5.8	ND	8.3	
729sSQ-NH3	P1503123-069	1.780	1.0	< 0.010	ND	5.8	ND	8.3	
729sF-NH3	P1503123-075	0.890	1.0	< 0.010	ND	12	ND	17	
729-Dup06	P1503123-082	2.670	1.0	< 0.010	ND	3.9	ND	5.5	
730FB-NH3	P1503123-087	NA	1.0	< 0.010	NA	NA	NA	NA	
Method Blank	P150804-MB	NA	1.0	< 0.010	NA	NA	NA	NA	
Method Blank	P150806-MB	NA	1.0	< 0.010	NA	NA	NA	NA	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

NA = Not applicable.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Duplicate Lab Control Sample  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P150804-LCS,  
 P150804-DLCS

**Laboratory Control Sample/Duplicate Laboratory Control Sample Summary**

Test Code: OSHA ID-188/ID-164  
 Instrument ID: PH01/Thermo Orion 920A+/Ammonia ISE  
 Analyst: Sue Anderson  
 Sampling Media: Anasorb 747 Tube(s) (Sulfuric Treated)  
 Test Notes:

Date Sampled: N/A  
 Date Received: N/A  
 Date Analyzed: 8/04/15  
 Volume(s) Analyzed: N/A

Compound	Spike Amount	Result		% Recovery		ALS Acceptance Limits	Relative Percent Difference	RPD Limit	Data Qualifier
	LCS / DLCS mg/L	LCS mg/L	DLCS mg/L	LCS	DLCS				
Ammonia	1.00	0.945	0.945	95	95	89-11	0	4	

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Duplicate Lab Control Sample  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P150806-LCS,  
 P150806-DLCS

**Laboratory Control Sample/Duplicate Laboratory Control Sample Summary**

Test Code: OSHA ID-188/ID-164  
 Instrument ID: PH01/Thermo Orion 920A+/Ammonia ISE  
 Analyst: Sue Anderson  
 Sampling Media: Anasorb 747 Tube(s) (Sulfuric Treated)  
 Test Notes:

Date Sampled: N/A  
 Date Received: N/A  
 Date Analyzed: 8/06/15  
 Volume(s) Analyzed: N/A

Compound	Spike Amount	Result		% Recovery		ALS Acceptance Limits	Relative Percent Difference	RPD Limit	Data Qualifier
	LCS / DLCS mg/L	LCS mg/L	DLCS mg/L	LCS	DLCS				
Ammonia	1.00	0.933	0.936	93	94	89-11	1	4	



Ammonia in Air  
OSHA ID-188/ID-164

page 1002

Filling solution changed  
prior to analysis:

Yes  No

Prep. Run# 24/817 Run # 456/64

Stds.	Conc.	millivolts	Slope:
			Range
	mg/L	mV	[-54~-60]
Std 1:	0.10	163.7	-59.5
Std 2:	1.00	109.6	
Std 3:	5.00	74.2	
Std 4:	10.00	51.7	
Std 5:	100.00	-6.7	

	Ref#	Exp. Date	Prep
Stock 1000 ppm	S24-0803/502	2/3/16	-
ICV/CCV 1214 ppm	S24-0520/402	01/20/16	$\frac{10 \cdot 0.05}{50} \Rightarrow 0.121 \text{ mg/L}$ $\frac{0.25}{50} \Rightarrow 76.07 \text{ mg/L}$
pH Buffer: ISA	S24-0623/501	6/23/16	-
Filling Soln	S24-0623/502	6/23/16	-

DE = 0.971

Sample I.D.	Volume mL	Millivolts mV	Conc. mg/L	DE Corrected		Final Value	
				Conc. mg/L	mg	mg/m <sup>3</sup>	ppmV
ICB	50	192.2	0.0296	20.1			
ICV 0.121 mg/L	T	158.4	0.125	1030			
MB		195.0	0.0263	0.0271	20.011		
LCS 1.00 mg/L		111.5	0.918	0.945	0.0945	11%	95%
NCS J		111.5	0.918	0.945	0.0945	RPD	95%
P1503014-3.01B		171.7	0.0708	0.0729	20.011	20.50	20.71
J -3.01F		68.5	5.96	6.138	0.614	29.4	42.2
P1503123-5.01B		182.9	0.0440	0.0453	20.011	20.092	20.14
T -5.01F		188.0	0.0354	0.0365			
T -11.01B		208.9	0.0145	0.0149		20.097	
T -11.01F		170.5	0.0742	0.0764			
V -15.01B		200.5	0.0207	0.0213		20.095	
CCM 6.07 mg/L		68.0	6.05	100%			
CCM1		200.0	0.0212	20.1			
P1503123-15.01F		194.0	0.0275	0.0283	20.011	20.098	20.14
T -21.01B		196.4	0.0247	0.0252		20.094	
T -21.01F		195.1	0.0261	0.0269		20.094	
T -27.01B		197.0	0.0241	0.0248		20.097	
T -27.01F		197.0	0.0241	0.0248		20.097	
T -31.01B		201.4	0.0200	0.0206		20.098	20.15
T -31.01F		198.9	0.0223	0.0230			
T -35.01B		212.2	0.0126	0.0130		20.097	20.14
T -35.01F		200.6	0.0207	0.0213			

Comments:

B = BACK F = FRONT

Analyst:

*[Signature]*

Date/Time:

8/4/15 @ 1000

Reviewer:

*[Signature]*

Date:

8/4/15



**Ammonia in Air**  
OSHA ID-188/ID-164

Filling solution changed prior to analysis:  Yes  No

Prep. Run# 242019 Run # 456603

Stds.	Conc.	millivolts	Slope:
			Range
	mg/L	mV	[-54~-60]
Std 1:	0.10	163.4	-57.8
Std 2:	1.00	106.5	
Std 3:	5.00	65.6	
Std 4:	10.00	48.5	
Std 5:	100.00	-9.2	

	Ref#	Exp.Date	Prep
Stock 1000 ppm	524-08031502	2/3/16	-
ICV/CCV 1214 ppm	524-05301402	01/20/16	to $\frac{0.065}{50} \Rightarrow 0.121 \text{ mg/L}$
pH Buffer: ISA	524-06231501	6/23/16	--
Filling Soln	524-06231503	6/23/16	--

DE = 0.971

Sample I.D.	Volume mL	Millivolts mV	Conc. mg/L	DE Corrected			
				Conc. mg/L	mg	Final Value mg/m <sup>3</sup>	ppmV
ICB	50	190.7	0.0273	10.1			
ICV 0.121 mg/L		158.1	0.124	102%			
MB		189.9	0.0286	0.0295	20.011		
LCS 1.00 mg/L		109.0	0.906	0.933	0.0933	41%	93%
DUS		108.8	0.909	0.936	0.0936	RPD	94%
P1503123-51.01B		201.1	0.0147	0.0151	20.011	20.099	20.15
	-51.01F	199.8	0.0161	0.0166			
	-63.01B	205.0	0.0112	0.0115		25.79	28.32
	-63.01F	204.7	0.0115	0.0118			
	-69.01B	202.0	0.0138	0.0142			
	-69.01F	201.7	0.0142	0.0146			
	-75.01B	202.2	0.0137	0.0141		211.6	216.7
CVI 0.121 mg/L		158.5	0.122	101%			
COB1		199.8	0.0161	20.1			
P1503123-75.01B		207.7	0.0091	0.0094	20.011	211.6	216.7
	-82.01B	207.2	0.0095	0.0098		23.86	25.55
	-82.01F	207.4	0.0093	0.0096			
	-87.01B	198.9	0.0170	0.0175			
	-87.01F	208.5	0.0085	0.0088			
	-57.01B	202.5	0.0134	0.0138		25.79	28.32
	-57.01F	207.1	0.0096	0.0099			
CVI 0.121 mg/L		158.7	0.121	100%			
COB2		202.2	0.0137	20.1			

Comments:

B = BACK F = FRONT

Analyst: [Signature]

Date/Time: 5/6/15

Reviewer: [Signature]

Date: 9/7/16



**ALS Environmental**  
ISE Method for Ammonia in Air

Printed: 8/4/15  
 Client: Stantec Consulting Group, Inc.  
 Analyst: SMA  
 CAS Job: P1503123  
 Method: OSHA ID-188/ ID-164  
 Instrument: pH01  
 Date Analyzed: 8/4/15  
 Sample Amt: 0.100 L  
 Solvent: 0.1 N H2SO4  
 Matrix: Anasorb 747 (sulfuric treated)

**SAMPLE RESULTS**

Sample	Ammonia (mg/L)	Desorption Vol (L)	Dilution	Sample Vol (L)	Ammonia (mg/tube)*	Ammonia mg/m3	Ammonia ppm
MW	17.03						
MRL	0.100	0.1	1.0	NA	0.01		
RB	0.0296	NA	NA	NA	ND	ND	ND
MB	0.0263	0.100	1.0	NA	ND	ND	ND
P1503123-005.01	0.0440	0.050	1.0	112.8	ND	ND	ND
P1503123-011.01	0.0145	0.050	1.0	106.4	ND	ND	ND
P1503123-015.01	0.0207	0.050	1.0	108.9	ND	ND	ND
P1503123-021.01	0.0247	0.050	1.0	109.8	ND	ND	ND
P1503123-027.01	0.0241	0.050	1.0	107.1	ND	ND	ND
P1503123-031.01	0.0200	0.050	1.0	105.6	ND	ND	ND
P1503123-035.01	0.0126	0.050	1.0	106.3	ND	ND	ND
P1503123-039.01	0.0162	0.050	1.0	105.7	ND	ND	ND
P1503123-045.01	0.0170	0.050	1.0	105.8	ND	ND	ND
P1503123-005.01	0.0354	0.100	1.0	112.8	ND	ND	ND
P1503123-011.01	0.0742	0.100	1.0	106.4	ND	ND	ND
P1503123-015.01	0.0275	0.100	1.0	108.9	ND	ND	ND
P1503123-021.01	0.0261	0.100	1.0	109.8	ND	ND	ND
P1503123-027.01	0.0241	0.100	1.0	107.1	ND	ND	ND
P1503123-031.01	0.0223	0.100	1.0	105.6	ND	ND	ND
P1503123-035.01	0.0207	0.100	1.0	106.3	ND	ND	ND
P1503123-039.01	0.0176	0.100	1.0	105.7	ND	ND	ND
P1503123-045.01	0.0197	0.100	1.0	105.8	ND	ND	ND

\*Samples are DE corrected  
 Desorption Efficiency (DE): 0.971

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**QC RESULTS**

0.121 mg/L NH3 ICV S24-05301402 (01/16)	0.121	LCS	1.00
ACTUAL	0.125	SPIKE STD	0.945
% RECOVERY	103.3%	% RECOVERY	94.5%
6.07 mg/L NH3 CCV1 S24-05301402 (01/16)	6.07	LCSD	1.00
ACTUAL	6.05	SPIKE STD	0.945
% RECOVERY	99.7%	% RECOVERY	94.5%
0.121 mg/L NH3 CCV2 S24-05301402 (01/16)	0.121	%RPD:	0.0%
ACTUAL	0.123	0.121 mg/L NH3 CCV3 S24-05301402 (01/16)	0.121
% RECOVERY	101.7%	ACTUAL	0.123
		% RECOVERY	101.7%

**ALS Environmental**  
ISE Method for Ammonia in Air

Printed: 8/6/15  
Client: Stantec Consulting Group, Inc.  
Analyst: SMA  
CAS Job: P1503123  
Method: OSHA ID-188/ ID-164

Instrument: pH01  
Date Analyzed: 8/6/15  
Sample Amt: 0.100 L  
Solvent: 0.1 N H2SO4  
Matrix: Anasorb 747 (sulfuric treated)

**SAMPLE RESULTS**

Sample	Ammonia (mg/L)	Description Vol (L)	Dilution	Sample Vol (L)	Ammonia (mg/tube)*	Ammonia mg/m3	Ammonia ppm
MW	17.03						
MRL	0.100	0.1	1.0	NA	0.01		
RB	0.0273	NA	NA	NA	ND	ND	ND
MB	0.0286	0.100	1.0	NA	ND	ND	ND
P1503123-051.01	0.0147	0.050	1.0	104.7	ND	ND	ND
P1503123-057.01	0.0134	0.050	1.0	1.78	ND	ND	ND
P1503123-063.01	0.0112	0.050	1.0	1.78	ND	ND	ND
P1503123-069.01	0.0138	0.050	1.0	1.78	ND	ND	ND
P1503123-075.01	0.0137	0.050	1.0	0.890	ND	ND	ND
P1503123-082.01	0.0095	0.050	1.0	2.67	ND	ND	ND
P1503123-087.01	0.0170	0.050	1.0	NA	ND	ND	ND
P1503123-051.01	0.0161	0.100	1.0	1.78	ND	ND	ND
P1503123-057.01	0.0096	0.100	1.0	1.78	ND	ND	ND
P1503123-063.01	0.0115	0.100	1.0	1.78	ND	ND	ND
P1503123-069.01	0.0142	0.100	1.0	0.890	ND	ND	ND
P1503123-075.01	0.0091	0.100	1.0	2.67	ND	ND	ND
P1503123-082.01	0.0093	0.100	1.0	NA	ND	ND	ND
P1503123-087.01	0.0085	0.100	1.0	106.3	ND	ND	ND

\*Samples are DE corrected  
Desorption Efficiency (DE): 0.971

**QC RESULTS**

0.121 mg/L NH3 ICV S24-05301402 (01/16)	0.121	LCS	1.00				
ACTUAL	0.124	SPIKE STD	0.933				
% RECOVERY	102.5%	% RECOVERY	93.3%				
0.121 mg/L NH3 CCV1 S24-05301402 (01/16)	0.12	LCS	1.00				
ACTUAL	0.12	SPIKE STD	0.936				
% RECOVERY	100.8%	% RECOVERY	93.6%				
0.121 mg/L NH3 CCV2 S24-05301402 (01/16)	0.121						
ACTUAL	0.121						
% RECOVERY	100.0%	%RPD:	0.3%				

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728U1-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-006

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/28/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 98.7 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	2.2	22	21	9.0	8.4	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	2.7	ND	0.89	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.6	ND	0.72	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	2.6	ND	0.72	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	2.6	ND	0.61	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.5	ND	0.61	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	2.6	ND	0.62	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	2.6	ND	0.54	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.6	ND	0.54	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	2.6	ND	0.54	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.6	ND	0.54	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	2.6	ND	0.48	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	2.8	ND	0.48	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	2.5	ND	0.48	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	2.6	ND	0.43	
65-85-0	Benzoic Acid	< 0.31	ND	3.1	ND	0.62	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.6	ND	0.40	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D1-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-012

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/28/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 94.8 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	2.1	22	22	8.9	8.8	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	2.8	ND	0.93	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.7	ND	0.75	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	2.7	ND	0.75	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	2.7	ND	0.64	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.6	ND	0.63	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	2.7	ND	0.64	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	2.7	ND	0.56	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.7	ND	0.56	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	2.7	ND	0.56	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.7	ND	0.56	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	2.7	ND	0.50	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	2.9	ND	0.50	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	2.6	ND	0.50	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	2.7	ND	0.45	
65-85-0	Benzoic Acid	< 0.31	ND	3.2	ND	0.65	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.7	ND	0.41	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D2-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-016

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/28/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 92.4 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	< 2.0	ND	22	ND	9.0	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	2.9	ND	0.95	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.8	ND	0.76	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	2.8	ND	0.77	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	2.7	ND	0.65	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.7	ND	0.65	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	2.8	ND	0.66	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	2.7	ND	0.57	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.7	ND	0.58	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	2.7	ND	0.58	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.7	ND	0.58	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	2.7	ND	0.51	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	3.0	ND	0.51	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	2.7	ND	0.52	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	2.7	ND	0.46	
65-85-0	Benzoic Acid	< 0.31	ND	3.3	ND	0.66	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.7	ND	0.42	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728F-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-022

Test Code: GC/MS  
 Instrument ID: Agilent 5973/Agilent 6890/MS14  
 Analyst: Zheng Wang  
 Sampling Media: Silica Gel Tube  
 Test Notes: **BC, DE**

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Desorption Volume: 1.0 ml  
 Volume Sampled: 95.2 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	< 2.0	ND	21	ND	8.7	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	2.8	ND	0.92	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.7	ND	0.74	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	2.7	ND	0.75	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	2.6	ND	0.63	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.6	ND	0.63	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	2.7	ND	0.64	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	2.6	ND	0.56	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.7	ND	0.56	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	2.7	ND	0.56	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.7	ND	0.56	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	2.6	ND	0.50	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	2.9	ND	0.49	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	2.6	ND	0.50	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	2.7	ND	0.45	
65-85-0	Benzoic Acid	< 0.31	ND	3.2	ND	0.64	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.7	ND	0.41	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728SQ-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-028

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/28/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 91.8 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	< 2.0	ND	22	ND	9.0	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	2.9	ND	0.96	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.8	ND	0.77	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	2.8	ND	0.78	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	2.7	ND	0.66	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.7	ND	0.65	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	2.8	ND	0.67	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	2.7	ND	0.58	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.8	ND	0.58	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	2.8	ND	0.58	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.8	ND	0.58	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	2.7	ND	0.52	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	3.0	ND	0.51	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	2.7	ND	0.52	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	2.8	ND	0.47	
65-85-0	Benzoic Acid	< 0.31	ND	3.3	ND	0.67	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.8	ND	0.43	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729U1-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-032

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/29/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 95.6 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	< 2.0	ND	21	ND	8.7	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	2.8	ND	0.92	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.7	ND	0.74	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	2.7	ND	0.74	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	2.6	ND	0.63	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.6	ND	0.63	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	2.7	ND	0.64	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	2.6	ND	0.56	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.6	ND	0.56	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	2.7	ND	0.56	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.7	ND	0.56	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	2.6	ND	0.49	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	2.9	ND	0.49	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	2.6	ND	0.50	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	2.6	ND	0.45	
65-85-0	Benzoic Acid	< 0.31	ND	3.2	ND	0.64	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.6	ND	0.41	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729D1-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-036

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/29/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 94.6 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	< 2.0	ND	22	ND	8.8	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	2.8	ND	0.93	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.7	ND	0.75	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	2.7	ND	0.75	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	2.7	ND	0.64	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.7	ND	0.64	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	2.7	ND	0.65	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	2.7	ND	0.56	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.7	ND	0.56	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	2.7	ND	0.56	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.7	ND	0.56	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	2.7	ND	0.50	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	2.9	ND	0.50	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	2.6	ND	0.51	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	2.7	ND	0.45	
65-85-0	Benzoic Acid	< 0.31	ND	3.2	ND	0.65	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.7	ND	0.41	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729D2-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-040

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/29/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 91.6 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	< 2.0	ND	22	ND	9.1	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	2.9	ND	0.96	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.8	ND	0.77	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	2.8	ND	0.78	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	2.8	ND	0.66	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.7	ND	0.66	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	2.8	ND	0.67	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	2.8	ND	0.58	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.8	ND	0.58	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	2.8	ND	0.58	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.8	ND	0.58	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	2.7	ND	0.52	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	3.0	ND	0.51	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	2.7	ND	0.52	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	2.8	ND	0.47	
65-85-0	Benzoic Acid	< 0.31	ND	3.3	ND	0.67	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.8	ND	0.43	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729N-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-046

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/29/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 91.5 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	< 2.0	ND	22	ND	9.1	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	2.9	ND	0.96	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.8	ND	0.77	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	2.8	ND	0.78	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	2.8	ND	0.66	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.7	ND	0.66	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	2.8	ND	0.67	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	2.8	ND	0.58	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.8	ND	0.58	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	2.8	ND	0.58	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.8	ND	0.58	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	2.8	ND	0.52	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	3.0	ND	0.51	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	2.7	ND	0.52	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	2.8	ND	0.47	
65-85-0	Benzoic Acid	< 0.31	ND	3.3	ND	0.67	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.8	ND	0.43	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729NQ-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-052

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/29/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 93.5 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	2.1	23	22	9.4	8.9	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	2.8	ND	0.94	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.7	ND	0.76	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	2.7	ND	0.76	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	2.7	ND	0.65	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.7	ND	0.64	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	2.7	ND	0.65	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	2.7	ND	0.57	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.7	ND	0.57	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	2.7	ND	0.57	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.7	ND	0.57	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	2.7	ND	0.51	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	3.0	ND	0.50	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	2.7	ND	0.51	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	2.7	ND	0.46	
65-85-0	Benzoic Acid	< 0.31	ND	3.3	ND	0.66	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.7	ND	0.42	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sN-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-058

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/29/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 2.313 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	< 2.0	ND	880	ND	360	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	120	ND	38	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	110	ND	31	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	110	ND	31	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	110	ND	26	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	110	ND	26	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	110	ND	26	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	110	ND	23	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	110	ND	23	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	110	ND	23	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	110	ND	23	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	110	ND	20	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	120	ND	20	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	110	ND	21	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	110	ND	19	
65-85-0	Benzoic Acid	< 0.31	ND	130	ND	27	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	110	ND	17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sNQ-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-064

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/29/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5 - 8/6/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 2.313 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	< 2.0	ND	880	ND	360	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	120	ND	38	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	110	ND	31	
107-92-6	Butanoic Acid (Butyric)	< 0.26	ND	110	ND	31	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	110	ND	26	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	110	ND	26	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	110	ND	26	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	110	ND	23	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	110	ND	23	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	110	ND	23	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	110	ND	23	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	110	ND	20	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	120	ND	20	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	110	ND	21	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	110	ND	19	
65-85-0	Benzoic Acid	< 0.31	ND	130	ND	27	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	110	ND	17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sSQ-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-070

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/29/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5 - 8/6/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 2.313 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	87	<b>37,000</b>	880	<b>15,000</b>	360	<b>BT</b>
79-09-4	Propionic Acid (Propanoic)	79	<b>34,000</b>	120	<b>11,000</b>	38	<b>BT</b>
79-31-2	2-Methylpropanoic Acid (Isobutyric)	90	<b>39,000</b>	110	<b>11,000</b>	31	<b>BT</b>
107-92-6	Butanoic Acid (Butyric)	340	<b>150,000</b>	110	<b>41,000</b>	31	<b>BT</b>
116-53-0	2-Methylbutanoic Acid	40	<b>17,000</b>	110	<b>4,200</b>	26	<b>BT</b>
503-74-2	3-Methylbutanoic Acid (Isovaleric)	66	<b>29,000</b>	110	<b>6,900</b>	26	<b>BT</b>
109-52-4	Pentanoic Acid (Valeric)	75	<b>33,000</b>	110	<b>7,800</b>	26	<b>BT</b>
97-61-0	2-Methylpentanoic Acid	7.1	<b>3,100</b>	110	<b>650</b>	23	<b>BT</b>
105-43-1	3-Methylpentanoic Acid	1.7	<b>720</b>	110	<b>150</b>	23	<b>BT</b>
646-07-1	4-Methylpentanoic Acid (Isocaproic)	3.2	<b>1,400</b>	110	<b>290</b>	23	<b>BT</b>
142-62-1	Hexanoic Acid (Caproic)	53	<b>23,000</b>	110	<b>4,800</b>	23	<b>BT</b>
111-14-8	Heptanoic Acid (Enanthoic)	0.60	<b>260</b>	110	<b>48</b>	20	
149-57-5	2-Ethylhexanoic Acid	4.6	<b>2,000</b>	120	<b>340</b>	20	<b>BT</b>
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	110	ND	21	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	110	ND	19	
65-85-0	Benzoic Acid	< 0.31	ND	130	ND	27	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	110	ND	17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

BT = Results indicated possible breakthrough; back section ≥10% front section.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-076

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/29/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5 - 8/6/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 1.157 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	96	<b>83,000</b>	1,800	<b>34,000</b>	720	<b>BT</b>
79-09-4	Propionic Acid (Propanoic)	110	<b>95,000</b>	230	<b>31,000</b>	76	<b>BT</b>
79-31-2	2-Methylpropanoic Acid (Isobutyric)	59	<b>51,000</b>	220	<b>14,000</b>	61	<b>BT</b>
107-92-6	Butanoic Acid (Butyric)	420	<b>370,000</b>	220	<b>100,000</b>	62	<b>BT</b>
116-53-0	2-Methylbutanoic Acid	27	<b>23,000</b>	220	<b>5,500</b>	52	<b>BT</b>
503-74-2	3-Methylbutanoic Acid (Isovaleric)	41	<b>36,000</b>	220	<b>8,600</b>	52	<b>BT</b>
109-52-4	Pentanoic Acid (Valeric)	130	<b>110,000</b>	220	<b>26,000</b>	53	<b>BT</b>
97-61-0	2-Methylpentanoic Acid	3.7	<b>3,200</b>	220	<b>670</b>	46	<b>BT</b>
105-43-1	3-Methylpentanoic Acid	0.93	<b>800</b>	220	<b>170</b>	46	<b>BT</b>
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	220	ND	46	
142-62-1	Hexanoic Acid (Caproic)	140	<b>120,000</b>	220	<b>26,000</b>	46	<b>BT</b>
111-14-8	Heptanoic Acid (Enanthoic)	7.6	<b>6,500</b>	220	<b>1,200</b>	41	<b>BT</b>
149-57-5	2-Ethylhexanoic Acid	6.8	<b>5,900</b>	240	<b>1,000</b>	41	<b>BT</b>
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	220	ND	41	
124-07-2	Octanoic Acid (Caprylic)	3.0	<b>2,600</b>	220	<b>430</b>	37	
65-85-0	Benzoic Acid	< 0.31	ND	260	ND	53	
112-05-0	Nonanoic Acid (Pelargonic)	0.26	<b>220</b>	220	<b>35</b>	34	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

BT = Results indicated possible breakthrough; back section ≥10% front section.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728-Dup03  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-079

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/28/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5 - 8/6/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 96.4 Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	2.4	<b>25</b>	21	<b>10</b>	8.6	
79-09-4	Propionic Acid (Propanoic)	< 0.27	ND	2.8	ND	0.91	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.6	ND	0.73	
107-92-6	Butanoic Acid (Butyric)	0.26	<b>2.7</b>	2.7	<b>0.75</b>	0.74	
116-53-0	2-Methylbutanoic Acid	< 0.25	ND	2.6	ND	0.63	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.6	ND	0.62	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	ND	2.6	ND	0.63	
97-61-0	2-Methylpentanoic Acid	< 0.25	ND	2.6	ND	0.55	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.6	ND	0.55	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	ND	2.6	ND	0.55	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.6	ND	0.55	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	ND	2.6	ND	0.49	
149-57-5	2-Ethylhexanoic Acid	< 0.28	ND	2.9	ND	0.49	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	ND	2.6	ND	0.50	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	ND	2.6	ND	0.44	
65-85-0	Benzoic Acid	< 0.31	ND	3.2	ND	0.64	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.6	ND	0.41	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730FB-Carbox  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P1503123-088

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 7/30/15  
**Date Received:** 7/31/15  
**Date Analyzed:** 8/5 - 8/6/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** NA Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	< 2.0	NA	NA	NA	NA	
79-09-4	Propionic Acid (Propanoic)	< 0.27	NA	NA	NA	NA	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	NA	NA	NA	NA	
107-92-6	Butanoic Acid (Butyric)	< 0.26	NA	NA	NA	NA	
116-53-0	2-Methylbutanoic Acid	< 0.25	NA	NA	NA	NA	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	NA	NA	NA	NA	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	NA	NA	NA	NA	
97-61-0	2-Methylpentanoic Acid	< 0.25	NA	NA	NA	NA	
105-43-1	3-Methylpentanoic Acid	< 0.25	NA	NA	NA	NA	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	NA	NA	NA	NA	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	NA	NA	NA	NA	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	NA	NA	NA	NA	
149-57-5	2-Ethylhexanoic Acid	< 0.28	NA	NA	NA	NA	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	NA	NA	NA	NA	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	NA	NA	NA	NA	
65-85-0	Benzoic Acid	< 0.31	NA	NA	NA	NA	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	NA	NA	NA	NA	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

NA = Not applicable.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P150805-MB

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Zheng Wang  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** NA  
**Date Received:** NA  
**Date Analyzed:** 8/5/15  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** NA Liter(s)

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
64-19-7	Acetic Acid	< 2.0	NA	NA	NA	NA	
79-09-4	Propionic Acid (Propanoic)	< 0.27	NA	NA	NA	NA	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	NA	NA	NA	NA	
107-92-6	Butanoic Acid (Butyric)	< 0.26	NA	NA	NA	NA	
116-53-0	2-Methylbutanoic Acid	< 0.25	NA	NA	NA	NA	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	NA	NA	NA	NA	
109-52-4	Pentanoic Acid (Valeric)	< 0.26	NA	NA	NA	NA	
97-61-0	2-Methylpentanoic Acid	< 0.25	NA	NA	NA	NA	
105-43-1	3-Methylpentanoic Acid	< 0.25	NA	NA	NA	NA	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.25	NA	NA	NA	NA	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	NA	NA	NA	NA	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.25	NA	NA	NA	NA	
149-57-5	2-Ethylhexanoic Acid	< 0.28	NA	NA	NA	NA	
98-89-5	Cyclohexanecarboxylic Acid	< 0.25	NA	NA	NA	NA	
124-07-2	Octanoic Acid (Caprylic)	< 0.25	NA	NA	NA	NA	
65-85-0	Benzoic Acid	< 0.31	NA	NA	NA	NA	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	NA	NA	NA	NA	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

NA = Not applicable.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

# ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Duplicate Lab Control Sample  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503123  
 ALS Sample ID: P150805-DLCS

Test Code: GC/MS  
 Instrument ID: Agilent 5973/Agilent 6890/MS14  
 Analyst: Zheng Wang  
 Sampling Media: Silica Gel Tube  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/05/15  
 Volume(s) Analyzed: NA Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		ALS	RPD	RPD	Data Qualifier
		LCS / DLCS µg/ml	LCS µg/ml	DLCS µg/ml	LCS	DLCS	Acceptance Limits				
64-19-7	Acetic Acid	19.8	18.5	19.1	<b>93</b>	<b>96</b>	56-135	3	31		
79-09-4	Propionic Acid (Propanoic)	9.57	8.85	9.14	<b>92</b>	<b>96</b>	73-119	4	15		
79-31-2	2-Methylpropanoic Acid (Isobutyric)	9.44	8.91	9.16	<b>94</b>	<b>97</b>	81-114	3	13		
107-92-6	Butanoic Acid (Butyric)	8.56	8.16	8.28	<b>95</b>	<b>97</b>	85-110	2	10		
116-53-0	2-Methylbutanoic Acid	9.47	9.10	9.18	<b>96</b>	<b>97</b>	89-109	1	8		
503-74-2	3-Methylbutanoic Acid (Isovaleric)	9.56	9.30	9.41	<b>97</b>	<b>98</b>	89-109	1	8		
109-52-4	Pentanoic Acid (Valeric)	9.80	9.60	9.52	<b>98</b>	<b>97</b>	91-107	1	7		
97-61-0	2-Methylpentanoic Acid	9.65	9.55	9.51	<b>99</b>	<b>99</b>	93-106	0	4		
105-43-1	3-Methylpentanoic Acid	9.63	9.51	9.44	<b>99</b>	<b>98</b>	93-106	1	4		
646-07-1	4-Methylpentanoic Acid (Isocaproic)	9.48	9.44	9.35	<b>100</b>	<b>99</b>	92-107	1	5		
142-62-1	Hexanoic Acid (Caproic)	9.45	9.42	9.34	<b>100</b>	<b>99</b>	93-105	1	4		
111-14-8	Heptanoic Acid (Enanthoic)	9.86	9.35	9.84	<b>95</b>	<b>100</b>	92-107	5	7		
149-57-5	2-Ethylhexanoic Acid	9.63	9.17	9.33	<b>95</b>	<b>97</b>	81-107	2	10		
98-89-5	Cyclohexanecarboxylic Acid	9.78	9.28	9.53	<b>95</b>	<b>97</b>	91-108	2	6		
124-07-2	Octanoic Acid (Caprylic)	9.72	9.30	9.66	<b>96</b>	<b>99</b>	92-107	3	6		
65-85-0	Benzoic Acid	9.92	9.50	9.23	<b>96</b>	<b>93</b>	68-106	3	15		
112-05-0	Nonanoic Acid (Pelargonic)	9.78	9.77	9.75	<b>100</b>	<b>100</b>	90-107	0	8		

Method Path : J:\MS14\METHODS\  
 Method File : CA062315E.M  
 Title : Short Chain Carboxylic Acids in Air  
 Last Update : Wed Jun 24 15:28:13 2015  
 Response Via : Initial Calibration

21  
6/24/15

Calibration Files  
 0.25=06231503.D 1 =06231505.D 5 =06231506.D 10 =06231507.D  
 25 =06231508.D 50 =06231509.D

Compound	0.25	1	5	10	25	50	Avg	%RSD
1) I IS1 Bromofluoroben...	-----ISTD-----							
2) T Acetic acid		0.106	0.085	0.100	0.103	0.098	0.098	8.12
3) T Propanoic acid	0.759	0.792	0.649	0.732	0.726	0.698	0.726	6.82
4) T 2-Methylpropan...	0.588	0.568	0.474	0.525	0.516	0.491	0.527	8.33
5) T Butanoic acid	1.377	1.065	0.862	0.910	0.890	0.827	0.989	20.97
6) 2-Methylbutano...	1.430	1.395	1.250	1.316	1.257	1.168	1.303	7.53
7) T 3-Methylbutano...	1.722	1.718	1.682	1.751	1.677	1.540	1.682	4.44
8) T Pentanoic acid	1.410	1.644	1.570	1.651	1.569	1.444	1.548	6.50
9) T 2-Methylpentan...	1.967	2.182	2.159	2.222	2.088	1.861	2.080	6.71
10) T 3-Methylpentan...	2.280	2.613	2.569	2.622	2.456	2.176	2.453	7.61
11) T 4-Methylpentan...	1.193	1.321	1.284	1.321	1.241	1.135	1.249	5.96
12) T Hexanoic acid	2.079	2.211	2.195	2.246	2.138	1.898	2.128	5.97
13) I IS2 1,4-Dibromoben...	-----ISTD-----							
14) T Heptanoic acid	2.644	3.270	3.252	3.343	3.144	2.769	3.070	9.49
15) T 2-Ethylhexanoi...	2.467	2.677	2.607	2.684	2.484	2.179	2.516	7.53
16) T Cyclohexanecar...	1.131	1.129	1.192	1.238	1.161	1.084	1.156	4.69
17) T Octanoic acid	3.179	3.692	3.663	3.800	3.496	3.039	3.478	8.77
18) T Benzoic acid	1.954	2.574	2.658	2.716	2.571	2.375	2.475	11.31
19) I IS3 Biphenyl	-----ISTD-----							
20) T Nonanoic acid	0.774	0.885	0.917	0.938	0.889	0.774	0.863	8.31
21) T Decanoic Acid	0.549	0.707	0.816	0.845	0.796	0.715	0.738	14.59

(#) = Out of Range

Evaluate Continuing Calibration Report

Data Path : I:\MS14\DATA\ACIDS\2015\_08\05\  
 Data File : 08051502.D  
 Acq On : 5 Aug 2015 9:59 am  
 Operator : ZW  
 Sample : 5/10ug/ml Carboxylic Acid  
 Misc : S28-06231512  
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 07 08:32:19 2015  
 Quant Method : J:\MS14\METHODS\CA062315E.M  
 Quant Title : Short Chain Carboxylic Acids in Air  
 QLast Update : Fri Jul 10 08:14:06 2015  
 Response via : Initial Calibration  
 DataAcq Meth:FAME

ZW  
 8/7/15

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev (min)
1 I	IS1 Bromofluorobenzene (BFB)	1.000	1.000	0.0	95	0.00
2 T	Acetic acid	0.098	0.091	7.1	102	0.00
3 T	Propanoic acid	0.726	0.674	7.2	99	0.00
4 T	2-Methylpropanoic acid	0.527	0.498	5.5	100	0.00
5 T	Butanoic acid	0.989	0.893	9.7	99	0.00
6	2-Methylbutanoic acid	1.303	1.269	2.6	97	0.00
7 T	3-Methylbutanoic acid	1.682	1.724	-2.5	98	0.00
8 T	Pentanoic acid	1.548	1.615	-4.3	98	0.00
9 T	2-Methylpentanoic acid	2.080	2.159	-3.8	95	0.00
10 T	3-Methylpentanoic acid	2.453	2.566	-4.6	95	0.00
11 T	4-Methylpentanoic acid	1.249	1.296	-3.8	96	0.00
12 T	Hexanoic acid	2.128	2.199	-3.3	95	0.00
13 I	IS2 1,4-Dibromobenzene	1.000	1.000	0.0	86	0.00
14 T	Heptanoic acid	3.070	3.537	-15.2	93	0.00
15 T	2-Ethylhexanoic acid	2.516	2.750	-9.3	90	0.00
16 T	Cyclohexanecarboxylic acid	1.156	1.310	-13.3	94	0.00
17 T	Octanoic acid	3.478	3.851	-10.7	90	0.00
18 T	Benzoic acid	2.475	2.822	-14.0	91	0.00
19 I	IS3 Biphenyl	1.000	1.000	0.0	81	0.00
20 T	Nonanoic acid	0.863	0.968	-12.2	86	0.00
21 T	Decanoic Acid	0.738	0.856	-16.0	85	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Data Path : I:\MS14\DATA\ACIDS\2015\_08\06\  
 Data File : 08061501.D  
 Acq On : 6 Aug 2015 9:15 am  
 Operator : MD  
 Sample : 5/10ug/ml Carboxylic Acid  
 Misc : S28-06231512  
 ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 07 09:02:59 2015  
 Quant Method : J:\MS14\METHODS\CA062315E.M  
 Quant Title : Short Chain Carboxylic Acids in Air  
 QLast Update : Fri Jul 10 08:14:06 2015  
 Response via : Initial Calibration  
 DataAcq Meth:FAME

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 8/7/15

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 I IS1 Bromofluorobenzene (BFB)	1.000	1.000	0.0	86	0.00
2 T Acetic acid	0.098	0.083	15.3	84	0.00
3 T Propanoic acid	0.726	0.656	9.6	87	0.00
4 T 2-Methylpropanoic acid	0.527	0.489	7.2	89	0.00
5 T Butanoic acid	0.989	0.878	11.2	88	0.00
6 2-Methylbutanoic acid	1.303	1.285	1.4	89	0.00
7 T 3-Methylbutanoic acid	1.682	1.725	-2.6	88	0.00
8 T Pentanoic acid	1.548	1.592	-2.8	87	0.00
9 T 2-Methylpentanoic acid	2.080	2.151	-3.4	86	0.00
10 T 3-Methylpentanoic acid	2.453	2.592	-5.7	87	0.00
11 T 4-Methylpentanoic acid	1.249	1.284	-2.8	86	0.00
12 T Hexanoic acid	2.128	2.208	-3.8	87	0.00
13 I IS2 1,4-Dibromobenzene	1.000	1.000	0.0	80	0.00
14 T Heptanoic acid	3.070	3.520	-14.7	87	0.00
15 T 2-Ethylhexanoic acid	2.516	2.725	-8.3	84	0.00
16 T Cyclohexanecarboxylic acid	1.156	1.285	-11.2	86	0.00
17 T Octanoic acid	3.478	3.808	-9.5	83	0.00
18 T Benzoic acid	2.475	2.715	-9.7	82	0.00
19 I IS3 Biphenyl	1.000	1.000	0.0	75	0.00
20 T Nonanoic acid	0.863	0.954	-10.5	78	0.00
21 T Decanoic Acid	0.738	0.857	-16.1	79	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

# ANALYTICAL REPORT

Report Date: August 12, 2015

Deb Gray  
 Stantec Consulting  
 1500 Lake Shore Drive  
 Suite 100  
 Columbus, OH 43204

Phone: (614) 643-4362

E-mail: Deb.Gray@Stantec.com

Workorder: **34-1521703**

Client Project ID: P1503123 080415

Purchase Order: P1503123

Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>728U1-HCn</b>		Collected: 07/28/2015		
Lab ID: 1521703001	Sampling Location: P1503123	Received: 08/04/2015		
<b>Method: NIOSH 6010 Mod.</b>	<b>Media:</b> SKC 226-28, Soda Lime-200/600	<b>Analyzed:</b> 08/12/2015		
<b>Sampling Parameter: Air Volume 16.6 L</b>				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	<0.013	<0.011	0.21

Sample ID: <b>728U1-Hg</b>		Collected: 07/28/2015		
Lab ID: 1521703002	Sampling Location: P1503123	Received: 08/04/2015		
<b>Method: NIOSH 6009 Mod.</b>	<b>Media:</b> SKC 226-17-1A, Hopcalite Tube	<b>Analyzed:</b> 08/11/2015		
<b>Sampling Parameter: Air Volume 49.1 L</b>				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Mercury	<0.010	<0.00020	<0.000025	0.010

Sample ID: <b>728D1-HCn</b>		Collected: 07/28/2015		
Lab ID: 1521703003	Sampling Location: P1503123	Received: 08/04/2015		
<b>Method: NIOSH 6010 Mod.</b>	<b>Media:</b> SKC 226-28, Soda Lime-200/600	<b>Analyzed:</b> 08/12/2015		
<b>Sampling Parameter: Air Volume 14.7 L</b>				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	<0.014	<0.013	0.21

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# ANALYTICAL REPORT

Workorder: **34-1521703**

Client Project ID: P1503123 080415

Purchase Order: P1503123

Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>728D1-Hg</b>	Collected: 07/28/2015
Lab ID: 1521703004	Received: 08/04/2015

Method: NIOSH 6009 Mod.	Media: SKC 226-17-1A, Hopcalite Tube	Analyzed: 08/11/2015
Sampling Parameter: Air Volume 48.1 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Mercury	<0.010	<0.00021	<0.000025	0.010

Sample ID: <b>728F-HCn</b>	Collected: 07/28/2015
Lab ID: 1521703005	Received: 08/04/2015

Method: NIOSH 6010 Mod.	Media: SKC 226-28, Soda Lime-200/600	Analyzed: 08/12/2015
Sampling Parameter: Air Volume 16.8 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	<0.013	<0.011	0.21

Sample ID: <b>728F-Hg</b>	Collected: 07/28/2015
Lab ID: 1521703006	Received: 08/04/2015

Method: NIOSH 6009 Mod.	Media: SKC 226-17-1A, Hopcalite Tube	Analyzed: 08/11/2015
Sampling Parameter: Air Volume 49 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Mercury	<0.010	<0.00020	<0.000025	0.010

Sample ID: <b>728SQ-HCn</b>	Collected: 07/28/2015
Lab ID: 1521703007	Received: 08/04/2015

Method: NIOSH 6010 Mod.	Media: SKC 226-28, Soda Lime-200/600	Analyzed: 08/12/2015
Sampling Parameter: Air Volume 14.8 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	<0.014	<0.013	0.21

Sample ID: <b>728SQ-Hg</b>	Collected: 07/28/2015
Lab ID: 1521703008	Received: 08/04/2015

Method: NIOSH 6009 Mod.	Media: SKC 226-17-1A, Hopcalite Tube	Analyzed: 08/11/2015
Sampling Parameter: Air Volume 48 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Mercury	<0.010	<0.00021	<0.000025	0.010

# ANALYTICAL REPORT

Workorder: **34-1521703**

Client Project ID: P1503123 080415

Purchase Order: P1503123

Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>729N-HCN</b>	Collected: 07/29/2015
Lab ID: 1521703009	Received: 08/04/2015

Method: NIOSH 6010 Mod.	Media: SKC 226-28, Soda Lime-200/600	Analyzed: 08/12/2015
Sampling Parameter: Air Volume 14.7 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	<0.014	<0.013	0.21

Sample ID: <b>729N-Hg</b>	Collected: 07/29/2015
Lab ID: 1521703010	Received: 08/04/2015

Method: NIOSH 6009 Mod.	Media: SKC 226-17-1A, Hopcalite Tube	Analyzed: 08/11/2015
Sampling Parameter: Air Volume 45.9 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Mercury	<0.010	<0.00022	<0.000027	0.010

Sample ID: <b>729NQ-HCN</b>	Collected: 07/29/2015
Lab ID: 1521703011	Received: 08/04/2015

Method: NIOSH 6010 Mod.	Media: SKC 226-28, Soda Lime-200/600	Analyzed: 08/12/2015
Sampling Parameter: Air Volume 14.7 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	<0.014	<0.013	0.21

Sample ID: <b>729NQ-Hg</b>	Collected: 07/29/2015
Lab ID: 1521703012	Received: 08/04/2015

Method: NIOSH 6009 Mod.	Media: SKC 226-17-1A, Hopcalite Tube	Analyzed: 08/11/2015
Sampling Parameter: Air Volume 45.2 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Mercury	<0.010	<0.00022	<0.000027	0.010

Sample ID: <b>729sN-HCn</b>	Collected: 07/29/2015
Lab ID: 1521703013	Received: 08/04/2015

Method: NIOSH 6010 Mod.	Media: SKC 226-28, Soda Lime-200/600	Analyzed: 08/12/2015
Sampling Parameter: Air Volume 0.353 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	<0.59	<0.54	0.21

# ANALYTICAL REPORT

Workorder: **34-1521703**

Client Project ID: P1503123 080415

Purchase Order: P1503123

Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>729sN-Hg</b>		Collected: 07/29/2015		
Lab ID: 1521703014	Sampling Location: P1503123	Received: 08/04/2015		
Method: NIOSH 6009 Mod.		Media: SKC 226-17-1A, Hopcalite Tube		
		Analyzed: 08/11/2015		
Sampling Parameter: Air Volume 1.158 L				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Mercury	<0.010	<0.0086	<0.0011	0.010

Sample ID: <b>729sNQ-HCn</b>		Collected: 07/29/2015		
Lab ID: 1521703015	Sampling Location: P1503123	Received: 08/04/2015		
Method: NIOSH 6010 Mod.		Media: SKC 226-28, Soda Lime-200/600		
		Analyzed: 08/12/2015		
Sampling Parameter: Air Volume 0.352 L				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	<0.60	<0.54	0.21

Sample ID: <b>729sNQ-Hg</b>		Collected: 07/29/2015		
Lab ID: 1521703016	Sampling Location: P1503123	Received: 08/04/2015		
Method: NIOSH 6009 Mod.		Media: SKC 226-17-1A, Hopcalite Tube		
		Analyzed: 08/11/2015		
Sampling Parameter: Air Volume 1.158 L				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Mercury	<0.010	<0.0086	<0.0011	0.010

Sample ID: <b>729sSQ-HCn</b>		Collected: 07/29/2015		
Lab ID: 1521703017	Sampling Location: P1503123	Received: 08/04/2015		
Method: NIOSH 6010 Mod.		Media: SKC 226-28, Soda Lime-200/600		
		Analyzed: 08/12/2015		
Sampling Parameter: Air Volume 0.352 L				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	<0.60	<0.54	0.21

Sample ID: <b>729sSQ-Hg</b>		Collected: 07/29/2015		
Lab ID: 1521703018	Sampling Location: P1503123	Received: 08/04/2015		
Method: NIOSH 6009 Mod.		Media: SKC 226-17-1A, Hopcalite Tube		
		Analyzed: 08/11/2015		
Sampling Parameter: Air Volume 1.158 L				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Mercury	<0.010	<0.0086	<0.0011	0.010

# ANALYTICAL REPORT

Workorder: **34-1521703**

Client Project ID: P1503123 080415

Purchase Order: P1503123

Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>729sF-HCn</b>	Collected: 07/29/2015
Lab ID: 1521703019	Received: 08/04/2015

Method: NIOSH 6010 Mod.	Media: SKC 226-28, Soda Lime-200/600	Analyzed: 08/12/2015
Sampling Parameter: Air Volume 0.176 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	<1.2	<1.1	0.21

Sample ID: <b>729sF-Hg</b>	Collected: 07/29/2015
Lab ID: 1521703020	Received: 08/04/2015

Method: NIOSH 6009 Mod.	Media: SKC 226-17-1A, Hopcalite Tube	Analyzed: 08/11/2015
Sampling Parameter: Air Volume 0.579 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Mercury	<b>0.036</b>	<b>0.063</b>	<b>0.0076</b>	0.010

Sample ID: <b>728-Dup02</b>	Collected: 07/28/2015
Lab ID: 1521703021	Received: 08/04/2015

Method: NIOSH 6009 Mod.	Media: SKC 226-17-1A, Hopcalite Tube	Analyzed: 08/11/2015
Sampling Parameter: Air Volume 48.7 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Mercury	<0.010	<0.00021	<0.000025	0.010

Sample ID: <b>729-Dup04</b>	Collected: 07/29/2015
Lab ID: 1521703022	Received: 08/04/2015

Method: NIOSH 6010 Mod.	Media: SKC 226-28, Soda Lime-200/600	Analyzed: 08/12/2015
Sampling Parameter: Air Volume 0.176 L		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	<1.2	<1.1	0.21

Sample ID: <b>730FB-Cn</b>	Collected: 07/30/2015
Lab ID: 1521703023	Received: 08/04/2015

Method: NIOSH 6010 Mod.	Media: SKC 226-28, Soda Lime-200/600	Analyzed: 08/12/2015
Sampling Parameter: Air Volume Not Applicable		

Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hydrogen Cyanide	<0.21	NA	NA	0.21

# ANALYTICAL REPORT

Workorder: **34-1521703**

Client Project ID: P1503123 080415

Purchase Order: P1503123

Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>730FB-Hg</b>	Collected: 07/30/2015			
Lab ID: 1521703024	Received: 08/04/2015			
Method: NIOSH 6009 Mod.	Media: SKC 226-17-1A, Hopcalite Tube			
	Analyzed: 08/11/2015			
Sampling Parameter: Air Volume Not Applicable				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Mercury	<0.010	NA	NA	0.010

## Report Authorization ( /S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 6009 Mod.	/S/ Christopher R. Hansen 08/11/2015 16:08	/S/ Kristie F. Bitner 08/11/2015 16:08
NIOSH 6010 Mod.	/S/ Brittney Austin 08/12/2015 13:08	/S/ Christopher R. Hansen 08/12/2015 16:08

## Laboratory Contact Information

ALS Environmental  
960 W Levoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: [alslt.lab@ALSGlobal.com](mailto:alslt.lab@ALSGlobal.com)  
Web: [www.alssl.com](http://www.alssl.com)

# ANALYTICAL REPORT

Workorder: **34-1521703**

Client Project ID: P1503123 080415

Purchase Order: P1503123

Project Manager: Paul Pope

## General Lab Comments

The results provided in this report relate only to the items tested.  
Samples were received in acceptable condition unless otherwise noted.  
Samples have not been blank corrected unless otherwise noted.  
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	AClass (DoD ELAP)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	AClass (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	AClass (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

< This testing result is less than the numerical value.

( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1521703

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** NA  
**Batch:** NA  
**Prepared By:** NA

**Analysis:** NIOSH 6009 Mod.  
**Batch:** IHG/2989 (HBN: 153790)  
**Analyzed By:** Christopher R. Hansen

## Blank

<b>LRB:</b> 460357 <b>Analyzed:</b> 08/11/2015 15:16  <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Mercury	ND	NA	0.0100

<b>LMB:</b> 460358 <b>Analyzed:</b> 08/11/2015 15:17  <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Mercury	ND	NA	0.0100

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 460359 <b>Analyzed:</b> 08/11/2015 15:18 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 460360 <b>Analyzed:</b> 08/11/2015 15:20 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Mercury	0.529	0.500	106	80.3 128.9	0.538	108	1.71	0.0 15.0	

## QC Data Approved and Reviewed by

<u>Christopher R. Hansen</u> <b>Analyst</b>	<u>Kristie F. Bitner</u> <b>Peer Review</b>	<u>8/11/2015</u> <b>Date</b>
--	--	---------------------------------

## Symbols and Definitions

- - Analyte above reporting limit or outside of control limits
- - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable

# Quality Control Sample Batch Report

## Analysis Information

**Workorder: 1521703**

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** NA  
**Batch:** NA  
**Prepared By:** NA

**Analysis:** NIOSH 6010 Mod.  
**Batch:** IWC/2304 (HBN: 153739)  
**Analyzed By:** Brittney Austin

## Blank

**LMB:** 460278  
**Analyzed:** 08/12/2015 10:57  
**Units:** ug/sample

Analyte	Result	MDL	RL
Cyanide	ND	NA	0.200

## Laboratory Control Sample - Laboratory Control Sample Duplicate

**LCS:** 460279  
**Analyzed:** 08/12/2015 10:57  
**Dilution:** 1  
**Units:** ug/sample

**LCSD:** 460280  
**Analyzed:** 08/12/2015 11:00  
**Dilution:** 1  
**Units:** ug/sample

Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Cyanide	1.67	2.00	83.7	66.5   114.4	1.91	95.3	13.0	0.0   20.0

## QC Data Approved and Reviewed by

Brittney Austin <hr/> <b>Analyst</b>	Christopher R. Hansen <hr/> <b>Peer Review</b>	8/12/2015 <hr/> <b>Date</b>
---	---	--------------------------------

## Symbols and Definitions

- - Analyte above reporting limit or outside of control limits
- - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





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## LABORATORY REPORT

August 14, 2015

Deborah Gray  
Stantec Consulting Services, Inc.  
1500 Lake Shore Drive Suite 100  
Columbus, OH 43204

**RE: Bridgeton Landfill / 182608020.900**

Dear Deborah:

Enclosed are the results of the samples submitted to our laboratory on July 31, 2015. For your reference, these analyses have been assigned our service request number P1503125.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**ALS | Environmental**

By Samantha Henningsen at 4:06 pm, Aug 14, 2015

Samantha Henningsen  
Project Manager



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[www.alsglobal.com](http://www.alsglobal.com)

Client: Stantec Consulting Services, Inc.  
Project: Bridgeton Landfill / 182608020.900

Service Request No: P1503125

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## CASE NARRATIVE

The samples were received intact under chain of custody on July 31, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

### Fixed Gases Analysis

The samples were analyzed for fixed gases according to modified EPA Method 3C (single injection) using a gas chromatograph equipped with a thermal conductivity detector (TCD). This procedure is described in laboratory SOP VOA-EPA3C. This method is included on the laboratory's DoD-ELAP scope of accreditation, however it is not part of the NELAP or AIHA-LAP accreditation.

### Sulfur and Total Reduced Sulfur as Hydrogen Sulfide Analysis

The samples were also analyzed for twenty sulfur compounds and total reduced sulfur as hydrogen sulfide (TRS as H<sub>2</sub>S) per ASTM D 5504-12 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). All compounds with the exception of hydrogen sulfide and carbonyl sulfide are quantitated against the initial calibration curve for methyl mercaptan. The TRS as H<sub>2</sub>S result(s) were determined by obtaining the total response for all chromatographic peaks and quantitating the value against the initial calibration curve for hydrogen sulfide thus generating a result specified as "Total Reduced Sulfur as Hydrogen Sulfide". This method is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP or AIHA-LAP accreditation.

### Volatile Organic Compound Analysis

The samples were analyzed for volatile organic compounds and tentatively identified compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. The method was modified to include the use of helium as a diluent gas in place of zero-grade air for container pressurization. When necessary, analytical sample volumes were adjusted by a correction factor for containers pressurized with helium. A summary sheet has been included listing the affected samples. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation, however it is not part of the AIHA-LAP accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.



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Client: Stantec Consulting Services, Inc.  
Project: Bridgeton Landfill / 182608020.900

Service Request No: P1503125

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## CASE NARRATIVE

The canisters were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

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*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*



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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>	101661
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0694
DoD ELAP	<a href="http://www.pjlabs.com/search-accredited-labs">http://www.pjlabs.com/search-accredited-labs</a>	L14-2
Florida DOH (NELAP)	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E871020
Maine DHHS	<a href="http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm">http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm</a>	2014025
Minnesota DOH (NELAP)	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	876241
New Jersey DEP (NELAP)	<a href="http://www.nj.gov/dep/oqa/">http://www.nj.gov/dep/oqa/</a>	CA009
New York DOH (NELAP)	<a href="http://www.wadsworth.org/labcert/elap/elap.html">http://www.wadsworth.org/labcert/elap/elap.html</a>	11221
Oregon PHD (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	4068-001
Pennsylvania DEP	<a href="http://www.depweb.state.pa.us/labs">http://www.depweb.state.pa.us/labs</a>	68-03307 (Registration)
Texas CEQ (NELAP)	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704413-15-6
Utah DOH (NELAP)	<a href="http://www.health.utah.gov/lab/labimp/certification/index.html">http://www.health.utah.gov/lab/labimp/certification/index.html</a>	CA01627201 5-5
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at [www.alsglobal.com](http://www.alsglobal.com), or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

# ALS ENVIRONMENTAL

## DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: Bridgeton Landfill / 182608020.900

Service Request: P1503125

Date Received: 7/31/2015  
 Time Received: 10:00

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	3C Modified - Fxd Gases Can	ASTM D5504-08 - Sulfur Can	TO-15 Modified - VOC Cans
728U1-Summa	P1503125-001	Air	7/28/2015	17:10	AS00819	-4.82	3.50	X	X	X
728D1-Summa	P1503125-002	Air	7/28/2015	17:00	AS00300	-3.76	3.93	X	X	X
728D2-Summa	P1503125-003	Air	7/28/2015	17:17	AS00655	-3.83	3.60	X	X	X
728F-Summa	P1503125-004	Air	7/28/2015	16:50	AS00846	-3.49	3.72	X	X	X
728SQ-Summa	P1503125-005	Air	7/28/2015	17:40	AS00582	-3.69	3.54	X	X	X
728-DUPE10	P1503125-006	Air	7/28/2015	00:00	AS00113	-3.18	3.59	X	X	X
729U1-Summa	P1503125-007	Air	7/29/2015	17:09	AS00417	-4.57	3.87	X	X	X
729D1-Summa	P1503125-008	Air	7/29/2015	17:38	SSC00149	-4.20	3.79	X	X	X
729NQ-Summa	P1503125-009	Air	7/29/2015	18:08	AS00199	-6.75	4.10	X	X	X
729N-Summa	P1503125-010	Air	7/29/2015	18:17	SSC00056	-3.58	3.60	X	X	X
729-DUPE11	P1503125-011	Air	7/29/2015	00:00	SSC00247	-2.93	3.63	X	X	X
729sN-Summa	P1503125-012	Air	7/29/2015	12:12	1SS00153	-3.20	7.08	X	X	X
729sSQ-Summa	P1503125-013	Air	7/29/2015	11:15	1SS00109	-13.25	9.54	X	X	X
729sF-Summa (A)	P1503125-014	Air	7/29/2015	09:38	1SS00148	-0.35	7.96	X	X	X
729sNQ-Summa	P1503125-015	Air	7/29/2015	13:36	1SS00121	-13.88	8.99	X	X	X
730TB-Summa	P1503125-016	Air	7/30/2015	16:00	SSC00123	-1.84	3.60	X	X	X
730TB-GSumma	P1503125-017	Air	7/30/2015	16:00	1SS00017	-14.14	7.06	X	X	X
729sF-Summa (B)	P1503125-018	Air	7/30/2015	09:38	1SS00102	-2.84	6.44	X	X	X

**ALS ENVIRONMENTAL**  
**Sample Volume Correction for Helium Pressurization**  
**for SCAN Analysis**

<u>Sample ID</u>	<u>Pi</u>	<u>Pf</u>	<u>Sample Volume (L)</u>	<u>Adjusted Volume (L)</u>
P1503125-001	-4.82	3.50	0.855	1.00
P1503125-002	-3.76	3.93	0.867	1.00
P1503125-003	-3.83	3.60	0.974	1.12
P1503125-004	-3.49	3.72	0.968	1.11
P1503125-005	-3.69	3.54	0.973	1.12
P1503125-006	-3.18	3.59	0.877	1.00
P1503125-007	-4.57	3.87	0.856	1.00
P1503125-008	-4.20	3.79	0.862	1.00
P1503125-009	-6.75	4.10	0.824	1.00
P1503125-010	-3.58	3.60	0.872	1.00
P1503125-011	-2.93	3.63	0.881	1.00
P1503125-004DIL	-3.49	3.60	0.087	0.100
P1503125-012	-3.20	7.08	0.013	0.0150
P1503125-015	-13.88	8.99	0.289	0.400
P1503125-016	-1.84	3.60	0.896	1.00
P1503125-016DIL	-1.84	3.60	0.045	0.0500
P1503125-017	-14.14	7.06	0.288	0.400



2655 Park Center Drive, Suite A  
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**Air - Chain of Custody Record & Analytical Service Request**

Company Name & Address (Reporting Information) <b>STANTEC</b> 1500 LAKESHORE DR., SUITE 100 COLUMBUS OH 43204 Project Manager: <b>DEB GRAY</b> Phone: (614) 643-4362 Email Address for Result Reporting: <b>CHRIS.LAWRENCE@stantec.com</b> Fax: <b>DEB.GRAY@stantec.com</b>		Project Name: <b>BRIDGE TON LANDFILL</b> Project Number: <b>182008020.900</b> P.O. # / Billing Information: <b>Bill to P.O. Provided by Bridge TON Landfill LLC</b> Sampler (Print & Sign): <b>CHRIS LAWRENCE</b>		Requested Turnaround Time in Business Days (Surcharges) please circle: 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard		ALS Project No: <b>150325</b> ALS Contact: <b>SAM HENNINGS</b>			
Client Sample ID 72801 - Summer 72801 - Summer 72802 - Summer 7280F - Summer 72858 - Summer 728 - DUPE 10 72901 - Summer 72901 - Summer 72900 - Summer 729N - Summer 729 - DUPE 11 7295N - Summer 7295S - Summer 7295F - Summer (A)	Laboratory ID Number ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭	Date Collected 7/28/15           7/28/15               	Time Collected 17:10 17:00 17:17 16:50 17:40 --- 17:09 17:38 18:08 18:17 --- 12:12 11:15 09:38	Flow Controller ID (Bar code # - FC #) SFC00029 SFC00021 SFC00061 SFC00046 SFC00066 SFC00032 SFC00024 SFC00033 SFC00047 SFC00026 SFC00059 --- --- ---	Canister Start Pressure (Bar code # - FC #) -30 -30 -30 -30 -30 -30 -28 -28 -30 -28.5 -29.33 -29.3 -25.61	Canister End Pressure (Bar code # - FC #) -9 -10 -6 -8 -9 -5 -8 -7.5 -17 -12 -7.5 --- --- ---	Sample Volume 6L                         	Analysis Method <del>ASTM-D5504</del> EPA 30M X                       	Comments e.g. Actual Preservative or specific instructions ERK TOIS + TICS X                         

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PLEASE "J" FLAG RESULTS



2655 Park Center Drive, Suite A  
 Simi Valley, California 93065  
 Phone (805) 526-7161  
 Fax (805) 526-7270

**Air - Chain of Custody Record & Analytical Service Request**

Company Name & Address (Reporting Information)		Requested Turnaround Time in Business Days (Surcharges) please circle		ALS Project #						
STANTEC 1500 Lake Shore Dr Suite 100 Columbus, Ohio 43204		1. Day (100%) 2. Day (75%) 3. Day (50%) 4. Day (35%) 5. Day (25%) 10. Day-Standard		ALS Project # <u>1503125</u>						
Project Manager Deb Gray		Project Name Bridgeton Landfill		ALS Contract Simi, Tennessee						
Phone 614-643-4362		Project Number 182608020.900		Analysis Method * ASTM D5304						
Email Address for Result Reporting Deb.Gray@stantec.com		P.O. # / Billing Information Bill to P.O. Provided by Bridgeton Landfill LLC								
ALS Address for Result Reporting Chris.Lawler@stantec.com		Sampler (Print & Sign) Chris Lawler		Comments e.g. Actual Preservative or specific instructions						
Fax		Flow Controller ID (Bar code # - FC #)								
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	Analysis Method	Project Requirements (MRLs, QAPP)
7195NQ-Summer	10	7/29/15	1336	15500121	-	-	-	1L	X EPA TO15+TCS	TRIP BLANK <del>TRIP BLANK</del> * please analyze per discussion 7/30/15 with M/SH/CG
DO NOT ANALYZE	16	7/30/15	16:00	15500181	LEAKED	OFF	OFF	IN-TRANSIT	X ASTM D5304	
730TB-Summer	16	7/30/15	16:00	15500123	-	-	-	6L	X ASTM D5304	
730TB-6.5Summer	17	7/30/15	16:00	15500017	-	-	-	1L	X ASTM D5304	
729sF-Summer (B)	17	7/29/15	0938	15500102	-	-29.3	-	1L	X ASTM D5304	
Report: Tier Levels - please select Tier I - Results (Default in not specified) Tier II (Results + QC Summaries) Tier III (Results + QC & Calibration Summaries) Tier IV (Date Validation Package) 10% Surcharge		Date: 7/30/15 Time: 17:00		EDD required YES/No Type: CUSTOMER		Units: ug/m <sup>3</sup>		Chain of Custody Seal: (Circle) INTACT		Project Requirements (MRLs, QAPP)
Relinquished by: (Signature)		Date: 7/30/15 Time: 17:00		Received by: (Signature)		Date: 7/30/15 Time: 17:00		Relinquished by: (Signature)		Project Requirements (MRLs, QAPP)
Relinquished by: (Signature)		Date: 7/30/15 Time: 17:00		Received by: (Signature)		Date: 7/30/15 Time: 17:00		Relinquished by: (Signature)		Project Requirements (MRLs, QAPP)

PLEASE "SI" Flag Results



**ALS Environmental  
Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc.

Work order: P1503125

Project: Bridgeton Landfill / 182608020.900

Sample(s) received on: 7/31/15

Date opened: 7/31/15

by: ADAVID

**Note:** This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- |  | <b>Yes</b>                          | <b>No</b>                           | <b>N/A</b>                          |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were <b>sample containers</b> properly marked with client sample ID?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by ALS</b> ?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?                          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 9 Was a <b>trip blank</b> received?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 10 Were <b>custody seals</b> on outside of cooler/Box?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Were signature and date included?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Were seals intact?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Were custody seals on outside of sample container?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information? | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?                                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1503125-001.01	6.0 L Silonite Can					
P1503125-002.01	6.0 L Silonite Can					
P1503125-003.01	6.0 L Silonite Can					
P1503125-004.01	6.0 L Silonite Can					
P1503125-005.01	6.0 L Silonite Can					
P1503125-006.01	6.0 L Silonite Can					
P1503125-007.01	6.0 L Silonite Can					
P1503125-008.01	6.0 L Silonite Can					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_

### ALS Environmental Sample Acceptance Check Form

Client: Stantec Consulting Services, Inc.

Work order: P1503125

Project: Bridgeton Landfill / 182608020.900

Sample(s) received on: 7/31/15

Date opened: 7/31/15

by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1503125-009.01	6.0 L Silonite Can					
P1503125-010.01	6.0 L Silonite Can					
P1503125-011.01	6.0 L Silonite Can					
P1503125-012.01	1.0 L Source Silonite Canister					
P1503125-013.01	1.0 L Source Silonite Canister					
P1503125-014.01	1.0 L Source Silonite Canister					
P1503125-015.01	1.0 L Source Silonite Canister					
P1503125-016.01	6.0 L Silonite Can					
P1503125-017.01	1.0 L Source Silonite Canister					
P1503125-018.01	1.0 L Source Silonite Canister					
P1503125-019.01	1.0 L Source Silonite Canister					
P1503125-020.01	1.0 L Source Silonite Canister					
P1503125-021.01	6.0 L Silonite Can					
P1503125-022.01	6.0 L Silonite Can					
P1503125-023.01	6.0 L Silonite Can					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-001

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00819

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -4.82      Final Pressure (psig): 3.50

Canister Dilution Factor: 1.84

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.18	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.3</b>	0.18	
7727-37-9	<b>Nitrogen</b>	<b>77.6</b>	0.18	
630-08-0	Carbon Monoxide	ND	0.18	
74-82-8	Methane	ND	0.18	
124-38-9	Carbon Dioxide	ND	0.18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-002

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00300

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -3.76      Final Pressure (psig): 3.93

Canister Dilution Factor: 1.70

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.17	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.3</b>	0.17	
7727-37-9	<b>Nitrogen</b>	<b>77.6</b>	0.17	
630-08-0	Carbon Monoxide	ND	0.17	
74-82-8	Methane	ND	0.17	
124-38-9	Carbon Dioxide	ND	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D2-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-003

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00655

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -3.83      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.68

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.17	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.3</b>	0.17	
7727-37-9	<b>Nitrogen</b>	<b>77.7</b>	0.17	
630-08-0	Carbon Monoxide	ND	0.17	
74-82-8	Methane	ND	0.17	
124-38-9	Carbon Dioxide	ND	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728F-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-004

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00846

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -3.49      Final Pressure (psig): 3.72

Canister Dilution Factor: 1.64

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.16	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.3</b>	0.16	
7727-37-9	<b>Nitrogen</b>	<b>77.7</b>	0.16	
630-08-0	Carbon Monoxide	ND	0.16	
74-82-8	Methane	ND	0.16	
124-38-9	Carbon Dioxide	ND	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728SQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-005

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00582

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -3.69      Final Pressure (psig): 3.54

Canister Dilution Factor: 1.66

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.17	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.3</b>	0.17	
7727-37-9	<b>Nitrogen</b>	<b>77.7</b>	0.17	
630-08-0	Carbon Monoxide	ND	0.17	
74-82-8	Methane	ND	0.17	
124-38-9	Carbon Dioxide	ND	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728-DUPE10  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-006

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00113

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -3.18      Final Pressure (psig): 3.59

Canister Dilution Factor: 1.59

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.16	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.3</b>	0.16	
7727-37-9	<b>Nitrogen</b>	<b>77.7</b>	0.16	
630-08-0	Carbon Monoxide	ND	0.16	
74-82-8	Methane	ND	0.16	
124-38-9	Carbon Dioxide	ND	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



**ALS ENVIRONMENTAL**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-007

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00417

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -4.57      Final Pressure (psig): 3.87

Canister Dilution Factor: 1.83

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.18	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.3</b>	0.18	
7727-37-9	<b>Nitrogen</b>	<b>77.6</b>	0.18	
630-08-0	Carbon Monoxide	ND	0.18	
74-82-8	Methane	ND	0.18	
124-38-9	Carbon Dioxide	ND	0.18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-008

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00149

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -4.20      Final Pressure (psig): 3.79

Canister Dilution Factor: 1.76

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.18	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.3</b>	0.18	
7727-37-9	<b>Nitrogen</b>	<b>77.7</b>	0.18	
630-08-0	Carbon Monoxide	ND	0.18	
74-82-8	Methane	ND	0.18	
124-38-9	Carbon Dioxide	ND	0.18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729NQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-009

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00199

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -6.75      Final Pressure (psig): 4.10

Canister Dilution Factor: 2.36

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.24	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.3</b>	0.24	
7727-37-9	<b>Nitrogen</b>	<b>77.7</b>	0.24	
630-08-0	Carbon Monoxide	ND	0.24	
74-82-8	Methane	ND	0.24	
124-38-9	Carbon Dioxide	ND	0.24	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729N-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-010

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00056

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -3.58      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.65

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.17	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.3</b>	0.17	
7727-37-9	<b>Nitrogen</b>	<b>77.7</b>	0.17	
630-08-0	Carbon Monoxide	ND	0.17	
74-82-8	Methane	ND	0.17	
124-38-9	Carbon Dioxide	ND	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729-DUPE11  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-011

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00247

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -2.93      Final Pressure (psig): 3.63

Canister Dilution Factor: 1.56

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.16	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.3</b>	0.16	
7727-37-9	<b>Nitrogen</b>	<b>77.7</b>	0.16	
630-08-0	Carbon Monoxide	ND	0.16	
74-82-8	Methane	ND	0.16	
124-38-9	Carbon Dioxide	ND	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sN-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-012

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00153

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -3.20      Final Pressure (psig): 7.08

Canister Dilution Factor: 1.89

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.19	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>1.09</b>	0.19	
7727-37-9	<b>Nitrogen</b>	<b>47.8</b>	0.19	
630-08-0	Carbon Monoxide	ND	0.19	
74-82-8	<b>Methane</b>	<b>21.7</b>	0.19	
124-38-9	<b>Carbon Dioxide</b>	<b>29.4</b>	0.19	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sSQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-013

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00109

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -13.25      Final Pressure (psig): 9.54

Canister Dilution Factor: 16.72

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	<b>Hydrogen</b>	<b>2.08</b>	1.7	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>14.8</b>	1.7	
7727-37-9	<b>Nitrogen</b>	<b>61.8</b>	1.7	
630-08-0	Carbon Monoxide	ND	1.7	
74-82-8	<b>Methane</b>	<b>3.95</b>	1.7	
124-38-9	<b>Carbon Dioxide</b>	<b>17.4</b>	1.7	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Summa (A)  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-014

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00148

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -0.35      Final Pressure (psig): 7.96

Canister Dilution Factor: 1.58

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	<b>Hydrogen</b>	<b>8.61</b>	0.16	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>10.4</b>	0.16	
7727-37-9	<b>Nitrogen</b>	<b>39.9</b>	0.16	
630-08-0	Carbon Monoxide	ND	0.16	
74-82-8	<b>Methane</b>	<b>8.75</b>	0.16	
124-38-9	<b>Carbon Dioxide</b>	<b>32.3</b>	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



**ALS ENVIRONMENTAL**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sNQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-015

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00121

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -13.88      Final Pressure (psig): 8.99

Canister Dilution Factor: 28.89

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	2.9	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>12.9</b>	2.9	
7727-37-9	<b>Nitrogen</b>	<b>80.3</b>	2.9	
630-08-0	Carbon Monoxide	ND	2.9	
74-82-8	Methane	ND	2.9	
124-38-9	<b>Carbon Dioxide</b>	<b>6.84</b>	2.9	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-016

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00123

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -1.84      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.42

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.14	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>22.2</b>	0.14	
7727-37-9	<b>Nitrogen</b>	<b>77.7</b>	0.14	
630-08-0	Carbon Monoxide	ND	0.14	
74-82-8	Methane	ND	0.14	
124-38-9	Carbon Dioxide	ND	0.14	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-GSumma  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-017

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00017

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.10	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>0.179</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>0.650</b>	0.10	
630-08-0	Carbon Monoxide	ND	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Summa (B)  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-018

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00102

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -2.84      Final Pressure (psig): 6.44

Canister Dilution Factor: 1.78

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	<b>Hydrogen</b>	<b>9.77</b>	0.18	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>8.99</b>	0.18	
7727-37-9	<b>Nitrogen</b>	<b>35.5</b>	0.18	
630-08-0	Carbon Monoxide	ND	0.18	
74-82-8	<b>Methane</b>	<b>9.45</b>	0.18	
124-38-9	<b>Carbon Dioxide</b>	<b>36.2</b>	0.18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
ALS Sample ID: P150811-MB

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Nalini Lall  
Sample Type: 6.0 L Silonite Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/11/15  
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.10	
7782-44-7	Oxygen +			
7440-37-1	Argon	ND	0.10	
7727-37-9	Nitrogen	ND	0.10	
630-08-0	Carbon Monoxide	ND	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150811-LCS

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppmV	Result ppmV	% Recovery	ALS Acceptance Limits	Data Qualifier
1333-74-0	Hydrogen	40,000	<b>43,100</b>	<b>108</b>	83-114	
7782-44-7	Oxygen +					
7440-37-1	Argon	50,000	<b>56,500</b>	<b>113</b>	84-121	
7727-37-9	Nitrogen	50,000	<b>55,700</b>	<b>111</b>	88-122	
630-08-0	Carbon Monoxide	50,000	<b>56,200</b>	<b>112</b>	87-118	
74-82-8	Methane	40,000	<b>44,300</b>	<b>111</b>	85-116	
124-38-9	Carbon Dioxide	50,000	<b>54,400</b>	<b>109</b>	84-117	

Method Path : I:\GC01\METHODS\  
 Method File : 3C112914.M  
 Title : EPA 3C, ASTM D 1946-90, VOA-EPA3C  
 Last Update : Mon Dec 01 13:41:04 2014  
 Response Via : Initial Calibration

Calibration Files

1	=11291412.D	2	=11291410.D	3	=11291413.D
4	=11291414.D	5	=11291415.D	6	=11291421.D

Compound	1	2	3	4	5	6	Avg		%RSD
1) Hydrogen	1.258	1.246	1.311	1.308	1.519		1.328	E1	8.32
2) Oxygen	1.420	1.594	1.603	1.604	1.561	1.649	1.572	E1	5.07
3) Nitrogen	2.029	1.951	1.833	1.829	1.803		1.829	E1	9.36
4) Carbon Monoxide	1.712	1.637	1.814	1.800	1.763		1.745	E1	4.14
5) Methane	1.370	1.329	1.353	1.359	1.332		1.348	E1	1.17
6) Carbon Dioxide	2.104	2.103	2.082	2.080	2.018		2.102	E1	3.20

(#) = Out of Range ### Number of calibration levels exceeded format ###

**Modified EPA Method 3C Daily QC Summary**

Client : Stantec Consulting Services, Inc.  
 Analyst : NL  
 Method Name : EPA 3C, ASTM D 1946-90, VOA-EPA3C

Instrument : GC01\_FXG  
 Date Analyzed : 8/11/2015

**RT Summaries and QC Check (minutes)**

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	File ID	Time
ICAL Mean RT	0.708	2.188	2.368	3.076	5.045	6.707		
RT Windows (+/- min )	0.072	0.133	0.146	0.034	0.130	0.145		
std s30-07021501	0.706	2.224	2.400	3.088	5.079	6.741	08111501.D	07:35
+/- 0.33min of ICAL Mean RT	Pass	Pass	Pass	Pass	Pass	Pass		
mb							08111502.D	07:53
lab air		2.164 Pass	2.301 Pass			6.741 Pass	08111503.D	08:12
ics s30-04161504	0.705 Pass	2.212 Pass	2.388 Pass	3.076 Pass	5.066 Pass	6.729 Pass	08111505.D	09:17
3125-001		2.182 Pass	2.334 Pass			6.741 Pass	08111506.D	10:00
3125-001dup		2.188 Pass	2.339 Pass				08111507.D	10:15
3125-002		2.181 Pass	2.331 Pass			6.735 Pass	08111508.D	10:29
3125-003		2.172 Pass	2.320 Pass				08111509.D	10:45
3125-004		2.194 Pass	2.344 Pass			6.754 Pass	08111510.D	11:01
3125-005		2.175 Pass	2.323 Pass			6.732 Pass	08111511.D	11:17
3125-006		2.186 Pass	2.333 Pass			6.738 Pass	08111512.D	11:35
3125-007		2.190 Pass	2.340 Pass			6.741 Pass	08111513.D	11:57
3125-008		2.179 Pass	2.327 Pass			6.749 Pass	08111514.D	12:13
3125-009		2.191 Pass	2.347 Pass				08111515.D	12:29
std s30-07021501	0.707 Pass	2.217 Pass	2.392 Pass	3.079 Pass	5.068 Pass	6.730 Pass	08111516.D	12:54
3125-010		2.185 Pass	2.333 Pass			6.733 Pass	08111517.D	13:35
3125-011		2.175 Pass	2.321 Pass			6.728 Pass	08111518.D	13:52
3125-015		2.217 Pass	2.388 Pass			6.732 Pass	08111519.D	14:07
3125-017		2.213 Pass	2.386 Pass				08111520.D	14:22
3125-012		2.187 Pass	2.324 Pass		5.038 Pass	6.699 Pass	08111521.D	14:38
3125-013	0.702 Pass	2.217 Pass	2.389 Pass		5.071 Pass	6.735 Pass	08111522.D	15:05
3125-014	0.703 Pass	2.195 Pass	2.352 Pass	3.083 Pass	5.059 Pass	6.702 Pass	08111523.D	15:17
3125-016		2.172 Pass	2.316 Pass			6.727 Pass	08111524.D	15:31
3125-018	0.702 Pass	2.202 Pass	2.361 Pass	3.089 Pass	5.062 Pass	6.703 Pass	08111525.D	15:52

**Continuing Calibration Standards Summary (ppm)**

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	File ID	Time
ACTUAL	39980.0	40030.0	50000.0	49990.0	40020.0	50040.0		
CCV Criteria (+/- %D)	15.0%	10.0%	10.0%	10.0%	10.0%	10.0%		
std s30-07021501	39719.4 0.7%	40891.0 2.2%	51119.8 2.2%	51195.7 2.4%	39897.4 0.3%	49257.4 1.6%	08111501.D	07:35
std s30-07021501	40997.0 2.5%	42275.7 5.6%	53219.9 6.4%	52455.4 4.9%	41067.3 2.6%	50468.0 0.9%	08111516.D	12:54
std s30-07021501	40125.3 0.4%	41871.2 4.6%	53874.8 7.7%	51267.0 2.6%	39970.6 0.1%	49493.7 1.1%	08111526.D	16:05

**Lab Dup Summary (ppm, without DF correction and nomalization)**

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	File ID	Time
Duplicate Criteria % RPD	10%	9%	10%	9%	9%	9%		
3125-001		112031.2	389687.3				08111506.D	10:00
3125-001dup		113592.9	395491.1				08111507.D	10:15
Duplicate % RPD		1.4% Pass	1.5% Pass					

**LCS / LCS Dup Summary (ppm, without DF correction)**

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	File ID	Time
LCS Actual Conc. (ppm)	40000.0	50000.0	50000.0	50000.0	40000.0	50000.0		
LCS Criteria (% Range)	83%-114%	84%-121%	88%-122%	87%-118%	85%-116%	84%-117%		
ics s30-04161504	43143.1	56522.1	55660.8	56216.4	44302.3	54384.3	08111505.D	09:17
LCS % Recovery	108% Pass	113% Pass	111% Pass	112% Pass	111% Pass	109% Pass		

**Lab Air QC Summary**

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxid	Methane	Carbon Dioxide	Lab Air Criteria Total (90%-110%)
lab air		213470.4	754882.6			458.5	96.9% Pass
Lab Air Normalized (%)		22.03%	77.91%			0.05%	100.0%



**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-001

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00819

Date Collected: 7/28/15  
 Time Collected: 17:10  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 10:40  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -4.82      Final Pressure (psig): 3.50

Canister Dilution Factor: 1.84

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	13	4.4	ND	9.2	3.1	
463-58-1	Carbonyl Sulfide	ND	23	8.6	ND	9.2	3.5	
74-93-1	Methyl Mercaptan	ND	18	8.0	ND	9.2	4.0	
75-08-1	Ethyl Mercaptan	ND	23	10	ND	9.2	4.0	
75-18-3	Dimethyl Sulfide	ND	23	10	ND	9.2	4.0	
75-15-0	Carbon Disulfide	ND	14	6.3	ND	4.6	2.0	
75-33-2	Isopropyl Mercaptan	ND	29	13	ND	9.2	4.0	
75-66-1	tert-Butyl Mercaptan	ND	34	15	ND	9.2	4.0	
107-03-9	n-Propyl Mercaptan	ND	29	13	ND	9.2	4.0	
624-89-5	Ethyl Methyl Sulfide	ND	29	13	ND	9.2	4.0	
110-02-1	Thiophene	ND	32	14	ND	9.2	4.0	
513-44-0	Isobutyl Mercaptan	ND	34	15	ND	9.2	4.0	
352-93-2	Diethyl Sulfide	ND	34	15	ND	9.2	4.0	
109-79-5	n-Butyl Mercaptan	ND	34	15	ND	9.2	4.0	
624-92-0	Dimethyl Disulfide	ND	18	7.8	ND	4.6	2.0	
616-44-4	3-Methylthiophene	ND	37	16	ND	9.2	4.0	
110-01-0	Tetrahydrothiophene	ND	33	15	ND	9.2	4.0	
638-02-8	2,5-Dimethylthiophene	ND	42	19	ND	9.2	4.0	
872-55-9	2-Ethylthiophene	ND	42	19	ND	9.2	4.0	
110-81-6	Diethyl Disulfide	ND	23	10	ND	4.6	2.0	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-002

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00300

Date Collected: 7/28/15  
 Time Collected: 17:00  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 10:55  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -3.76      Final Pressure (psig): 3.93

Canister Dilution Factor: 1.70

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	12	4.0	ND	8.5	2.9	
463-58-1	Carbonyl Sulfide	ND	21	7.9	ND	8.5	3.2	
74-93-1	Methyl Mercaptan	ND	17	7.4	ND	8.5	3.7	
75-08-1	Ethyl Mercaptan	ND	22	9.5	ND	8.5	3.7	
75-18-3	Dimethyl Sulfide	ND	22	9.5	ND	8.5	3.7	
75-15-0	Carbon Disulfide	ND	13	5.8	ND	4.3	1.9	
75-33-2	Isopropyl Mercaptan	ND	26	12	ND	8.5	3.7	
75-66-1	tert-Butyl Mercaptan	ND	31	14	ND	8.5	3.7	
107-03-9	n-Propyl Mercaptan	ND	26	12	ND	8.5	3.7	
624-89-5	Ethyl Methyl Sulfide	ND	26	12	ND	8.5	3.7	
110-02-1	Thiophene	ND	29	13	ND	8.5	3.7	
513-44-0	Isobutyl Mercaptan	ND	31	14	ND	8.5	3.7	
352-93-2	Diethyl Sulfide	ND	31	14	ND	8.5	3.7	
109-79-5	n-Butyl Mercaptan	ND	31	14	ND	8.5	3.7	
624-92-0	Dimethyl Disulfide	ND	16	7.2	ND	4.3	1.9	
616-44-4	3-Methylthiophene	ND	34	15	ND	8.5	3.7	
110-01-0	Tetrahydrothiophene	ND	31	13	ND	8.5	3.7	
638-02-8	2,5-Dimethylthiophene	ND	39	17	ND	8.5	3.7	
872-55-9	2-Ethylthiophene	ND	39	17	ND	8.5	3.7	
110-81-6	Diethyl Disulfide	ND	21	9.3	ND	4.3	1.9	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D2-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-003

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00655

Date Collected: 7/28/15  
 Time Collected: 17:17  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 11:12  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -3.83      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.68

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	12	4.0	ND	8.4	2.9	
463-58-1	Carbonyl Sulfide	ND	21	7.8	ND	8.4	3.2	
74-93-1	Methyl Mercaptan	ND	17	7.3	ND	8.4	3.7	
75-08-1	Ethyl Mercaptan	ND	21	9.4	ND	8.4	3.7	
75-18-3	Dimethyl Sulfide	ND	21	9.4	ND	8.4	3.7	
75-15-0	Carbon Disulfide	ND	13	5.8	ND	4.2	1.8	
75-33-2	Isopropyl Mercaptan	ND	26	12	ND	8.4	3.7	
75-66-1	tert-Butyl Mercaptan	ND	31	14	ND	8.4	3.7	
107-03-9	n-Propyl Mercaptan	ND	26	12	ND	8.4	3.7	
624-89-5	Ethyl Methyl Sulfide	ND	26	12	ND	8.4	3.7	
110-02-1	Thiophene	ND	29	13	ND	8.4	3.7	
513-44-0	Isobutyl Mercaptan	ND	31	14	ND	8.4	3.7	
352-93-2	Diethyl Sulfide	ND	31	14	ND	8.4	3.7	
109-79-5	n-Butyl Mercaptan	ND	31	14	ND	8.4	3.7	
624-92-0	Dimethyl Disulfide	ND	16	7.1	ND	4.2	1.8	
616-44-4	3-Methylthiophene	ND	34	15	ND	8.4	3.7	
110-01-0	Tetrahydrothiophene	ND	30	13	ND	8.4	3.7	
638-02-8	2,5-Dimethylthiophene	ND	39	17	ND	8.4	3.7	
872-55-9	2-Ethylthiophene	ND	39	17	ND	8.4	3.7	
110-81-6	Diethyl Disulfide	ND	21	9.2	ND	4.2	1.8	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728F-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-004

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00846

Date Collected: 7/28/15  
 Time Collected: 16:50  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 11:28  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -3.49      Final Pressure (psig): 3.72

Canister Dilution Factor: 1.64

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	11	3.9	ND	8.2	2.8	
463-58-1	Carbonyl Sulfide	ND	20	7.7	ND	8.2	3.1	
74-93-1	Methyl Mercaptan	ND	16	7.1	ND	8.2	3.6	
75-08-1	Ethyl Mercaptan	ND	21	9.2	ND	8.2	3.6	
75-18-3	Dimethyl Sulfide	ND	21	9.2	ND	8.2	3.6	
75-15-0	Carbon Disulfide	ND	13	5.6	ND	4.1	1.8	
75-33-2	Isopropyl Mercaptan	ND	26	11	ND	8.2	3.6	
75-66-1	tert-Butyl Mercaptan	ND	30	13	ND	8.2	3.6	
107-03-9	n-Propyl Mercaptan	ND	26	11	ND	8.2	3.6	
624-89-5	Ethyl Methyl Sulfide	ND	26	11	ND	8.2	3.6	
110-02-1	Thiophene	ND	28	12	ND	8.2	3.6	
513-44-0	Isobutyl Mercaptan	ND	30	13	ND	8.2	3.6	
352-93-2	Diethyl Sulfide	ND	30	13	ND	8.2	3.6	
109-79-5	n-Butyl Mercaptan	ND	30	13	ND	8.2	3.6	
624-92-0	Dimethyl Disulfide	ND	16	6.9	ND	4.1	1.8	
616-44-4	3-Methylthiophene	ND	33	14	ND	8.2	3.6	
110-01-0	Tetrahydrothiophene	ND	30	13	ND	8.2	3.6	
638-02-8	2,5-Dimethylthiophene	ND	38	17	ND	8.2	3.6	
872-55-9	2-Ethylthiophene	ND	38	17	ND	8.2	3.6	
110-81-6	Diethyl Disulfide	ND	20	9.0	ND	4.1	1.8	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728SQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-005

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00582

Date Collected: 7/28/15  
 Time Collected: 17:40  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 11:43  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -3.69      Final Pressure (psig): 3.54

Canister Dilution Factor: 1.66

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	12	3.9	ND	8.3	2.8	
463-58-1	Carbonyl Sulfide	ND	20	7.7	ND	8.3	3.2	
74-93-1	Methyl Mercaptan	ND	16	7.2	ND	8.3	3.7	
75-08-1	Ethyl Mercaptan	ND	21	9.3	ND	8.3	3.7	
75-18-3	Dimethyl Sulfide	ND	21	9.3	ND	8.3	3.7	
75-15-0	Carbon Disulfide	ND	13	5.7	ND	4.2	1.8	
75-33-2	Isopropyl Mercaptan	ND	26	11	ND	8.3	3.7	
75-66-1	tert-Butyl Mercaptan	ND	31	13	ND	8.3	3.7	
107-03-9	n-Propyl Mercaptan	ND	26	11	ND	8.3	3.7	
624-89-5	Ethyl Methyl Sulfide	ND	26	11	ND	8.3	3.7	
110-02-1	Thiophene	ND	29	13	ND	8.3	3.7	
513-44-0	Isobutyl Mercaptan	ND	31	13	ND	8.3	3.7	
352-93-2	Diethyl Sulfide	ND	31	13	ND	8.3	3.7	
109-79-5	n-Butyl Mercaptan	ND	31	13	ND	8.3	3.7	
624-92-0	Dimethyl Disulfide	ND	16	7.0	ND	4.2	1.8	
616-44-4	3-Methylthiophene	ND	33	15	ND	8.3	3.7	
110-01-0	Tetrahydrothiophene	ND	30	13	ND	8.3	3.7	
638-02-8	2,5-Dimethylthiophene	ND	38	17	ND	8.3	3.7	
872-55-9	2-Ethylthiophene	ND	38	17	ND	8.3	3.7	
110-81-6	Diethyl Disulfide	ND	21	9.1	ND	4.2	1.8	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

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**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728-DUPE10  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-006

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00113

Date Collected: 7/28/15  
 Time Collected: NA  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 12:36  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -3.18      Final Pressure (psig): 3.59

Canister Dilution Factor: 1.59

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	11	3.8	ND	8.0	2.7	
463-58-1	Carbonyl Sulfide	ND	20	7.4	ND	8.0	3.0	
74-93-1	Methyl Mercaptan	ND	16	6.9	ND	8.0	3.5	
75-08-1	Ethyl Mercaptan	ND	20	8.9	ND	8.0	3.5	
75-18-3	Dimethyl Sulfide	ND	20	8.9	ND	8.0	3.5	
75-15-0	Carbon Disulfide	ND	12	5.4	ND	4.0	1.7	
75-33-2	Isopropyl Mercaptan	ND	25	11	ND	8.0	3.5	
75-66-1	tert-Butyl Mercaptan	ND	29	13	ND	8.0	3.5	
107-03-9	n-Propyl Mercaptan	ND	25	11	ND	8.0	3.5	
624-89-5	Ethyl Methyl Sulfide	ND	25	11	ND	8.0	3.5	
110-02-1	Thiophene	ND	27	12	ND	8.0	3.5	
513-44-0	Isobutyl Mercaptan	ND	29	13	ND	8.0	3.5	
352-93-2	Diethyl Sulfide	ND	29	13	ND	8.0	3.5	
109-79-5	n-Butyl Mercaptan	ND	29	13	ND	8.0	3.5	
624-92-0	Dimethyl Disulfide	ND	15	6.7	ND	4.0	1.7	
616-44-4	3-Methylthiophene	ND	32	14	ND	8.0	3.5	
110-01-0	Tetrahydrothiophene	ND	29	13	ND	8.0	3.5	
638-02-8	2,5-Dimethylthiophene	ND	36	16	ND	8.0	3.5	
872-55-9	2-Ethylthiophene	ND	36	16	ND	8.0	3.5	
110-81-6	Diethyl Disulfide	ND	20	8.7	ND	4.0	1.7	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-007

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00417

Date Collected: 7/29/15  
 Time Collected: 17:09  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 12:52  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -4.57      Final Pressure (psig): 3.87

Canister Dilution Factor: 1.83

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	13	4.3	ND	9.2	3.1	
463-58-1	Carbonyl Sulfide	ND	22	8.5	ND	9.2	3.5	
74-93-1	Methyl Mercaptan	ND	18	7.9	ND	9.2	4.0	
75-08-1	Ethyl Mercaptan	ND	23	10	ND	9.2	4.0	
75-18-3	Dimethyl Sulfide	ND	23	10	ND	9.2	4.0	
75-15-0	Carbon Disulfide	ND	14	6.3	ND	4.6	2.0	
75-33-2	Isopropyl Mercaptan	ND	28	13	ND	9.2	4.0	
75-66-1	tert-Butyl Mercaptan	ND	34	15	ND	9.2	4.0	
107-03-9	n-Propyl Mercaptan	ND	28	13	ND	9.2	4.0	
624-89-5	Ethyl Methyl Sulfide	ND	28	13	ND	9.2	4.0	
110-02-1	Thiophene	ND	31	14	ND	9.2	4.0	
513-44-0	Isobutyl Mercaptan	ND	34	15	ND	9.2	4.0	
352-93-2	Diethyl Sulfide	ND	34	15	ND	9.2	4.0	
109-79-5	n-Butyl Mercaptan	ND	34	15	ND	9.2	4.0	
624-92-0	Dimethyl Disulfide	ND	18	7.8	ND	4.6	2.0	
616-44-4	3-Methylthiophene	ND	37	16	ND	9.2	4.0	
110-01-0	Tetrahydrothiophene	ND	33	15	ND	9.2	4.0	
638-02-8	2,5-Dimethylthiophene	ND	42	18	ND	9.2	4.0	
872-55-9	2-Ethylthiophene	ND	42	18	ND	9.2	4.0	
110-81-6	Diethyl Disulfide	ND	23	10	ND	4.6	2.0	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-008

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00149

Date Collected: 7/29/15  
 Time Collected: 17:38  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 13:47  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -4.20      Final Pressure (psig): 3.79

Canister Dilution Factor: 1.76

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	12	4.2	ND	8.8	3.0	
463-58-1	Carbonyl Sulfide	ND	22	8.2	ND	8.8	3.3	
74-93-1	Methyl Mercaptan	ND	17	7.6	ND	8.8	3.9	
75-08-1	Ethyl Mercaptan	ND	22	9.8	ND	8.8	3.9	
75-18-3	Dimethyl Sulfide	ND	22	9.8	ND	8.8	3.9	
75-15-0	Carbon Disulfide	ND	14	6.0	ND	4.4	1.9	
75-33-2	Isopropyl Mercaptan	ND	27	12	ND	8.8	3.9	
75-66-1	tert-Butyl Mercaptan	ND	32	14	ND	8.8	3.9	
107-03-9	n-Propyl Mercaptan	ND	27	12	ND	8.8	3.9	
624-89-5	Ethyl Methyl Sulfide	ND	27	12	ND	8.8	3.9	
110-02-1	Thiophene	ND	30	13	ND	8.8	3.9	
513-44-0	Isobutyl Mercaptan	ND	32	14	ND	8.8	3.9	
352-93-2	Diethyl Sulfide	ND	32	14	ND	8.8	3.9	
109-79-5	n-Butyl Mercaptan	ND	32	14	ND	8.8	3.9	
624-92-0	Dimethyl Disulfide	ND	17	7.5	ND	4.4	1.9	
616-44-4	3-Methylthiophene	ND	35	16	ND	8.8	3.9	
110-01-0	Tetrahydrothiophene	ND	32	14	ND	8.8	3.9	
638-02-8	2,5-Dimethylthiophene	ND	40	18	ND	8.8	3.9	
872-55-9	2-Ethylthiophene	ND	40	18	ND	8.8	3.9	
110-81-6	Diethyl Disulfide	ND	22	9.7	ND	4.4	1.9	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729NQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-009

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00199

Date Collected: 7/29/15  
 Time Collected: 18:08  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 14:30  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -6.75      Final Pressure (psig): 4.10

Canister Dilution Factor: 2.36

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	16	5.6	ND	12	4.0	
463-58-1	Carbonyl Sulfide	ND	29	11	ND	12	4.5	
74-93-1	Methyl Mercaptan	ND	23	10	ND	12	5.2	
75-08-1	Ethyl Mercaptan	ND	30	13	ND	12	5.2	
75-18-3	Dimethyl Sulfide	ND	30	13	ND	12	5.2	
75-15-0	Carbon Disulfide	ND	18	8.1	ND	5.9	2.6	
75-33-2	Isopropyl Mercaptan	ND	37	16	ND	12	5.2	
75-66-1	tert-Butyl Mercaptan	ND	44	19	ND	12	5.2	
107-03-9	n-Propyl Mercaptan	ND	37	16	ND	12	5.2	
624-89-5	Ethyl Methyl Sulfide	ND	37	16	ND	12	5.2	
110-02-1	Thiophene	ND	41	18	ND	12	5.2	
513-44-0	Isobutyl Mercaptan	ND	44	19	ND	12	5.2	
352-93-2	Diethyl Sulfide	ND	44	19	ND	12	5.2	
109-79-5	n-Butyl Mercaptan	ND	44	19	ND	12	5.2	
624-92-0	Dimethyl Disulfide	ND	23	10	ND	5.9	2.6	
616-44-4	3-Methylthiophene	ND	47	21	ND	12	5.2	
110-01-0	Tetrahydrothiophene	ND	43	19	ND	12	5.2	
638-02-8	2,5-Dimethylthiophene	ND	54	24	ND	12	5.2	
872-55-9	2-Ethylthiophene	ND	54	24	ND	12	5.2	
110-81-6	Diethyl Disulfide	ND	29	13	ND	5.9	2.6	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729N-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-010

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00056

Date Collected: 7/29/15  
 Time Collected: 18:17  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 14:47  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -3.58      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.65

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	11	3.9	ND	8.3	2.8	
463-58-1	Carbonyl Sulfide	ND	20	7.7	ND	8.3	3.1	
74-93-1	Methyl Mercaptan	ND	16	7.1	ND	8.3	3.6	
75-08-1	Ethyl Mercaptan	ND	21	9.2	ND	8.3	3.6	
75-18-3	Dimethyl Sulfide	ND	21	9.2	ND	8.3	3.6	
75-15-0	Carbon Disulfide	ND	13	5.6	ND	4.1	1.8	
75-33-2	Isopropyl Mercaptan	ND	26	11	ND	8.3	3.6	
75-66-1	tert-Butyl Mercaptan	ND	30	13	ND	8.3	3.6	
107-03-9	n-Propyl Mercaptan	ND	26	11	ND	8.3	3.6	
624-89-5	Ethyl Methyl Sulfide	ND	26	11	ND	8.3	3.6	
110-02-1	Thiophene	ND	28	12	ND	8.3	3.6	
513-44-0	Isobutyl Mercaptan	ND	30	13	ND	8.3	3.6	
352-93-2	Diethyl Sulfide	ND	30	13	ND	8.3	3.6	
109-79-5	n-Butyl Mercaptan	ND	30	13	ND	8.3	3.6	
624-92-0	Dimethyl Disulfide	ND	16	7.0	ND	4.1	1.8	
616-44-4	3-Methylthiophene	ND	33	15	ND	8.3	3.6	
110-01-0	Tetrahydrothiophene	ND	30	13	ND	8.3	3.6	
638-02-8	2,5-Dimethylthiophene	ND	38	17	ND	8.3	3.6	
872-55-9	2-Ethylthiophene	ND	38	17	ND	8.3	3.6	
110-81-6	Diethyl Disulfide	ND	21	9.1	ND	4.1	1.8	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729-DUPE11  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-011

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00247

Date Collected: 7/29/15  
 Time Collected: NA  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 15:02  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.93      Final Pressure (psig): 3.63

Canister Dilution Factor: 1.56

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	11	3.7	ND	7.8	2.7	
463-58-1	Carbonyl Sulfide	ND	19	7.3	ND	7.8	3.0	
74-93-1	Methyl Mercaptan	ND	15	6.8	ND	7.8	3.4	
75-08-1	Ethyl Mercaptan	ND	20	8.7	ND	7.8	3.4	
75-18-3	Dimethyl Sulfide	ND	20	8.7	ND	7.8	3.4	
75-15-0	Carbon Disulfide	ND	12	5.3	ND	3.9	1.7	
75-33-2	Isopropyl Mercaptan	ND	24	11	ND	7.8	3.4	
75-66-1	tert-Butyl Mercaptan	ND	29	13	ND	7.8	3.4	
107-03-9	n-Propyl Mercaptan	ND	24	11	ND	7.8	3.4	
624-89-5	Ethyl Methyl Sulfide	ND	24	11	ND	7.8	3.4	
110-02-1	Thiophene	ND	27	12	ND	7.8	3.4	
513-44-0	Isobutyl Mercaptan	ND	29	13	ND	7.8	3.4	
352-93-2	Diethyl Sulfide	ND	29	13	ND	7.8	3.4	
109-79-5	n-Butyl Mercaptan	ND	29	13	ND	7.8	3.4	
624-92-0	Dimethyl Disulfide	ND	15	6.6	ND	3.9	1.7	
616-44-4	3-Methylthiophene	ND	31	14	ND	7.8	3.4	
110-01-0	Tetrahydrothiophene	ND	28	12	ND	7.8	3.4	
638-02-8	2,5-Dimethylthiophene	ND	36	16	ND	7.8	3.4	
872-55-9	2-Ethylthiophene	ND	36	16	ND	7.8	3.4	
110-81-6	Diethyl Disulfide	ND	19	8.6	ND	3.9	1.7	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sN-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-012

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00153

Date Collected: 7/29/15  
 Time Collected: 12:12  
 Date Received: 7/31/15  
 Date Analyzed: 8/6/15  
 Time Analyzed: 08:42  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -3.20      Final Pressure (psig): 7.08

Canister Dilution Factor: 1.89

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	13	4.5	ND	9.5	3.2	
463-58-1	Carbonyl Sulfide	ND	23	8.8	ND	9.5	3.6	
74-93-1	Methyl Mercaptan	ND	19	8.2	ND	9.5	4.2	
75-08-1	Ethyl Mercaptan	ND	24	11	ND	9.5	4.2	
75-18-3	Dimethyl Sulfide	<b>77</b>	24	11	<b>30</b>	9.5	4.2	
75-15-0	Carbon Disulfide	<b>24</b>	15	6.5	<b>7.7</b>	4.7	2.1	
75-33-2	Isopropyl Mercaptan	ND	29	13	ND	9.5	4.2	
75-66-1	tert-Butyl Mercaptan	ND	35	15	ND	9.5	4.2	
107-03-9	n-Propyl Mercaptan	ND	29	13	ND	9.5	4.2	
624-89-5	Ethyl Methyl Sulfide	ND	29	13	ND	9.5	4.2	
110-02-1	Thiophene	ND	33	14	ND	9.5	4.2	
513-44-0	Isobutyl Mercaptan	ND	35	15	ND	9.5	4.2	
352-93-2	Diethyl Sulfide	ND	35	15	ND	9.5	4.2	
109-79-5	n-Butyl Mercaptan	ND	35	15	ND	9.5	4.2	
624-92-0	Dimethyl Disulfide	<b>120</b>	18	8.0	<b>31</b>	4.7	2.1	
616-44-4	3-Methylthiophene	ND	38	17	ND	9.5	4.2	
110-01-0	Tetrahydrothiophene	ND	34	15	ND	9.5	4.2	
638-02-8	2,5-Dimethylthiophene	ND	43	19	ND	9.5	4.2	
872-55-9	2-Ethylthiophene	ND	43	19	ND	9.5	4.2	
110-81-6	Diethyl Disulfide	ND	24	10	ND	4.7	2.1	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sSQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-013

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Mike Conejo  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00109

Date Collected: 7/29/15  
 Time Collected: 11:15  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 15:51  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -13.25      Final Pressure (psig): 9.54

Canister Dilution Factor: 16.72

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	120	40	ND	84	28	
463-58-1	Carbonyl Sulfide	ND	210	78	ND	84	32	
74-93-1	Methyl Mercaptan	<b>11,000</b>	160	72	<b>5,500</b>	84	37	
75-08-1	Ethyl Mercaptan	ND	210	93	ND	84	37	
75-18-3	Dimethyl Sulfide	<b>450,000</b>	210	93	<b>180,000</b>	84	37	
75-15-0	Carbon Disulfide	<b>450</b>	130	57	<b>140</b>	42	18	
75-33-2	Isopropyl Mercaptan	ND	260	110	ND	84	37	
75-66-1	tert-Butyl Mercaptan	ND	310	140	ND	84	37	
107-03-9	n-Propyl Mercaptan	ND	260	110	ND	84	37	
624-89-5	Ethyl Methyl Sulfide	<b>4,900</b>	260	110	<b>1,600</b>	84	37	
110-02-1	Thiophene	<b>9,300</b>	290	130	<b>2,700</b>	84	37	
513-44-0	Isobutyl Mercaptan	ND	310	140	ND	84	37	
352-93-2	Diethyl Sulfide	ND	310	140	ND	84	37	
109-79-5	n-Butyl Mercaptan	<b>1,800</b>	310	140	<b>500</b>	84	37	
624-92-0	Dimethyl Disulfide	<b>110,000</b>	160	71	<b>29,000</b>	42	18	
616-44-4	3-Methylthiophene	<b>840</b>	340	150	<b>210</b>	84	37	
110-01-0	Tetrahydrothiophene	<b>4,700</b>	300	130	<b>1,300</b>	84	37	
638-02-8	2,5-Dimethylthiophene	ND	380	170	ND	84	37	
872-55-9	2-Ethylthiophene	ND	380	170	ND	84	37	
110-81-6	Diethyl Disulfide	ND	210	92	ND	42	18	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Summa (A)  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-014

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Mike Conejo  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00148

Date Collected: 7/29/15  
 Time Collected: 09:38  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 16:33  
 Volume(s) Analyzed: 0.025 ml(s)

Initial Pressure (psig): -0.35      Final Pressure (psig): 7.96

Canister Dilution Factor: 1.58

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	440	150	ND	320	110	
463-58-1	Carbonyl Sulfide	ND	780	290	ND	320	120	
74-93-1	Methyl Mercaptan	<b>1,300</b>	620	270	<b>680</b>	320	140	
75-08-1	Ethyl Mercaptan	ND	800	350	ND	320	140	
75-18-3	Dimethyl Sulfide	<b>580,000</b>	800	350	<b>230,000</b>	320	140	
75-15-0	Carbon Disulfide	ND	490	220	ND	160	70	
75-33-2	Isopropyl Mercaptan	ND	980	430	ND	320	140	
75-66-1	tert-Butyl Mercaptan	ND	1,200	510	ND	320	140	
107-03-9	n-Propyl Mercaptan	ND	980	430	ND	320	140	
624-89-5	Ethyl Methyl Sulfide	<b>5,200</b>	980	430	<b>1,700</b>	320	140	
110-02-1	Thiophene	<b>9,100</b>	1,100	480	<b>2,600</b>	320	140	
513-44-0	Isobutyl Mercaptan	ND	1,200	510	ND	320	140	
352-93-2	Diethyl Sulfide	ND	1,200	510	ND	320	140	
109-79-5	n-Butyl Mercaptan	ND	1,200	510	ND	320	140	
624-92-0	Dimethyl Disulfide	<b>140,000</b>	610	270	<b>37,000</b>	160	70	
616-44-4	3-Methylthiophene	ND	1,300	560	ND	320	140	
110-01-0	Tetrahydrothiophene	ND	1,100	500	ND	320	140	
638-02-8	2,5-Dimethylthiophene	ND	1,400	640	ND	320	140	
872-55-9	2-Ethylthiophene	ND	1,400	640	ND	320	140	
110-81-6	Diethyl Disulfide	ND	790	350	ND	160	70	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sNQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-015

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Mike Conejo  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00121

Date Collected: 7/29/15  
 Time Collected: 13:36  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 15:14  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -13.88      Final Pressure (psig): 8.99

Canister Dilution Factor: 28.89

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	200	68	ND	140	49	
463-58-1	Carbonyl Sulfide	ND	350	130	ND	140	55	
74-93-1	Methyl Mercaptan	ND	280	130	ND	140	64	
75-08-1	Ethyl Mercaptan	ND	370	160	ND	140	64	
75-18-3	Dimethyl Sulfide	ND	370	160	ND	140	64	
75-15-0	Carbon Disulfide	ND	220	99	ND	72	32	
75-33-2	Isopropyl Mercaptan	ND	450	200	ND	140	64	
75-66-1	tert-Butyl Mercaptan	ND	530	230	ND	140	64	
107-03-9	n-Propyl Mercaptan	ND	450	200	ND	140	64	
624-89-5	Ethyl Methyl Sulfide	ND	450	200	ND	140	64	
110-02-1	Thiophene	ND	500	220	ND	140	64	
513-44-0	Isobutyl Mercaptan	ND	530	230	ND	140	64	
352-93-2	Diethyl Sulfide	ND	530	230	ND	140	64	
109-79-5	n-Butyl Mercaptan	ND	530	230	ND	140	64	
624-92-0	Dimethyl Disulfide	ND	280	120	ND	72	32	
616-44-4	3-Methylthiophene	ND	580	260	ND	140	64	
110-01-0	Tetrahydrothiophene	ND	520	230	ND	140	64	
638-02-8	2,5-Dimethylthiophene	ND	660	290	ND	140	64	
872-55-9	2-Ethylthiophene	ND	660	290	ND	140	64	
110-81-6	Diethyl Disulfide	ND	360	160	ND	72	32	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-016

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00123

Date Collected: 7/30/15  
 Time Collected: 16:00  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 15:23  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -1.84      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	9.9	3.4	ND	7.1	2.4	
463-58-1	Carbonyl Sulfide	ND	17	6.6	ND	7.1	2.7	
74-93-1	Methyl Mercaptan	ND	14	6.1	ND	7.1	3.1	
75-08-1	Ethyl Mercaptan	ND	18	7.9	ND	7.1	3.1	
75-18-3	Dimethyl Sulfide	ND	18	7.9	ND	7.1	3.1	
75-15-0	Carbon Disulfide	ND	11	4.9	ND	3.6	1.6	
75-33-2	Isopropyl Mercaptan	ND	22	9.7	ND	7.1	3.1	
75-66-1	tert-Butyl Mercaptan	ND	26	12	ND	7.1	3.1	
107-03-9	n-Propyl Mercaptan	ND	22	9.7	ND	7.1	3.1	
624-89-5	Ethyl Methyl Sulfide	ND	22	9.7	ND	7.1	3.1	
110-02-1	Thiophene	ND	24	11	ND	7.1	3.1	
513-44-0	Isobutyl Mercaptan	ND	26	12	ND	7.1	3.1	
352-93-2	Diethyl Sulfide	ND	26	12	ND	7.1	3.1	
109-79-5	n-Butyl Mercaptan	ND	26	12	ND	7.1	3.1	
624-92-0	Dimethyl Disulfide	ND	14	6.0	ND	3.6	1.6	
616-44-4	3-Methylthiophene	ND	28	13	ND	7.1	3.1	
110-01-0	Tetrahydrothiophene	ND	26	11	ND	7.1	3.1	
638-02-8	2,5-Dimethylthiophene	ND	33	14	ND	7.1	3.1	
872-55-9	2-Ethylthiophene	ND	33	14	ND	7.1	3.1	
110-81-6	Diethyl Disulfide	ND	18	7.8	ND	3.6	1.6	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-GSumma  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-017

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00017

Date Collected: 7/30/15  
 Time Collected: 16:00  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 15:40  
 Volume(s) Analyzed: 1.0 ml(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	2.4	ND	5.0	1.7	
463-58-1	Carbonyl Sulfide	ND	12	4.7	ND	5.0	1.9	
74-93-1	Methyl Mercaptan	ND	9.8	4.3	ND	5.0	2.2	
75-08-1	Ethyl Mercaptan	ND	13	5.6	ND	5.0	2.2	
75-18-3	Dimethyl Sulfide	ND	13	5.6	ND	5.0	2.2	
75-15-0	Carbon Disulfide	ND	7.8	3.4	ND	2.5	1.1	
75-33-2	Isopropyl Mercaptan	ND	16	6.9	ND	5.0	2.2	
75-66-1	tert-Butyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
107-03-9	n-Propyl Mercaptan	ND	16	6.9	ND	5.0	2.2	
624-89-5	Ethyl Methyl Sulfide	ND	16	6.9	ND	5.0	2.2	
110-02-1	Thiophene	ND	17	7.6	ND	5.0	2.2	
513-44-0	Isobutyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
352-93-2	Diethyl Sulfide	ND	18	8.1	ND	5.0	2.2	
109-79-5	n-Butyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
624-92-0	Dimethyl Disulfide	ND	9.6	4.2	ND	2.5	1.1	
616-44-4	3-Methylthiophene	ND	20	8.8	ND	5.0	2.2	
110-01-0	Tetrahydrothiophene	ND	18	7.9	ND	5.0	2.2	
638-02-8	2,5-Dimethylthiophene	ND	23	10	ND	5.0	2.2	
872-55-9	2-Ethylthiophene	ND	23	10	ND	5.0	2.2	
110-81-6	Diethyl Disulfide	ND	12	5.5	ND	2.5	1.1	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Summa (B)  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-018

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Mike Conejo  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00102

Date Collected: 7/30/15  
 Time Collected: 09:38  
 Date Received: 7/31/15  
 Date Analyzed: 8/5/15  
 Time Analyzed: 15:30  
 Volume(s) Analyzed: 0.025 ml(s)

Initial Pressure (psig): -2.84      Final Pressure (psig): 6.44

Canister Dilution Factor: 1.78

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	500	170	ND	360	120	
463-58-1	Carbonyl Sulfide	ND	870	330	ND	360	140	
74-93-1	Methyl Mercaptan	<b>1,400</b>	700	310	<b>730</b>	360	160	
75-08-1	Ethyl Mercaptan	ND	900	400	ND	360	160	
75-18-3	Dimethyl Sulfide	<b>1,100,000</b>	900	400	<b>430,000</b>	360	160	
75-15-0	Carbon Disulfide	ND	550	240	ND	180	78	
75-33-2	Isopropyl Mercaptan	ND	1,100	490	ND	360	160	
75-66-1	tert-Butyl Mercaptan	ND	1,300	580	ND	360	160	
107-03-9	n-Propyl Mercaptan	ND	1,100	490	ND	360	160	
624-89-5	Ethyl Methyl Sulfide	<b>10,000</b>	1,100	490	<b>3,300</b>	360	160	
110-02-1	Thiophene	<b>20,000</b>	1,200	540	<b>5,800</b>	360	160	
513-44-0	Isobutyl Mercaptan	ND	1,300	580	ND	360	160	
352-93-2	Diethyl Sulfide	ND	1,300	580	ND	360	160	
109-79-5	n-Butyl Mercaptan	ND	1,300	580	ND	360	160	
624-92-0	Dimethyl Disulfide	<b>320,000</b>	690	300	<b>82,000</b>	180	78	
616-44-4	3-Methylthiophene	ND	1,400	630	ND	360	160	
110-01-0	Tetrahydrothiophene	<b>6,200</b>	1,300	560	<b>1,700</b>	360	160	
638-02-8	2,5-Dimethylthiophene	ND	1,600	720	ND	360	160	
872-55-9	2-Ethylthiophene	ND	1,600	720	ND	360	160	
110-81-6	Diethyl Disulfide	ND	890	390	ND	180	78	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125

**Total Reduced Sulfur as Hydrogen Sulfide**

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister(s)  
 Test Notes:

Date(s) Collected: 7/28 - 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/5 - 8/6/15

Client Sample ID	ALS Sample ID	Canister Dilution Factor	Injection Volume ml(s)	Time Analyzed	Result $\mu\text{g}/\text{m}^3$	MRL $\mu\text{g}/\text{m}^3$	Result ppbV	MRL ppbV	Data Qualifier
728U1-Summa	P1503125-001	1.84	1.0	10:40	ND	13	ND	9.2	
728D1-Summa	P1503125-002	1.70	1.0	10:55	ND	12	ND	8.5	
728D2-Summa	P1503125-003	1.68	1.0	11:12	ND	12	ND	8.4	
728F-Summa	P1503125-004	1.64	1.0	11:28	ND	11	ND	8.2	
728SQ-Summa	P1503125-005	1.66	1.0	11:43	ND	12	ND	8.3	
728-DUPE10	P1503125-006	1.59	1.0	12:36	ND	11	ND	8.0	
729U1-Summa	P1503125-007	1.83	1.0	12:52	ND	13	ND	9.2	
729D1-Summa	P1503125-008	1.76	1.0	13:47	ND	12	ND	8.8	
729NQ-Summa	P1503125-009	2.36	1.0	14:30	ND	16	ND	12	
729N-Summa	P1503125-010	1.65	1.0	14:47	ND	11	ND	8.3	
729-DUPE11	P1503125-011	1.56	1.0	15:02	ND	11	ND	7.8	
729sN-Summa	P1503125-012	1.89	1.0	08:42	140	13	100	9.5	
729sSQ-Summa	P1503125-013	16.72	1.0	15:51	350,000	120	250,000	84	
729sF-Summa (A)	P1503125-014	1.58	0.025	16:33	440,000	440	320,000	320	
729sNQ-Summa	P1503125-015	28.89	1.0	15:14	ND	200	ND	140	
730TB-Summa	P1503125-016	1.42	1.0	15:23	ND	9.9	ND	7.1	
730TB-GSumma	P1503125-017	1.00	1.0	15:40	ND	7.0	ND	5.0	
729sF-Summa (B)	P1503125-018	1.78	0.025	15:30	870,000	500	620,000	360	
Method Blank	P130805-MB	1.00	1.0	08:08	ND	7.0	ND	5.0	
Method Blank	P130805-MB	1.00	1.0	08:08	ND	7.0	ND	5.0	
Method Blank	P130806-MB	1.00	1.0	08:06	ND	7.0	ND	5.0	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

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**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P130805-MB

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/05/13  
 Time Analyzed: 08:08  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	2.4	ND	5.0	1.7	
463-58-1	Carbonyl Sulfide	ND	12	4.7	ND	5.0	1.9	
74-93-1	Methyl Mercaptan	ND	9.8	4.3	ND	5.0	2.2	
75-08-1	Ethyl Mercaptan	ND	13	5.6	ND	5.0	2.2	
75-18-3	Dimethyl Sulfide	ND	13	5.6	ND	5.0	2.2	
75-15-0	Carbon Disulfide	ND	7.8	3.4	ND	2.5	1.1	
75-33-2	Isopropyl Mercaptan	ND	16	6.9	ND	5.0	2.2	
75-66-1	tert-Butyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
107-03-9	n-Propyl Mercaptan	ND	16	6.9	ND	5.0	2.2	
624-89-5	Ethyl Methyl Sulfide	ND	16	6.9	ND	5.0	2.2	
110-02-1	Thiophene	ND	17	7.6	ND	5.0	2.2	
513-44-0	Isobutyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
352-93-2	Diethyl Sulfide	ND	18	8.1	ND	5.0	2.2	
109-79-5	n-Butyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
624-92-0	Dimethyl Disulfide	ND	9.6	4.2	ND	2.5	1.1	
616-44-4	3-Methylthiophene	ND	20	8.8	ND	5.0	2.2	
110-01-0	Tetrahydrothiophene	ND	18	7.9	ND	5.0	2.2	
638-02-8	2,5-Dimethylthiophene	ND	23	10	ND	5.0	2.2	
872-55-9	2-Ethylthiophene	ND	23	10	ND	5.0	2.2	
110-81-6	Diethyl Disulfide	ND	12	5.5	ND	2.5	1.1	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P130805-MB

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/05/13  
 Time Analyzed: 08:08  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	2.4	ND	5.0	1.7	
463-58-1	Carbonyl Sulfide	ND	12	4.7	ND	5.0	1.9	
74-93-1	Methyl Mercaptan	ND	9.8	4.3	ND	5.0	2.2	
75-08-1	Ethyl Mercaptan	ND	13	5.6	ND	5.0	2.2	
75-18-3	Dimethyl Sulfide	ND	13	5.6	ND	5.0	2.2	
75-15-0	Carbon Disulfide	ND	7.8	3.4	ND	2.5	1.1	
75-33-2	Isopropyl Mercaptan	ND	16	6.9	ND	5.0	2.2	
75-66-1	tert-Butyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
107-03-9	n-Propyl Mercaptan	ND	16	6.9	ND	5.0	2.2	
624-89-5	Ethyl Methyl Sulfide	ND	16	6.9	ND	5.0	2.2	
110-02-1	Thiophene	ND	17	7.6	ND	5.0	2.2	
513-44-0	Isobutyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
352-93-2	Diethyl Sulfide	ND	18	8.1	ND	5.0	2.2	
109-79-5	n-Butyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
624-92-0	Dimethyl Disulfide	ND	9.6	4.2	ND	2.5	1.1	
616-44-4	3-Methylthiophene	ND	20	8.8	ND	5.0	2.2	
110-01-0	Tetrahydrothiophene	ND	18	7.9	ND	5.0	2.2	
638-02-8	2,5-Dimethylthiophene	ND	23	10	ND	5.0	2.2	
872-55-9	2-Ethylthiophene	ND	23	10	ND	5.0	2.2	
110-81-6	Diethyl Disulfide	ND	12	5.5	ND	2.5	1.1	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P130806-MB

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/06/13  
 Time Analyzed: 08:06  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	2.4	ND	5.0	1.7	
463-58-1	Carbonyl Sulfide	ND	12	4.7	ND	5.0	1.9	
74-93-1	Methyl Mercaptan	ND	9.8	4.3	ND	5.0	2.2	
75-08-1	Ethyl Mercaptan	ND	13	5.6	ND	5.0	2.2	
75-18-3	Dimethyl Sulfide	ND	13	5.6	ND	5.0	2.2	
75-15-0	Carbon Disulfide	ND	7.8	3.4	ND	2.5	1.1	
75-33-2	Isopropyl Mercaptan	ND	16	6.9	ND	5.0	2.2	
75-66-1	tert-Butyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
107-03-9	n-Propyl Mercaptan	ND	16	6.9	ND	5.0	2.2	
624-89-5	Ethyl Methyl Sulfide	ND	16	6.9	ND	5.0	2.2	
110-02-1	Thiophene	ND	17	7.6	ND	5.0	2.2	
513-44-0	Isobutyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
352-93-2	Diethyl Sulfide	ND	18	8.1	ND	5.0	2.2	
109-79-5	n-Butyl Mercaptan	ND	18	8.1	ND	5.0	2.2	
624-92-0	Dimethyl Disulfide	ND	9.6	4.2	ND	2.5	1.1	
616-44-4	3-Methylthiophene	ND	20	8.8	ND	5.0	2.2	
110-01-0	Tetrahydrothiophene	ND	18	7.9	ND	5.0	2.2	
638-02-8	2,5-Dimethylthiophene	ND	23	10	ND	5.0	2.2	
872-55-9	2-Ethylthiophene	ND	23	10	ND	5.0	2.2	
110-81-6	Diethyl Disulfide	ND	12	5.5	ND	2.5	1.1	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
ALS Sample ID: P130805-LCS

Test Code: ASTM D 5504-12  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Mike Conejo  
Sample Type: 6.0 L Silonite Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/05/13  
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
7783-06-4	Hydrogen Sulfide	1,990	2,280	115	51-141	
463-58-1	Carbonyl Sulfide	2,030	2,040	100	63-147	
74-93-1	Methyl Mercaptan	2,020	2,140	106	54-156	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
ALS Sample ID: P130805-LCS

Test Code: ASTM D 5504-12  
Instrument ID: Agilent 7890A/GC22/SCD  
Analyst: Mike Conejo  
Sample Type: 6.0 L Silonite Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/05/13  
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
7783-06-4	Hydrogen Sulfide	1,990	2,130	107	51-141	
463-58-1	Carbonyl Sulfide	2,030	2,100	103	63-147	
74-93-1	Methyl Mercaptan	2,020	2,100	104	54-156	



**ALS ENVIRONMENTAL**

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P130806-LCS

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/06/13  
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
7783-06-4	Hydrogen Sulfide	1,990	<b>2,190</b>	<b>110</b>	51-141	
463-58-1	Carbonyl Sulfide	2,030	<b>2,170</b>	<b>107</b>	63-147	
74-93-1	Methyl Mercaptan	2,020	<b>2,130</b>	<b>105</b>	54-156	

Method Path : J:\GC13\METHODS\  
 Method File : GC13060815.M  
 Title : 20 Sulfurs  
 Last Update : Tue Jun 09 07:35:50 2015  
 Response Via : Initial Calibration

Calibration Files

1 =06081509.D 2 =06081515.D 3 =06081511.D  
 4 =06081512.D 5 =06081513.D 6 =06081514.D

Compound	1	2	3	4	5	6	Avg	%RSD
1) Z Hydrogen_Sulfide	2.243	2.156	2.236	2.428	2.947	2.583	2.432	E4 12.18
2) W Carbonyl_Sulfide	2.616	2.447	2.554	2.635	3.204	2.692	2.691	E4 9.83
3) T Methyl_Mercaptan	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
4) T Ethyl_Mercaptan	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
5) T Dimethyl_Sulfide	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
6) T Carbon_Disulfide	4.089	4.251	4.440	4.881	5.913	5.082	4.776	E4 14.07
7) T 2-Propyl_Merc...	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
8) T t-Butyl_Merca...	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
9) T Propyl_Mercaptan	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
10) T Ethyl_Methyl_...	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
11) T Thiophene	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
12) T i-Butyl_Merca...	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
13) T Diethyl_Sulfide	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
14) n-Butyl_Merca...	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
15) Dimethyl_Disu...	4.089	4.251	4.440	4.881	5.913	5.082	4.776	E4 14.07
16) T 2-Methyl_Thio...	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
17) 3-Methyl_Thio...	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
18) T Tetrahydrothi...	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
19) 2,5-Dimethyl_...	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
20) T 2-Ethyl_Thiop...	2.045	2.126	2.220	2.441	2.956	2.541	2.388	E4 14.07
21) T Diethyl_Disul...	4.089	4.251	4.440	4.881	5.913	5.082	4.776	E4 14.07
22) T Methyltrisulfide	6.134	6.377	6.660	7.322	8.869	7.623	7.164	E4 14.07

(#) = Out of Range

GC13060815.M Tue Jun 09 08:23:14 2015

Method Path : J:\GC22\METHODS\  
 Method File : GC22060815.M  
 Title : 20 Sulfurs Initial Calibration  
 Last Update : Tue Jun 09 07:14:43 2015  
 Response Via : Initial Calibration

Calibration Files

1 =06081528.d 2 =06081529.d 3 =06081530.d  
 4 =06081531.d 5 =06081532.d 6 =06081533.d

	Compound	1	2	3	4	5	6	Avg	%RSD
1) Z	Hydrogen_Sulfide	2.690	1.993	2.266	2.637	2.687	2.210	2.414	E4 12.31
2) W	Carbonyl_Sulfide	1.925	2.233	2.495	2.803	2.899	2.376	2.455	E4 14.77
3) T	Methyl_Mercaptan	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
4) T	Ethyl_Mercaptan	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
5) T	Dimethyl_Sulfide	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
6) T	Carbon_Disulfide	3.923	3.602	4.339	5.153	5.220	4.542	4.463	E4 14.53
7) T	2-Propyl_Merc...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
8) T	t-Butyl_Merca...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
9) T	Propyl_Mercaptan	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
10) T	Ethyl_Methyl_...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
11) T	Thiophene	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
12) T	i-Butyl_Merca...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
13) T	Diethyl_Sulfide	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
14) T	n-Butyl_Merca...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
15) T	Dimethyl_Disu...	3.923	3.602	4.339	5.153	5.220	4.542	4.463	E4 14.53
16) T	2-Methylthiop...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
17) T	3-Methylthiop...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
18) T	Tetrahydrothi...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
19) T	2,5-Dimethylt...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
20) T	2-Ethylthiophene	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
21) T	Diethyl_Disul...	3.923	3.602	4.339	5.153	5.220	4.542	4.463	E4 14.53
22) T	Methyltrisulfide	5.885	5.404	6.509	7.729	7.830	6.813	6.695	E4 14.53

(#) = Out of Range

GC22060815.M Tue Jun 09 08:10:15 2015

# ALS Environmental

## REPORT SUMMARY

Method : 20 Sulfurs  
 Client : Stantec Consulting Services, Inc.  
 Analyst : MC  
 Service Request : P1503125  
 Instrument : GC13  
 Date Acquired : 8/5/15

Compounds	MDL	RL	MB QC		Dry Wall QC	Lab Dup		Continuing Calibration Standards Summary (ppbv)														
			MB	mb /ml		dup	%RSD	ppbv	% Diff	sid	ppbv	% Diff	sid	ppbv	% Diff	sid	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff
<b>Sample Information :</b>	ppb	ppb				0	0	sid 2000ppb s30- 07201501	ppbv	% Diff	sid 2000ppb s30- 07201501	ppbv	% Diff	sid 2000ppb s30- 07201501	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff
Inj. Vol. (ml)	1.0	1.0		1.00	1.0	1.0	1.0	0.20			0.20			0.20			0.20				0.20	
Dilution	1.0	1.0		1.00	1.0	1.0	1.0															
Pi:	1.0	1.0		1.0	1.0	1.0	1.0															
Pi:	1.0	1.0		1.0	1.0	1.0	1.0															
PI Pf DF:	1.0	1.0		1.0	1.0	1.0	1.0															
Hydrogen_Sulfide	2.800	5.000		ND	P			1774.88	12.1%	2456.530	21.6%	1474.138	27.0%									
Carbonyl_Sulfide	2.000	5.000		ND	P			1705.42	14.7%	2444.025	22.2%	1444.570	27.8%									
Methyl_Mercaptan	2.700	5.000		ND	P			1759.62	12.0%	2465.239	23.3%	1500.608	25.0%									
Ethyl_Mercaptan	2.700	5.000		ND	P																	
Dimethyl_Sulfide	2.700	5.000		ND	P																	
Carbon_Disulfide	1.400	2.500		ND	P																	
2-Propyl_Mercaptan	2.700	5.000		ND	P																	
t-Butyl_Mercaptan	2.700	5.000		ND	P																	
Propyl_Mercaptan	2.700	5.000		ND	P																	
Ethyl_Methyl_Sulfide	2.700	5.000		ND	P																	
Thiophene	2.700	5.000		ND	P																	
i-Butyl_Mercaptan	2.700	5.000		ND	P																	
Diethyl_Sulfide	2.700	5.000		ND	P																	
n-Butyl_Mercaptan	2.700	5.000		ND	P																	
Dimethyl_Disulfide	1.400	2.500		ND	P																	
2-Methylthiophene	2.700	5.000		ND	P																	
3-Methylthiophene	2.700	5.000		ND	P																	
Tetrahydrothiophene	2.700	5.000		ND	P																	
2,5-Dimethylthiophene	2.700	5.000		ND	P																	
2-Ethylthiophene	2.700	5.000		ND	P																	
Diethyl_Disulfide	1.400	2.500		ND	P																	
Methyltrisulfide	1.400	2.500		ND	P																	
Acquisition Time				8:08 AM																		
DataFile				08051506.D																		
<b>LCS / LCS Dup Summary (ppbv)</b>																						
Hydrogen_Sulfide																						1992.00
Carbonyl_Sulfide																						2032.00
Methyl_Mercaptan																						2022.00
Acquisition Time																						
DataFile																						

MC 8/15/15

# ALS Environmental

## REPORT SUMMARY

Method : 20 Sulfurs Initial Calibration  
 Client : Stantec Consulting Services, Inc.  
 Analyst : MC

Service Request : P1503125  
 Instrument : GC #22  
 Date Acquired : 5 Aug 2015 3:40 pm

Compounds	MDL	RL	MB QC	Dry Wall QC	Lab Dup		Continuing Calibration Standards Summary (ppbv)												
					MB	dup	%RSD	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff
Sample Information :	ppb	ppb	mb /ml		0	0	sid 2000ppb s30- 07201501	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff
Inj. Vol. (ml)	1.0	1.0	1.00	1.0	1.0	1.0	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Dilution	1.0	1.0	1.00	1.0	1.0	1.0													
Pi:	1.0	1.0	1.0	1.0	1.0	1.0													
Pi:	1.0	1.0	1.0	1.0	1.0	1.0													
PIPF DF:	1.0	1.0	1.0	1.0	1.0	1.0													
Hydrogen_Sulfide	2.800	5.000	ND	P			2177.33	7.8%	2170.039	7.4%									
Carbonyl_Sulfide	2.000	5.000	ND	P			2339.15	17.0%	2392.537	19.6%									
Methyl_Mercaptan	2.700	5.000	ND	P			2242.29	12.1%	2282.853	14.1%									
Ethyl_Mercaptan	2.700	5.000	ND	P															
Dimethyl_Sulfide	2.700	5.000	ND	P															
Carbon_Disulfide	1.400	2.500	ND	P															
2-Propyl_Mercaptan	2.700	5.000	ND	P															
t-Butyl_Mercaptan	2.700	5.000	ND	P															
Propyl_Mercaptan	2.700	5.000	ND	P															
Ethyl_Methyl_Sulfide	2.700	5.000	ND	P															
Thiophene	2.700	5.000	ND	P															
i-Butyl_Mercaptan	2.700	5.000	ND	P															
Diethyl_Sulfide	2.700	5.000	ND	P															
n-Butyl_Mercaptan	2.700	5.000	ND	P															
Dimethyl_Disulfide	1.400	2.500	ND	P															
2-Methylthiophene	2.700	5.000	ND	P															
3-Methylthiophene	2.700	5.000	ND	P															
Tetrahydrothiophene	2.700	5.000	ND	P															
2,5-Dimethylthiophene	2.700	5.000	ND	P															
2-Ethylthiophene	2.700	5.000	ND	P															
Diethyl_Disulfide	1.400	2.500	ND	P															
Methyltrisulfide	1.400	2.500	ND	P															
Acquisition Time			5 Aug 2015 8:08 am																
DataFile			08051505.d																
<b>LCS / LCS Dup Summary (ppbv)</b>																			
							ppbv	%R		%R						%RPD		Actual	
Hydrogen_Sulfide							2134.16	107.1%										1992.00	
Carbonyl_Sulfide							2096.87	103.2%										2032.00	
Methyl_Mercaptan							2095.97	103.7%										2022.00	
Acquisition Time							5 Aug 2015 7:35 am												
DataFile							08051502.d												

MC 8/15/15



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-001

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00819

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.82      Final Pressure (psig): 3.50

Canister Dilution Factor: 1.84

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	<b>4.7</b>	0.92	0.26	<b>2.7</b>	0.53	0.15	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.0</b>	0.92	0.31	<b>0.41</b>	0.19	0.063	
74-87-3	Chloromethane	ND	0.92	0.28	ND	0.45	0.13	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.92	0.35	ND	0.13	0.050	
75-01-4	Vinyl Chloride	ND	0.92	0.31	ND	0.36	0.12	
106-99-0	1,3-Butadiene	ND	0.92	0.40	ND	0.42	0.18	
74-83-9	Bromomethane	ND	0.92	0.35	ND	0.24	0.090	
75-00-3	Chloroethane	ND	0.92	0.31	ND	0.35	0.12	
64-17-5	Ethanol	<b>5.7</b>	9.2	1.5	<b>3.0</b>	4.9	0.78	<b>J</b>
75-05-8	Acetonitrile	<b>0.64</b>	0.92	0.33	<b>0.38</b>	0.55	0.20	<b>J</b>
107-02-8	Acrolein	<b>0.47</b>	3.7	0.31	<b>0.20</b>	1.6	0.14	<b>J</b>
67-64-1	Acetone	<b>14</b>	9.2	1.4	<b>6.0</b>	3.9	0.60	
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.92	0.31	<b>0.20</b>	0.16	0.056	
67-63-0	2-Propanol (Isopropyl Alcohol)	<b>7.0</b>	9.2	0.77	<b>2.8</b>	3.7	0.31	<b>J</b>
107-13-1	Acrylonitrile	ND	0.92	0.31	ND	0.42	0.14	
75-35-4	1,1-Dichloroethene	ND	0.92	0.31	ND	0.23	0.079	
75-09-2	Methylene Chloride	<b>0.54</b>	0.92	0.31	<b>0.16</b>	0.26	0.090	<b>J</b>
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.92	0.29	ND	0.29	0.094	
76-13-1	Trichlorotrifluoroethane	<b>0.45</b>	0.92	0.31	<b>0.059</b>	0.12	0.041	<b>J</b>
75-15-0	Carbon Disulfide	ND	9.2	0.28	ND	3.0	0.089	
156-60-5	trans-1,2-Dichloroethene	ND	0.92	0.35	ND	0.23	0.088	
75-34-3	1,1-Dichloroethane	ND	0.92	0.29	ND	0.23	0.073	
1634-04-4	Methyl tert-Butyl Ether	ND	0.92	0.31	ND	0.26	0.087	
108-05-4	Vinyl Acetate	<b>1.3</b>	9.2	1.2	<b>0.37</b>	2.6	0.34	<b>J</b>
78-93-3	2-Butanone (MEK)	<b>1.8</b>	9.2	0.39	<b>0.61</b>	3.1	0.13	<b>J</b>

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-001

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00819

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.82      Final Pressure (psig): 3.50

Canister Dilution Factor: 1.84

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.92	0.29	ND	0.23	0.074	
141-78-6	Ethyl Acetate	<b>2.5</b>	1.8	0.64	<b>0.68</b>	0.51	0.18	
110-54-3	n-Hexane	<b>0.76</b>	0.92	0.28	<b>0.21</b>	0.26	0.078	<b>J</b>
67-66-3	Chloroform	ND	0.92	0.31	ND	0.19	0.064	
109-99-9	Tetrahydrofuran (THF)	ND	0.92	0.37	ND	0.31	0.12	
107-06-2	1,2-Dichloroethane	ND	0.92	0.29	ND	0.23	0.073	
71-55-6	1,1,1-Trichloroethane	ND	0.92	0.31	ND	0.17	0.057	
71-43-2	Benzene	<b>0.95</b>	0.92	0.29	<b>0.30</b>	0.29	0.092	
56-23-5	Carbon Tetrachloride	<b>0.39</b>	0.92	0.28	<b>0.063</b>	0.15	0.044	<b>J</b>
110-82-7	Cyclohexane	ND	1.8	0.53	ND	0.53	0.16	
78-87-5	1,2-Dichloropropane	ND	0.92	0.29	ND	0.20	0.064	
75-27-4	Bromodichloromethane	ND	0.92	0.28	ND	0.14	0.041	
79-01-6	Trichloroethene	ND	0.92	0.26	ND	0.17	0.048	
123-91-1	1,4-Dioxane	ND	0.92	0.29	ND	0.26	0.082	
80-62-6	Methyl Methacrylate	ND	1.8	0.57	ND	0.45	0.14	
142-82-5	n-Heptane	ND	0.92	0.31	ND	0.22	0.076	
10061-01-5	cis-1,3-Dichloropropene	ND	0.92	0.26	ND	0.20	0.057	
108-10-1	4-Methyl-2-pentanone	ND	0.92	0.29	ND	0.22	0.072	
10061-02-6	trans-1,3-Dichloropropene	ND	0.92	0.29	ND	0.20	0.065	
79-00-5	1,1,2-Trichloroethane	ND	0.92	0.29	ND	0.17	0.054	
108-88-3	Toluene	<b>1.2</b>	0.92	0.31	<b>0.33</b>	0.24	0.083	
591-78-6	2-Hexanone	ND	0.92	0.29	ND	0.22	0.072	
124-48-1	Dibromochloromethane	ND	0.92	0.29	ND	0.11	0.035	
106-93-4	1,2-Dibromoethane	ND	0.92	0.29	ND	0.12	0.038	
123-86-4	n-Butyl Acetate	ND	0.92	0.29	ND	0.19	0.062	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-001

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00819

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.82      Final Pressure (psig): 3.50

Canister Dilution Factor: 1.84

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.92	0.33	ND	0.20	0.071	
127-18-4	Tetrachloroethene	ND	0.92	0.26	ND	0.14	0.038	
108-90-7	Chlorobenzene	ND	0.92	0.29	ND	0.20	0.064	
100-41-4	Ethylbenzene	ND	0.92	0.29	ND	0.21	0.068	
179601-23-1	m,p-Xylenes	ND	1.8	0.55	ND	0.42	0.13	
75-25-2	Bromoform	ND	0.92	0.28	ND	0.089	0.027	
100-42-5	Styrene	ND	0.92	0.28	ND	0.22	0.065	
95-47-6	o-Xylene	ND	0.92	0.28	ND	0.21	0.064	
111-84-2	n-Nonane	ND	0.92	0.28	ND	0.18	0.053	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.92	0.28	ND	0.13	0.040	
98-82-8	Cumene	ND	0.92	0.28	ND	0.19	0.056	
80-56-8	alpha-Pinene	ND	0.92	0.26	ND	0.17	0.046	
103-65-1	n-Propylbenzene	ND	0.92	0.29	ND	0.19	0.060	
622-96-8	4-Ethyltoluene	ND	0.92	0.29	ND	0.19	0.060	
108-67-8	1,3,5-Trimethylbenzene	ND	0.92	0.29	ND	0.19	0.060	
95-63-6	1,2,4-Trimethylbenzene	ND	0.92	0.28	ND	0.19	0.056	
100-44-7	Benzyl Chloride	ND	0.92	0.20	ND	0.18	0.039	
541-73-1	1,3-Dichlorobenzene	ND	0.92	0.28	ND	0.15	0.046	
106-46-7	1,4-Dichlorobenzene	ND	0.92	0.26	ND	0.15	0.043	
95-50-1	1,2-Dichlorobenzene	ND	0.92	0.28	ND	0.15	0.046	
5989-27-5	d-Limonene	<b>0.35</b>	0.92	0.26	<b>0.063</b>	0.17	0.046	<b>J</b>
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.92	0.18	ND	0.095	0.019	
120-82-1	1,2,4-Trichlorobenzene	ND	0.92	0.29	ND	0.12	0.040	
91-20-3	Naphthalene	ND	0.92	0.33	ND	0.18	0.063	
87-68-3	Hexachlorobutadiene	ND	0.92	0.26	ND	0.086	0.024	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-001

**Tentatively Identified Compounds**

Test Code:	EPA TO-15 Modified	Date Collected:	7/28/15
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	7/31/15
Analyst:	Lusine Hakobyan	Date Analyzed:	8/10/15
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:	<b>T</b>		
Container ID:	AS00819		

Initial Pressure (psig): -4.82      Final Pressure (psig): 3.50

Canister Dilution Factor: 1.84

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
9.48	unknown	4.2	
10.11	Trimethylsilanol	16	
10.79	Acetic Acid	6.7	
17.28	Hexamethylcyclotrisiloxane	86	
20.11	unknown siloxane	21	
21.22	n-Nonanal	3.8	
21.82	unknown siloxane	13	
23.04	unknown	3.6	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-002

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00300

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.76      Final Pressure (psig): 3.93

Canister Dilution Factor: 1.70

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	1.1	0.85	0.24	0.63	0.49	0.14	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.3	0.85	0.29	0.47	0.17	0.058	
74-87-3	Chloromethane	0.26	0.85	0.26	0.12	0.41	0.12	J
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.85	0.32	ND	0.12	0.046	
75-01-4	Vinyl Chloride	ND	0.85	0.29	ND	0.33	0.11	
106-99-0	1,3-Butadiene	ND	0.85	0.37	ND	0.38	0.17	
74-83-9	Bromomethane	ND	0.85	0.32	ND	0.22	0.083	
75-00-3	Chloroethane	ND	0.85	0.29	ND	0.32	0.11	
64-17-5	Ethanol	6.7	8.5	1.4	3.5	4.5	0.72	J
75-05-8	Acetonitrile	0.50	0.85	0.31	0.30	0.51	0.18	J
107-02-8	Acrolein	0.58	3.4	0.29	0.25	1.5	0.13	J
67-64-1	Acetone	16	8.5	1.3	6.6	3.6	0.55	
75-69-4	Trichlorofluoromethane	1.2	0.85	0.29	0.22	0.15	0.051	
67-63-0	2-Propanol (Isopropyl Alcohol)	1.4	8.5	0.71	0.56	3.5	0.29	J
107-13-1	Acrylonitrile	ND	0.85	0.29	ND	0.39	0.13	
75-35-4	1,1-Dichloroethene	ND	0.85	0.29	ND	0.21	0.073	
75-09-2	Methylene Chloride	0.48	0.85	0.29	0.14	0.24	0.083	J
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.85	0.27	ND	0.27	0.087	
76-13-1	Trichlorotrifluoroethane	0.51	0.85	0.29	0.066	0.11	0.038	J
75-15-0	Carbon Disulfide	ND	8.5	0.26	ND	2.7	0.082	
156-60-5	trans-1,2-Dichloroethene	ND	0.85	0.32	ND	0.21	0.081	
75-34-3	1,1-Dichloroethane	ND	0.85	0.27	ND	0.21	0.067	
1634-04-4	Methyl tert-Butyl Ether	ND	0.85	0.29	ND	0.24	0.080	
108-05-4	Vinyl Acetate	2.3	8.5	1.1	0.66	2.4	0.31	J
78-93-3	2-Butanone (MEK)	2.1	8.5	0.36	0.72	2.9	0.12	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-002

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00300

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.76      Final Pressure (psig): 3.93

Canister Dilution Factor: 1.70

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.85	0.27	ND	0.21	0.069	
141-78-6	Ethyl Acetate	<b>9.4</b>	1.7	0.60	<b>2.6</b>	0.47	0.17	
110-54-3	n-Hexane	<b>0.62</b>	0.85	0.26	<b>0.18</b>	0.24	0.072	<b>J</b>
67-66-3	Chloroform	ND	0.85	0.29	ND	0.17	0.059	
109-99-9	Tetrahydrofuran (THF)	ND	0.85	0.34	ND	0.29	0.12	
107-06-2	1,2-Dichloroethane	ND	0.85	0.27	ND	0.21	0.067	
71-55-6	1,1,1-Trichloroethane	ND	0.85	0.29	ND	0.16	0.053	
71-43-2	Benzene	<b>0.53</b>	0.85	0.27	<b>0.17</b>	0.27	0.085	<b>J</b>
56-23-5	Carbon Tetrachloride	<b>0.45</b>	0.85	0.26	<b>0.072</b>	0.14	0.041	<b>J</b>
110-82-7	Cyclohexane	ND	1.7	0.49	ND	0.49	0.14	
78-87-5	1,2-Dichloropropane	ND	0.85	0.27	ND	0.18	0.059	
75-27-4	Bromodichloromethane	ND	0.85	0.26	ND	0.13	0.038	
79-01-6	Trichloroethene	ND	0.85	0.24	ND	0.16	0.044	
123-91-1	1,4-Dioxane	ND	0.85	0.27	ND	0.24	0.076	
80-62-6	Methyl Methacrylate	ND	1.7	0.53	ND	0.42	0.13	
142-82-5	n-Heptane	ND	0.85	0.29	ND	0.21	0.071	
10061-01-5	cis-1,3-Dichloropropene	ND	0.85	0.24	ND	0.19	0.052	
108-10-1	4-Methyl-2-pentanone	<b>0.54</b>	0.85	0.27	<b>0.13</b>	0.21	0.066	<b>J</b>
10061-02-6	trans-1,3-Dichloropropene	ND	0.85	0.27	ND	0.19	0.060	
79-00-5	1,1,2-Trichloroethane	ND	0.85	0.27	ND	0.16	0.050	
108-88-3	Toluene	<b>1.7</b>	0.85	0.29	<b>0.46</b>	0.23	0.077	
591-78-6	2-Hexanone	ND	0.85	0.27	ND	0.21	0.066	
124-48-1	Dibromochloromethane	ND	0.85	0.27	ND	0.10	0.032	
106-93-4	1,2-Dibromoethane	ND	0.85	0.27	ND	0.11	0.035	
123-86-4	n-Butyl Acetate	ND	0.85	0.27	ND	0.18	0.057	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-002

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00300

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.76      Final Pressure (psig): 3.93

Canister Dilution Factor: 1.70

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.85	0.31	ND	0.18	0.066	
127-18-4	Tetrachloroethene	ND	0.85	0.24	ND	0.13	0.035	
108-90-7	Chlorobenzene	ND	0.85	0.27	ND	0.18	0.059	
100-41-4	Ethylbenzene	ND	0.85	0.27	ND	0.20	0.063	
179601-23-1	m,p-Xylenes	ND	1.7	0.51	ND	0.39	0.12	
75-25-2	Bromoform	ND	0.85	0.26	ND	0.082	0.025	
100-42-5	Styrene	ND	0.85	0.26	ND	0.20	0.060	
95-47-6	o-Xylene	ND	0.85	0.26	ND	0.20	0.059	
111-84-2	n-Nonane	ND	0.85	0.26	ND	0.16	0.049	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.85	0.26	ND	0.12	0.037	
98-82-8	Cumene	ND	0.85	0.26	ND	0.17	0.052	
80-56-8	alpha-Pinene	ND	0.85	0.24	ND	0.15	0.043	
103-65-1	n-Propylbenzene	ND	0.85	0.27	ND	0.17	0.055	
622-96-8	4-Ethyltoluene	ND	0.85	0.27	ND	0.17	0.055	
108-67-8	1,3,5-Trimethylbenzene	ND	0.85	0.27	ND	0.17	0.055	
95-63-6	1,2,4-Trimethylbenzene	ND	0.85	0.26	ND	0.17	0.052	
100-44-7	Benzyl Chloride	ND	0.85	0.19	ND	0.16	0.036	
541-73-1	1,3-Dichlorobenzene	ND	0.85	0.26	ND	0.14	0.042	
106-46-7	1,4-Dichlorobenzene	ND	0.85	0.24	ND	0.14	0.040	
95-50-1	1,2-Dichlorobenzene	ND	0.85	0.26	ND	0.14	0.042	
5989-27-5	d-Limonene	ND	0.85	0.24	ND	0.15	0.043	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.85	0.17	ND	0.088	0.017	
120-82-1	1,2,4-Trichlorobenzene	ND	0.85	0.27	ND	0.11	0.037	
91-20-3	Naphthalene	ND	0.85	0.31	ND	0.16	0.058	
87-68-3	Hexachlorobutadiene	ND	0.85	0.24	ND	0.080	0.022	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-002

**Tentatively Identified Compounds**

Test Code:	EPA TO-15 Modified	Date Collected:	7/28/15
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	7/31/15
Analyst:	Lusine Hakobyan	Date Analyzed:	8/10/15
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:	<b>T</b>		
Container ID:	AS00300		

Initial Pressure (psig): -3.76      Final Pressure (psig): 3.93

Canister Dilution Factor: 1.70

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
9.48	unknown	7.3	
10.12	Trimethylsilanol	26	
10.74	Acetic Acid	4.4	
13.61	Dimethylsilanediol	4.8	
16.42	unknown	3.8	
17.28	Hexamethylcyclotrisiloxane	34	
20.11	unknown	6.4	
21.22	n-Nonanal	3.7	
21.65	2-Ethylhexylacetate	4.7	
21.81	unknown siloxane	6.7	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D2-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-003

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00655

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.12 Liter(s)

Initial Pressure (psig): -3.83      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.68

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	<b>0.56</b>	0.75	0.21	<b>0.33</b>	0.44	0.12	<b>J</b>
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.3</b>	0.75	0.26	<b>0.47</b>	0.15	0.052	
74-87-3	Chloromethane	<b>0.26</b>	0.75	0.23	<b>0.13</b>	0.36	0.11	<b>J</b>
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.75	0.29	ND	0.11	0.041	
75-01-4	Vinyl Chloride	ND	0.75	0.26	ND	0.29	0.10	
106-99-0	1,3-Butadiene	ND	0.75	0.33	ND	0.34	0.15	
74-83-9	Bromomethane	ND	0.75	0.29	ND	0.19	0.073	
75-00-3	Chloroethane	ND	0.75	0.26	ND	0.28	0.097	
64-17-5	Ethanol	<b>5.9</b>	7.5	1.2	<b>3.1</b>	4.0	0.64	<b>J</b>
75-05-8	Acetonitrile	<b>7.1</b>	0.75	0.27	<b>4.3</b>	0.45	0.16	
107-02-8	Acrolein	<b>0.38</b>	3.0	0.26	<b>0.16</b>	1.3	0.11	<b>J</b>
67-64-1	Acetone	<b>15</b>	7.5	1.2	<b>6.3</b>	3.2	0.49	
75-69-4	Trichlorofluoromethane	<b>1.2</b>	0.75	0.26	<b>0.21</b>	0.13	0.045	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.5	0.63	ND	3.1	0.26	
107-13-1	Acrylonitrile	ND	0.75	0.26	ND	0.35	0.12	
75-35-4	1,1-Dichloroethene	ND	0.75	0.26	ND	0.19	0.064	
75-09-2	Methylene Chloride	<b>0.49</b>	0.75	0.26	<b>0.14</b>	0.22	0.073	<b>J</b>
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.75	0.24	ND	0.24	0.077	
76-13-1	Trichlorotrifluoroethane	<b>0.50</b>	0.75	0.26	<b>0.065</b>	0.098	0.033	<b>J</b>
75-15-0	Carbon Disulfide	ND	7.5	0.23	ND	2.4	0.072	
156-60-5	trans-1,2-Dichloroethene	ND	0.75	0.29	ND	0.19	0.072	
75-34-3	1,1-Dichloroethane	ND	0.75	0.24	ND	0.19	0.059	
1634-04-4	Methyl tert-Butyl Ether	ND	0.75	0.26	ND	0.21	0.071	
108-05-4	Vinyl Acetate	<b>1.6</b>	7.5	0.98	<b>0.45</b>	2.1	0.28	<b>J</b>
78-93-3	2-Butanone (MEK)	<b>2.1</b>	7.5	0.32	<b>0.70</b>	2.5	0.11	<b>J</b>

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D2-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-003

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00655

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.12 Liter(s)

Initial Pressure (psig): -3.83      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.68

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.75	0.24	ND	0.19	0.061	
141-78-6	Ethyl Acetate	<b>6.2</b>	1.5	0.53	<b>1.7</b>	0.42	0.15	
110-54-3	n-Hexane	<b>0.45</b>	0.75	0.23	<b>0.13</b>	0.21	0.064	<b>J</b>
67-66-3	Chloroform	ND	0.75	0.26	ND	0.15	0.052	
109-99-9	Tetrahydrofuran (THF)	<b>0.43</b>	0.75	0.30	<b>0.15</b>	0.25	0.10	<b>J</b>
107-06-2	1,2-Dichloroethane	ND	0.75	0.24	ND	0.19	0.059	
71-55-6	1,1,1-Trichloroethane	ND	0.75	0.26	ND	0.14	0.047	
71-43-2	Benzene	<b>0.38</b>	0.75	0.24	<b>0.12</b>	0.23	0.075	<b>J</b>
56-23-5	Carbon Tetrachloride	<b>0.45</b>	0.75	0.23	<b>0.072</b>	0.12	0.036	<b>J</b>
110-82-7	Cyclohexane	ND	1.5	0.44	ND	0.44	0.13	
78-87-5	1,2-Dichloropropane	ND	0.75	0.24	ND	0.16	0.052	
75-27-4	Bromodichloromethane	ND	0.75	0.23	ND	0.11	0.034	
79-01-6	Trichloroethene	ND	0.75	0.21	ND	0.14	0.039	
123-91-1	1,4-Dioxane	ND	0.75	0.24	ND	0.21	0.067	
80-62-6	Methyl Methacrylate	ND	1.5	0.47	ND	0.37	0.11	
142-82-5	n-Heptane	ND	0.75	0.26	ND	0.18	0.062	
10061-01-5	cis-1,3-Dichloropropene	ND	0.75	0.21	ND	0.17	0.046	
108-10-1	4-Methyl-2-pentanone	ND	0.75	0.24	ND	0.18	0.059	
10061-02-6	trans-1,3-Dichloropropene	ND	0.75	0.24	ND	0.17	0.053	
79-00-5	1,1,2-Trichloroethane	ND	0.75	0.24	ND	0.14	0.044	
108-88-3	Toluene	<b>1.3</b>	0.75	0.26	<b>0.33</b>	0.20	0.068	
591-78-6	2-Hexanone	ND	0.75	0.24	ND	0.18	0.059	
124-48-1	Dibromochloromethane	ND	0.75	0.24	ND	0.088	0.028	
106-93-4	1,2-Dibromoethane	ND	0.75	0.24	ND	0.098	0.031	
123-86-4	n-Butyl Acetate	ND	0.75	0.24	ND	0.16	0.051	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D2-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-003

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00655

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.12 Liter(s)

Initial Pressure (psig): -3.83      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.68

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.75	0.27	ND	0.16	0.058	
127-18-4	Tetrachloroethene	ND	0.75	0.21	ND	0.11	0.031	
108-90-7	Chlorobenzene	ND	0.75	0.24	ND	0.16	0.052	
100-41-4	Ethylbenzene	ND	0.75	0.24	ND	0.17	0.055	
179601-23-1	m,p-Xylenes	ND	1.5	0.45	ND	0.35	0.10	
75-25-2	Bromoform	ND	0.75	0.23	ND	0.073	0.022	
100-42-5	Styrene	ND	0.75	0.23	ND	0.18	0.053	
95-47-6	o-Xylene	ND	0.75	0.23	ND	0.17	0.052	
111-84-2	n-Nonane	ND	0.75	0.23	ND	0.14	0.043	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.75	0.23	ND	0.11	0.033	
98-82-8	Cumene	ND	0.75	0.23	ND	0.15	0.046	
80-56-8	alpha-Pinene	ND	0.75	0.21	ND	0.13	0.038	
103-65-1	n-Propylbenzene	ND	0.75	0.24	ND	0.15	0.049	
622-96-8	4-Ethyltoluene	ND	0.75	0.24	ND	0.15	0.049	
108-67-8	1,3,5-Trimethylbenzene	ND	0.75	0.24	ND	0.15	0.049	
95-63-6	1,2,4-Trimethylbenzene	ND	0.75	0.23	ND	0.15	0.046	
100-44-7	Benzyl Chloride	ND	0.75	0.17	ND	0.14	0.032	
541-73-1	1,3-Dichlorobenzene	ND	0.75	0.23	ND	0.12	0.037	
106-46-7	1,4-Dichlorobenzene	ND	0.75	0.21	ND	0.12	0.035	
95-50-1	1,2-Dichlorobenzene	ND	0.75	0.23	ND	0.12	0.037	
5989-27-5	d-Limonene	ND	0.75	0.21	ND	0.13	0.038	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.75	0.15	ND	0.078	0.015	
120-82-1	1,2,4-Trichlorobenzene	ND	0.75	0.24	ND	0.10	0.032	
91-20-3	Naphthalene	<b>0.57</b>	0.75	0.27	<b>0.11</b>	0.14	0.052	<b>J</b>
87-68-3	Hexachlorobutadiene	ND	0.75	0.21	ND	0.070	0.020	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728D2-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-003

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes: **T**  
 Container ID: AS00655

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.12 Liter(s)

Initial Pressure (psig): -3.83      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.68

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
4.10	Chlorodifluoromethane	4.8	
9.48	unknown	3.3	
10.12	Trimethylsilanol	4.3	
13.63	Dimethylsilanediol	4.7	
17.28	Hexamethylcyclotrisiloxane	11	
20.12	unknown	4.3	
21.22	n-Nonanal	7.4	
21.82	unknown siloxane	43	
22.17	n-Decanal	8.4	
23.32	unknown siloxane	51	
24.93	unknown siloxane	20	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728F-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-004

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00846

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10 - 8/11/15  
 Volume(s) Analyzed: 1.11 Liter(s)  
 0.10 Liter(s)

Initial Pressure (psig): -3.49      Final Pressure (psig): 3.72

Canister Dilution Factor: 1.64

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	1.8	0.74	0.21	1.0	0.43	0.12	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.3	0.74	0.25	0.47	0.15	0.051	
74-87-3	Chloromethane	0.24	0.74	0.22	0.12	0.36	0.11	J
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.74	0.28	ND	0.11	0.040	
75-01-4	Vinyl Chloride	ND	0.74	0.25	ND	0.29	0.098	
106-99-0	1,3-Butadiene	ND	0.74	0.33	ND	0.33	0.15	
74-83-9	Bromomethane	ND	0.74	0.28	ND	0.19	0.072	
75-00-3	Chloroethane	ND	0.74	0.25	ND	0.28	0.095	
64-17-5	Ethanol	6.8	7.4	1.2	3.6	3.9	0.63	J
75-05-8	Acetonitrile	1.1	0.74	0.27	0.65	0.44	0.16	
107-02-8	Acrolein	1.7	3.0	0.25	0.74	1.3	0.11	J
67-64-1	Acetone	15	7.4	1.1	6.3	3.1	0.48	
75-69-4	Trichlorofluoromethane	1.2	0.74	0.25	0.22	0.13	0.045	
67-63-0	2-Propanol (Isopropyl Alcohol)	2.6	7.4	0.62	1.1	3.0	0.25	J
107-13-1	Acrylonitrile	ND	0.74	0.25	ND	0.34	0.12	
75-35-4	1,1-Dichloroethene	ND	0.74	0.25	ND	0.19	0.063	
75-09-2	Methylene Chloride	0.44	0.74	0.25	0.13	0.21	0.072	J
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.74	0.24	ND	0.24	0.076	
76-13-1	Trichlorotrifluoroethane	0.51	0.74	0.25	0.066	0.096	0.033	J
75-15-0	Carbon Disulfide	ND	7.4	0.22	ND	2.4	0.071	
156-60-5	trans-1,2-Dichloroethene	ND	0.74	0.28	ND	0.19	0.071	
75-34-3	1,1-Dichloroethane	ND	0.74	0.24	ND	0.18	0.058	
1634-04-4	Methyl tert-Butyl Ether	ND	0.74	0.25	ND	0.20	0.070	
108-05-4	Vinyl Acetate	2.0	7.4	0.96	0.57	2.1	0.27	J
78-93-3	2-Butanone (MEK)	2.1	7.4	0.31	0.71	2.5	0.11	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728F-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-004

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00846

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10 - 8/11/15  
 Volume(s) Analyzed: 1.11 Liter(s)  
 0.10 Liter(s)

Initial Pressure (psig): -3.49      Final Pressure (psig): 3.72

Canister Dilution Factor: 1.64

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.74	0.24	ND	0.19	0.060	
141-78-6	Ethyl Acetate	<b>4.6</b>	1.5	0.52	<b>1.3</b>	0.41	0.14	
110-54-3	n-Hexane	<b>0.43</b>	0.74	0.22	<b>0.12</b>	0.21	0.063	<b>J</b>
67-66-3	Chloroform	ND	0.74	0.25	ND	0.15	0.051	
109-99-9	Tetrahydrofuran (THF)	ND	0.74	0.30	ND	0.25	0.10	
107-06-2	1,2-Dichloroethane	<b>170</b>	8.2	2.6	<b>42</b>	2.0	0.65	<b>D</b>
71-55-6	1,1,1-Trichloroethane	ND	0.74	0.25	ND	0.14	0.046	
71-43-2	Benzene	<b>0.49</b>	0.74	0.24	<b>0.15</b>	0.23	0.074	<b>J</b>
56-23-5	Carbon Tetrachloride	<b>0.44</b>	0.74	0.22	<b>0.071</b>	0.12	0.035	<b>J</b>
110-82-7	Cyclohexane	ND	1.5	0.43	ND	0.43	0.12	
78-87-5	1,2-Dichloropropane	ND	0.74	0.24	ND	0.16	0.051	
75-27-4	Bromodichloromethane	ND	0.74	0.22	ND	0.11	0.033	
79-01-6	Trichloroethene	ND	0.74	0.21	ND	0.14	0.039	
123-91-1	1,4-Dioxane	<b>700</b>	8.2	2.6	<b>190</b>	2.3	0.73	<b>D</b>
80-62-6	Methyl Methacrylate	ND	1.5	0.46	ND	0.36	0.11	
142-82-5	n-Heptane	ND	0.74	0.25	ND	0.18	0.061	
10061-01-5	cis-1,3-Dichloropropene	ND	0.74	0.21	ND	0.16	0.046	
108-10-1	4-Methyl-2-pentanone	ND	0.74	0.24	ND	0.18	0.058	
10061-02-6	trans-1,3-Dichloropropene	ND	0.74	0.24	ND	0.16	0.052	
79-00-5	1,1,2-Trichloroethane	ND	0.74	0.24	ND	0.14	0.043	
108-88-3	Toluene	<b>1.4</b>	0.74	0.25	<b>0.37</b>	0.20	0.067	
591-78-6	2-Hexanone	ND	0.74	0.24	ND	0.18	0.058	
124-48-1	Dibromochloromethane	ND	0.74	0.24	ND	0.087	0.028	
106-93-4	1,2-Dibromoethane	ND	0.74	0.24	ND	0.096	0.031	
123-86-4	n-Butyl Acetate	ND	0.74	0.24	ND	0.16	0.050	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728F-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-004

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00846

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10 - 8/11/15  
 Volume(s) Analyzed: 1.11 Liter(s)  
 0.10 Liter(s)

Initial Pressure (psig): -3.49      Final Pressure (psig): 3.72

Canister Dilution Factor: 1.64

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.74	0.27	ND	0.16	0.057	
127-18-4	Tetrachloroethene	ND	0.74	0.21	ND	0.11	0.031	
108-90-7	Chlorobenzene	ND	0.74	0.24	ND	0.16	0.051	
100-41-4	Ethylbenzene	ND	0.74	0.24	ND	0.17	0.054	
179601-23-1	m,p-Xylenes	<b>0.48</b>	1.5	0.44	<b>0.11</b>	0.34	0.10	<b>J</b>
75-25-2	Bromoform	ND	0.74	0.22	ND	0.071	0.021	
100-42-5	Styrene	<b>0.26</b>	0.74	0.22	<b>0.061</b>	0.17	0.052	<b>J</b>
95-47-6	o-Xylene	ND	0.74	0.22	ND	0.17	0.051	
111-84-2	n-Nonane	ND	0.74	0.22	ND	0.14	0.042	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.74	0.22	ND	0.11	0.032	
98-82-8	Cumene	ND	0.74	0.22	ND	0.15	0.045	
80-56-8	alpha-Pinene	ND	0.74	0.21	ND	0.13	0.037	
103-65-1	n-Propylbenzene	ND	0.74	0.24	ND	0.15	0.048	
622-96-8	4-Ethyltoluene	ND	0.74	0.24	ND	0.15	0.048	
108-67-8	1,3,5-Trimethylbenzene	ND	0.74	0.24	ND	0.15	0.048	
95-63-6	1,2,4-Trimethylbenzene	ND	0.74	0.22	ND	0.15	0.045	
100-44-7	Benzyl Chloride	ND	0.74	0.16	ND	0.14	0.031	
541-73-1	1,3-Dichlorobenzene	ND	0.74	0.22	ND	0.12	0.037	
106-46-7	1,4-Dichlorobenzene	ND	0.74	0.21	ND	0.12	0.034	
95-50-1	1,2-Dichlorobenzene	ND	0.74	0.22	ND	0.12	0.037	
5989-27-5	d-Limonene	<b>0.37</b>	0.74	0.21	<b>0.067</b>	0.13	0.037	<b>J</b>
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.74	0.15	ND	0.076	0.015	
120-82-1	1,2,4-Trichlorobenzene	ND	0.74	0.24	ND	0.10	0.032	
91-20-3	Naphthalene	ND	0.74	0.27	ND	0.14	0.051	
87-68-3	Hexachlorobutadiene	ND	0.74	0.21	ND	0.069	0.019	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728F-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-004

### Tentatively Identified Compounds

Test Code:	EPA TO-15 Modified	Date Collected: 7/28/15
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received: 7/31/15
Analyst:	Lusine Hakobyan	Date Analyzed: 8/10 - 8/11/15
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed: 1.11 Liter(s)
Test Notes:	<b>T</b>	0.10 Liter(s)
Container ID:	AS00846	

Initial Pressure (psig): -3.49      Final Pressure (psig): 3.72

Canister Dilution Factor: 1.64

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
4.80	Acetaldehyde	9.4	
10.13	Trimethylsilanol	8.5	
10.82	1,1-Dimethoxyethane	9.6	
11.06	1,3-Dioxolane	10	
13.63	Dimethylsilanediol	5.1	
17.28	Hexamethylcyclotrisiloxane	5.5	
17.57	1,3-Butanediol	39	
18.54	(E,E)-2,4-hexadienal	9.5	
18.73	1,2,3-Trichloropropane	270	
19.67	Bis(2-Chloroethoxy)Methane	190	
20.24	unknown	13	
20.91	unknown	6.5	
21.16	unknown	6.2	
21.66	Bis(2-chloroethyl) ether	28	
22.62	unknown	13	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728SQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-005

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00582

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.12 Liter(s)

Initial Pressure (psig): -3.69      Final Pressure (psig): 3.54

Canister Dilution Factor: 1.66

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	<b>0.87</b>	0.74	0.21	<b>0.51</b>	0.43	0.12	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.3</b>	0.74	0.25	<b>0.47</b>	0.15	0.051	
74-87-3	Chloromethane	<b>0.27</b>	0.74	0.22	<b>0.13</b>	0.36	0.11	<b>J</b>
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.74	0.28	ND	0.11	0.040	
75-01-4	Vinyl Chloride	ND	0.74	0.25	ND	0.29	0.099	
106-99-0	1,3-Butadiene	ND	0.74	0.33	ND	0.34	0.15	
74-83-9	Bromomethane	ND	0.74	0.28	ND	0.19	0.073	
75-00-3	Chloroethane	ND	0.74	0.25	ND	0.28	0.096	
64-17-5	Ethanol	<b>8.0</b>	7.4	1.2	<b>4.2</b>	3.9	0.63	
75-05-8	Acetonitrile	<b>1.8</b>	0.74	0.27	<b>1.1</b>	0.44	0.16	
107-02-8	Acrolein	<b>0.42</b>	3.0	0.25	<b>0.18</b>	1.3	0.11	<b>J</b>
67-64-1	Acetone	<b>17</b>	7.4	1.1	<b>7.3</b>	3.1	0.48	
75-69-4	Trichlorofluoromethane	<b>1.2</b>	0.74	0.25	<b>0.21</b>	0.13	0.045	
67-63-0	2-Propanol (Isopropyl Alcohol)	<b>0.92</b>	7.4	0.62	<b>0.38</b>	3.0	0.25	<b>J</b>
107-13-1	Acrylonitrile	ND	0.74	0.25	ND	0.34	0.12	
75-35-4	1,1-Dichloroethene	ND	0.74	0.25	ND	0.19	0.064	
75-09-2	Methylene Chloride	<b>0.43</b>	0.74	0.25	<b>0.12</b>	0.21	0.073	<b>J</b>
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.74	0.24	ND	0.24	0.076	
76-13-1	Trichlorotrifluoroethane	<b>0.50</b>	0.74	0.25	<b>0.065</b>	0.097	0.033	<b>J</b>
75-15-0	Carbon Disulfide	ND	7.4	0.22	ND	2.4	0.071	
156-60-5	trans-1,2-Dichloroethene	ND	0.74	0.28	ND	0.19	0.071	
75-34-3	1,1-Dichloroethane	ND	0.74	0.24	ND	0.18	0.059	
1634-04-4	Methyl tert-Butyl Ether	ND	0.74	0.25	ND	0.21	0.070	
108-05-4	Vinyl Acetate	<b>1.7</b>	7.4	0.96	<b>0.47</b>	2.1	0.27	<b>J</b>
78-93-3	2-Butanone (MEK)	<b>3.0</b>	7.4	0.31	<b>1.0</b>	2.5	0.11	<b>J</b>

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728SQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-005

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00582

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.12 Liter(s)

Initial Pressure (psig): -3.69      Final Pressure (psig): 3.54

Canister Dilution Factor: 1.66

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.74	0.24	ND	0.19	0.060	
141-78-6	Ethyl Acetate	<b>4.2</b>	1.5	0.52	<b>1.2</b>	0.41	0.14	
110-54-3	n-Hexane	<b>0.43</b>	0.74	0.22	<b>0.12</b>	0.21	0.063	<b>J</b>
67-66-3	Chloroform	ND	0.74	0.25	ND	0.15	0.052	
109-99-9	Tetrahydrofuran (THF)	<b>0.97</b>	0.74	0.30	<b>0.33</b>	0.25	0.10	
107-06-2	1,2-Dichloroethane	ND	0.74	0.24	ND	0.18	0.059	
71-55-6	1,1,1-Trichloroethane	ND	0.74	0.25	ND	0.14	0.046	
71-43-2	Benzene	<b>0.52</b>	0.74	0.24	<b>0.16</b>	0.23	0.074	<b>J</b>
56-23-5	Carbon Tetrachloride	<b>0.45</b>	0.74	0.22	<b>0.071</b>	0.12	0.035	<b>J</b>
110-82-7	Cyclohexane	ND	1.5	0.43	ND	0.43	0.12	
78-87-5	1,2-Dichloropropane	ND	0.74	0.24	ND	0.16	0.051	
75-27-4	Bromodichloromethane	ND	0.74	0.22	ND	0.11	0.033	
79-01-6	Trichloroethene	ND	0.74	0.21	ND	0.14	0.039	
123-91-1	1,4-Dioxane	<b>0.26</b>	0.74	0.24	<b>0.072</b>	0.21	0.066	<b>J</b>
80-62-6	Methyl Methacrylate	ND	1.5	0.46	ND	0.36	0.11	
142-82-5	n-Heptane	ND	0.74	0.25	ND	0.18	0.062	
10061-01-5	cis-1,3-Dichloropropene	ND	0.74	0.21	ND	0.16	0.046	
108-10-1	4-Methyl-2-pentanone	ND	0.74	0.24	ND	0.18	0.058	
10061-02-6	trans-1,3-Dichloropropene	ND	0.74	0.24	ND	0.16	0.052	
79-00-5	1,1,2-Trichloroethane	ND	0.74	0.24	ND	0.14	0.043	
108-88-3	Toluene	<b>1.1</b>	0.74	0.25	<b>0.29</b>	0.20	0.067	
591-78-6	2-Hexanone	ND	0.74	0.24	ND	0.18	0.058	
124-48-1	Dibromochloromethane	ND	0.74	0.24	ND	0.087	0.028	
106-93-4	1,2-Dibromoethane	ND	0.74	0.24	ND	0.096	0.031	
123-86-4	n-Butyl Acetate	<b>0.39</b>	0.74	0.24	<b>0.082</b>	0.16	0.050	<b>J</b>

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728SQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-005

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00582

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.12 Liter(s)

Initial Pressure (psig): -3.69      Final Pressure (psig): 3.54

Canister Dilution Factor: 1.66

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.74	0.27	ND	0.16	0.057	
127-18-4	Tetrachloroethene	ND	0.74	0.21	ND	0.11	0.031	
108-90-7	Chlorobenzene	ND	0.74	0.24	ND	0.16	0.052	
100-41-4	Ethylbenzene	ND	0.74	0.24	ND	0.17	0.055	
179601-23-1	m,p-Xylenes	ND	1.5	0.44	ND	0.34	0.10	
75-25-2	Bromoform	ND	0.74	0.22	ND	0.072	0.022	
100-42-5	Styrene	ND	0.74	0.22	ND	0.17	0.052	
95-47-6	o-Xylene	ND	0.74	0.22	ND	0.17	0.051	
111-84-2	n-Nonane	ND	0.74	0.22	ND	0.14	0.042	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.74	0.22	ND	0.11	0.032	
98-82-8	Cumene	ND	0.74	0.22	ND	0.15	0.045	
80-56-8	alpha-Pinene	ND	0.74	0.21	ND	0.13	0.037	
103-65-1	n-Propylbenzene	ND	0.74	0.24	ND	0.15	0.048	
622-96-8	4-Ethyltoluene	ND	0.74	0.24	ND	0.15	0.048	
108-67-8	1,3,5-Trimethylbenzene	ND	0.74	0.24	ND	0.15	0.048	
95-63-6	1,2,4-Trimethylbenzene	ND	0.74	0.22	ND	0.15	0.045	
100-44-7	Benzyl Chloride	ND	0.74	0.16	ND	0.14	0.032	
541-73-1	1,3-Dichlorobenzene	ND	0.74	0.22	ND	0.12	0.037	
106-46-7	1,4-Dichlorobenzene	<b>0.27</b>	0.74	0.21	<b>0.045</b>	0.12	0.035	<b>J</b>
95-50-1	1,2-Dichlorobenzene	ND	0.74	0.22	ND	0.12	0.037	
5989-27-5	d-Limonene	ND	0.74	0.21	ND	0.13	0.037	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.74	0.15	ND	0.077	0.015	
120-82-1	1,2,4-Trichlorobenzene	ND	0.74	0.24	ND	0.10	0.032	
91-20-3	Naphthalene	<b>0.52</b>	0.74	0.27	<b>0.10</b>	0.14	0.051	<b>J</b>
87-68-3	Hexachlorobutadiene	ND	0.74	0.21	ND	0.070	0.019	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728SQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-005

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes: **T**  
 Container ID: AS00582

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.12 Liter(s)

Initial Pressure (psig): -3.69      Final Pressure (psig): 3.54

Canister Dilution Factor: 1.66

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
9.48	unknown	4.7	
10.12	Trimethylsilanol	5.1	
12.89	1-Butanol	4.3	
13.63	Dimethylsilanediol	7.1	
17.28	Hexamethylcyclotrisiloxane	10	
20.11	unknown	4.4	
20.41	2-Ethyl-1-hexanol	4.4	
21.22	n-Nonanal	11	
21.81	unknown siloxane	48	
22.17	n-Decanal	9.2	
23.32	unknown siloxane	49	
24.93	unknown siloxane	14	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728-DUPE10  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-006

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00113

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.18      Final Pressure (psig): 3.59

Canister Dilution Factor: 1.59

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	1.3	0.80	0.22	0.77	0.46	0.13	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.3	0.80	0.27	0.46	0.16	0.055	
74-87-3	Chloromethane	0.26	0.80	0.24	0.12	0.39	0.12	J
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.80	0.30	ND	0.11	0.043	
75-01-4	Vinyl Chloride	ND	0.80	0.27	ND	0.31	0.11	
106-99-0	1,3-Butadiene	ND	0.80	0.35	ND	0.36	0.16	
74-83-9	Bromomethane	ND	0.80	0.30	ND	0.20	0.078	
75-00-3	Chloroethane	ND	0.80	0.27	ND	0.30	0.10	
64-17-5	Ethanol	7.2	8.0	1.3	3.8	4.2	0.68	J
75-05-8	Acetonitrile	0.43	0.80	0.29	0.26	0.47	0.17	J
107-02-8	Acrolein	0.56	3.2	0.27	0.25	1.4	0.12	J
67-64-1	Acetone	17	8.0	1.2	7.2	3.3	0.52	
75-69-4	Trichlorofluoromethane	1.2	0.80	0.27	0.22	0.14	0.048	
67-63-0	2-Propanol (Isopropyl Alcohol)	1.9	8.0	0.67	0.78	3.2	0.27	J
107-13-1	Acrylonitrile	ND	0.80	0.27	ND	0.37	0.12	
75-35-4	1,1-Dichloroethene	ND	0.80	0.27	ND	0.20	0.068	
75-09-2	Methylene Chloride	0.50	0.80	0.27	0.14	0.23	0.078	J
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.80	0.25	ND	0.25	0.081	
76-13-1	Trichlorotrifluoroethane	0.50	0.80	0.27	0.065	0.10	0.035	J
75-15-0	Carbon Disulfide	ND	8.0	0.24	ND	2.6	0.077	
156-60-5	trans-1,2-Dichloroethene	ND	0.80	0.30	ND	0.20	0.076	
75-34-3	1,1-Dichloroethane	ND	0.80	0.25	ND	0.20	0.063	
1634-04-4	Methyl tert-Butyl Ether	ND	0.80	0.27	ND	0.22	0.075	
108-05-4	Vinyl Acetate	1.7	8.0	1.0	0.49	2.3	0.29	J
78-93-3	2-Butanone (MEK)	2.2	8.0	0.33	0.73	2.7	0.11	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728-DUPE10  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-006

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00113

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.18      Final Pressure (psig): 3.59

Canister Dilution Factor: 1.59

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.80	0.25	ND	0.20	0.064	
141-78-6	Ethyl Acetate	<b>10</b>	1.6	0.56	<b>2.9</b>	0.44	0.15	
110-54-3	n-Hexane	<b>0.59</b>	0.80	0.24	<b>0.17</b>	0.23	0.068	<b>J</b>
67-66-3	Chloroform	ND	0.80	0.27	ND	0.16	0.055	
109-99-9	Tetrahydrofuran (THF)	ND	0.80	0.32	ND	0.27	0.11	
107-06-2	1,2-Dichloroethane	ND	0.80	0.25	ND	0.20	0.063	
71-55-6	1,1,1-Trichloroethane	ND	0.80	0.27	ND	0.15	0.050	
71-43-2	Benzene	<b>0.55</b>	0.80	0.25	<b>0.17</b>	0.25	0.080	<b>J</b>
56-23-5	Carbon Tetrachloride	<b>0.45</b>	0.80	0.24	<b>0.072</b>	0.13	0.038	<b>J</b>
110-82-7	Cyclohexane	ND	1.6	0.46	ND	0.46	0.13	
78-87-5	1,2-Dichloropropane	ND	0.80	0.25	ND	0.17	0.055	
75-27-4	Bromodichloromethane	ND	0.80	0.24	ND	0.12	0.036	
79-01-6	Trichloroethene	ND	0.80	0.22	ND	0.15	0.041	
123-91-1	1,4-Dioxane	ND	0.80	0.25	ND	0.22	0.071	
80-62-6	Methyl Methacrylate	ND	1.6	0.49	ND	0.39	0.12	
142-82-5	n-Heptane	ND	0.80	0.27	ND	0.19	0.066	
10061-01-5	cis-1,3-Dichloropropene	ND	0.80	0.22	ND	0.18	0.049	
108-10-1	4-Methyl-2-pentanone	ND	0.80	0.25	ND	0.19	0.062	
10061-02-6	trans-1,3-Dichloropropene	ND	0.80	0.25	ND	0.18	0.056	
79-00-5	1,1,2-Trichloroethane	ND	0.80	0.25	ND	0.15	0.047	
108-88-3	Toluene	<b>4.9</b>	0.80	0.27	<b>1.3</b>	0.21	0.072	
591-78-6	2-Hexanone	ND	0.80	0.25	ND	0.19	0.062	
124-48-1	Dibromochloromethane	ND	0.80	0.25	ND	0.093	0.030	
106-93-4	1,2-Dibromoethane	ND	0.80	0.25	ND	0.10	0.033	
123-86-4	n-Butyl Acetate	ND	0.80	0.25	ND	0.17	0.054	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728-DUPE10  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-006

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00113

Date Collected: 7/28/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.18      Final Pressure (psig): 3.59

Canister Dilution Factor: 1.59

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.80	0.29	ND	0.17	0.061	
127-18-4	Tetrachloroethene	ND	0.80	0.22	ND	0.12	0.033	
108-90-7	Chlorobenzene	ND	0.80	0.25	ND	0.17	0.055	
100-41-4	Ethylbenzene	<b>0.83</b>	0.80	0.25	<b>0.19</b>	0.18	0.059	
179601-23-1	m,p-Xylenes	<b>3.3</b>	1.6	0.48	<b>0.76</b>	0.37	0.11	
75-25-2	Bromoform	ND	0.80	0.24	ND	0.077	0.023	
100-42-5	Styrene	ND	0.80	0.24	ND	0.19	0.056	
95-47-6	o-Xylene	<b>0.63</b>	0.80	0.24	<b>0.14</b>	0.18	0.055	<b>J</b>
111-84-2	n-Nonane	ND	0.80	0.24	ND	0.15	0.045	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.80	0.24	ND	0.12	0.035	
98-82-8	Cumene	ND	0.80	0.24	ND	0.16	0.049	
80-56-8	alpha-Pinene	ND	0.80	0.22	ND	0.14	0.040	
103-65-1	n-Propylbenzene	ND	0.80	0.25	ND	0.16	0.052	
622-96-8	4-Ethyltoluene	<b>0.46</b>	0.80	0.25	<b>0.094</b>	0.16	0.052	<b>J</b>
108-67-8	1,3,5-Trimethylbenzene	ND	0.80	0.25	ND	0.16	0.052	
95-63-6	1,2,4-Trimethylbenzene	<b>0.90</b>	0.80	0.24	<b>0.18</b>	0.16	0.049	
100-44-7	Benzyl Chloride	ND	0.80	0.17	ND	0.15	0.034	
541-73-1	1,3-Dichlorobenzene	ND	0.80	0.24	ND	0.13	0.040	
106-46-7	1,4-Dichlorobenzene	ND	0.80	0.22	ND	0.13	0.037	
95-50-1	1,2-Dichlorobenzene	ND	0.80	0.24	ND	0.13	0.040	
5989-27-5	d-Limonene	ND	0.80	0.22	ND	0.14	0.040	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.80	0.16	ND	0.082	0.016	
120-82-1	1,2,4-Trichlorobenzene	ND	0.80	0.25	ND	0.11	0.034	
91-20-3	Naphthalene	<b>1.3</b>	0.80	0.29	<b>0.25</b>	0.15	0.055	
87-68-3	Hexachlorobutadiene	ND	0.80	0.22	ND	0.075	0.021	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 728-DUPE10  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-006

**Tentatively Identified Compounds**

Test Code:	EPA TO-15 Modified	Date Collected:	7/28/15
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	7/31/15
Analyst:	Lusine Hakobyan	Date Analyzed:	8/10/15
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:	<b>T</b>		
Container ID:	AS00113		

Initial Pressure (psig): -3.18      Final Pressure (psig): 3.59

Canister Dilution Factor: 1.59

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
9.48	unknown	5.8	
10.12	Trimethylsilanol	5.9	
13.63	Dimethylsilanediol	5.6	
17.28	Hexamethylcyclotrisiloxane	5.5	
21.22	n-Nonanal	8.7	
22.17	n-Decanal	8.0	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-007

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00417

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.57      Final Pressure (psig): 3.87

Canister Dilution Factor: 1.83

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	ND	0.92	0.26	ND	0.53	0.15	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.4</b>	0.92	0.31	<b>0.49</b>	0.19	0.063	
74-87-3	Chloromethane	ND	0.92	0.27	ND	0.44	0.13	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.92	0.35	ND	0.13	0.050	
75-01-4	Vinyl Chloride	ND	0.92	0.31	ND	0.36	0.12	
106-99-0	1,3-Butadiene	ND	0.92	0.40	ND	0.41	0.18	
74-83-9	Bromomethane	ND	0.92	0.35	ND	0.24	0.090	
75-00-3	Chloroethane	ND	0.92	0.31	ND	0.35	0.12	
64-17-5	Ethanol	<b>4.4</b>	9.2	1.5	<b>2.3</b>	4.9	0.78	<b>J</b>
75-05-8	Acetonitrile	<b>0.52</b>	0.92	0.33	<b>0.31</b>	0.55	0.20	<b>J</b>
107-02-8	Acrolein	<b>0.71</b>	3.7	0.31	<b>0.31</b>	1.6	0.14	<b>J</b>
67-64-1	Acetone	<b>34</b>	9.2	1.4	<b>14</b>	3.9	0.59	
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.92	0.31	<b>0.20</b>	0.16	0.055	
67-63-0	2-Propanol (Isopropyl Alcohol)	<b>1.1</b>	9.2	0.77	<b>0.44</b>	3.7	0.31	<b>J</b>
107-13-1	Acrylonitrile	ND	0.92	0.31	ND	0.42	0.14	
75-35-4	1,1-Dichloroethene	ND	0.92	0.31	ND	0.23	0.078	
75-09-2	Methylene Chloride	<b>0.76</b>	0.92	0.31	<b>0.22</b>	0.26	0.090	<b>J</b>
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.92	0.29	ND	0.29	0.094	
76-13-1	Trichlorotrifluoroethane	<b>0.54</b>	0.92	0.31	<b>0.071</b>	0.12	0.041	<b>J</b>
75-15-0	Carbon Disulfide	<b>0.29</b>	9.2	0.27	<b>0.092</b>	2.9	0.088	<b>J</b>
156-60-5	trans-1,2-Dichloroethene	ND	0.92	0.35	ND	0.23	0.088	
75-34-3	1,1-Dichloroethane	ND	0.92	0.29	ND	0.23	0.072	
1634-04-4	Methyl tert-Butyl Ether	ND	0.92	0.31	ND	0.25	0.086	
108-05-4	Vinyl Acetate	ND	9.2	1.2	ND	2.6	0.34	
78-93-3	2-Butanone (MEK)	<b>1.3</b>	9.2	0.38	<b>0.43</b>	3.1	0.13	<b>J</b>

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

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J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-007

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00417

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.57      Final Pressure (psig): 3.87

Canister Dilution Factor: 1.83

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.92	0.29	ND	0.23	0.074	
141-78-6	Ethyl Acetate	<b>5.2</b>	1.8	0.64	<b>1.4</b>	0.51	0.18	
110-54-3	n-Hexane	<b>0.45</b>	0.92	0.27	<b>0.13</b>	0.26	0.078	<b>J</b>
67-66-3	Chloroform	ND	0.92	0.31	ND	0.19	0.064	
109-99-9	Tetrahydrofuran (THF)	ND	0.92	0.37	ND	0.31	0.12	
107-06-2	1,2-Dichloroethane	<b>0.61</b>	0.92	0.29	<b>0.15</b>	0.23	0.072	<b>J</b>
71-55-6	1,1,1-Trichloroethane	ND	0.92	0.31	ND	0.17	0.057	
71-43-2	Benzene	ND	0.92	0.29	ND	0.29	0.092	
56-23-5	Carbon Tetrachloride	<b>0.47</b>	0.92	0.27	<b>0.074</b>	0.15	0.044	<b>J</b>
110-82-7	Cyclohexane	ND	1.8	0.53	ND	0.53	0.15	
78-87-5	1,2-Dichloropropane	ND	0.92	0.29	ND	0.20	0.063	
75-27-4	Bromodichloromethane	ND	0.92	0.27	ND	0.14	0.041	
79-01-6	Trichloroethene	ND	0.92	0.26	ND	0.17	0.048	
123-91-1	1,4-Dioxane	<b>13</b>	0.92	0.29	<b>3.6</b>	0.25	0.081	
80-62-6	Methyl Methacrylate	ND	1.8	0.57	ND	0.45	0.14	
142-82-5	n-Heptane	ND	0.92	0.31	ND	0.22	0.076	
10061-01-5	cis-1,3-Dichloropropene	ND	0.92	0.26	ND	0.20	0.056	
108-10-1	4-Methyl-2-pentanone	ND	0.92	0.29	ND	0.22	0.071	
10061-02-6	trans-1,3-Dichloropropene	ND	0.92	0.29	ND	0.20	0.065	
79-00-5	1,1,2-Trichloroethane	ND	0.92	0.29	ND	0.17	0.054	
108-88-3	Toluene	<b>14</b>	0.92	0.31	<b>3.7</b>	0.24	0.083	
591-78-6	2-Hexanone	ND	0.92	0.29	ND	0.22	0.072	
124-48-1	Dibromochloromethane	ND	0.92	0.29	ND	0.11	0.034	
106-93-4	1,2-Dibromoethane	ND	0.92	0.29	ND	0.12	0.038	
123-86-4	n-Butyl Acetate	<b>1.5</b>	0.92	0.29	<b>0.31</b>	0.19	0.062	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-007

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00417

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.57      Final Pressure (psig): 3.87

Canister Dilution Factor: 1.83

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	<b>0.40</b>	0.92	0.33	<b>0.086</b>	0.20	0.071	<b>J</b>
127-18-4	Tetrachloroethene	ND	0.92	0.26	ND	0.13	0.038	
108-90-7	Chlorobenzene	ND	0.92	0.29	ND	0.20	0.064	
100-41-4	Ethylbenzene	ND	0.92	0.29	ND	0.21	0.067	
179601-23-1	m,p-Xylenes	ND	1.8	0.55	ND	0.42	0.13	
75-25-2	Bromoform	ND	0.92	0.27	ND	0.089	0.027	
100-42-5	Styrene	ND	0.92	0.27	ND	0.21	0.064	
95-47-6	o-Xylene	ND	0.92	0.27	ND	0.21	0.063	
111-84-2	n-Nonane	<b>0.33</b>	0.92	0.27	<b>0.064</b>	0.17	0.052	<b>J</b>
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.92	0.27	ND	0.13	0.040	
98-82-8	Cumene	ND	0.92	0.27	ND	0.19	0.056	
80-56-8	alpha-Pinene	ND	0.92	0.26	ND	0.16	0.046	
103-65-1	n-Propylbenzene	ND	0.92	0.29	ND	0.19	0.060	
622-96-8	4-Ethyltoluene	ND	0.92	0.29	ND	0.19	0.060	
108-67-8	1,3,5-Trimethylbenzene	ND	0.92	0.29	ND	0.19	0.060	
95-63-6	1,2,4-Trimethylbenzene	<b>0.42</b>	0.92	0.27	<b>0.086</b>	0.19	0.056	<b>J</b>
100-44-7	Benzyl Chloride	ND	0.92	0.20	ND	0.18	0.039	
541-73-1	1,3-Dichlorobenzene	ND	0.92	0.27	ND	0.15	0.046	
106-46-7	1,4-Dichlorobenzene	ND	0.92	0.26	ND	0.15	0.043	
95-50-1	1,2-Dichlorobenzene	ND	0.92	0.27	ND	0.15	0.046	
5989-27-5	d-Limonene	ND	0.92	0.26	ND	0.16	0.046	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.92	0.18	ND	0.095	0.019	
120-82-1	1,2,4-Trichlorobenzene	ND	0.92	0.29	ND	0.12	0.039	
91-20-3	Naphthalene	ND	0.92	0.33	ND	0.17	0.063	
87-68-3	Hexachlorobutadiene	ND	0.92	0.26	ND	0.086	0.024	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729U1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-007

**Tentatively Identified Compounds**

Test Code:	EPA TO-15 Modified	Date Collected:	7/29/15
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	7/31/15
Analyst:	Lusine Hakobyan	Date Analyzed:	8/10/15
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:	<b>T</b>		
Container ID:	AS00417		

Initial Pressure (psig): -4.57      Final Pressure (psig): 3.87

Canister Dilution Factor: 1.83

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
4.14	Propane	12	
5.32	n-Butane	7.1	
8.01	Isoprene	3.9	
10.11	Trimethylsilanol	17	
17.27	Hexamethylcyclotrisiloxane	4.4	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-008

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00149

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.20      Final Pressure (psig): 3.79

Canister Dilution Factor: 1.76

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	0.49	0.88	0.25	0.29	0.51	0.14	J
75-71-8	Dichlorodifluoromethane (CFC 12)	2.3	0.88	0.30	0.47	0.18	0.061	
74-87-3	Chloromethane	0.30	0.88	0.26	0.15	0.43	0.13	J
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.88	0.33	ND	0.13	0.048	
75-01-4	Vinyl Chloride	ND	0.88	0.30	ND	0.34	0.12	
106-99-0	1,3-Butadiene	ND	0.88	0.39	ND	0.40	0.18	
74-83-9	Bromomethane	ND	0.88	0.33	ND	0.23	0.086	
75-00-3	Chloroethane	ND	0.88	0.30	ND	0.33	0.11	
64-17-5	Ethanol	6.0	8.8	1.4	3.2	4.7	0.75	J
75-05-8	Acetonitrile	0.96	0.88	0.32	0.57	0.52	0.19	
107-02-8	Acrolein	0.46	3.5	0.30	0.20	1.5	0.13	J
67-64-1	Acetone	10	8.8	1.4	4.2	3.7	0.57	
75-69-4	Trichlorofluoromethane	1.1	0.88	0.30	0.19	0.16	0.053	
67-63-0	2-Propanol (Isopropyl Alcohol)	0.84	8.8	0.74	0.34	3.6	0.30	J
107-13-1	Acrylonitrile	ND	0.88	0.30	ND	0.41	0.14	
75-35-4	1,1-Dichloroethene	ND	0.88	0.30	ND	0.22	0.075	
75-09-2	Methylene Chloride	0.48	0.88	0.30	0.14	0.25	0.086	J
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.88	0.28	ND	0.28	0.090	
76-13-1	Trichlorotrifluoroethane	0.51	0.88	0.30	0.066	0.11	0.039	J
75-15-0	Carbon Disulfide	ND	8.8	0.26	ND	2.8	0.085	
156-60-5	trans-1,2-Dichloroethene	ND	0.88	0.33	ND	0.22	0.084	
75-34-3	1,1-Dichloroethane	ND	0.88	0.28	ND	0.22	0.070	
1634-04-4	Methyl tert-Butyl Ether	ND	0.88	0.30	ND	0.24	0.083	
108-05-4	Vinyl Acetate	ND	8.8	1.1	ND	2.5	0.33	
78-93-3	2-Butanone (MEK)	1.3	8.8	0.37	0.46	3.0	0.13	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-008

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00149

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.20      Final Pressure (psig): 3.79

Canister Dilution Factor: 1.76

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.88	0.28	ND	0.22	0.071	
141-78-6	Ethyl Acetate	3.7	1.8	0.62	1.0	0.49	0.17	
110-54-3	n-Hexane	0.29	0.88	0.26	0.083	0.25	0.075	J
67-66-3	Chloroform	ND	0.88	0.30	ND	0.18	0.061	
109-99-9	Tetrahydrofuran (THF)	ND	0.88	0.35	ND	0.30	0.12	
107-06-2	1,2-Dichloroethane	ND	0.88	0.28	ND	0.22	0.070	
71-55-6	1,1,1-Trichloroethane	ND	0.88	0.30	ND	0.16	0.055	
71-43-2	Benzene	0.55	0.88	0.28	0.17	0.28	0.088	J
56-23-5	Carbon Tetrachloride	0.45	0.88	0.26	0.071	0.14	0.042	J
110-82-7	Cyclohexane	ND	1.8	0.51	ND	0.51	0.15	
78-87-5	1,2-Dichloropropane	ND	0.88	0.28	ND	0.19	0.061	
75-27-4	Bromodichloromethane	ND	0.88	0.26	ND	0.13	0.039	
79-01-6	Trichloroethene	ND	0.88	0.25	ND	0.16	0.046	
123-91-1	1,4-Dioxane	ND	0.88	0.28	ND	0.24	0.078	
80-62-6	Methyl Methacrylate	ND	1.8	0.55	ND	0.43	0.13	
142-82-5	n-Heptane	ND	0.88	0.30	ND	0.21	0.073	
10061-01-5	cis-1,3-Dichloropropene	ND	0.88	0.25	ND	0.19	0.054	
108-10-1	4-Methyl-2-pentanone	ND	0.88	0.28	ND	0.21	0.069	
10061-02-6	trans-1,3-Dichloropropene	ND	0.88	0.28	ND	0.19	0.062	
79-00-5	1,1,2-Trichloroethane	ND	0.88	0.28	ND	0.16	0.052	
108-88-3	Toluene	1.1	0.88	0.30	0.30	0.23	0.079	
591-78-6	2-Hexanone	ND	0.88	0.28	ND	0.21	0.069	
124-48-1	Dibromochloromethane	ND	0.88	0.28	ND	0.10	0.033	
106-93-4	1,2-Dibromoethane	ND	0.88	0.28	ND	0.11	0.037	
123-86-4	n-Butyl Acetate	0.29	0.88	0.28	0.060	0.19	0.059	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-008

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00149

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.20      Final Pressure (psig): 3.79

Canister Dilution Factor: 1.76

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.88	0.32	ND	0.19	0.068	
127-18-4	Tetrachloroethene	ND	0.88	0.25	ND	0.13	0.036	
108-90-7	Chlorobenzene	ND	0.88	0.28	ND	0.19	0.061	
100-41-4	Ethylbenzene	ND	0.88	0.28	ND	0.20	0.065	
179601-23-1	m,p-Xylenes	ND	1.8	0.53	ND	0.41	0.12	
75-25-2	Bromoform	ND	0.88	0.26	ND	0.085	0.026	
100-42-5	Styrene	ND	0.88	0.26	ND	0.21	0.062	
95-47-6	o-Xylene	ND	0.88	0.26	ND	0.20	0.061	
111-84-2	n-Nonane	ND	0.88	0.26	ND	0.17	0.050	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.88	0.26	ND	0.13	0.038	
98-82-8	Cumene	ND	0.88	0.26	ND	0.18	0.054	
80-56-8	alpha-Pinene	ND	0.88	0.25	ND	0.16	0.044	
103-65-1	n-Propylbenzene	ND	0.88	0.28	ND	0.18	0.057	
622-96-8	4-Ethyltoluene	ND	0.88	0.28	ND	0.18	0.057	
108-67-8	1,3,5-Trimethylbenzene	ND	0.88	0.28	ND	0.18	0.057	
95-63-6	1,2,4-Trimethylbenzene	ND	0.88	0.26	ND	0.18	0.054	
100-44-7	Benzyl Chloride	ND	0.88	0.19	ND	0.17	0.037	
541-73-1	1,3-Dichlorobenzene	ND	0.88	0.26	ND	0.15	0.044	
106-46-7	1,4-Dichlorobenzene	ND	0.88	0.25	ND	0.15	0.041	
95-50-1	1,2-Dichlorobenzene	ND	0.88	0.26	ND	0.15	0.044	
5989-27-5	d-Limonene	ND	0.88	0.25	ND	0.16	0.044	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.88	0.17	ND	0.091	0.018	
120-82-1	1,2,4-Trichlorobenzene	ND	0.88	0.28	ND	0.12	0.038	
91-20-3	Naphthalene	ND	0.88	0.32	ND	0.17	0.060	
87-68-3	Hexachlorobutadiene	ND	0.88	0.25	ND	0.083	0.023	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729D1-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-008

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes: **T**  
 Container ID: SSC00149

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.20      Final Pressure (psig): 3.79

Canister Dilution Factor: 1.76

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
10.11	Trimethylsilanol	13	
17.28	Hexamethylcyclotrisiloxane	6.1	
21.22	n-Nonanal	3.4	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729NQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-009

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00199

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -6.75      Final Pressure (psig): 4.10

Canister Dilution Factor: 2.36

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	1.0	1.2	0.33	0.59	0.69	0.19	J
75-71-8	Dichlorodifluoromethane (CFC 12)	2.4	1.2	0.40	0.48	0.24	0.081	
74-87-3	Chloromethane	ND	1.2	0.35	ND	0.57	0.17	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	1.2	0.45	ND	0.17	0.064	
75-01-4	Vinyl Chloride	ND	1.2	0.40	ND	0.46	0.16	
106-99-0	1,3-Butadiene	ND	1.2	0.52	ND	0.53	0.23	
74-83-9	Bromomethane	ND	1.2	0.45	ND	0.30	0.12	
75-00-3	Chloroethane	ND	1.2	0.40	ND	0.45	0.15	
64-17-5	Ethanol	10	12	1.9	5.5	6.3	1.0	J
75-05-8	Acetonitrile	0.43	1.2	0.42	0.26	0.70	0.25	J
107-02-8	Acrolein	ND	4.7	0.40	ND	2.1	0.18	
67-64-1	Acetone	9.5	12	1.8	4.0	5.0	0.77	J
75-69-4	Trichlorofluoromethane	1.1	1.2	0.40	0.19	0.21	0.071	J
67-63-0	2-Propanol (Isopropyl Alcohol)	1.2	12	0.99	0.51	4.8	0.40	J
107-13-1	Acrylonitrile	ND	1.2	0.40	ND	0.54	0.18	
75-35-4	1,1-Dichloroethene	ND	1.2	0.40	ND	0.30	0.10	
75-09-2	Methylene Chloride	0.72	1.2	0.40	0.21	0.34	0.12	J
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	1.2	0.38	ND	0.38	0.12	
76-13-1	Trichlorotrifluoroethane	0.49	1.2	0.40	0.064	0.15	0.052	J
75-15-0	Carbon Disulfide	ND	12	0.35	ND	3.8	0.11	
156-60-5	trans-1,2-Dichloroethene	ND	1.2	0.45	ND	0.30	0.11	
75-34-3	1,1-Dichloroethane	ND	1.2	0.38	ND	0.29	0.093	
1634-04-4	Methyl tert-Butyl Ether	ND	1.2	0.40	ND	0.33	0.11	
108-05-4	Vinyl Acetate	ND	12	1.5	ND	3.4	0.44	
78-93-3	2-Butanone (MEK)	1.1	12	0.50	0.38	4.0	0.17	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729NQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-009

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00199

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -6.75      Final Pressure (psig): 4.10

Canister Dilution Factor: 2.36

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	1.2	0.38	ND	0.30	0.095	
141-78-6	Ethyl Acetate	<b>3.3</b>	2.4	0.83	<b>0.92</b>	0.66	0.23	
110-54-3	n-Hexane	ND	1.2	0.35	ND	0.33	0.10	
67-66-3	Chloroform	ND	1.2	0.40	ND	0.24	0.082	
109-99-9	Tetrahydrofuran (THF)	ND	1.2	0.47	ND	0.40	0.16	
107-06-2	1,2-Dichloroethane	ND	1.2	0.38	ND	0.29	0.093	
71-55-6	1,1,1-Trichloroethane	ND	1.2	0.40	ND	0.22	0.074	
71-43-2	Benzene	ND	1.2	0.38	ND	0.37	0.12	
56-23-5	Carbon Tetrachloride	<b>0.46</b>	1.2	0.35	<b>0.072</b>	0.19	0.056	<b>J</b>
110-82-7	Cyclohexane	ND	2.4	0.68	ND	0.69	0.20	
78-87-5	1,2-Dichloropropane	ND	1.2	0.38	ND	0.26	0.082	
75-27-4	Bromodichloromethane	ND	1.2	0.35	ND	0.18	0.053	
79-01-6	Trichloroethene	ND	1.2	0.33	ND	0.22	0.062	
123-91-1	1,4-Dioxane	ND	1.2	0.38	ND	0.33	0.10	
80-62-6	Methyl Methacrylate	ND	2.4	0.73	ND	0.58	0.18	
142-82-5	n-Heptane	ND	1.2	0.40	ND	0.29	0.098	
10061-01-5	cis-1,3-Dichloropropene	ND	1.2	0.33	ND	0.26	0.073	
108-10-1	4-Methyl-2-pentanone	ND	1.2	0.38	ND	0.29	0.092	
10061-02-6	trans-1,3-Dichloropropene	ND	1.2	0.38	ND	0.26	0.083	
79-00-5	1,1,2-Trichloroethane	ND	1.2	0.38	ND	0.22	0.069	
108-88-3	Toluene	<b>0.81</b>	1.2	0.40	<b>0.21</b>	0.31	0.11	<b>J</b>
591-78-6	2-Hexanone	ND	1.2	0.38	ND	0.29	0.092	
124-48-1	Dibromochloromethane	ND	1.2	0.38	ND	0.14	0.044	
106-93-4	1,2-Dibromoethane	ND	1.2	0.38	ND	0.15	0.049	
123-86-4	n-Butyl Acetate	ND	1.2	0.38	ND	0.25	0.080	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729NQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-009

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00199

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -6.75      Final Pressure (psig): 4.10

Canister Dilution Factor: 2.36

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	1.2	0.42	ND	0.25	0.091	
127-18-4	Tetrachloroethene	ND	1.2	0.33	ND	0.17	0.049	
108-90-7	Chlorobenzene	ND	1.2	0.38	ND	0.26	0.082	
100-41-4	Ethylbenzene	ND	1.2	0.38	ND	0.27	0.087	
179601-23-1	m,p-Xylenes	ND	2.4	0.71	ND	0.54	0.16	
75-25-2	Bromoform	ND	1.2	0.35	ND	0.11	0.034	
100-42-5	Styrene	ND	1.2	0.35	ND	0.28	0.083	
95-47-6	o-Xylene	ND	1.2	0.35	ND	0.27	0.082	
111-84-2	n-Nonane	ND	1.2	0.35	ND	0.23	0.068	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.2	0.35	ND	0.17	0.052	
98-82-8	Cumene	ND	1.2	0.35	ND	0.24	0.072	
80-56-8	alpha-Pinene	ND	1.2	0.33	ND	0.21	0.059	
103-65-1	n-Propylbenzene	ND	1.2	0.38	ND	0.24	0.077	
622-96-8	4-Ethyltoluene	ND	1.2	0.38	ND	0.24	0.077	
108-67-8	1,3,5-Trimethylbenzene	ND	1.2	0.38	ND	0.24	0.077	
95-63-6	1,2,4-Trimethylbenzene	ND	1.2	0.35	ND	0.24	0.072	
100-44-7	Benzyl Chloride	ND	1.2	0.26	ND	0.23	0.050	
541-73-1	1,3-Dichlorobenzene	ND	1.2	0.35	ND	0.20	0.059	
106-46-7	1,4-Dichlorobenzene	ND	1.2	0.33	ND	0.20	0.055	
95-50-1	1,2-Dichlorobenzene	ND	1.2	0.35	ND	0.20	0.059	
5989-27-5	d-Limonene	ND	1.2	0.33	ND	0.21	0.059	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.2	0.23	ND	0.12	0.024	
120-82-1	1,2,4-Trichlorobenzene	ND	1.2	0.38	ND	0.16	0.051	
91-20-3	Naphthalene	ND	1.2	0.42	ND	0.23	0.081	
87-68-3	Hexachlorobutadiene	ND	1.2	0.33	ND	0.11	0.031	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729NQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-009

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes: **T**  
 Container ID: AS00199

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -6.75      Final Pressure (psig): 4.10

Canister Dilution Factor: 2.36

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
4.13	Chlorodifluoromethane	5.1	
9.48	unknown	5.8	
10.11	Trimethylsilanol	12	
17.28	Hexamethylcyclotrisiloxane	7.4	
21.81	unknown siloxane	4.8	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729N-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-010

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00056

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.58      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.65

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	2.6	0.83	0.23	1.5	0.48	0.13	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.3	0.83	0.28	0.47	0.17	0.057	
74-87-3	Chloromethane	0.27	0.83	0.25	0.13	0.40	0.12	J
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.83	0.31	ND	0.12	0.045	
75-01-4	Vinyl Chloride	ND	0.83	0.28	ND	0.32	0.11	
106-99-0	1,3-Butadiene	ND	0.83	0.36	ND	0.37	0.16	
74-83-9	Bromomethane	ND	0.83	0.31	ND	0.21	0.081	
75-00-3	Chloroethane	ND	0.83	0.28	ND	0.31	0.11	
64-17-5	Ethanol	27	8.3	1.3	14	4.4	0.70	
75-05-8	Acetonitrile	7.0	0.83	0.30	4.2	0.49	0.18	
107-02-8	Acrolein	0.38	3.3	0.28	0.16	1.4	0.12	J
67-64-1	Acetone	14	8.3	1.3	6.1	3.5	0.54	
75-69-4	Trichlorofluoromethane	1.1	0.83	0.28	0.20	0.15	0.050	
67-63-0	2-Propanol (Isopropyl Alcohol)	4.2	8.3	0.69	1.7	3.4	0.28	J
107-13-1	Acrylonitrile	ND	0.83	0.28	ND	0.38	0.13	
75-35-4	1,1-Dichloroethene	ND	0.83	0.28	ND	0.21	0.071	
75-09-2	Methylene Chloride	0.90	0.83	0.28	0.26	0.24	0.081	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.83	0.26	ND	0.26	0.084	
76-13-1	Trichlorotrifluoroethane	0.51	0.83	0.28	0.067	0.11	0.037	J
75-15-0	Carbon Disulfide	0.31	8.3	0.25	0.098	2.7	0.080	J
156-60-5	trans-1,2-Dichloroethene	ND	0.83	0.31	ND	0.21	0.079	
75-34-3	1,1-Dichloroethane	ND	0.83	0.26	ND	0.20	0.065	
1634-04-4	Methyl tert-Butyl Ether	ND	0.83	0.28	ND	0.23	0.078	
108-05-4	Vinyl Acetate	1.1	8.3	1.1	0.31	2.3	0.30	J
78-93-3	2-Butanone (MEK)	1.5	8.3	0.35	0.49	2.8	0.12	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729N-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-010

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00056

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.58      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.65

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.83	0.26	ND	0.21	0.067	
141-78-6	Ethyl Acetate	<b>3.2</b>	1.7	0.58	<b>0.88</b>	0.46	0.16	
110-54-3	n-Hexane	<b>0.59</b>	0.83	0.25	<b>0.17</b>	0.23	0.070	<b>J</b>
67-66-3	Chloroform	ND	0.83	0.28	ND	0.17	0.057	
109-99-9	Tetrahydrofuran (THF)	ND	0.83	0.33	ND	0.28	0.11	
107-06-2	1,2-Dichloroethane	ND	0.83	0.26	ND	0.20	0.065	
71-55-6	1,1,1-Trichloroethane	ND	0.83	0.28	ND	0.15	0.051	
71-43-2	Benzene	<b>0.37</b>	0.83	0.26	<b>0.11</b>	0.26	0.083	<b>J</b>
56-23-5	Carbon Tetrachloride	<b>0.44</b>	0.83	0.25	<b>0.069</b>	0.13	0.039	<b>J</b>
110-82-7	Cyclohexane	ND	1.7	0.48	ND	0.48	0.14	
78-87-5	1,2-Dichloropropane	ND	0.83	0.26	ND	0.18	0.057	
75-27-4	Bromodichloromethane	ND	0.83	0.25	ND	0.12	0.037	
79-01-6	Trichloroethene	ND	0.83	0.23	ND	0.15	0.043	
123-91-1	1,4-Dioxane	ND	0.83	0.26	ND	0.23	0.073	
80-62-6	Methyl Methacrylate	ND	1.7	0.51	ND	0.40	0.12	
142-82-5	n-Heptane	ND	0.83	0.28	ND	0.20	0.068	
10061-01-5	cis-1,3-Dichloropropene	ND	0.83	0.23	ND	0.18	0.051	
108-10-1	4-Methyl-2-pentanone	ND	0.83	0.26	ND	0.20	0.064	
10061-02-6	trans-1,3-Dichloropropene	ND	0.83	0.26	ND	0.18	0.058	
79-00-5	1,1,2-Trichloroethane	ND	0.83	0.26	ND	0.15	0.048	
108-88-3	Toluene	<b>1.2</b>	0.83	0.28	<b>0.31</b>	0.22	0.074	
591-78-6	2-Hexanone	ND	0.83	0.26	ND	0.20	0.064	
124-48-1	Dibromochloromethane	ND	0.83	0.26	ND	0.097	0.031	
106-93-4	1,2-Dibromoethane	ND	0.83	0.26	ND	0.11	0.034	
123-86-4	n-Butyl Acetate	<b>0.30</b>	0.83	0.26	<b>0.062</b>	0.17	0.056	<b>J</b>

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 729N-Summa

**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125

ALS Sample ID: P1503125-010

Test Code: EPA TO-15 Modified

Date Collected: 7/29/15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Date Received: 7/31/15

Analyst: Lusine Hakobyan

Date Analyzed: 8/10/15

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: SSC00056

Initial Pressure (psig): -3.58      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.65

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.83	0.30	ND	0.18	0.064	
127-18-4	Tetrachloroethene	ND	0.83	0.23	ND	0.12	0.034	
108-90-7	Chlorobenzene	ND	0.83	0.26	ND	0.18	0.057	
100-41-4	Ethylbenzene	ND	0.83	0.26	ND	0.19	0.061	
179601-23-1	m,p-Xylenes	ND	1.7	0.50	ND	0.38	0.11	
75-25-2	Bromoform	ND	0.83	0.25	ND	0.080	0.024	
100-42-5	Styrene	ND	0.83	0.25	ND	0.19	0.058	
95-47-6	o-Xylene	ND	0.83	0.25	ND	0.19	0.057	
111-84-2	n-Nonane	<b>0.27</b>	0.83	0.25	<b>0.052</b>	0.16	0.047	<b>J</b>
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.83	0.25	ND	0.12	0.036	
98-82-8	Cumene	ND	0.83	0.25	ND	0.17	0.050	
80-56-8	alpha-Pinene	ND	0.83	0.23	ND	0.15	0.041	
103-65-1	n-Propylbenzene	ND	0.83	0.26	ND	0.17	0.054	
622-96-8	4-Ethyltoluene	ND	0.83	0.26	ND	0.17	0.054	
108-67-8	1,3,5-Trimethylbenzene	ND	0.83	0.26	ND	0.17	0.054	
95-63-6	1,2,4-Trimethylbenzene	ND	0.83	0.25	ND	0.17	0.050	
100-44-7	Benzyl Chloride	ND	0.83	0.18	ND	0.16	0.035	
541-73-1	1,3-Dichlorobenzene	ND	0.83	0.25	ND	0.14	0.041	
106-46-7	1,4-Dichlorobenzene	ND	0.83	0.23	ND	0.14	0.038	
95-50-1	1,2-Dichlorobenzene	ND	0.83	0.25	ND	0.14	0.041	
5989-27-5	d-Limonene	<b>0.66</b>	0.83	0.23	<b>0.12</b>	0.15	0.041	<b>J</b>
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.83	0.16	ND	0.085	0.017	
120-82-1	1,2,4-Trichlorobenzene	ND	0.83	0.26	ND	0.11	0.036	
91-20-3	Naphthalene	ND	0.83	0.30	ND	0.16	0.057	
87-68-3	Hexachlorobutadiene	ND	0.83	0.23	ND	0.077	0.022	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729N-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-010

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes: **T**  
 Container ID: SSC00056

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.58      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.65

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
17.28	Hexamethylcyclotrisiloxane	5.1	
21.22	n-Nonanal	4.0	
22.17	n-Decanal	3.9	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729-DUPE11  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-011

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00247

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.93      Final Pressure (psig): 3.63

Canister Dilution Factor: 1.56

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	0.52	0.78	0.22	0.30	0.45	0.13	J
75-71-8	Dichlorodifluoromethane (CFC 12)	2.3	0.78	0.27	0.47	0.16	0.054	
74-87-3	Chloromethane	0.25	0.78	0.23	0.12	0.38	0.11	J
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.78	0.30	ND	0.11	0.042	
75-01-4	Vinyl Chloride	ND	0.78	0.27	ND	0.31	0.10	
106-99-0	1,3-Butadiene	ND	0.78	0.34	ND	0.35	0.16	
74-83-9	Bromomethane	ND	0.78	0.30	ND	0.20	0.076	
75-00-3	Chloroethane	ND	0.78	0.27	ND	0.30	0.10	
64-17-5	Ethanol	3.5	7.8	1.2	1.9	4.1	0.66	J
75-05-8	Acetonitrile	0.34	0.78	0.28	0.20	0.46	0.17	J
107-02-8	Acrolein	0.29	3.1	0.27	0.13	1.4	0.12	J
67-64-1	Acetone	9.3	7.8	1.2	3.9	3.3	0.51	
75-69-4	Trichlorofluoromethane	1.1	0.78	0.27	0.19	0.14	0.047	
67-63-0	2-Propanol (Isopropyl Alcohol)	0.73	7.8	0.66	0.30	3.2	0.27	J
107-13-1	Acrylonitrile	ND	0.78	0.27	ND	0.36	0.12	
75-35-4	1,1-Dichloroethene	ND	0.78	0.27	ND	0.20	0.067	
75-09-2	Methylene Chloride	0.37	0.78	0.27	0.11	0.22	0.076	J
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.78	0.25	ND	0.25	0.080	
76-13-1	Trichlorotrifluoroethane	0.49	0.78	0.27	0.064	0.10	0.035	J
75-15-0	Carbon Disulfide	ND	7.8	0.23	ND	2.5	0.075	
156-60-5	trans-1,2-Dichloroethene	ND	0.78	0.30	ND	0.20	0.075	
75-34-3	1,1-Dichloroethane	ND	0.78	0.25	ND	0.19	0.062	
1634-04-4	Methyl tert-Butyl Ether	ND	0.78	0.27	ND	0.22	0.074	
108-05-4	Vinyl Acetate	ND	7.8	1.0	ND	2.2	0.29	
78-93-3	2-Butanone (MEK)	0.91	7.8	0.33	0.31	2.6	0.11	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

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# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729-DUPE11  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-011

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00247

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.93      Final Pressure (psig): 3.63

Canister Dilution Factor: 1.56

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.78	0.25	ND	0.20	0.063	
141-78-6	Ethyl Acetate	<b>3.0</b>	1.6	0.55	<b>0.84</b>	0.43	0.15	
110-54-3	n-Hexane	ND	0.78	0.23	ND	0.22	0.066	
67-66-3	Chloroform	ND	0.78	0.27	ND	0.16	0.054	
109-99-9	Tetrahydrofuran (THF)	ND	0.78	0.31	ND	0.26	0.11	
107-06-2	1,2-Dichloroethane	ND	0.78	0.25	ND	0.19	0.062	
71-55-6	1,1,1-Trichloroethane	ND	0.78	0.27	ND	0.14	0.049	
71-43-2	Benzene	ND	0.78	0.25	ND	0.24	0.078	
56-23-5	Carbon Tetrachloride	<b>0.45</b>	0.78	0.23	<b>0.071</b>	0.12	0.037	<b>J</b>
110-82-7	Cyclohexane	ND	1.6	0.45	ND	0.45	0.13	
78-87-5	1,2-Dichloropropane	ND	0.78	0.25	ND	0.17	0.054	
75-27-4	Bromodichloromethane	ND	0.78	0.23	ND	0.12	0.035	
79-01-6	Trichloroethene	ND	0.78	0.22	ND	0.15	0.041	
123-91-1	1,4-Dioxane	ND	0.78	0.25	ND	0.22	0.069	
80-62-6	Methyl Methacrylate	ND	1.6	0.48	ND	0.38	0.12	
142-82-5	n-Heptane	ND	0.78	0.27	ND	0.19	0.065	
10061-01-5	cis-1,3-Dichloropropene	ND	0.78	0.22	ND	0.17	0.048	
108-10-1	4-Methyl-2-pentanone	<b>0.48</b>	0.78	0.25	<b>0.12</b>	0.19	0.061	<b>J</b>
10061-02-6	trans-1,3-Dichloropropene	ND	0.78	0.25	ND	0.17	0.055	
79-00-5	1,1,2-Trichloroethane	ND	0.78	0.25	ND	0.14	0.046	
108-88-3	Toluene	<b>0.57</b>	0.78	0.27	<b>0.15</b>	0.21	0.070	<b>J</b>
591-78-6	2-Hexanone	ND	0.78	0.25	ND	0.19	0.061	
124-48-1	Dibromochloromethane	ND	0.78	0.25	ND	0.092	0.029	
106-93-4	1,2-Dibromoethane	ND	0.78	0.25	ND	0.10	0.032	
123-86-4	n-Butyl Acetate	ND	0.78	0.25	ND	0.16	0.053	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

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J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.



**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729-DUPE11  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-011

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00247

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.93      Final Pressure (psig): 3.63

Canister Dilution Factor: 1.56

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.78	0.28	ND	0.17	0.060	
127-18-4	Tetrachloroethene	ND	0.78	0.22	ND	0.12	0.032	
108-90-7	Chlorobenzene	ND	0.78	0.25	ND	0.17	0.054	
100-41-4	Ethylbenzene	ND	0.78	0.25	ND	0.18	0.057	
179601-23-1	m,p-Xylenes	ND	1.6	0.47	ND	0.36	0.11	
75-25-2	Bromoform	ND	0.78	0.23	ND	0.075	0.023	
100-42-5	Styrene	ND	0.78	0.23	ND	0.18	0.055	
95-47-6	o-Xylene	ND	0.78	0.23	ND	0.18	0.054	
111-84-2	n-Nonane	ND	0.78	0.23	ND	0.15	0.045	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.78	0.23	ND	0.11	0.034	
98-82-8	Cumene	ND	0.78	0.23	ND	0.16	0.048	
80-56-8	alpha-Pinene	ND	0.78	0.22	ND	0.14	0.039	
103-65-1	n-Propylbenzene	ND	0.78	0.25	ND	0.16	0.051	
622-96-8	4-Ethyltoluene	ND	0.78	0.25	ND	0.16	0.051	
108-67-8	1,3,5-Trimethylbenzene	ND	0.78	0.25	ND	0.16	0.051	
95-63-6	1,2,4-Trimethylbenzene	ND	0.78	0.23	ND	0.16	0.048	
100-44-7	Benzyl Chloride	ND	0.78	0.17	ND	0.15	0.033	
541-73-1	1,3-Dichlorobenzene	ND	0.78	0.23	ND	0.13	0.039	
106-46-7	1,4-Dichlorobenzene	ND	0.78	0.22	ND	0.13	0.036	
95-50-1	1,2-Dichlorobenzene	ND	0.78	0.23	ND	0.13	0.039	
5989-27-5	d-Limonene	ND	0.78	0.22	ND	0.14	0.039	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.78	0.15	ND	0.081	0.016	
120-82-1	1,2,4-Trichlorobenzene	ND	0.78	0.25	ND	0.11	0.034	
91-20-3	Naphthalene	ND	0.78	0.28	ND	0.15	0.054	
87-68-3	Hexachlorobutadiene	ND	0.78	0.22	ND	0.073	0.020	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729-DUPE11  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-011

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes: **T**  
 Container ID: SSC00247

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.93      Final Pressure (psig): 3.63

Canister Dilution Factor: 1.56

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
4.11	Chlorodifluoromethane	4.2	
8.00	Isoprene	3.5	
9.48	unknown	4.0	
10.12	Trimethylsilanol	3.1	
10.77	Acetic Acid	5.1	
17.28	Hexamethylcyclotrisiloxane	7.6	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sN-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-012

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00153

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.015 Liter(s)

Initial Pressure (psig): -3.20      Final Pressure (psig): 7.08

Canister Dilution Factor: 1.89

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	11,000	63	18	6,200	37	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	190	63	21	39	13	4.3	
74-87-3	Chloromethane	ND	63	19	ND	31	9.2	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	67	63	24	9.5	9.0	3.4	
75-01-4	Vinyl Chloride	26	63	21	10	25	8.4	J
106-99-0	1,3-Butadiene	66	63	28	30	28	13	
74-83-9	Bromomethane	ND	63	24	ND	16	6.2	
75-00-3	Chloroethane	ND	63	21	ND	24	8.1	
64-17-5	Ethanol	ND	630	100	ND	330	54	
75-05-8	Acetonitrile	ND	63	23	ND	38	14	
107-02-8	Acrolein	ND	250	21	ND	110	9.3	
67-64-1	Acetone	2,500	630	97	1,100	270	41	
75-69-4	Trichlorofluoromethane	ND	63	21	ND	11	3.8	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	630	53	ND	260	22	
107-13-1	Acrylonitrile	ND	63	21	ND	29	9.9	
75-35-4	1,1-Dichloroethene	ND	63	21	ND	16	5.4	
75-09-2	Methylene Chloride	56	63	21	16	18	6.2	J
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	63	20	ND	20	6.4	
76-13-1	Trichlorotrifluoroethane	ND	63	21	ND	8.2	2.8	
75-15-0	Carbon Disulfide	38	630	19	12	200	6.1	J
156-60-5	trans-1,2-Dichloroethene	ND	63	24	ND	16	6.0	
75-34-3	1,1-Dichloroethane	ND	63	20	ND	16	5.0	
1634-04-4	Methyl tert-Butyl Ether	100	63	21	29	17	5.9	
108-05-4	Vinyl Acetate	ND	630	82	ND	180	23	
78-93-3	2-Butanone (MEK)	77	630	26	26	210	9.0	J

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sN-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-012

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00153

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.015 Liter(s)

Initial Pressure (psig): -3.20      Final Pressure (psig): 7.08

Canister Dilution Factor: 1.89

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	63	20	ND	16	5.1	
141-78-6	Ethyl Acetate	ND	130	44	ND	35	12	
110-54-3	n-Hexane	<b>1,100</b>	63	19	<b>320</b>	18	5.4	
67-66-3	Chloroform	ND	63	21	ND	13	4.4	
109-99-9	Tetrahydrofuran (THF)	<b>31</b>	63	25	<b>10</b>	21	8.5	<b>J</b>
107-06-2	1,2-Dichloroethane	ND	63	20	ND	16	5.0	
71-55-6	1,1,1-Trichloroethane	ND	63	21	ND	12	3.9	
71-43-2	Benzene	<b>1,200</b>	63	20	<b>370</b>	20	6.3	
56-23-5	Carbon Tetrachloride	ND	63	19	ND	10	3.0	
110-82-7	Cyclohexane	<b>400</b>	130	37	<b>120</b>	37	11	
78-87-5	1,2-Dichloropropane	ND	63	20	ND	14	4.4	
75-27-4	Bromodichloromethane	ND	63	19	ND	9.4	2.8	
79-01-6	Trichloroethene	ND	63	18	ND	12	3.3	
123-91-1	1,4-Dioxane	ND	63	20	ND	17	5.6	
80-62-6	Methyl Methacrylate	ND	130	39	ND	31	9.5	
142-82-5	n-Heptane	<b>460</b>	63	21	<b>110</b>	15	5.2	
10061-01-5	cis-1,3-Dichloropropene	ND	63	18	ND	14	3.9	
108-10-1	4-Methyl-2-pentanone	ND	63	20	ND	15	4.9	
10061-02-6	trans-1,3-Dichloropropene	ND	63	20	ND	14	4.4	
79-00-5	1,1,2-Trichloroethane	ND	63	20	ND	12	3.7	
108-88-3	Toluene	<b>61</b>	63	21	<b>16</b>	17	5.7	<b>J</b>
591-78-6	2-Hexanone	ND	63	20	ND	15	4.9	
124-48-1	Dibromochloromethane	ND	63	20	ND	7.4	2.4	
106-93-4	1,2-Dibromoethane	ND	63	20	ND	8.2	2.6	
123-86-4	n-Butyl Acetate	ND	63	20	ND	13	4.2	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 729sN-Summa

**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125

ALS Sample ID: P1503125-012

Test Code: EPA TO-15 Modified

Date Collected: 7/29/15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Date Received: 7/31/15

Analyst: Lusine Hakobyan

Date Analyzed: 8/11/15

Sample Type: 1.0 L Silonite Summa Canister

Volume(s) Analyzed: 0.015 Liter(s)

Test Notes:

Container ID: 1SS00153

Initial Pressure (psig): -3.20      Final Pressure (psig): 7.08

Canister Dilution Factor: 1.89

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	63	23	ND	13	4.9	
127-18-4	Tetrachloroethene	20	63	18	3.0	9.3	2.6	J
108-90-7	Chlorobenzene	92	63	20	20	14	4.4	
100-41-4	Ethylbenzene	150	63	20	35	15	4.6	
179601-23-1	m,p-Xylenes	410	130	38	94	29	8.7	
75-25-2	Bromoform	ND	63	19	ND	6.1	1.8	
100-42-5	Styrene	ND	63	19	ND	15	4.4	
95-47-6	o-Xylene	210	63	19	49	15	4.4	
111-84-2	n-Nonane	220	63	19	43	12	3.6	
79-34-5	1,1,2,2-Tetrachloroethane	ND	63	19	ND	9.2	2.8	
98-82-8	Cumene	280	63	19	57	13	3.8	
80-56-8	alpha-Pinene	1,200	63	18	210	11	3.2	
103-65-1	n-Propylbenzene	ND	63	20	ND	13	4.1	
622-96-8	4-Ethyltoluene	150	63	20	31	13	4.1	
108-67-8	1,3,5-Trimethylbenzene	360	63	20	73	13	4.1	
95-63-6	1,2,4-Trimethylbenzene	82	63	19	17	13	3.8	
100-44-7	Benzyl Chloride	ND	63	14	ND	12	2.7	
541-73-1	1,3-Dichlorobenzene	19	63	19	3.2	10	3.1	J
106-46-7	1,4-Dichlorobenzene	3,300	63	18	550	10	2.9	
95-50-1	1,2-Dichlorobenzene	ND	63	19	ND	10	3.1	
5989-27-5	d-Limonene	ND	63	18	ND	11	3.2	
96-12-8	1,2-Dibromo-3-chloropropane	ND	63	12	ND	6.5	1.3	
120-82-1	1,2,4-Trichlorobenzene	ND	63	20	ND	8.5	2.7	
91-20-3	Naphthalene	ND	63	23	ND	12	4.3	
87-68-3	Hexachlorobutadiene	ND	63	18	ND	5.9	1.7	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sN-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-012

**Tentatively Identified Compounds**

Test Code:	EPA TO-15 Modified	Date Collected:	7/29/15
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	7/31/15
Analyst:	Lusine Hakobyan	Date Analyzed:	8/11/15
Sample Type:	1.0 L Silonite Summa Canister	Volume(s) Analyzed:	0.015 Liter(s)
Test Notes:	<b>T</b>		
Container ID:	1SS00153		

Initial Pressure (psig): -3.20      Final Pressure (psig): 7.08

Canister Dilution Factor: 1.89

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
5.17	2-Methylpropene	11,000	
5.34	n-Butane	11,000	
5.53	C4H8 Alkene	8,900	
5.81	C4H8 Alkene	5,300	
8.54	C5H10 Alkene	3,400	
9.65	Cyclopentene	2,300	
10.28	C6H12 Alkene	2,500	
16.66	C8H16 Alkene	2,500	
19.89	unknown	3,800	
20.05	C10H20 Compound	2,600	
20.72	unknown	2,800	
20.82	(C12H26) Alkane: Straight-Chain	5,300	
21.04	(C12H26) Alkane: Straight-Chain	4,300	
21.13	decahydronaphthalene isomer	2,700	
21.22	unknown	2,700	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sSQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-013

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00109

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.0050 Liter(s)

Initial Pressure (psig): -13.25      Final Pressure (psig): 9.54

Canister Dilution Factor: 16.72

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	55,000	1,700	470	32,000	970	270	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	1,700	570	ND	340	120	
74-87-3	Chloromethane	4,100	1,700	500	2,000	810	240	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	1,700	640	ND	240	91	
75-01-4	Vinyl Chloride	ND	1,700	570	ND	650	220	
106-99-0	1,3-Butadiene	1,200	1,700	740	540	760	330	J
74-83-9	Bromomethane	ND	1,700	640	ND	430	160	
75-00-3	Chloroethane	ND	1,700	570	ND	630	220	
64-17-5	Ethanol	5,200	17,000	2,700	2,800	8,900	1,400	J
75-05-8	Acetonitrile	ND	1,700	600	ND	1,000	360	
107-02-8	Acrolein	ND	6,700	570	ND	2,900	250	
67-64-1	Acetone	260,000	17,000	2,600	110,000	7,000	1,100	
75-69-4	Trichlorofluoromethane	ND	1,700	570	ND	300	100	
67-63-0	2-Propanol (Isopropyl Alcohol)	31,000	17,000	1,400	13,000	6,800	570	
107-13-1	Acrylonitrile	ND	1,700	570	ND	770	260	
75-35-4	1,1-Dichloroethene	ND	1,700	570	ND	420	140	
75-09-2	Methylene Chloride	ND	1,700	570	ND	480	160	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	1,700	540	ND	530	170	
76-13-1	Trichlorotrifluoroethane	ND	1,700	570	ND	220	74	
75-15-0	Carbon Disulfide	760	17,000	500	240	5,400	160	J
156-60-5	trans-1,2-Dichloroethene	ND	1,700	640	ND	420	160	
75-34-3	1,1-Dichloroethane	ND	1,700	540	ND	410	130	
1634-04-4	Methyl tert-Butyl Ether	1,300	1,700	570	370	460	160	J
108-05-4	Vinyl Acetate	ND	17,000	2,200	ND	4,800	620	
78-93-3	2-Butanone (MEK)	260,000	17,000	700	88,000	5,700	240	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sSQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-013

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00109

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.0050 Liter(s)

Initial Pressure (psig): -13.25      Final Pressure (psig): 9.54

Canister Dilution Factor: 16.72

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	1,700	540	ND	420	140	
141-78-6	Ethyl Acetate	<b>38,000</b>	3,300	1,200	<b>10,000</b>	930	320	<b>M1</b>
110-54-3	n-Hexane	<b>3,600</b>	1,700	500	<b>1,000</b>	470	140	
67-66-3	Chloroform	ND	1,700	570	ND	340	120	
109-99-9	Tetrahydrofuran (THF)	<b>300,000</b>	1,700	670	<b>100,000</b>	570	230	
107-06-2	1,2-Dichloroethane	ND	1,700	540	ND	410	130	
71-55-6	1,1,1-Trichloroethane	ND	1,700	570	ND	310	100	
71-43-2	Benzene	<b>150,000</b>	1,700	540	<b>46,000</b>	520	170	
56-23-5	Carbon Tetrachloride	ND	1,700	500	ND	270	80	
110-82-7	Cyclohexane	ND	3,300	970	ND	970	280	
78-87-5	1,2-Dichloropropane	ND	1,700	540	ND	360	120	
75-27-4	Bromodichloromethane	ND	1,700	500	ND	250	75	
79-01-6	Trichloroethene	<b>580</b>	1,700	470	<b>110</b>	310	87	<b>J</b>
123-91-1	1,4-Dioxane	<b>2,600</b>	1,700	540	<b>730</b>	460	150	
80-62-6	Methyl Methacrylate	ND	3,300	1,000	ND	820	250	
142-82-5	n-Heptane	<b>3,400</b>	1,700	570	<b>830</b>	410	140	
10061-01-5	cis-1,3-Dichloropropene	ND	1,700	470	ND	370	100	
108-10-1	4-Methyl-2-pentanone	<b>30,000</b>	1,700	540	<b>7,400</b>	410	130	
10061-02-6	trans-1,3-Dichloropropene	ND	1,700	540	ND	370	120	
79-00-5	1,1,2-Trichloroethane	ND	1,700	540	ND	310	98	
108-88-3	Toluene	<b>53,000</b>	1,700	570	<b>14,000</b>	440	150	
591-78-6	2-Hexanone	<b>13,000</b>	1,700	540	<b>3,100</b>	410	130	
124-48-1	Dibromochloromethane	ND	1,700	540	ND	200	63	
106-93-4	1,2-Dibromoethane	ND	1,700	540	ND	220	70	
123-86-4	n-Butyl Acetate	<b>27,000</b>	1,700	540	<b>5,800</b>	350	110	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

M1 = Matrix interference due to coelution with a non-target compound; results may be biased high.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 729sSQ-Summa

**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125

ALS Sample ID: P1503125-013

Test Code: EPA TO-15 Modified

Date Collected: 7/29/15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Date Received: 7/31/15

Analyst: Lusine Hakobyan

Date Analyzed: 8/11/15

Sample Type: 1.0 L Silonite Summa Canister

Volume(s) Analyzed: 0.0050 Liter(s)

Test Notes:

Container ID: 1SS00109

Initial Pressure (psig): -13.25      Final Pressure (psig): 9.54

Canister Dilution Factor: 16.72

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	9,200	1,700	600	2,000	360	130	
127-18-4	Tetrachloroethene	ND	1,700	470	ND	250	69	
108-90-7	Chlorobenzene	1,800	1,700	540	390	360	120	
100-41-4	Ethylbenzene	38,000	1,700	540	8,800	390	120	
179601-23-1	m,p-Xylenes	62,000	3,300	1,000	14,000	770	230	
75-25-2	Bromoform	ND	1,700	500	ND	160	49	
100-42-5	Styrene	960	1,700	500	230	390	120	J
95-47-6	o-Xylene	28,000	1,700	500	6,400	390	120	
111-84-2	n-Nonane	17,000	1,700	500	3,200	320	96	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1,700	500	ND	240	73	
98-82-8	Cumene	11,000	1,700	500	2,300	340	100	
80-56-8	alpha-Pinene	44,000	1,700	470	7,900	300	84	
103-65-1	n-Propylbenzene	6,300	1,700	540	1,300	340	110	
622-96-8	4-Ethyltoluene	8,500	1,700	540	1,700	340	110	
108-67-8	1,3,5-Trimethylbenzene	8,800	1,700	540	1,800	340	110	
95-63-6	1,2,4-Trimethylbenzene	28,000	1,700	500	5,700	340	100	
100-44-7	Benzyl Chloride	ND	1,700	370	ND	320	71	
541-73-1	1,3-Dichlorobenzene	ND	1,700	500	ND	280	83	
106-46-7	1,4-Dichlorobenzene	14,000	1,700	470	2,300	280	78	
95-50-1	1,2-Dichlorobenzene	ND	1,700	500	ND	280	83	
5989-27-5	d-Limonene	81,000	1,700	470	14,000	300	84	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1,700	330	ND	170	34	
120-82-1	1,2,4-Trichlorobenzene	ND	1,700	540	ND	230	72	
91-20-3	Naphthalene	ND	1,700	600	ND	320	110	
87-68-3	Hexachlorobutadiene	ND	1,700	470	ND	160	44	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sSQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-013

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes: **T**  
 Container ID: 1SS00109

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.0050 Liter(s)

Initial Pressure (psig): -13.25      Final Pressure (psig): 9.54

Canister Dilution Factor: 16.72

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
4.50	Dimethyl Ether	100,000	
5.15	2-Methylpropene	85,000	
7.56	Furan	250,000	
8.15	Dimethyl Sulfide	570,000	
8.47	Methyl Acetate	69,000	
9.65	Cyclopentene	50,000	
10.93	2-Butanol	40,000	
11.10	2-Methylfuran	250,000	
11.85	Methyl Propionate	62,000	
13.38	2-Pentanone	47,000	
14.51	Methyl Butyrate	140,000	
15.13	Dimethyl disulfide	94,000	
17.27	2-Methylcyclopentanone	46,000	
20.24	n-Decane	46,000	
20.54	p-Isopropyltoluene	140,000	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Summa (A)  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-014

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00148

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.00020 Liter(s)

Initial Pressure (psig): -0.35      Final Pressure (psig): 7.96

Canister Dilution Factor: 1.58

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	<b>83,000</b>	4,000	1,100	<b>48,000</b>	2,300	640	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	4,000	1,300	ND	800	270	
74-87-3	Chloromethane	<b>6,100</b>	4,000	1,200	<b>2,900</b>	1,900	570	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	4,000	1,500	ND	570	210	
75-01-4	Vinyl Chloride	ND	4,000	1,300	ND	1,500	530	
106-99-0	1,3-Butadiene	<b>2,100</b>	4,000	1,700	<b>960</b>	1,800	790	<b>J</b>
74-83-9	Bromomethane	ND	4,000	1,500	ND	1,000	390	
75-00-3	Chloroethane	<b>1,600</b>	4,000	1,300	<b>620</b>	1,500	510	<b>J</b>
64-17-5	Ethanol	<b>1,200,000</b>	40,000	6,300	<b>620,000</b>	21,000	3,400	
75-05-8	Acetonitrile	ND	4,000	1,400	ND	2,400	850	
107-02-8	Acrolein	ND	16,000	1,300	ND	6,900	590	
67-64-1	Acetone	<b>1,100,000</b>	40,000	6,100	<b>460,000</b>	17,000	2,600	
75-69-4	Trichlorofluoromethane	ND	4,000	1,300	ND	700	240	
67-63-0	2-Propanol (Isopropyl Alcohol)	<b>320,000</b>	40,000	3,300	<b>130,000</b>	16,000	1,400	
107-13-1	Acrylonitrile	ND	4,000	1,300	ND	1,800	620	
75-35-4	1,1-Dichloroethene	ND	4,000	1,300	ND	1,000	340	
75-09-2	Methylene Chloride	ND	4,000	1,300	ND	1,100	390	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	4,000	1,300	ND	1,300	400	
76-13-1	Trichlorotrifluoroethane	ND	4,000	1,300	ND	520	180	
75-15-0	Carbon Disulfide	<b>1,200</b>	40,000	1,200	<b>390</b>	13,000	380	<b>J</b>
156-60-5	trans-1,2-Dichloroethene	ND	4,000	1,500	ND	1,000	380	
75-34-3	1,1-Dichloroethane	ND	4,000	1,300	ND	980	310	
1634-04-4	Methyl tert-Butyl Ether	ND	4,000	1,300	ND	1,100	370	
108-05-4	Vinyl Acetate	<b>6,100</b>	40,000	5,100	<b>1,700</b>	11,000	1,500	<b>J</b>
78-93-3	2-Butanone (MEK)	<b>660,000</b>	40,000	1,700	<b>220,000</b>	13,000	560	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 729sF-Summa (A)

**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125

ALS Sample ID: P1503125-014

Test Code: EPA TO-15 Modified

Date Collected: 7/29/15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Date Received: 7/31/15

Analyst: Lusine Hakobyan

Date Analyzed: 8/11/15

Sample Type: 1.0 L Silonite Summa Canister

Volume(s) Analyzed: 0.00020 Liter(s)

Test Notes:

Container ID: 1SS00148

Initial Pressure (psig): -0.35      Final Pressure (psig): 7.96

Canister Dilution Factor: 1.58

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	4,000	1,300	ND	1,000	320	
141-78-6	Ethyl Acetate	<b>120,000</b>	7,900	2,800	<b>34,000</b>	2,200	770	
110-54-3	n-Hexane	<b>4,400</b>	4,000	1,200	<b>1,300</b>	1,100	340	
67-66-3	Chloroform	ND	4,000	1,300	ND	810	280	
109-99-9	Tetrahydrofuran (THF)	<b>430,000</b>	4,000	1,600	<b>150,000</b>	1,300	540	
107-06-2	1,2-Dichloroethane	ND	4,000	1,300	ND	980	310	
71-55-6	1,1,1-Trichloroethane	ND	4,000	1,300	ND	720	250	
71-43-2	Benzene	<b>320,000</b>	4,000	1,300	<b>99,000</b>	1,200	400	
56-23-5	Carbon Tetrachloride	ND	4,000	1,200	ND	630	190	
110-82-7	Cyclohexane	ND	7,900	2,300	ND	2,300	670	
78-87-5	1,2-Dichloropropane	ND	4,000	1,300	ND	860	270	
75-27-4	Bromodichloromethane	ND	4,000	1,200	ND	590	180	
79-01-6	Trichloroethene	ND	4,000	1,100	ND	740	210	
123-91-1	1,4-Dioxane	<b>21,000</b>	4,000	1,300	<b>5,800</b>	1,100	350	
80-62-6	Methyl Methacrylate	ND	7,900	2,400	ND	1,900	600	
142-82-5	n-Heptane	<b>3,800</b>	4,000	1,300	<b>920</b>	960	330	<b>J</b>
10061-01-5	cis-1,3-Dichloropropene	ND	4,000	1,100	ND	870	240	
108-10-1	4-Methyl-2-pentanone	<b>31,000</b>	4,000	1,300	<b>7,500</b>	960	310	
10061-02-6	trans-1,3-Dichloropropene	ND	4,000	1,300	ND	870	280	
79-00-5	1,1,2-Trichloroethane	ND	4,000	1,300	ND	720	230	
108-88-3	Toluene	<b>79,000</b>	4,000	1,300	<b>21,000</b>	1,000	360	
591-78-6	2-Hexanone	<b>20,000</b>	4,000	1,300	<b>4,800</b>	960	310	
124-48-1	Dibromochloromethane	ND	4,000	1,300	ND	460	150	
106-93-4	1,2-Dibromoethane	ND	4,000	1,300	ND	510	160	
123-86-4	n-Butyl Acetate	<b>81,000</b>	4,000	1,300	<b>17,000</b>	830	270	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 729sF-Summa (A)

**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125

ALS Sample ID: P1503125-014

Test Code: EPA TO-15 Modified

Date Collected: 7/29/15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Date Received: 7/31/15

Analyst: Lusine Hakobyan

Date Analyzed: 8/11/15

Sample Type: 1.0 L Silonite Summa Canister

Volume(s) Analyzed: 0.00020 Liter(s)

Test Notes:

Container ID: 1SS00148

Initial Pressure (psig): -0.35      Final Pressure (psig): 7.96

Canister Dilution Factor: 1.58

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	12,000	4,000	1,400	2,600	850	300	
127-18-4	Tetrachloroethene	ND	4,000	1,100	ND	580	160	
108-90-7	Chlorobenzene	2,400	4,000	1,300	510	860	270	J
100-41-4	Ethylbenzene	38,000	4,000	1,300	8,700	910	290	
179601-23-1	m,p-Xylenes	66,000	7,900	2,400	15,000	1,800	550	
75-25-2	Bromoform	ND	4,000	1,200	ND	380	110	
100-42-5	Styrene	1,900	4,000	1,200	450	930	280	J
95-47-6	o-Xylene	25,000	4,000	1,200	5,800	910	270	
111-84-2	n-Nonane	16,000	4,000	1,200	3,100	750	230	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4,000	1,200	ND	580	170	
98-82-8	Cumene	8,500	4,000	1,200	1,700	800	240	
80-56-8	alpha-Pinene	19,000	4,000	1,100	3,500	710	200	
103-65-1	n-Propylbenzene	5,500	4,000	1,300	1,100	800	260	
622-96-8	4-Ethyltoluene	7,600	4,000	1,300	1,600	800	260	
108-67-8	1,3,5-Trimethylbenzene	7,900	4,000	1,300	1,600	800	260	
95-63-6	1,2,4-Trimethylbenzene	26,000	4,000	1,200	5,400	800	240	
100-44-7	Benzyl Chloride	ND	4,000	870	ND	760	170	
541-73-1	1,3-Dichlorobenzene	ND	4,000	1,200	ND	660	200	
106-46-7	1,4-Dichlorobenzene	22,000	4,000	1,100	3,700	660	180	
95-50-1	1,2-Dichlorobenzene	ND	4,000	1,200	ND	660	200	
5989-27-5	d-Limonene	50,000	4,000	1,100	8,900	710	200	
96-12-8	1,2-Dibromo-3-chloropropane	ND	4,000	780	ND	410	81	
120-82-1	1,2,4-Trichlorobenzene	ND	4,000	1,300	ND	530	170	
91-20-3	Naphthalene	2,200	4,000	1,400	420	750	270	J
87-68-3	Hexachlorobutadiene	ND	4,000	1,100	ND	370	100	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Summa (A)  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-014

**Tentatively Identified Compounds**

Test Code:	EPA TO-15 Modified	Date Collected:	7/29/15
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	7/31/15
Analyst:	Lusine Hakobyan	Date Analyzed:	8/11/15
Sample Type:	1.0 L Silonite Summa Canister	Volume(s) Analyzed:	0.00020 Liter(s)
Test Notes:	<b>T</b>		
Container ID:	1SS00148		

Initial Pressure (psig): -0.35      Final Pressure (psig): 7.96

Canister Dilution Factor: 1.58

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
8.15	Dimethyl Sulfide	1,200,000	
8.46	Methyl Acetate	520,000	
9.59	1-Propanol	230,000	
10.95	2-Butanol	240,000	
11.10	2-Methylfuran	330,000	
11.85	Methyl Propionate	420,000	
13.39	2-Pentanone	89,000	
13.56	Methyl isobutyrate	99,000	
14.52	Methyl Butyrate	630,000	
15.13	Dimethyl disulfide	150,000	
15.94	Methyl isovalerate	76,000	
17.00	Methyl valerate	79,000	
17.27	2-Methylcyclopentanone	140,000	
18.90	Methyl hexanoate	130,000	
20.53	p-Isopropyltoluene	130,000	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sNQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-015

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00121

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.40 Liter(s)

Initial Pressure (psig): -13.88      Final Pressure (psig): 8.99

Canister Dilution Factor: 28.89

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	<b>80</b>	36	10	<b>47</b>	21	5.9	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>39</b>	36	12	<b>7.9</b>	7.3	2.5	
74-87-3	Chloromethane	ND	36	11	ND	17	5.2	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	36	14	ND	5.2	2.0	
75-01-4	Vinyl Chloride	ND	36	12	ND	14	4.8	
106-99-0	1,3-Butadiene	ND	36	16	ND	16	7.2	
74-83-9	Bromomethane	ND	36	14	ND	9.3	3.5	
75-00-3	Chloroethane	ND	36	12	ND	14	4.7	
64-17-5	Ethanol	<b>63</b>	360	58	<b>33</b>	190	31	<b>J</b>
75-05-8	Acetonitrile	ND	36	13	ND	22	7.7	
107-02-8	Acrolein	ND	140	12	ND	63	5.4	
67-64-1	Acetone	ND	360	56	ND	150	23	
75-69-4	Trichlorofluoromethane	ND	36	12	ND	6.4	2.2	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	360	30	ND	150	12	
107-13-1	Acrylonitrile	ND	36	12	ND	17	5.7	
75-35-4	1,1-Dichloroethene	ND	36	12	ND	9.1	3.1	
75-09-2	Methylene Chloride	ND	36	12	ND	10	3.5	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	36	12	ND	12	3.7	
76-13-1	Trichlorotrifluoroethane	ND	36	12	ND	4.7	1.6	
75-15-0	Carbon Disulfide	ND	360	11	ND	120	3.5	
156-60-5	trans-1,2-Dichloroethene	ND	36	14	ND	9.1	3.5	
75-34-3	1,1-Dichloroethane	ND	36	12	ND	8.9	2.9	
1634-04-4	Methyl tert-Butyl Ether	ND	36	12	ND	10	3.4	
108-05-4	Vinyl Acetate	ND	360	47	ND	100	13	
78-93-3	2-Butanone (MEK)	ND	360	15	ND	120	5.1	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sNQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-015

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00121

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.40 Liter(s)

Initial Pressure (psig): -13.88      Final Pressure (psig): 8.99

Canister Dilution Factor: 28.89

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	36	12	ND	9.1	2.9	
141-78-6	Ethyl Acetate	ND	72	25	ND	20	7.0	
110-54-3	n-Hexane	<b>24</b>	36	11	<b>6.7</b>	10	3.1	<b>J</b>
67-66-3	Chloroform	<b>99</b>	36	12	<b>20</b>	7.4	2.5	
109-99-9	Tetrahydrofuran (THF)	<b>15</b>	36	14	<b>5.1</b>	12	4.9	<b>J</b>
107-06-2	1,2-Dichloroethane	ND	36	12	ND	8.9	2.9	
71-55-6	1,1,1-Trichloroethane	ND	36	12	ND	6.6	2.3	
71-43-2	Benzene	<b>16</b>	36	12	<b>5.2</b>	11	3.6	<b>J</b>
56-23-5	Carbon Tetrachloride	ND	36	11	ND	5.7	1.7	
110-82-7	Cyclohexane	ND	72	21	ND	21	6.1	
78-87-5	1,2-Dichloropropane	ND	36	12	ND	7.8	2.5	
75-27-4	Bromodichloromethane	ND	36	11	ND	5.4	1.6	
79-01-6	Trichloroethene	ND	36	10	ND	6.7	1.9	
123-91-1	1,4-Dioxane	ND	36	12	ND	10	3.2	
80-62-6	Methyl Methacrylate	ND	72	22	ND	18	5.5	
142-82-5	n-Heptane	ND	36	12	ND	8.8	3.0	
10061-01-5	cis-1,3-Dichloropropene	ND	36	10	ND	8.0	2.2	
108-10-1	4-Methyl-2-pentanone	ND	36	12	ND	8.8	2.8	
10061-02-6	trans-1,3-Dichloropropene	ND	36	12	ND	8.0	2.5	
79-00-5	1,1,2-Trichloroethane	ND	36	12	ND	6.6	2.1	
108-88-3	Toluene	<b>23</b>	36	12	<b>6.0</b>	9.6	3.3	<b>J</b>
591-78-6	2-Hexanone	ND	36	12	ND	8.8	2.8	
124-48-1	Dibromochloromethane	ND	36	12	ND	4.2	1.4	
106-93-4	1,2-Dibromoethane	ND	36	12	ND	4.7	1.5	
123-86-4	n-Butyl Acetate	ND	36	12	ND	7.6	2.4	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sNQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-015

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00121

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.40 Liter(s)

Initial Pressure (psig): -13.88      Final Pressure (psig): 8.99

Canister Dilution Factor: 28.89

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	16	36	13	3.4	7.7	2.8	J
127-18-4	Tetrachloroethene	ND	36	10	ND	5.3	1.5	
108-90-7	Chlorobenzene	ND	36	12	ND	7.8	2.5	
100-41-4	Ethylbenzene	ND	36	12	ND	8.3	2.7	
179601-23-1	m,p-Xylenes	ND	72	22	ND	17	5.0	
75-25-2	Bromoform	ND	36	11	ND	3.5	1.0	
100-42-5	Styrene	ND	36	11	ND	8.5	2.5	
95-47-6	o-Xylene	ND	36	11	ND	8.3	2.5	
111-84-2	n-Nonane	ND	36	11	ND	6.9	2.1	
79-34-5	1,1,2,2-Tetrachloroethane	ND	36	11	ND	5.3	1.6	
98-82-8	Cumene	ND	36	11	ND	7.3	2.2	
80-56-8	alpha-Pinene	ND	36	10	ND	6.5	1.8	
103-65-1	n-Propylbenzene	ND	36	12	ND	7.3	2.4	
622-96-8	4-Ethyltoluene	ND	36	12	ND	7.3	2.4	
108-67-8	1,3,5-Trimethylbenzene	ND	36	12	ND	7.3	2.4	
95-63-6	1,2,4-Trimethylbenzene	ND	36	11	ND	7.3	2.2	
100-44-7	Benzyl Chloride	ND	36	7.9	ND	7.0	1.5	
541-73-1	1,3-Dichlorobenzene	ND	36	11	ND	6.0	1.8	
106-46-7	1,4-Dichlorobenzene	ND	36	10	ND	6.0	1.7	
95-50-1	1,2-Dichlorobenzene	ND	36	11	ND	6.0	1.8	
5989-27-5	d-Limonene	15	36	10	2.6	6.5	1.8	J
96-12-8	1,2-Dibromo-3-chloropropane	ND	36	7.2	ND	3.7	0.74	
120-82-1	1,2,4-Trichlorobenzene	ND	36	12	ND	4.9	1.6	
91-20-3	Naphthalene	ND	36	13	ND	6.9	2.5	
87-68-3	Hexachlorobutadiene	ND	36	10	ND	3.4	0.95	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sNQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-015

**Tentatively Identified Compounds**

Test Code:	EPA TO-15 Modified	Date Collected:	7/29/15
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	7/31/15
Analyst:	Lusine Hakobyan	Date Analyzed:	8/11/15
Sample Type:	1.0 L Silonite Summa Canister	Volume(s) Analyzed:	0.40 Liter(s)
Test Notes:	<b>T</b>		
Container ID:	1SS00121		

Initial Pressure (psig): -13.88      Final Pressure (psig): 8.99

Canister Dilution Factor: 28.89

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
5.17	2-Methylpropene	140	
10.11	Trimethylsilanol	830	
17.28	Hexamethylcyclotrisiloxane	140	
20.11	unknown	230	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-016

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00123

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 1.00 Liter(s)  
 0.050 Liter(s)

Initial Pressure (psig): -1.84      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.42

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	3.9	0.71	0.20	2.3	0.41	0.12	
75-71-8	Dichlorodifluoromethane (CFC 12)	3.6	0.71	0.24	0.73	0.14	0.049	
74-87-3	Chloromethane	0.48	0.71	0.21	0.23	0.34	0.10	J
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.71	0.27	ND	0.10	0.039	
75-01-4	Vinyl Chloride	ND	0.71	0.24	ND	0.28	0.094	
106-99-0	1,3-Butadiene	ND	0.71	0.31	ND	0.32	0.14	
74-83-9	Bromomethane	ND	0.71	0.27	ND	0.18	0.070	
75-00-3	Chloroethane	ND	0.71	0.24	ND	0.27	0.092	
64-17-5	Ethanol	120	7.1	1.1	65	3.8	0.60	
75-05-8	Acetonitrile	4.4	0.71	0.26	2.6	0.42	0.15	
107-02-8	Acrolein	7.1	2.8	0.24	3.1	1.2	0.11	
67-64-1	Acetone	68	7.1	1.1	29	3.0	0.46	
75-69-4	Trichlorofluoromethane	1.9	0.71	0.24	0.34	0.13	0.043	
67-63-0	2-Propanol (Isopropyl Alcohol)	47	7.1	0.60	19	2.9	0.24	
107-13-1	Acrylonitrile	ND	0.71	0.24	ND	0.33	0.11	
75-35-4	1,1-Dichloroethene	ND	0.71	0.24	ND	0.18	0.061	
75-09-2	Methylene Chloride	2.9	0.71	0.24	0.84	0.20	0.070	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.71	0.23	ND	0.23	0.073	
76-13-1	Trichlorotrifluoroethane	0.50	0.71	0.24	0.065	0.093	0.032	J
75-15-0	Carbon Disulfide	5.0	7.1	0.21	1.6	2.3	0.068	J
156-60-5	trans-1,2-Dichloroethene	0.32	0.71	0.27	0.081	0.18	0.068	J
75-34-3	1,1-Dichloroethane	ND	0.71	0.23	ND	0.18	0.056	
1634-04-4	Methyl tert-Butyl Ether	ND	0.71	0.24	ND	0.20	0.067	
108-05-4	Vinyl Acetate	67	7.1	0.92	19	2.0	0.26	
78-93-3	2-Butanone (MEK)	17	7.1	0.30	5.6	2.4	0.10	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-016

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00123

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 1.00 Liter(s)  
 0.050 Liter(s)

Initial Pressure (psig): -1.84      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.71	0.23	ND	0.18	0.057	
141-78-6	Ethyl Acetate	<b>2,500</b>	28	9.9	<b>710</b>	7.9	2.8	<b>D</b>
110-54-3	n-Hexane	<b>52</b>	0.71	0.21	<b>15</b>	0.20	0.060	
67-66-3	Chloroform	<b>0.51</b>	0.71	0.24	<b>0.10</b>	0.15	0.049	<b>J</b>
109-99-9	Tetrahydrofuran (THF)	<b>2.7</b>	0.71	0.28	<b>0.92</b>	0.24	0.096	
107-06-2	1,2-Dichloroethane	<b>0.25</b>	0.71	0.23	<b>0.062</b>	0.18	0.056	<b>J</b>
71-55-6	1,1,1-Trichloroethane	ND	0.71	0.24	ND	0.13	0.044	
71-43-2	Benzene	<b>12</b>	0.71	0.23	<b>3.8</b>	0.22	0.071	
56-23-5	Carbon Tetrachloride	<b>0.48</b>	0.71	0.21	<b>0.076</b>	0.11	0.034	<b>J</b>
110-82-7	Cyclohexane	<b>5.7</b>	1.4	0.41	<b>1.7</b>	0.41	0.12	
78-87-5	1,2-Dichloropropane	ND	0.71	0.23	ND	0.15	0.049	
75-27-4	Bromodichloromethane	ND	0.71	0.21	ND	0.11	0.032	
79-01-6	Trichloroethene	ND	0.71	0.20	ND	0.13	0.037	
123-91-1	1,4-Dioxane	ND	0.71	0.23	ND	0.20	0.063	
80-62-6	Methyl Methacrylate	<b>4.1</b>	1.4	0.44	<b>0.99</b>	0.35	0.11	
142-82-5	n-Heptane	<b>5.6</b>	0.71	0.24	<b>1.4</b>	0.17	0.059	
10061-01-5	cis-1,3-Dichloropropene	ND	0.71	0.20	ND	0.16	0.044	
108-10-1	4-Methyl-2-pentanone	<b>1.5</b>	0.71	0.23	<b>0.36</b>	0.17	0.055	
10061-02-6	trans-1,3-Dichloropropene	ND	0.71	0.23	ND	0.16	0.050	
79-00-5	1,1,2-Trichloroethane	ND	0.71	0.23	ND	0.13	0.042	
108-88-3	Toluene	<b>260</b>	14	4.8	<b>70</b>	3.8	1.3	<b>D</b>
591-78-6	2-Hexanone	<b>0.71</b>	0.71	0.23	<b>0.17</b>	0.17	0.055	<b>J</b>
124-48-1	Dibromochloromethane	ND	0.71	0.23	ND	0.083	0.027	
106-93-4	1,2-Dibromoethane	ND	0.71	0.23	ND	0.092	0.030	
123-86-4	n-Butyl Acetate	<b>8.3</b>	0.71	0.23	<b>1.8</b>	0.15	0.048	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-016

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00123

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 1.00 Liter(s)  
 0.050 Liter(s)

Initial Pressure (psig): -1.84      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	0.98	0.71	0.26	0.21	0.15	0.055	
127-18-4	Tetrachloroethene	0.45	0.71	0.20	0.067	0.10	0.029	J
108-90-7	Chlorobenzene	0.32	0.71	0.23	0.069	0.15	0.049	J
100-41-4	Ethylbenzene	2.2	0.71	0.23	0.52	0.16	0.052	
179601-23-1	m,p-Xylenes	6.2	1.4	0.43	1.4	0.33	0.098	
75-25-2	Bromoform	ND	0.71	0.21	ND	0.069	0.021	
100-42-5	Styrene	2.7	0.71	0.21	0.62	0.17	0.050	
95-47-6	o-Xylene	2.6	0.71	0.21	0.59	0.16	0.049	
111-84-2	n-Nonane	4.0	0.71	0.21	0.76	0.14	0.041	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.71	0.21	ND	0.10	0.031	
98-82-8	Cumene	0.42	0.71	0.21	0.086	0.14	0.043	J
80-56-8	alpha-Pinene	3.1	0.71	0.20	0.56	0.13	0.036	
103-65-1	n-Propylbenzene	0.45	0.71	0.23	0.092	0.14	0.046	J
622-96-8	4-Ethyltoluene	0.57	0.71	0.23	0.12	0.14	0.046	J
108-67-8	1,3,5-Trimethylbenzene	0.57	0.71	0.23	0.12	0.14	0.046	J
95-63-6	1,2,4-Trimethylbenzene	1.8	0.71	0.21	0.36	0.14	0.043	
100-44-7	Benzyl Chloride	ND	0.71	0.16	ND	0.14	0.030	
541-73-1	1,3-Dichlorobenzene	ND	0.71	0.21	ND	0.12	0.035	
106-46-7	1,4-Dichlorobenzene	0.25	0.71	0.20	0.042	0.12	0.033	J
95-50-1	1,2-Dichlorobenzene	ND	0.71	0.21	ND	0.12	0.035	
5989-27-5	d-Limonene	10	0.71	0.20	1.8	0.13	0.036	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.71	0.14	ND	0.073	0.015	
120-82-1	1,2,4-Trichlorobenzene	ND	0.71	0.23	ND	0.096	0.031	
91-20-3	Naphthalene	0.54	0.71	0.26	0.10	0.14	0.049	J
87-68-3	Hexachlorobutadiene	ND	0.71	0.20	ND	0.067	0.019	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-016

**Tentatively Identified Compounds**

Test Code:	EPA TO-15 Modified	Date Collected:	7/30/15
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	7/31/15
Analyst:	Lusine Hakobyan	Date Analyzed:	8/11/15
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:	<b>T</b>		0.050 Liter(s)
Container ID:	SSC00123		

Initial Pressure (psig): -1.84      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.42

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
4.03	1,1-Difluoroethane	62	
4.20	Sulfur Dioxide	97	
4.80	Isobutane	41	
7.87	n-Pentane	46	
10.72	3-Methylpentane	15	
12.18	Methylcyclopentane	17	
16.35	n-Hexanal	17	
19.84	(C11H24) Alkane: Straight-Chain	77	
20.02	(C11H24) Alkane: Straight-Chain	20	
20.27	(C12H26) Alkane: Straight-Chain	21	
20.41	2-Ethyl-1-hexanol	35	
20.61	(C12H26) Alkane: Straight-Chain	31	
20.82	(C12H26) Alkane: Straight-Chain	26	
21.22	n-Nonanal	15	
21.65	2-Ethylhexylacetate	73	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-GSumma  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-017

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00017

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.40 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	ND	1.3	0.35	ND	0.73	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	1.3	0.43	ND	0.25	0.086	
74-87-3	Chloromethane	ND	1.3	0.38	ND	0.61	0.18	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	1.3	0.48	ND	0.18	0.068	
75-01-4	Vinyl Chloride	ND	1.3	0.43	ND	0.49	0.17	
106-99-0	1,3-Butadiene	ND	1.3	0.55	ND	0.57	0.25	
74-83-9	Bromomethane	ND	1.3	0.48	ND	0.32	0.12	
75-00-3	Chloroethane	ND	1.3	0.43	ND	0.47	0.16	
64-17-5	Ethanol	ND	13	2.0	ND	6.6	1.1	
75-05-8	Acetonitrile	ND	1.3	0.45	ND	0.74	0.27	
107-02-8	Acrolein	ND	5.0	0.43	ND	2.2	0.19	
67-64-1	Acetone	ND	13	1.9	ND	5.3	0.81	
75-69-4	Trichlorofluoromethane	ND	1.3	0.43	ND	0.22	0.076	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	13	1.1	ND	5.1	0.43	
107-13-1	Acrylonitrile	ND	1.3	0.43	ND	0.58	0.20	
75-35-4	1,1-Dichloroethene	ND	1.3	0.43	ND	0.32	0.11	
75-09-2	Methylene Chloride	ND	1.3	0.43	ND	0.36	0.12	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	1.3	0.40	ND	0.40	0.13	
76-13-1	Trichlorotrifluoroethane	ND	1.3	0.43	ND	0.16	0.055	
75-15-0	Carbon Disulfide	ND	13	0.38	ND	4.0	0.12	
156-60-5	trans-1,2-Dichloroethene	ND	1.3	0.48	ND	0.32	0.12	
75-34-3	1,1-Dichloroethane	ND	1.3	0.40	ND	0.31	0.099	
1634-04-4	Methyl tert-Butyl Ether	ND	1.3	0.43	ND	0.35	0.12	
108-05-4	Vinyl Acetate	ND	13	1.6	ND	3.6	0.46	
78-93-3	2-Butanone (MEK)	ND	13	0.53	ND	4.2	0.18	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-GSumma  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-017

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00017

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.40 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	1.3	0.40	ND	0.32	0.10	
141-78-6	Ethyl Acetate	ND	2.5	0.88	ND	0.69	0.24	
110-54-3	n-Hexane	ND	1.3	0.38	ND	0.35	0.11	
67-66-3	Chloroform	ND	1.3	0.43	ND	0.26	0.087	
109-99-9	Tetrahydrofuran (THF)	ND	1.3	0.50	ND	0.42	0.17	
107-06-2	1,2-Dichloroethane	ND	1.3	0.40	ND	0.31	0.099	
71-55-6	1,1,1-Trichloroethane	ND	1.3	0.43	ND	0.23	0.078	
71-43-2	Benzene	ND	1.3	0.40	ND	0.39	0.13	
56-23-5	Carbon Tetrachloride	ND	1.3	0.38	ND	0.20	0.060	
110-82-7	Cyclohexane	ND	2.5	0.73	ND	0.73	0.21	
78-87-5	1,2-Dichloropropane	ND	1.3	0.40	ND	0.27	0.087	
75-27-4	Bromodichloromethane	ND	1.3	0.38	ND	0.19	0.056	
79-01-6	Trichloroethene	ND	1.3	0.35	ND	0.23	0.065	
123-91-1	1,4-Dioxane	ND	1.3	0.40	ND	0.35	0.11	
80-62-6	Methyl Methacrylate	ND	2.5	0.78	ND	0.61	0.19	
142-82-5	n-Heptane	ND	1.3	0.43	ND	0.31	0.10	
10061-01-5	cis-1,3-Dichloropropene	ND	1.3	0.35	ND	0.28	0.077	
108-10-1	4-Methyl-2-pentanone	ND	1.3	0.40	ND	0.31	0.098	
10061-02-6	trans-1,3-Dichloropropene	ND	1.3	0.40	ND	0.28	0.088	
79-00-5	1,1,2-Trichloroethane	ND	1.3	0.40	ND	0.23	0.073	
108-88-3	Toluene	ND	1.3	0.43	ND	0.33	0.11	
591-78-6	2-Hexanone	ND	1.3	0.40	ND	0.31	0.098	
124-48-1	Dibromochloromethane	ND	1.3	0.40	ND	0.15	0.047	
106-93-4	1,2-Dibromoethane	ND	1.3	0.40	ND	0.16	0.052	
123-86-4	n-Butyl Acetate	ND	1.3	0.40	ND	0.26	0.084	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-GSumma  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-017

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00017

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.40 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	1.3	0.45	ND	0.27	0.096	
127-18-4	Tetrachloroethene	ND	1.3	0.35	ND	0.18	0.052	
108-90-7	Chlorobenzene	ND	1.3	0.40	ND	0.27	0.087	
100-41-4	Ethylbenzene	ND	1.3	0.40	ND	0.29	0.092	
179601-23-1	m,p-Xylenes	ND	2.5	0.75	ND	0.58	0.17	
75-25-2	Bromoform	ND	1.3	0.38	ND	0.12	0.036	
100-42-5	Styrene	ND	1.3	0.38	ND	0.29	0.088	
95-47-6	o-Xylene	ND	1.3	0.38	ND	0.29	0.086	
111-84-2	n-Nonane	ND	1.3	0.38	ND	0.24	0.072	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.3	0.38	ND	0.18	0.055	
98-82-8	Cumene	ND	1.3	0.38	ND	0.25	0.076	
80-56-8	alpha-Pinene	ND	1.3	0.35	ND	0.22	0.063	
103-65-1	n-Propylbenzene	ND	1.3	0.40	ND	0.25	0.081	
622-96-8	4-Ethyltoluene	ND	1.3	0.40	ND	0.25	0.081	
108-67-8	1,3,5-Trimethylbenzene	ND	1.3	0.40	ND	0.25	0.081	
95-63-6	1,2,4-Trimethylbenzene	ND	1.3	0.38	ND	0.25	0.076	
100-44-7	Benzyl Chloride	ND	1.3	0.28	ND	0.24	0.053	
541-73-1	1,3-Dichlorobenzene	ND	1.3	0.38	ND	0.21	0.062	
106-46-7	1,4-Dichlorobenzene	ND	1.3	0.35	ND	0.21	0.058	
95-50-1	1,2-Dichlorobenzene	ND	1.3	0.38	ND	0.21	0.062	
5989-27-5	d-Limonene	ND	1.3	0.35	ND	0.22	0.063	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.3	0.25	ND	0.13	0.026	
120-82-1	1,2,4-Trichlorobenzene	ND	1.3	0.40	ND	0.17	0.054	
91-20-3	Naphthalene	ND	1.3	0.45	ND	0.24	0.086	
87-68-3	Hexachlorobutadiene	ND	1.3	0.35	ND	0.12	0.033	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 730TB-GSumma  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
ALS Sample ID: P1503125-017

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sample Type: 1.0 L Silonite Summa Canister  
Test Notes: **T**  
Container ID: 1SS00017

Date Collected: 7/30/15  
Date Received: 7/31/15  
Date Analyzed: 8/11/15  
Volume(s) Analyzed: 0.40 Liter(s)

Canister Dilution Factor: 1.00

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
17.28	Hexamethylcyclotrisiloxane	290	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Summa (B)  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-018

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00102

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.00020 Liter(s)

Initial Pressure (psig): -2.84      Final Pressure (psig): 6.44

Canister Dilution Factor: 1.78

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	<b>130,000</b>	4,500	1,200	<b>78,000</b>	2,600	720	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	4,500	1,500	ND	900	310	
74-87-3	Chloromethane	<b>8,400</b>	4,500	1,300	<b>4,100</b>	2,200	650	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	4,500	1,700	ND	640	240	
75-01-4	Vinyl Chloride	ND	4,500	1,500	ND	1,700	590	
106-99-0	1,3-Butadiene	<b>3,200</b>	4,500	2,000	<b>1,400</b>	2,000	890	<b>J</b>
74-83-9	Bromomethane	ND	4,500	1,700	ND	1,100	440	
75-00-3	Chloroethane	<b>2,300</b>	4,500	1,500	<b>870</b>	1,700	570	<b>J</b>
64-17-5	Ethanol	<b>1,500,000</b>	45,000	7,100	<b>780,000</b>	24,000	3,800	
75-05-8	Acetonitrile	ND	4,500	1,600	ND	2,700	950	
107-02-8	Acrolein	ND	18,000	1,500	ND	7,800	660	
67-64-1	Acetone	<b>1,500,000</b>	45,000	6,900	<b>630,000</b>	19,000	2,900	
75-69-4	Trichlorofluoromethane	ND	4,500	1,500	ND	790	270	
67-63-0	2-Propanol (Isopropyl Alcohol)	<b>400,000</b>	45,000	3,700	<b>160,000</b>	18,000	1,500	
107-13-1	Acrylonitrile	ND	4,500	1,500	ND	2,100	700	
75-35-4	1,1-Dichloroethene	ND	4,500	1,500	ND	1,100	380	
75-09-2	Methylene Chloride	ND	4,500	1,500	ND	1,300	440	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	4,500	1,400	ND	1,400	460	
76-13-1	Trichlorotrifluoroethane	ND	4,500	1,500	ND	580	200	
75-15-0	Carbon Disulfide	<b>1,700</b>	45,000	1,300	<b>560</b>	14,000	430	<b>J</b>
156-60-5	trans-1,2-Dichloroethene	ND	4,500	1,700	ND	1,100	430	
75-34-3	1,1-Dichloroethane	ND	4,500	1,400	ND	1,100	350	
1634-04-4	Methyl tert-Butyl Ether	ND	4,500	1,500	ND	1,200	420	
108-05-4	Vinyl Acetate	ND	45,000	5,800	ND	13,000	1,600	
78-93-3	2-Butanone (MEK)	<b>930,000</b>	45,000	1,900	<b>310,000</b>	15,000	630	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

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J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Summa (B)  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-018

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00102

Date Collected: 7/30/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.00020 Liter(s)

Initial Pressure (psig): -2.84      Final Pressure (psig): 6.44

Canister Dilution Factor: 1.78

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	4,500	1,400	ND	1,100	360	
141-78-6	Ethyl Acetate	<b>180,000</b>	8,900	3,100	<b>50,000</b>	2,500	860	
110-54-3	n-Hexane	<b>6,000</b>	4,500	1,300	<b>1,700</b>	1,300	380	
67-66-3	Chloroform	ND	4,500	1,500	ND	910	310	
109-99-9	Tetrahydrofuran (THF)	<b>610,000</b>	4,500	1,800	<b>210,000</b>	1,500	600	
107-06-2	1,2-Dichloroethane	ND	4,500	1,400	ND	1,100	350	
71-55-6	1,1,1-Trichloroethane	ND	4,500	1,500	ND	820	280	
71-43-2	Benzene	<b>450,000</b>	4,500	1,400	<b>140,000</b>	1,400	450	
56-23-5	Carbon Tetrachloride	ND	4,500	1,300	ND	710	210	
110-82-7	Cyclohexane	ND	8,900	2,600	ND	2,600	750	
78-87-5	1,2-Dichloropropane	ND	4,500	1,400	ND	960	310	
75-27-4	Bromodichloromethane	ND	4,500	1,300	ND	660	200	
79-01-6	Trichloroethene	<b>1,400</b>	4,500	1,200	<b>260</b>	830	230	<b>J</b>
123-91-1	1,4-Dioxane	<b>26,000</b>	4,500	1,400	<b>7,100</b>	1,200	400	
80-62-6	Methyl Methacrylate	ND	8,900	2,800	ND	2,200	670	
142-82-5	n-Heptane	<b>5,800</b>	4,500	1,500	<b>1,400</b>	1,100	370	
10061-01-5	cis-1,3-Dichloropropene	ND	4,500	1,200	ND	980	270	
108-10-1	4-Methyl-2-pentanone	<b>42,000</b>	4,500	1,400	<b>10,000</b>	1,100	350	
10061-02-6	trans-1,3-Dichloropropene	ND	4,500	1,400	ND	980	310	
79-00-5	1,1,2-Trichloroethane	ND	4,500	1,400	ND	820	260	
108-88-3	Toluene	<b>110,000</b>	4,500	1,500	<b>30,000</b>	1,200	400	
591-78-6	2-Hexanone	<b>26,000</b>	4,500	1,400	<b>6,200</b>	1,100	350	
124-48-1	Dibromochloromethane	ND	4,500	1,400	ND	520	170	
106-93-4	1,2-Dibromoethane	ND	4,500	1,400	ND	580	190	
123-86-4	n-Butyl Acetate	<b>110,000</b>	4,500	1,400	<b>22,000</b>	940	300	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 729sF-Summa (B)

**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125

ALS Sample ID: P1503125-018

Test Code: EPA TO-15 Modified

Date Collected: 7/30/15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Date Received: 7/31/15

Analyst: Lusine Hakobyan

Date Analyzed: 8/11/15

Sample Type: 1.0 L Silonite Summa Canister

Volume(s) Analyzed: 0.00020 Liter(s)

Test Notes:

Container ID: 1SS00102

Initial Pressure (psig): -2.84      Final Pressure (psig): 6.44

Canister Dilution Factor: 1.78

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	17,000	4,500	1,600	3,600	950	340	
127-18-4	Tetrachloroethene	ND	4,500	1,200	ND	660	180	
108-90-7	Chlorobenzene	3,400	4,500	1,400	730	970	310	J
100-41-4	Ethylbenzene	51,000	4,500	1,400	12,000	1,000	330	
179601-23-1	m,p-Xylenes	88,000	8,900	2,700	20,000	2,000	610	
75-25-2	Bromoform	ND	4,500	1,300	ND	430	130	
100-42-5	Styrene	2,500	4,500	1,300	590	1,000	310	J
95-47-6	o-Xylene	33,000	4,500	1,300	7,700	1,000	310	
111-84-2	n-Nonane	20,000	4,500	1,300	3,900	850	250	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4,500	1,300	ND	650	190	
98-82-8	Cumene	11,000	4,500	1,300	2,300	910	270	
80-56-8	alpha-Pinene	25,000	4,500	1,200	4,400	800	220	
103-65-1	n-Propylbenzene	7,300	4,500	1,400	1,500	910	290	
622-96-8	4-Ethyltoluene	10,000	4,500	1,400	2,100	910	290	
108-67-8	1,3,5-Trimethylbenzene	10,000	4,500	1,400	2,100	910	290	
95-63-6	1,2,4-Trimethylbenzene	35,000	4,500	1,300	7,200	910	270	
100-44-7	Benzyl Chloride	ND	4,500	980	ND	860	190	
541-73-1	1,3-Dichlorobenzene	ND	4,500	1,300	ND	740	220	
106-46-7	1,4-Dichlorobenzene	31,000	4,500	1,200	5,100	740	210	
95-50-1	1,2-Dichlorobenzene	ND	4,500	1,300	ND	740	220	
5989-27-5	d-Limonene	67,000	4,500	1,200	12,000	800	220	
96-12-8	1,2-Dibromo-3-chloropropane	ND	4,500	880	ND	460	91	
120-82-1	1,2,4-Trichlorobenzene	ND	4,500	1,400	ND	600	190	
91-20-3	Naphthalene	2,600	4,500	1,600	500	850	310	J
87-68-3	Hexachlorobutadiene	ND	4,500	1,200	ND	420	120	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sF-Summa (B)  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-018

**Tentatively Identified Compounds**

Test Code:	EPA TO-15 Modified	Date Collected:	7/30/15
Instrument ID:	Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16	Date Received:	7/31/15
Analyst:	Lusine Hakobyan	Date Analyzed:	8/11/15
Sample Type:	1.0 L Silonite Summa Canister	Volume(s) Analyzed:	0.00020 Liter(s)
Test Notes:	<b>T</b>		
Container ID:	1SS00102		

Initial Pressure (psig): -2.84      Final Pressure (psig): 6.44

Canister Dilution Factor: 1.78

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
4.49	Dimethyl Ether	180,000	
5.15	2-Methylpropene	110,000	
8.15	Dimethyl Sulfide	1,700,000	
8.46	Methyl Acetate	750,000	
9.60	1-Propanol	290,000	
10.95	2-Butanol	320,000	
11.10	2-Methylfuran	480,000	
11.85	Methyl Propionate	600,000	
13.39	2-Pentanone	120,000	
13.56	Methyl isobutyrate	140,000	
14.52	Methyl Butyrate	870,000	
15.13	Dimethyl disulfide	310,000	
17.27	2-Methylcyclopentanone	180,000	
18.90	Methyl hexanoate	170,000	
20.53	p-Isopropyltoluene	180,000	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150810-MB

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	ND	0.50	0.14	ND	0.29	0.081	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	0.17	ND	0.10	0.034	
74-87-3	Chloromethane	ND	0.50	0.15	ND	0.24	0.073	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	0.19	ND	0.072	0.027	
75-01-4	Vinyl Chloride	ND	0.50	0.17	ND	0.20	0.067	
106-99-0	1,3-Butadiene	ND	0.50	0.22	ND	0.23	0.099	
74-83-9	Bromomethane	ND	0.50	0.19	ND	0.13	0.049	
75-00-3	Chloroethane	ND	0.50	0.17	ND	0.19	0.064	
64-17-5	Ethanol	ND	5.0	0.80	ND	2.7	0.42	
75-05-8	Acetonitrile	ND	0.50	0.18	ND	0.30	0.11	
107-02-8	Acrolein	ND	2.0	0.17	ND	0.87	0.074	
67-64-1	Acetone	ND	5.0	0.77	ND	2.1	0.32	
75-69-4	Trichlorofluoromethane	ND	0.50	0.17	ND	0.089	0.030	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	0.42	ND	2.0	0.17	
107-13-1	Acrylonitrile	ND	0.50	0.17	ND	0.23	0.078	
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	ND	0.13	0.043	
75-09-2	Methylene Chloride	ND	0.50	0.17	ND	0.14	0.049	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	0.16	ND	0.16	0.051	
76-13-1	Trichlorotrifluoroethane	ND	0.50	0.17	ND	0.065	0.022	
75-15-0	Carbon Disulfide	ND	5.0	0.15	ND	1.6	0.048	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.19	ND	0.13	0.048	
75-34-3	1,1-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	0.17	ND	0.14	0.047	
108-05-4	Vinyl Acetate	ND	5.0	0.65	ND	1.4	0.18	
78-93-3	2-Butanone (MEK)	ND	5.0	0.21	ND	1.7	0.071	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150810-MB

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.16	ND	0.13	0.040	
141-78-6	Ethyl Acetate	ND	1.0	0.35	ND	0.28	0.097	
110-54-3	n-Hexane	ND	0.50	0.15	ND	0.14	0.043	
67-66-3	Chloroform	ND	0.50	0.17	ND	0.10	0.035	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	0.20	ND	0.17	0.068	
107-06-2	1,2-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.17	ND	0.092	0.031	
71-43-2	Benzene	ND	0.50	0.16	ND	0.16	0.050	
56-23-5	Carbon Tetrachloride	ND	0.50	0.15	ND	0.080	0.024	
110-82-7	Cyclohexane	ND	1.0	0.29	ND	0.29	0.084	
78-87-5	1,2-Dichloropropane	ND	0.50	0.16	ND	0.11	0.035	
75-27-4	Bromodichloromethane	ND	0.50	0.15	ND	0.075	0.022	
79-01-6	Trichloroethene	ND	0.50	0.14	ND	0.093	0.026	
123-91-1	1,4-Dioxane	ND	0.50	0.16	ND	0.14	0.044	
80-62-6	Methyl Methacrylate	ND	1.0	0.31	ND	0.24	0.076	
142-82-5	n-Heptane	ND	0.50	0.17	ND	0.12	0.041	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	ND	0.11	0.031	
108-10-1	4-Methyl-2-pentanone	ND	0.50	0.16	ND	0.12	0.039	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	ND	0.11	0.035	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.16	ND	0.092	0.029	
108-88-3	Toluene	ND	0.50	0.17	ND	0.13	0.045	
591-78-6	2-Hexanone	ND	0.50	0.16	ND	0.12	0.039	
124-48-1	Dibromochloromethane	ND	0.50	0.16	ND	0.059	0.019	
106-93-4	1,2-Dibromoethane	ND	0.50	0.16	ND	0.065	0.021	
123-86-4	n-Butyl Acetate	ND	0.50	0.16	ND	0.11	0.034	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150810-MB

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	0.18	ND	0.11	0.039	
127-18-4	Tetrachloroethene	ND	0.50	0.14	ND	0.074	0.021	
108-90-7	Chlorobenzene	ND	0.50	0.16	ND	0.11	0.035	
100-41-4	Ethylbenzene	ND	0.50	0.16	ND	0.12	0.037	
179601-23-1	m,p-Xylenes	ND	1.0	0.30	ND	0.23	0.069	
75-25-2	Bromoform	ND	0.50	0.15	ND	0.048	0.015	
100-42-5	Styrene	ND	0.50	0.15	ND	0.12	0.035	
95-47-6	o-Xylene	ND	0.50	0.15	ND	0.12	0.035	
111-84-2	n-Nonane	ND	0.50	0.15	ND	0.095	0.029	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.15	ND	0.073	0.022	
98-82-8	Cumene	ND	0.50	0.15	ND	0.10	0.031	
80-56-8	alpha-Pinene	ND	0.50	0.14	ND	0.090	0.025	
103-65-1	n-Propylbenzene	ND	0.50	0.16	ND	0.10	0.033	
622-96-8	4-Ethyltoluene	ND	0.50	0.16	ND	0.10	0.033	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.16	ND	0.10	0.033	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.15	ND	0.10	0.031	
100-44-7	Benzyl Chloride	ND	0.50	0.11	ND	0.097	0.021	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.14	ND	0.083	0.023	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
5989-27-5	d-Limonene	ND	0.50	0.14	ND	0.090	0.025	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	0.099	ND	0.052	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.16	ND	0.067	0.022	
91-20-3	Naphthalene	ND	0.50	0.18	ND	0.095	0.034	
87-68-3	Hexachlorobutadiene	ND	0.50	0.14	ND	0.047	0.013	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125

ALS Sample ID: P150810-MB

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/10/15

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
<hr/> No Compounds Detected <hr/>			

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150811-MB

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	ND	0.50	0.14	ND	0.29	0.081	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	0.17	ND	0.10	0.034	
74-87-3	Chloromethane	ND	0.50	0.15	ND	0.24	0.073	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	0.19	ND	0.072	0.027	
75-01-4	Vinyl Chloride	ND	0.50	0.17	ND	0.20	0.067	
106-99-0	1,3-Butadiene	ND	0.50	0.22	ND	0.23	0.099	
74-83-9	Bromomethane	ND	0.50	0.19	ND	0.13	0.049	
75-00-3	Chloroethane	ND	0.50	0.17	ND	0.19	0.064	
64-17-5	Ethanol	ND	5.0	0.80	ND	2.7	0.42	
75-05-8	Acetonitrile	ND	0.50	0.18	ND	0.30	0.11	
107-02-8	Acrolein	ND	2.0	0.17	ND	0.87	0.074	
67-64-1	Acetone	ND	5.0	0.77	ND	2.1	0.32	
75-69-4	Trichlorofluoromethane	ND	0.50	0.17	ND	0.089	0.030	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	0.42	ND	2.0	0.17	
107-13-1	Acrylonitrile	ND	0.50	0.17	ND	0.23	0.078	
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	ND	0.13	0.043	
75-09-2	Methylene Chloride	ND	0.50	0.17	ND	0.14	0.049	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	0.16	ND	0.16	0.051	
76-13-1	Trichlorotrifluoroethane	ND	0.50	0.17	ND	0.065	0.022	
75-15-0	Carbon Disulfide	ND	5.0	0.15	ND	1.6	0.048	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.19	ND	0.13	0.048	
75-34-3	1,1-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	0.17	ND	0.14	0.047	
108-05-4	Vinyl Acetate	ND	5.0	0.65	ND	1.4	0.18	
78-93-3	2-Butanone (MEK)	ND	5.0	0.21	ND	1.7	0.071	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150811-MB

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.16	ND	0.13	0.040	
141-78-6	Ethyl Acetate	ND	1.0	0.35	ND	0.28	0.097	
110-54-3	n-Hexane	ND	0.50	0.15	ND	0.14	0.043	
67-66-3	Chloroform	ND	0.50	0.17	ND	0.10	0.035	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	0.20	ND	0.17	0.068	
107-06-2	1,2-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.17	ND	0.092	0.031	
71-43-2	Benzene	ND	0.50	0.16	ND	0.16	0.050	
56-23-5	Carbon Tetrachloride	ND	0.50	0.15	ND	0.080	0.024	
110-82-7	Cyclohexane	ND	1.0	0.29	ND	0.29	0.084	
78-87-5	1,2-Dichloropropane	ND	0.50	0.16	ND	0.11	0.035	
75-27-4	Bromodichloromethane	ND	0.50	0.15	ND	0.075	0.022	
79-01-6	Trichloroethene	ND	0.50	0.14	ND	0.093	0.026	
123-91-1	1,4-Dioxane	ND	0.50	0.16	ND	0.14	0.044	
80-62-6	Methyl Methacrylate	ND	1.0	0.31	ND	0.24	0.076	
142-82-5	n-Heptane	ND	0.50	0.17	ND	0.12	0.041	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	ND	0.11	0.031	
108-10-1	4-Methyl-2-pentanone	ND	0.50	0.16	ND	0.12	0.039	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	ND	0.11	0.035	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.16	ND	0.092	0.029	
108-88-3	Toluene	ND	0.50	0.17	ND	0.13	0.045	
591-78-6	2-Hexanone	ND	0.50	0.16	ND	0.12	0.039	
124-48-1	Dibromochloromethane	ND	0.50	0.16	ND	0.059	0.019	
106-93-4	1,2-Dibromoethane	ND	0.50	0.16	ND	0.065	0.021	
123-86-4	n-Butyl Acetate	ND	0.50	0.16	ND	0.11	0.034	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150811-MB

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	0.18	ND	0.11	0.039	
127-18-4	Tetrachloroethene	ND	0.50	0.14	ND	0.074	0.021	
108-90-7	Chlorobenzene	ND	0.50	0.16	ND	0.11	0.035	
100-41-4	Ethylbenzene	ND	0.50	0.16	ND	0.12	0.037	
179601-23-1	m,p-Xylenes	ND	1.0	0.30	ND	0.23	0.069	
75-25-2	Bromoform	ND	0.50	0.15	ND	0.048	0.015	
100-42-5	Styrene	ND	0.50	0.15	ND	0.12	0.035	
95-47-6	o-Xylene	ND	0.50	0.15	ND	0.12	0.035	
111-84-2	n-Nonane	ND	0.50	0.15	ND	0.095	0.029	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.15	ND	0.073	0.022	
98-82-8	Cumene	ND	0.50	0.15	ND	0.10	0.031	
80-56-8	alpha-Pinene	ND	0.50	0.14	ND	0.090	0.025	
103-65-1	n-Propylbenzene	ND	0.50	0.16	ND	0.10	0.033	
622-96-8	4-Ethyltoluene	ND	0.50	0.16	ND	0.10	0.033	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.16	ND	0.10	0.033	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.15	ND	0.10	0.031	
100-44-7	Benzyl Chloride	ND	0.50	0.11	ND	0.097	0.021	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.14	ND	0.083	0.023	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
5989-27-5	d-Limonene	ND	0.50	0.14	ND	0.090	0.025	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	0.099	ND	0.052	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.16	ND	0.067	0.022	
91-20-3	Naphthalene	ND	0.50	0.18	ND	0.095	0.034	
87-68-3	Hexachlorobutadiene	ND	0.50	0.14	ND	0.047	0.013	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125

ALS Sample ID: P150811-MB

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/11/15

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
<hr/> No Compounds Detected <hr/>			

**ALS ENVIRONMENTAL**

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister(s)  
 Test Notes:

Date(s) Collected: 7/28 - 7/30/15  
 Date(s) Received: 7/31/15  
 Date(s) Analyzed: 8/10 - 8/11/15

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P150810-MB	99	104	98	70-130	
Method Blank	P150811-MB	100	102	101	70-130	
Lab Control Sample	P150810-LCS	97	104	100	70-130	
Lab Control Sample	P150811-LCS	97	100	101	70-130	
728U1-Summa	P1503125-001	98	104	100	70-130	
728D1-Summa	P1503125-002	98	103	100	70-130	
728D2-Summa	P1503125-003	100	104	101	70-130	
728F-Summa	P1503125-004	99	103	102	70-130	
728SQ-Summa	P1503125-005	100	102	100	70-130	
728-DUPE10	P1503125-006	99	101	102	70-130	
729U1-Summa	P1503125-007	99	101	101	70-130	
729D1-Summa	P1503125-008	99	101	101	70-130	
729NQ-Summa	P1503125-009	100	101	103	70-130	
729N-Summa	P1503125-010	100	100	102	70-130	
729-DUPE11	P1503125-011	99	100	103	70-130	
729sN-Summa	P1503125-012	97	97	99	70-130	
729sSQ-Summa	P1503125-013	99	99	99	70-130	
729sSQ-Summa	P1503125-013DUP	98	98	100	70-130	
729sF-Summa (A)	P1503125-014	98	97	99	70-130	
729sNQ-Summa	P1503125-015	100	101	99	70-130	
730TB-Summa	P1503125-016	97	102	99	70-130	
730TB-GSumma	P1503125-017	100	102	99	70-130	
729sF-Summa (B)	P1503125-018	98	97	97	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150810-LCS

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
115-07-1	Propene	196	191	97	50-128	
75-71-8	Dichlorodifluoromethane (CFC 12)	188	184	98	66-117	
74-87-3	Chloromethane	200	168	84	51-133	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	204	176	86	65-117	
75-01-4	Vinyl Chloride	200	183	92	61-127	
106-99-0	1,3-Butadiene	206	198	96	65-132	
74-83-9	Bromomethane	202	184	91	62-114	
75-00-3	Chloroethane	200	189	95	64-122	
64-17-5	Ethanol	998	881	88	57-131	
75-05-8	Acetonitrile	212	191	90	52-135	
107-02-8	Acrolein	214	196	92	64-124	
67-64-1	Acetone	1,080	961	89	60-113	
75-69-4	Trichlorofluoromethane	216	170	79	64-112	
67-63-0	2-Propanol (Isopropyl Alcohol)	418	393	94	62-129	
107-13-1	Acrylonitrile	212	203	96	69-133	
75-35-4	1,1-Dichloroethene	216	202	94	70-114	
75-09-2	Methylene Chloride	222	203	91	63-103	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	218	199	91	57-135	
76-13-1	Trichlorotrifluoroethane	220	196	89	69-116	
75-15-0	Carbon Disulfide	210	179	85	66-118	
156-60-5	trans-1,2-Dichloroethene	210	196	93	69-123	
75-34-3	1,1-Dichloroethane	212	185	87	65-118	
1634-04-4	Methyl tert-Butyl Ether	216	198	92	57-125	
108-05-4	Vinyl Acetate	1,040	1340	129	69-131	
78-93-3	2-Butanone (MEK)	220	184	84	63-121	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.



# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150810-LCS

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
156-59-2	cis-1,2-Dichloroethene	218	197	90	69-119	
141-78-6	Ethyl Acetate	428	433	101	65-129	
110-54-3	n-Hexane	212	199	94	55-116	
67-66-3	Chloroform	224	191	85	68-111	
109-99-9	Tetrahydrofuran (THF)	220	214	97	69-120	
107-06-2	1,2-Dichloroethane	214	188	88	67-117	
71-55-6	1,1,1-Trichloroethane	210	189	90	74-116	
71-43-2	Benzene	226	181	80	61-109	
56-23-5	Carbon Tetrachloride	230	199	87	76-120	
110-82-7	Cyclohexane	424	381	90	72-115	
78-87-5	1,2-Dichloropropane	216	195	90	67-119	
75-27-4	Bromodichloromethane	218	203	93	78-124	
79-01-6	Trichloroethene	216	180	83	69-115	
123-91-1	1,4-Dioxane	210	219	104	69-127	
80-62-6	Methyl Methacrylate	422	458	109	76-128	
142-82-5	n-Heptane	216	198	92	66-118	
10061-01-5	cis-1,3-Dichloropropene	208	213	102	77-124	
108-10-1	4-Methyl-2-pentanone	220	226	103	66-134	
10061-02-6	trans-1,3-Dichloropropene	210	232	110	80-130	
79-00-5	1,1,2-Trichloroethane	216	201	93	75-119	
108-88-3	Toluene	218	221	101	68-114	
591-78-6	2-Hexanone	220	236	107	60-136	
124-48-1	Dibromochloromethane	220	228	104	75-132	
106-93-4	1,2-Dibromoethane	218	227	104	72-122	
123-86-4	n-Butyl Acetate	226	243	108	60-137	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150810-LCS

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/10/15  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
111-65-9	n-Octane	210	195	93	66-120	
127-18-4	Tetrachloroethene	202	191	95	67-120	
108-90-7	Chlorobenzene	220	206	94	69-114	
100-41-4	Ethylbenzene	218	202	93	71-117	
179601-23-1	m,p-Xylenes	428	395	92	71-118	
75-25-2	Bromoform	228	230	101	76-149	
100-42-5	Styrene	222	227	102	71-128	
95-47-6	o-Xylene	210	192	91	72-118	
111-84-2	n-Nonane	204	184	90	63-123	
79-34-5	1,1,2,2-Tetrachloroethane	210	222	106	73-124	
98-82-8	Cumene	208	188	90	71-118	
80-56-8	alpha-Pinene	212	209	99	71-123	
103-65-1	n-Propylbenzene	204	204	100	71-120	
622-96-8	4-Ethyltoluene	214	215	100	71-121	
108-67-8	1,3,5-Trimethylbenzene	214	197	92	72-121	
95-63-6	1,2,4-Trimethylbenzene	218	200	92	71-122	
100-44-7	Benzyl Chloride	220	255	116	79-143	
541-73-1	1,3-Dichlorobenzene	228	210	92	67-121	
106-46-7	1,4-Dichlorobenzene	208	199	96	68-121	
95-50-1	1,2-Dichlorobenzene	220	206	94	68-121	
5989-27-5	d-Limonene	210	211	100	69-137	
96-12-8	1,2-Dibromo-3-chloropropane	218	254	117	73-145	
120-82-1	1,2,4-Trichlorobenzene	230	233	101	60-135	
91-20-3	Naphthalene	218	225	103	63-142	
87-68-3	Hexachlorobutadiene	230	212	92	65-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.  
 Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150811-LCS

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
115-07-1	Propene	196	183	93	50-128	
75-71-8	Dichlorodifluoromethane (CFC 12)	188	177	94	66-117	
74-87-3	Chloromethane	200	160	80	51-133	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	204	169	83	65-117	
75-01-4	Vinyl Chloride	200	177	89	61-127	
106-99-0	1,3-Butadiene	206	186	90	65-132	
74-83-9	Bromomethane	202	176	87	62-114	
75-00-3	Chloroethane	200	179	90	64-122	
64-17-5	Ethanol	998	846	85	57-131	
75-05-8	Acetonitrile	212	184	87	52-135	
107-02-8	Acrolein	214	187	87	64-124	
67-64-1	Acetone	1,080	930	86	60-113	
75-69-4	Trichlorofluoromethane	216	163	75	64-112	
67-63-0	2-Propanol (Isopropyl Alcohol)	418	382	91	62-129	
107-13-1	Acrylonitrile	212	196	92	69-133	
75-35-4	1,1-Dichloroethene	216	193	89	70-114	
75-09-2	Methylene Chloride	222	194	87	63-103	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	218	196	90	57-135	
76-13-1	Trichlorotrifluoroethane	220	190	86	69-116	
75-15-0	Carbon Disulfide	210	174	83	66-118	
156-60-5	trans-1,2-Dichloroethene	210	190	90	69-123	
75-34-3	1,1-Dichloroethane	212	179	84	65-118	
1634-04-4	Methyl tert-Butyl Ether	216	191	88	57-125	
108-05-4	Vinyl Acetate	1,040	1310	126	69-131	
78-93-3	2-Butanone (MEK)	220	179	81	63-121	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150811-LCS

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
156-59-2	cis-1,2-Dichloroethene	218	192	88	69-119	
141-78-6	Ethyl Acetate	428	414	97	65-129	
110-54-3	n-Hexane	212	190	90	55-116	
67-66-3	Chloroform	224	184	82	68-111	
109-99-9	Tetrahydrofuran (THF)	220	209	95	69-120	
107-06-2	1,2-Dichloroethane	214	182	85	67-117	
71-55-6	1,1,1-Trichloroethane	210	186	89	74-116	
71-43-2	Benzene	226	178	79	61-109	
56-23-5	Carbon Tetrachloride	230	197	86	76-120	
110-82-7	Cyclohexane	424	375	88	72-115	
78-87-5	1,2-Dichloropropane	216	189	88	67-119	
75-27-4	Bromodichloromethane	218	198	91	78-124	
79-01-6	Trichloroethene	216	176	81	69-115	
123-91-1	1,4-Dioxane	210	213	101	69-127	
80-62-6	Methyl Methacrylate	422	448	106	76-128	
142-82-5	n-Heptane	216	192	89	66-118	
10061-01-5	cis-1,3-Dichloropropene	208	208	100	77-124	
108-10-1	4-Methyl-2-pentanone	220	222	101	66-134	
10061-02-6	trans-1,3-Dichloropropene	210	228	109	80-130	
79-00-5	1,1,2-Trichloroethane	216	195	90	75-119	
108-88-3	Toluene	218	206	94	68-114	
591-78-6	2-Hexanone	220	221	100	60-136	
124-48-1	Dibromochloromethane	220	215	98	75-132	
106-93-4	1,2-Dibromoethane	218	212	97	72-122	
123-86-4	n-Butyl Acetate	226	225	100	60-137	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.  
 Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P150811-LCS

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
111-65-9	n-Octane	210	182	87	66-120	
127-18-4	Tetrachloroethene	202	179	89	67-120	
108-90-7	Chlorobenzene	220	192	87	69-114	
100-41-4	Ethylbenzene	218	188	86	71-117	
179601-23-1	m,p-Xylenes	428	370	86	71-118	
75-25-2	Bromoform	228	218	96	76-149	
100-42-5	Styrene	222	214	96	71-128	
95-47-6	o-Xylene	210	180	86	72-118	
111-84-2	n-Nonane	204	175	86	63-123	
79-34-5	1,1,2,2-Tetrachloroethane	210	209	100	73-124	
98-82-8	Cumene	208	178	86	71-118	
80-56-8	alpha-Pinene	212	198	93	71-123	
103-65-1	n-Propylbenzene	204	194	95	71-120	
622-96-8	4-Ethyltoluene	214	202	94	71-121	
108-67-8	1,3,5-Trimethylbenzene	214	187	87	72-121	
95-63-6	1,2,4-Trimethylbenzene	218	191	88	71-122	
100-44-7	Benzyl Chloride	220	245	111	79-143	
541-73-1	1,3-Dichlorobenzene	228	201	88	67-121	
106-46-7	1,4-Dichlorobenzene	208	190	91	68-121	
95-50-1	1,2-Dichlorobenzene	220	198	90	68-121	
5989-27-5	d-Limonene	210	202	96	69-137	
96-12-8	1,2-Dibromo-3-chloropropane	218	244	112	73-145	
120-82-1	1,2,4-Trichlorobenzene	230	223	97	60-135	
91-20-3	Naphthalene	218	216	99	63-142	
87-68-3	Hexachlorobutadiene	230	203	88	65-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.  
 Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY DUPLICATE SUMMARY RESULTS

Page 1 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sSQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-013DUP

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00109

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.0050 Liter(s)

Initial Pressure (psig): -13.25

Final Pressure (psig): 9.54

Canister Dilution Factor: 16.72

Compound	Sample Result		Duplicate Sample Result		Average µg/m <sup>3</sup>	% RPD	RPD Limit	Data Qualifier
	µg/m <sup>3</sup>	ppbV	µg/m <sup>3</sup>	ppbV				
Propene	55,300	32,100	57,300	33,300	56300	<b>4</b>	25	
Dichlorodifluoromethane (CFC 12)	ND	ND	ND	ND	-	-	25	
Chloromethane	4,050	1,960	4,010	1,940	4030	<b>1</b>	25	
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	ND	ND	ND	-	-	25	
Vinyl Chloride	ND	ND	ND	ND	-	-	25	
1,3-Butadiene	1,190	540	1,200	541	1195	<b>0.8</b>	25	<b>J</b>
Bromomethane	ND	ND	ND	ND	-	-	25	
Chloroethane	ND	ND	ND	ND	-	-	25	
Ethanol	5,210	2,770	5,320	2,820	5265	<b>2</b>	25	<b>J</b>
Acetonitrile	ND	ND	ND	ND	-	-	25	
Acrolein	ND	ND	ND	ND	-	-	25	
Acetone	264,000	111,000	265,000	112,000	264500	<b>0.4</b>	25	
Trichlorofluoromethane	ND	ND	ND	ND	-	-	25	
2-Propanol (Isopropyl Alcohol)	31,100	12,700	31,700	12,900	31400	<b>2</b>	25	
Acrylonitrile	ND	ND	ND	ND	-	-	25	
1,1-Dichloroethene	ND	ND	ND	ND	-	-	25	
Methylene Chloride	ND	ND	ND	ND	-	-	25	
3-Chloro-1-propene (Allyl Chloride)	ND	ND	ND	ND	-	-	25	
Trichlorotrifluoroethane	ND	ND	ND	ND	-	-	25	
Carbon Disulfide	756	243	776	249	766	<b>3</b>	25	<b>J</b>
trans-1,2-Dichloroethene	ND	ND	ND	ND	-	-	25	
1,1-Dichloroethane	ND	ND	ND	ND	-	-	25	
Methyl tert-Butyl Ether	1,320	366	1,310	364	1315	<b>0.8</b>	25	<b>J</b>
Vinyl Acetate	ND	ND	ND	ND	-	-	25	
2-Butanone (MEK)	259,000	87,700	261,000	88,400	260000	<b>0.8</b>	25	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## LABORATORY DUPLICATE SUMMARY RESULTS

Page 2 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 729sSQ-Summa  
**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125  
 ALS Sample ID: P1503125-013DUP

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sample Type: 1.0 L Silonite Summa Canister  
 Test Notes:  
 Container ID: 1SS00109

Date Collected: 7/29/15  
 Date Received: 7/31/15  
 Date Analyzed: 8/11/15  
 Volume(s) Analyzed: 0.0050 Liter(s)

Initial Pressure (psig): -13.25

Final Pressure (psig): 9.54

Canister Dilution Factor: 16.72

Compound	Sample Result		Duplicate Sample Result		Average µg/m <sup>3</sup>	% RPD	RPD Limit	Data Qualifier
	µg/m <sup>3</sup>	ppbV	µg/m <sup>3</sup>	ppbV				
cis-1,2-Dichloroethene	ND	ND	ND	ND	-	-	25	
Ethyl Acetate	37,600	10,400	37,400	10,400	37500	0.5	25	M1
n-Hexane	3,620	1,030	3,690	1,050	3655	2	25	
Chloroform	ND	ND	ND	ND	-	-	25	
Tetrahydrofuran (THF)	305,000	103,000	308,000	104,000	306500	1	25	
1,2-Dichloroethane	ND	ND	ND	ND	-	-	25	
1,1,1-Trichloroethane	ND	ND	ND	ND	-	-	25	
Benzene	148,000	46,400	149,000	46,800	148500	0.7	25	
Carbon Tetrachloride	ND	ND	ND	ND	-	-	25	
Cyclohexane	ND	ND	ND	ND	-	-	25	
1,2-Dichloropropane	ND	ND	ND	ND	-	-	25	
Bromodichloromethane	ND	ND	ND	ND	-	-	25	
Trichloroethene	582	108	585	109	583.5	0.5	25	J
1,4-Dioxane	2,620	727	2,710	751	2665	3	25	
Methyl Methacrylate	ND	ND	ND	ND	-	-	25	
n-Heptane	3,410	833	3,520	860	3465	3	25	
cis-1,3-Dichloropropene	ND	ND	ND	ND	-	-	25	
4-Methyl-2-pentanone	30,300	7,400	31,300	7,640	30800	3	25	
trans-1,3-Dichloropropene	ND	ND	ND	ND	-	-	25	
1,1,2-Trichloroethane	ND	ND	ND	ND	-	-	25	
Toluene	53,500	14,200	53,900	14,300	53700	0.7	25	
2-Hexanone	12,500	3,060	12,800	3,120	12650	2	25	
Dibromochloromethane	ND	ND	ND	ND	-	-	25	
1,2-Dibromoethane	ND	ND	ND	ND	-	-	25	
n-Butyl Acetate	27,500	5,790	28,500	5,990	28000	4	25	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

M1 = Matrix interference due to coelution with a non-target compound; results may be biased high.

# ALS ENVIRONMENTAL

## LABORATORY DUPLICATE SUMMARY RESULTS

Page 3 of 3

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 729sSQ-Summa

**Client Project ID:** Bridgeton Landfill / 182608020.900

ALS Project ID: P1503125

ALS Sample ID: P1503125-013DUP

Test Code: EPA TO-15 Modified

Date Collected: 7/29/15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Date Received: 7/31/15

Analyst: Lusine Hakobyan

Date Analyzed: 8/11/15

Sample Type: 1.0 L Silonite Summa Canister

Volume(s) Analyzed: 0.0050 Liter(s)

Test Notes:

Container ID: 1SS00109

Initial Pressure (psig): -13.25

Final Pressure (psig): 9.54

Canister Dilution Factor: 16.72

Compound	Sample Result		Duplicate Sample Result		Average µg/m <sup>3</sup>	% RPD	RPD Limit	Data Qualifier
	µg/m <sup>3</sup>	ppbV	µg/m <sup>3</sup>	ppbV				
n-Octane	9,230	1,980	9,290	1,990	9260	<b>0.6</b>	25	
Tetrachloroethene	ND	ND	ND	ND	-	-	25	
Chlorobenzene	1,800	390	1,840	399	1820	<b>2</b>	25	
Ethylbenzene	38,300	8,820	39,600	9,120	38950	<b>3</b>	25	
m,p-Xylenes	61,900	14,300	64,000	14,700	62950	<b>3</b>	25	
Bromoform	ND	ND	ND	ND	-	-	25	
Styrene	960	226	1,030	241	995	<b>7</b>	25	<b>J</b>
o-Xylene	27,800	6,410	28,900	6,650	28350	<b>4</b>	25	
n-Nonane	16,700	3,180	17,600	3,350	17150	<b>5</b>	25	
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	-	-	25	
Cumene	11,400	2,320	12,000	2,450	11700	<b>5</b>	25	
alpha-Pinene	44,100	7,910	46,000	8,260	45050	<b>4</b>	25	
n-Propylbenzene	6,330	1,290	6,850	1,390	6590	<b>8</b>	25	
4-Ethyltoluene	8,520	1,730	9,090	1,850	8805	<b>6</b>	25	
1,3,5-Trimethylbenzene	8,850	1,800	9,570	1,950	9210	<b>8</b>	25	
1,2,4-Trimethylbenzene	27,800	5,650	30,600	6,230	29200	<b>10</b>	25	
Benzyl Chloride	ND	ND	ND	ND	-	-	25	
1,3-Dichlorobenzene	ND	ND	ND	ND	-	-	25	
1,4-Dichlorobenzene	14,000	2,330	15,600	2,590	14800	<b>11</b>	25	
1,2-Dichlorobenzene	ND	ND	ND	ND	-	-	25	
d-Limonene	80,700	14,500	91,300	16,400	86000	<b>12</b>	25	
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	-	-	25	
1,2,4-Trichlorobenzene	ND	ND	ND	ND	-	-	25	
Naphthalene	ND	ND	806	154	-	-	25	<b>J</b>
Hexachlorobutadiene	ND	ND	ND	ND	-	-	25	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.



LH 8/5/15

Method Path : I:\MS16\METHODS\  
 Method File : R16080415.M  
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)  
 Last Update : Wed Aug 05 09:04:58 2015  
 Response Via : Initial Calibration

Calibration Files  
 0.08=08041535.D 0.10=08041536.D 0.20=08041537.D 0.40=08041538.D 1.0 =08041539.D 5.0 =08041540.D 25 =08041541.D  
 50 =08041542.D 100 =08041543.D

Compound	0.08	0.10	0.20	0.40	1.0	5.0	25	50	100	Avg	%RSD
1) IR Bromochloromethane...											
2) T Propene	1.408	1.418	1.241	1.246	1.092	1.073	1.246	1.092	1.073	1.246	11.86
3) T Dichlorodifluo...	2.807	2.664	2.363	2.391	2.115	1.867	2.405	2.115	1.867	2.405	13.73
4) T Chloromethane	2.578	2.320	2.000	1.913	1.366	1.613	1.839	1.366	1.229	1.839	23.34
5) T 1,2-Dichloro-1...	2.029	1.831	1.540	1.440	1.456	1.285	1.317	1.248	1.191	1.482	18.98
6) T Vinyl Chloride	2.385	2.099	1.892	1.850	1.859	1.712	1.785	1.752	1.675	1.890	11.83
7) T 1,3-Butadiene	1.545	1.398	1.320	1.146	1.324	1.135	1.262	1.262	1.179	1.283	10.28
8) T Bromomethane	1.892	1.774	1.347	1.321	1.276	1.113	1.304	1.233	1.190	1.383	19.25
9) T Chloroethane	1.303	1.124	0.988	1.017	1.057	0.940	1.007	0.964	0.920	1.036	11.37
10) T Ethanol	1.414	1.245	1.024	0.971	1.016	0.891	0.918	0.847	0.789	1.013	19.68
11) T Acetonitrile	2.696	2.630	2.580	2.330	2.502	2.377	2.307	2.489	2.307	2.489	6.18
12) T Acrolein	0.912	0.777	0.712	0.811	0.847	0.782	0.812	0.757	0.744	0.795	7.52
13) T Acetone	1.175	1.081	1.054	0.917	0.863	0.760	0.692	0.744	0.692	0.935	18.95
14) T Trichlorofluor...	2.947	2.634	2.319	2.218	2.155	1.959	2.028	1.878	1.819	2.217	16.70
15) T 2-Propanol (IS...	4.141	3.587	3.245	3.080	3.221	2.950	3.086	2.789	2.193	3.144	16.99
16) T Acrylonitrile	1.948	1.776	1.633	1.659	1.737	1.648	1.764	1.642	1.583	1.710	6.47
17) T 1,1-Dichloroet...	1.535	1.452	1.273	1.231	1.276	1.159	1.231	1.145	1.106	1.268	11.20
18) T 2-Methyl-2-Pro...	3.626	3.438	2.921	2.914	3.046	2.799	2.899	2.662	2.475	2.976	12.09
19) T Methylene Chlo...	1.660	1.464	1.247	1.264	1.167	1.088	1.315	1.167	1.088	1.315	16.02
20) T 3-Chloro-1-pro...	2.089	2.021	1.644	1.700	1.754	1.645	1.740	1.617	1.537	1.750	10.62
21) T Trichlorotrifl...	1.545	1.402	1.253	1.209	1.186	1.089	1.111	1.040	1.009	1.205	14.51
22) T Carbon Disulfide	5.465	5.544	4.894	4.894	5.162	4.749	4.493	5.051	4.493	5.051	8.18
23) T trans-1,2-Dich...	2.168	1.980	1.798	1.771	1.794	1.706	1.802	1.691	1.628	1.815	9.08
24) T 1,1-Dichloroet...	3.158	2.893	2.411	2.425	2.356	2.163	2.241	2.093	2.011	2.417	15.65
25) T Methyl tert-Bu...	4.530	4.058	3.547	3.493	3.523	3.248	3.380	3.177	3.048	3.556	13.09
26) T Vinyl Acetate	0.157	0.174	0.216	0.271	0.251	0.235	0.217	0.251	0.235	0.217	20.43
27) T 2-Butanone (MEK)	1.434	1.077	0.888	0.896	0.927	0.834	0.810	0.755	0.724	0.927	23.35
28) T cis-1,2-Dichlo...	2.115	2.057	1.748	1.692	1.716	1.591	1.669	1.560	1.485	1.737	12.35
29) T Diisopropyl Ether	1.476	1.361	1.205	1.222	1.215	1.103	0.950	0.839	0.776	1.128	20.74
30) T Ethyl Acetate	0.413	0.430	0.421	0.439	0.485	0.454	0.444	0.390	0.341	0.424	9.68
31) T n-Hexane	2.131	2.146	2.003	1.888	1.806	1.631	1.495	1.871	1.631	1.495	13.18
32) T Chloroform	2.903	2.665	2.233	2.167	2.128	1.942	1.971	1.805	1.702	2.169	18.09
33) S 1,2-Dichloroet...	1.383	1.367	1.365	1.370	1.366	1.349	1.364	1.356	1.347	1.363	0.81
34) T Tetrahydrofura...	0.830	0.840	0.775	0.813	0.760	0.733	0.792	0.760	0.733	0.792	5.35
35) T Ethyl tert-But...	1.740	1.605	1.407	1.427	1.405	1.316	1.366	1.285	1.228	1.420	11.30
36) T 1,2-Dichloroet...	1.825	1.730	1.488	1.441	1.416	1.302	1.360	1.271	1.216	1.450	14.19
37) IR 1,4-Difluorobenzen...											
38) T 1,1,1-Trichlor...	0.470	0.409	0.380	0.360	0.351	0.322	0.341	0.320	0.310	0.363	14.15
39) T Isopropyl Acetate	0.197	0.168	0.153	0.154	0.159	0.151	0.153	0.137	0.125	0.155	12.91
40) T 1-Butanol	0.199	0.238	0.239	0.239	0.236	0.213	0.188	0.213	0.188	0.219	10.10
41) T Benzene	1.630	1.445	1.172	1.066	1.020	0.914	0.821	0.732	0.681	0.821	27.15
42) T Carbon Tetrach...	0.372	0.356	0.312	0.304	0.299	0.284	0.299	0.284	0.276	0.310	10.69

Method Path : I:\MS16\METHODS\  
Method File : R16080415.M  
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

43) T	Cyclohexane	0.504	0.457	0.409	0.395	0.387	0.362	0.364	0.334	0.303	0.390	15.70
44) T	tert-Amyl Meth...	0.888	0.821	0.717	0.687	0.698	0.653	0.684	0.643	0.607	0.711	12.54
45) T	1,2-Dichloropr...	0.344	0.327	0.275	0.267	0.264	0.248	0.256	0.240	0.228	0.272	14.23
46) T	Bromodichlorom...	0.409	0.371	0.333	0.321	0.321	0.304	0.327	0.307	0.294	0.332	10.96
47) T	Trichloroethene	0.455	0.389	0.337	0.320	0.311	0.289	0.290	0.272	0.258	0.325	19.22
48) T	1,4-Dioxane	0.229	0.214	0.193	0.194	0.208	0.193	0.202	0.188	0.179	0.200	7.55
49) T	2,2,4-Trimethy...	1.469	1.394	1.169	1.126	1.106	1.028	1.043	0.954	0.852	1.127	17.56
50) T	Methyl Methacr...	0.083	0.090	0.082	0.091	0.096	0.097	0.102	0.095	0.090	0.092	7.10
51) T	n-Heptane	0.291	0.280	0.239	0.241	0.243	0.226	0.225	0.210	0.198	0.239	12.62
52) T	cis-1,3-Dichlo...	0.402	0.388	0.351	0.361	0.368	0.371	0.400	0.378	0.361	0.376	4.82
53) T	4-Methyl-2-pen...	0.218	0.201	0.193	0.211	0.229	0.224	0.230	0.212	0.197	0.213	6.50
54) T	trans-1,3-Dich...	0.280	0.280	0.258	0.287	0.311	0.322	0.355	0.340	0.328	0.307	10.53
55) T	1,1,2-Trichlor...	0.306	0.288	0.263	0.252	0.255	0.235	0.247	0.232	0.225	0.256	10.36

56) IR	Chlorobenzene-d5	(...)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
57) S	Toluene-d8 (SS2)	2.377	2.380	2.374	2.359	2.354	2.371	2.351	2.352	2.350	2.363	0.52	
58) T	Toluene				2.748	2.697	2.452	2.458	2.267	2.111	2.455	9.95	
59) T	2-Hexanone	1.378	1.148	1.143	1.269	1.411	1.353	1.328	1.206	1.097	1.259	7.07	
60) T	Dibromochlorom...	0.796	0.816	0.689	0.674	0.715	0.700	0.745	0.705	0.677	0.724	5.52	
61) T	1,2-Dibromoethane	0.783	0.749	0.723	0.679	0.727	0.703	0.741	0.689	0.654	0.717	8.50	
62) T	n-Butyl Acetate	1.612	1.323	1.291	1.341	1.498	1.458	1.506	1.378	1.246	1.406	17.22	
63) T	n-Octane	0.749	0.682	0.571	0.564	0.543	0.521	0.525	0.481	0.436	0.563	14.49	
64) T	Tetrachloroethene	1.136	1.027	0.899	0.862	0.867	0.798	0.823	0.773	0.736	0.880	16.71	
65) T	Chlorobenzene	2.422	2.216	1.950	1.798	1.819	1.661	1.693	1.569	1.469	1.844	21.55	
66) T	Ethylbenzene	4.527	3.582	2.967	2.860	2.904	2.737	2.794	2.568	2.348	3.032	20.32	
67) T	m- & p-Xylenes	3.403	2.754	2.328	2.290	2.343	2.166	2.165	1.961	1.772	2.354	5.98	
68) T	Bromoform	0.729	0.655	0.626	0.618	0.668	0.660	0.727	0.679	0.638	0.667	9.56	
69) T	Styrene	2.049	1.905	1.710	1.643	1.736	1.693	1.766	1.618	1.477	1.733	20.33	
70) T	o-Xylene	3.464	2.932	2.536	2.329	2.458	2.261	2.236	2.012	1.798	2.447	19.95	
71) T	n-Nonane	1.743	1.601	1.376	1.312	1.333	1.261	1.214	1.053	0.875	1.308	7.61	
72) T	1,1,2,2-Tetrac...	1.261	1.218	1.054	1.108	1.165	1.150	1.208	1.095	0.986	1.138	1.68	
73) S	Bromofluoroben...	0.998	1.009	1.012	1.028	1.026	1.028	1.023	0.993	0.982	1.011	20.56	
74) T	Cumene	4.386	4.188	3.317	3.104	3.152	2.909	2.927	2.671	2.376	3.226	11.95	
75) T	alpha-Pinene	1.851	1.669	1.508	1.438	1.474	1.437	1.486	1.362	1.225	1.495	11.51	
76) T	n-Propylbenzene	3.920	3.585	3.966	3.840	3.890	3.614	3.583	3.220	2.826	3.563	15.67	
77) T	3-Ethyltoluene	2.844	2.743	2.682	2.489	2.531	2.254	2.254	2.266	2.047	2.488	13.05	
78) T	4-Ethyltoluene	3.200	3.103	2.682	2.489	2.531	2.254	2.266	2.047	1.819	2.604	18.37	
79) T	1,3,5-Trimethy...	1.463	1.371	1.260	1.252	1.272	1.225	1.360	1.234	1.090	1.281	8.31	
80) T	alpha-Methylst...	3.329	2.862	2.541	2.461	2.541	2.311	2.273	2.017	1.732	2.452	13.19	
81) T	2-Ethyltoluene	3.091	2.971	3.062	2.760	2.760	2.760	2.703	2.418	2.113	2.731	18.88	
82) T	1,2,4-Trimethy...	1.793	1.628	1.491	1.428	1.522	1.354	1.273	1.102	0.900	1.388	19.48	
83) T	n-Decane	1.901	1.673	1.548	1.635	1.807	1.898	2.013	1.825	1.610	1.768	8.93	
84) T	Benzyl Chloride	2.059	1.879	1.575	1.555	1.571	1.427	1.428	1.289	1.133	1.546	18.29	
85) T	1,3-Dichlorobe...	2.191	2.006	1.720	1.607	1.628	1.461	1.477	1.344	1.200	1.626	19.24	
86) T	1,4-Dichlorobe...	4.266	3.965	3.468	3.345	3.484	3.131	3.074	2.710	2.319	3.307	17.99	
87) T	sec-Butylbenzene	4.022	3.598	3.233	3.153	3.275	2.981	2.872	2.465	2.036	3.071	19.07	
88) T	4-Isopropyltol...	3.154	2.952	2.606	2.567	2.661	2.408	2.345	2.061	1.759	2.501	17.02	
89) T	1,2,3-Trimethy...	1.952	1.752	1.577	1.521	1.571	1.430	1.408	1.249	1.063	1.502	17.39	
90) T	1,2-Dichlorobe...	1.048	1.013	0.920	0.907	0.943	0.901	0.923	0.789	0.639	0.898	13.52	
91) T	d-Limonene				0.408	0.461	0.507	0.568	0.525	0.478	0.491	11.27	
92) T	1,2-Dibromo-3-...	1.709	1.633	1.467	1.478	1.593	1.507	1.415	1.212	0.984	1.444	15.49	
93) T	n-Undecane	1.359	1.229	1.119	1.110	1.119	1.085	1.167	1.072	0.980	1.138	9.40	
94) T	1,2,4-Trichlor...												

Response Factor Report GCMS-16

Method Path : I:\MS16\METHODS\  
 Method File : R16080415.M

Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95) T	Naphthalene	3.706	3.540	3.425	3.586	3.181	2.708	3.358	10.86
96) T	n-Dodecane	1.632	1.440	1.362	1.394	1.468	1.465	1.304	1.097
97) T	Hexachlorobuta...	0.963	0.834	0.731	0.690	0.716	0.669	0.695	0.642
98) T	Cyclohexanone	0.975	0.909	0.993	0.912	0.882	0.797	0.715	0.883
99) T	tert-Butylbenzene	3.227	2.958	2.552	2.450	2.462	2.265	2.225	1.951
100) T	n-Butylbenzene	3.134	2.954	2.572	2.580	2.752	2.545	2.459	2.168

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File: I:\MS16\DATA\2015 08\10\08101502.D

Acq On : 10 Aug 2015 9:07 Operator: LH  
 Sample : CCV R16081015 25ng  
 Misc : S29-08041501/S29-07311504 (8/28)  
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 11 10:20:04 2015  
 Quant Method : I:\MS16\METHODS\R16080415.M  
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)  
 QLast Update : Wed Aug 05 09:04:58 2015  
 Response via : Initial Calibration  
 DataAcq Meth:TO15.M

LH 8/11/15

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 IR	Bromochloromethane (IS1)	1.000	1.000	0.0	110	-0.01
2 T	Propene	1.246	1.219	2.2	107	0.00
3 T	Dichlorodifluoromethane (CF	2.405	2.294	4.6	105	0.00
4 T	Chloromethane	1.839	1.581	14.0	102	0.00
5 T	1,2-Dichloro-1,1,2,2-tetra	1.482	1.280	13.6	107	0.00
6 T	Vinyl Chloride	1.890	1.734	8.3	106	0.00
7 T	1,3-Butadiene	1.283	1.232	4.0	107	0.00
8 T	Bromomethane	1.383	1.263	8.7	106	0.00
9 T	Chloroethane	1.036	0.982	5.2	107	0.00
10 T	Ethanol	1.013	0.874	13.7	104	-0.05
11 T	Acetonitrile	2.489	2.396	3.7	105	-0.03
12 T	Acrolein	0.795	0.775	2.5	104	0.00
13 T	Acetone	0.935	0.832	11.0	106	-0.03
14 T	Trichlorofluoromethane	2.217	1.947	12.2	105	0.00
15 T	2-Propanol (Isopropanol)	3.144	2.922	7.1	104	-0.04
16 T	Acrylonitrile	1.710	1.668	2.5	104	-0.02
17 T	1,1-Dichloroethene	1.268	1.187	6.4	106	0.00
18 T	2-Methyl-2-Propanol (tert-B	2.976	2.789	6.3	105	-0.04
19 T	Methylene Chloride	1.315	1.215	7.6	105	-0.01
20 T	3-Chloro-1-propene (Allyl C	1.750	1.643	6.1	103	0.00
21 T	Trichlorotrifluoroethane	1.205	1.083	10.1	107	0.00
22 T	Carbon Disulfide	5.051	4.969	1.6	105	0.00
23 T	trans-1,2-Dichloroethene	1.815	1.730	4.7	105	0.00
24 T	1,1-Dichloroethane	2.417	2.141	11.4	105	0.00
25 T	Methyl tert-Butyl Ether	3.556	3.296	7.3	107	0.00
26 T	Vinyl Acetate	0.217	0.278	-28.1	113	-0.02
27 T	2-Butanone (MEK)	0.927	0.782	15.6	106	-0.02
28 T	cis-1,2-Dichloroethene	1.737	1.587	8.6	104	0.00
29 T	Diisopropyl Ether	1.128	1.077	4.5	124	0.00
30 T	Ethyl Acetate	0.424	0.423	0.2	104	-0.01
31 T	n-Hexane	1.871	1.777	5.0	108	0.00
32 T	Chloroform	2.169	1.867	13.9	104	-0.01
33 S	1,2-Dichloroethane-d4 (SS1)	1.363	1.315	3.5	106	-0.01
34 T	Tetrahydrofuran (THF)	0.792	0.783	1.1	105	0.00
35 T	Ethyl tert-Butyl Ether	1.420	1.338	5.8	107	0.00
36 T	1,2-Dichloroethane	1.450	1.281	11.7	103	0.00
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	109	0.00
38 T	1,1,1-Trichloroethane	0.363	0.328	9.6	105	0.00
39 T	Isopropyl Acetate	0.155	0.146	5.8	104	-0.01
40 T	1-Butanol	0.219	0.225	-2.7	104	-0.03
41 T	Benzene	1.081	0.880	18.6	105	0.00
42 T	Carbon Tetrachloride	0.310	0.289	6.8	106	0.00
43 T	Cyclohexane	0.390	0.357	8.5	107	-0.01
44 T	tert-Amyl Methyl Ether	0.711	0.669	5.9	107	0.00
45 T	1,2-Dichloropropane	0.272	0.247	9.2	105	0.00
46 T	Bromodichloromethane	0.332	0.312	6.0	104	0.00
47 T	Trichloroethene	0.325	0.281	13.5	106	0.00
48 T	1,4-Dioxane	0.200	0.195	2.5	105	-0.01
49 T	2,2,4-Trimethylpentane (Iso	1.127	1.004	10.9	105	0.00
50 T	Methyl Methacrylate	0.092	0.099	-7.6	106	-0.01
51 T	n-Heptane	0.239	0.222	7.1	108	0.00
52 T	cis-1,3-Dichloropropene	0.376	0.387	-2.9	106	0.00
53 T	4-Methyl-2-pentanone	0.213	0.219	-2.8	104	-0.01
54 T	trans-1,3-Dichloropropene	0.307	0.342	-11.4	105	0.00

Evaluate Continuing Calibration Report

Data File: I:\MS16\DATA\2015 08\10\08101502.D

Acq On : 10 Aug 2015 9:07 Operator: LH  
 Sample : CCV R16081015 25ng  
 Misc : S29-08041501/S29-07311504 (8/28)  
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 11 10:20:04 2015  
 Quant Method : I:\MS16\METHODS\R16080415.M  
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)  
 QLast Update : Wed Aug 05 09:04:58 2015  
 Response via : Initial Calibration  
 DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55 T 1,1,2-Trichloroethane	0.256	0.239	6.6	106	0.00
56 IR Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	104	0.00
57 S Toluene-d8 (SS2)	2.363	2.446	-3.5	109	0.00
58 T Toluene	2.455	2.504	-2.0	106	0.00
59 T 2-Hexanone	1.259	1.297	-3.0	102	-0.01
60 T Dibromochloromethane	0.724	0.763	-5.4	107	0.00
61 T 1,2-Dibromoethane	0.717	0.744	-3.8	105	0.00
62 T n-Butyl Acetate	1.406	1.474	-4.8	102	0.00
63 T n-Octane	0.563	0.534	5.2	106	0.00
64 T Tetrachloroethene	0.880	0.841	4.4	107	0.00
65 T Chlorobenzene	1.844	1.722	6.6	106	0.00
66 T Ethylbenzene	3.032	2.819	7.0	105	0.00
67 T m- & p-Xylenes	2.354	2.187	7.1	105	0.00
68 T Bromoform	0.667	0.738	-10.6	106	0.00
69 T Styrene	1.733	1.791	-3.3	106	0.00
70 T o-Xylene	2.447	2.243	8.3	105	0.00
71 T n-Nonane	1.308	1.199	8.3	103	0.00
72 T 1,1,2,2-Tetrachloroethane	1.138	1.225	-7.6	106	0.00
73 S Bromofluorobenzene (SS3)	1.011	0.997	1.4	102	0.00
74 T Cumene	3.226	2.979	7.7	106	0.00
75 T alpha-Pinene	1.495	1.498	-0.2	105	0.00
76 T n-Propylbenzene	3.563	3.614	-1.4	105	0.00
77 T 3-Ethyltoluene	3.047	2.928	3.9	103	0.00
78 T 4-Ethyltoluene	2.604	2.653	-1.9	109	0.00
79 T 1,3,5-Trimethylbenzene	2.488	2.296	7.7	106	0.00
80 T alpha-Methylstyrene	1.281	1.372	-7.1	105	0.00
81 T 2-Ethyltoluene	2.731	2.728	0.1	105	0.00
82 T 1,2,4-Trimethylbenzene	2.452	2.298	6.3	106	-0.01
83 T n-Decane	1.388	1.265	8.9	104	0.00
84 T Benzyl Chloride	1.768	2.009	-13.6	104	-0.01
85 T 1,3-Dichlorobenzene	1.546	1.444	6.6	106	0.00
86 T 1,4-Dichlorobenzene	1.626	1.496	8.0	106	0.00
87 T sec-Butylbenzene	3.307	3.093	6.5	105	0.00
88 T 4-Isopropyltoluene (p-Cymen)	3.071	2.891	5.9	105	0.00
89 T 1,2,3-Trimethylbenzene	2.501	2.356	5.8	105	0.00
90 T 1,2-Dichlorobenzene	1.502	1.417	5.7	105	0.00
91 T d-Limonene	0.898	0.914	-1.8	103	0.00
92 T 1,2-Dibromo-3-Chloropropane	0.491	0.583	-18.7	107	0.00
93 T n-Undecane	1.444	1.382	4.3	102	0.00
94 T 1,2,4-Trichlorobenzene	1.138	1.153	-1.3	103	0.00
95 T Naphthalene	3.358	3.523	-4.9	103	0.00
96 T n-Dodecane	1.336	1.263	5.5	101	0.00
97 T Hexachlorobutadiene	0.727	0.688	5.4	103	0.00
98 T Cyclohexanone	0.883	0.863	2.3	102	-0.01
99 T tert-Butylbenzene	2.415	2.240	7.2	105	0.00
100 T n-Butylbenzene	2.559	2.445	4.5	104	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Data File: I:\MS16\DATA\2015 08\11\08111502.D

Acq On : 11 Aug 2015 3:07 Operator: LH  
 Sample : CCV R16081115 25ng  
 Misc : S29-08041501/S29-07311504 (8/28)  
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 11 08:36:03 2015  
 Quant Method : I:\MS16\METHODS\R16080415.M  
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)  
 QLast Update : Wed Aug 05 09:04:58 2015  
 Response via : Initial Calibration  
 DataAcq Meth:TO15.M

LH 8/11/15

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 IR Bromochloromethane (IS1)	1.000	1.000	0.0	103	-0.02
2 T Propene	1.246	1.201	3.6	100	0.00
3 T Dichlorodifluoromethane (CF	2.405	2.287	4.9	99	0.00
4 T Chloromethane	1.839	1.467	20.2	89	0.00
5 T 1,2-Dichloro-1,1,2,2-tetra	1.482	1.288	13.1	101	0.00
6 T Vinyl Chloride	1.890	1.718	9.1	99	-0.01
7 T 1,3-Butadiene	1.283	1.194	6.9	98	-0.02
8 T Bromomethane	1.383	1.252	9.5	99	-0.01
9 T Chloroethane	1.036	0.957	7.6	98	-0.01
10 T Ethanol	1.013	0.860	15.1	97	-0.07
11 T Acetonitrile	2.489	2.328	6.5	96	-0.04
12 T Acrolein	0.795	0.759	4.5	96	-0.02
13 T Acetone	0.935	0.825	11.8	99	-0.04
14 T Trichlorofluoromethane	2.217	1.933	12.8	98	-0.01
15 T 2-Propanol (Isopropanol)	3.144	2.875	8.6	96	-0.05
16 T Acrylonitrile	1.710	1.653	3.3	97	-0.03
17 T 1,1-Dichloroethene	1.268	1.180	6.9	99	-0.02
18 T 2-Methyl-2-Propanol (tert-B	2.976	2.786	6.4	99	-0.05
19 T Methylene Chloride	1.315	1.219	7.3	100	-0.02
20 T 3-Chloro-1-propene (Allyl C	1.750	1.631	6.8	97	-0.02
21 T Trichlorotrifluoroethane	1.205	1.091	9.5	101	-0.01
22 T Carbon Disulfide	5.051	4.941	2.2	99	-0.01
23 T trans-1,2-Dichloroethene	1.815	1.706	6.0	98	-0.01
24 T 1,1-Dichloroethane	2.417	2.124	12.1	98	-0.01
25 T Methyl tert-Butyl Ether	3.556	3.268	8.1	100	-0.01
26 T Vinyl Acetate	0.217	0.280	-29.0	107	-0.03
27 T 2-Butanone (MEK)	0.927	0.780	15.9	99	-0.02
28 T cis-1,2-Dichloroethene	1.737	1.587	8.6	98	-0.01
29 T Diisopropyl Ether	1.128	1.070	5.1	116	-0.01
30 T Ethyl Acetate	0.424	0.421	0.7	98	-0.02
31 T n-Hexane	1.871	1.721	8.0	98	0.00
32 T Chloroform	2.169	1.876	13.5	98	-0.02
33 S 1,2-Dichloroethane-d4 (SS1)	1.363	1.329	2.5	101	-0.01
34 T Tetrahydrofuran (THF)	0.792	0.778	1.8	99	-0.01
35 T Ethyl tert-Butyl Ether	1.420	1.328	6.5	100	-0.01
36 T 1,2-Dichloroethane	1.450	1.292	10.9	98	-0.01
37 IR 1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	104	-0.01
38 T 1,1,1-Trichloroethane	0.363	0.322	11.3	99	-0.01
39 T Isopropyl Acetate	0.155	0.142	8.4	97	-0.01
40 T 1-Butanol	0.219	0.221	-0.9	98	-0.04
41 T Benzene	1.081	0.864	20.1	99	-0.01
42 T Carbon Tetrachloride	0.310	0.285	8.1	100	0.00
43 T Cyclohexane	0.390	0.348	10.8	100	-0.01
44 T tert-Amyl Methyl Ether	0.711	0.656	7.7	100	-0.01
45 T 1,2-Dichloropropane	0.272	0.240	11.8	98	-0.01
46 T Bromodichloromethane	0.332	0.309	6.9	99	0.00
47 T Trichloroethene	0.325	0.276	15.1	99	0.00
48 T 1,4-Dioxane	0.200	0.192	4.0	99	-0.01
49 T 2,2,4-Trimethylpentane (Iso	1.127	0.981	13.0	98	0.00
50 T Methyl Methacrylate	0.092	0.097	-5.4	100	-0.01
51 T n-Heptane	0.239	0.214	10.5	99	-0.01
52 T cis-1,3-Dichloropropene	0.376	0.380	-1.1	99	0.00
53 T 4-Methyl-2-pentanone	0.213	0.215	-0.9	98	-0.01
54 T trans-1,3-Dichloropropene	0.307	0.335	-9.1	99	0.00

Evaluate Continuing Calibration Report

Data File: I:\MS16\DATA\2015 08\11\08111502.D

Acq On : 11 Aug 2015 3:07 Operator: LH  
 Sample : CCV R16081115 25ng  
 Misc : S29-08041501/S29-07311504 (8/28)  
 ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 11 08:36:03 2015  
 Quant Method : I:\MS16\METHODS\R16080415.M  
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)  
 QLast Update : Wed Aug 05 09:04:58 2015  
 Response via : Initial Calibration  
 DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

-----	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55 T	1,1,2-Trichloroethane	0.256	0.236	7.8	99	0.00
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	103	0.00
57 S	Toluene-d8 (SS2)	2.363	2.385	-0.9	105	0.00
58 T	Toluene	2.455	2.359	3.9	99	0.00
59 T	2-Hexanone	1.259	1.233	2.1	96	-0.01
60 T	Dibromochloromethane	0.724	0.732	-1.1	101	0.00
61 T	1,2-Dibromoethane	0.717	0.713	0.6	99	0.00
62 T	n-Butyl Acetate	1.406	1.384	1.6	95	0.00
63 T	n-Octane	0.563	0.498	11.5	98	0.00
64 T	Tetrachloroethene	0.880	0.802	8.9	101	0.00
65 T	Chlorobenzene	1.844	1.645	10.8	100	0.00
66 T	Ethylbenzene	3.032	2.678	11.7	99	0.00
67 T	m- & p-Xylenes	2.354	2.086	11.4	100	-0.01
68 T	Bromoform	0.667	0.712	-6.7	101	0.00
69 T	Styrene	1.733	1.703	1.7	100	0.00
70 T	o-Xylene	2.447	2.149	12.2	99	0.00
71 T	n-Nonane	1.308	1.146	12.4	98	0.00
72 T	1,1,2,2-Tetrachloroethane	1.138	1.181	-3.8	101	0.00
73 S	Bromofluorobenzene (SS3)	1.011	1.026	-1.5	104	0.00
74 T	Cumene	3.226	2.846	11.8	100	0.00
75 T	alpha-Pinene	1.495	1.436	3.9	100	0.00
76 T	n-Propylbenzene	3.563	3.466	2.7	100	0.00
77 T	3-Ethyltoluene	3.047	2.864	6.0	100	0.00
78 T	4-Ethyltoluene	2.604	2.488	4.5	102	0.00
79 T	1,3,5-Trimethylbenzene	2.488	2.204	11.4	100	0.00
80 T	alpha-Methylstyrene	1.281	1.324	-3.4	101	0.00
81 T	2-Ethyltoluene	2.731	2.635	3.5	101	0.00
82 T	1,2,4-Trimethylbenzene	2.452	2.222	9.4	101	-0.01
83 T	n-Decane	1.388	1.221	12.0	99	0.00
84 T	Benzyl Chloride	1.768	1.946	-10.1	100	-0.01
85 T	1,3-Dichlorobenzene	1.546	1.405	9.1	102	0.00
86 T	1,4-Dichlorobenzene	1.626	1.448	10.9	101	0.00
87 T	sec-Butylbenzene	3.307	2.991	9.6	101	0.00
88 T	4-Isopropyltoluene (p-Cymen	3.071	2.815	8.3	101	0.00
89 T	1,2,3-Trimethylbenzene	2.501	2.289	8.5	101	0.00
90 T	1,2-Dichlorobenzene	1.502	1.382	8.0	101	0.00
91 T	d-Limonene	0.898	0.882	1.8	99	0.00
92 T	1,2-Dibromo-3-Chloropropane	0.491	0.571	-16.3	104	0.00
93 T	n-Undecane	1.444	1.340	7.2	98	0.00
94 T	1,2,4-Trichlorobenzene	1.138	1.135	0.3	100	0.00
95 T	Naphthalene	3.358	3.448	-2.7	99	0.00
96 T	n-Dodecane	1.336	1.240	7.2	98	0.00
97 T	Hexachlorobutadiene	0.727	0.682	6.2	101	0.00
98 T	Cyclohexanone	0.883	0.826	6.5	97	-0.01
99 T	tert-Butylbenzene	2.415	2.177	9.9	101	0.00
100 T	n-Butylbenzene	2.559	2.377	7.1	100	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 0



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## LABORATORY REPORT

August 17, 2015

Deborah Gray  
Stantec Consulting Services, Inc.  
1500 Lake Shore Drive Suite 100  
Columbus, OH 43204

**RE: Bridgeton / 182608020**

Dear Deborah:

Enclosed are the results of the samples submitted to our laboratory on August 1, 2015. For your reference, these analyses have been assigned our service request number P1503133.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**ALS | Environmental**

By Samantha Henningsen at 4:04 pm, Aug 17, 2015

Samantha Henningsen  
Project Manager





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Simi Valley, CA 93065  
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[www.alsglobal.com](http://www.alsglobal.com)

Client: Stantec Consulting Services, Inc.  
Project: Bridgeton / 182608020

Service Request No: P1503133

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 1, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

### Polynuclear Aromatic Hydrocarbon Analysis

The high volume PUF/XAD-2 samples were analyzed for polynuclear aromatic hydrocarbons (PAHs). The extracts were analyzed according to the methodology outlined in EPA Method TO-13A using combined gas chromatography/mass spectrometry (GC/MS). The samples were analyzed in SIM mode which is a method modification. This method is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP or AIHA-LAP accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP scope of accreditation.

The lower control criteria were exceeded for Naphthalene, Acenphthylene and Acenaphthene in the Duplicate Laboratory Control Sample (DLCS) extracted on August 3, 2015. The laboratory control sample (LCS) met the recovery for the analytes in question. The relative percent difference (RPD) control criterion was exceeded for various analytes as measured in the LCS and DLCS. The corresponding laboratory data has been flagged accordingly. No further corrective action was taken.

The sample identified as 731sSQ-PAH (P1503133-007) was concentrated to 10mL final volume due to matrix interference. Therefore, surrogate control criteria were exceeded for all surrogates in this sample due to matrix interferences. The presence of non-target background components prevented adequate resolution of the surrogate; therefore, accurate quantitation was not possible and the associated data has been qualified. No further corrective action was appropriate.

Sample extraction was performed at the laboratory's off-site extraction facility located at 2360 Shasta Way, Suite G, Simi Valley, CA 93065.

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*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*



2655 Park Center Dr., Suite A  
 Simi Valley, CA 93065  
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 F: +1 805 526 7270  
[www.alsglobal.com](http://www.alsglobal.com)

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>	101661
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0694
DoD ELAP	<a href="http://www.pjlabs.com/search-accredited-labs">http://www.pjlabs.com/search-accredited-labs</a>	L14-2
Florida DOH (NELAP)	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E871020
Maine DHHS	<a href="http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm">http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm</a>	2014025
Minnesota DOH (NELAP)	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	876241
New Jersey DEP (NELAP)	<a href="http://www.nj.gov/dep/oqa/">http://www.nj.gov/dep/oqa/</a>	CA009
New York DOH (NELAP)	<a href="http://www.wadsworth.org/labcert/elap/elap.html">http://www.wadsworth.org/labcert/elap/elap.html</a>	11221
Oregon PHD (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	4068-001
Pennsylvania DEP	<a href="http://www.depweb.state.pa.us/labs">http://www.depweb.state.pa.us/labs</a>	68-03307 (Registration)
Texas CEQ (NELAP)	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704413-15-6
Utah DOH (NELAP)	<a href="http://www.health.utah.gov/lab/labimp/certification/index.html">http://www.health.utah.gov/lab/labimp/certification/index.html</a>	CA01627201 5-5
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at [www.alsglobal.com](http://www.alsglobal.com), or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

# ALS ENVIRONMENTAL

## DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
Project ID: Bridgeton / 182608020

Service Request: P1503133

Date Received: 8/1/2015  
Time Received: 10:20

TO-13A Modified - PAH SIM Hi Vol

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
731U1-PAH	P1503133-001	Air	7/31/2015	09:41	X
731D1-PAH	P1503133-002	Air	7/31/2015	08:34	X
731F-PAH	P1503133-003	Air	7/31/2015	08:22	X
731FB-PAH	P1503133-004	Air	7/31/2015	00:00	X
731sN-PAH	P1503133-005	Air	7/31/2015	13:40	X
731sNQ-PAH	P1503133-006	Air	7/31/2015	12:07	X
731sSQ-PAH	P1503133-007	Air	7/31/2015	11:46	X



**ALS Environmental  
Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc.

Work order: P1503133

Project: Bridgeton / 182608020

Sample(s) received on: 8/1/15

Date opened: 8/1/15

by: KKELPE

**Note:** This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- |   | <b>Yes</b>                          | <b>No</b>                           | <b>N/A</b>                          |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by ALS</b> ?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Did <b>sample container labels</b> and/or tags agree with custody papers?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?<br>Cooler Temperature: 5° C    Blank Temperature: ° C   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
|   | <b>Gel Packs</b>                    |                                     |                                     |
| 9 Was a <b>trip blank</b> received?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 10 Were <b>custody seals</b> on outside of cooler/Box?<br>Location of seal(s)? <u>SEALING COOLER</u>  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Sealing Lid?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Were signature and date included?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Were seals intact?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Were custody seals on outside of sample container?<br>Location of seal(s)? _____  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Sealing Lid?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?<br>Is there a client indication that the submitted samples are <b>pH</b> preserved?<br>Were <b>VOA vials</b> checked for presence/absence of air bubbles?<br>Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Do they contain moisture?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 13 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1503133-001.01	PUF/XAD-2/Filter (High Vol)					
P1503133-002.01	PUF/XAD-2/Filter (High Vol)					
P1503133-003.01	PUF/XAD-2/Filter (High Vol)					
P1503133-004.01	PUF/XAD-2/Filter (High Vol)					
P1503133-005.01	PUF/XAD-2/Filter (High Vol)					
P1503133-006.01	PUF/XAD-2/Filter (High Vol)					
P1503133-007.01	PUF/XAD-2/Filter (High Vol)					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 731U1-PAH

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503133

ALS Sample ID: P1503133-001

Test Code: EPA TO-13A Modified

Date Collected: 7/31/15

Instrument ID: Agilent 5973N/HP6890A/MS07

Date Received: 8/1/15

Analyst: Madeleine Dangazyan

Date Extracted: 8/3/15

Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge

Date Analyzed: 8/5/15

Test Notes:

Final Volume: 1.0 ml

Volume Sampled: 307831 Liter(s)

Dilution Factor: 1.00

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
91-20-3	Naphthalene	12	<b>0.040</b>	0.0032	<b>0.0077</b>	0.00062	<b>L</b>
208-96-8	Acenaphthylene	< 0.50	ND	0.0016	ND	0.00026	<b>L</b>
83-32-9	Acenaphthene	2.3	<b>0.0076</b>	0.0016	<b>0.0012</b>	0.00026	<b>L</b>
86-73-7	Fluorene	3.1	<b>0.010</b>	0.0016	<b>0.0015</b>	0.00024	
85-01-8	Phenanthrene	7.4	<b>0.024</b>	0.0016	<b>0.0033</b>	0.00022	
120-12-7	Anthracene	< 0.50	ND	0.0016	ND	0.00022	
206-44-0	Fluoranthene	1.9	<b>0.0061</b>	0.0016	<b>0.00074</b>	0.00020	
129-00-0	Pyrene	0.79	<b>0.0026</b>	0.0016	<b>0.00031</b>	0.00020	
56-55-3	Benz(a)anthracene	< 0.50	ND	0.0016	ND	0.00017	
218-01-9	Chrysene	< 0.50	ND	0.0016	ND	0.00017	
205-99-2	Benzo(b)fluoranthene	< 0.50	ND	0.0016	ND	0.00016	
207-08-9	Benzo(k)fluoranthene	< 0.50	ND	0.0016	ND	0.00016	
50-32-8	Benzo(a)pyrene	< 0.50	ND	0.0016	ND	0.00016	
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	ND	0.0016	ND	0.00014	
53-70-3	Dibenz(a,h)anthracene	< 0.50	ND	0.0016	ND	0.00014	
191-24-2	Benzo(g,h,i)perylene	< 0.50	ND	0.0016	ND	0.00014	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

L = Laboratory control sample recovery outside the specified limits.

**SURROGATE SPIKE RECOVERY RESULTS**

CAS #	Compound	Spike Amount µg/Sample	Amount Found µg/Sample	% Recovered	Acceptance Limits	Data Qualifier
81103-79-9	Fluorene-d10	5.00	3.58	<b>72</b>	60-120	
1718-52-1	Pyrene-d10	5.00	3.42	<b>68</b>	60-120	
93951-69-0	Fluoranthene-d10	10.0	6.65	<b>67</b>	60-120	
63466-71-7	Benzo[a]pyrene-d12	10.0	6.90	<b>69</b>	60-120	

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 731D1-PAH

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503133

ALS Sample ID: P1503133-002

Test Code: EPA TO-13A Modified

Date Collected: 7/31/15

Instrument ID: Agilent 5973N/HP6890A/MS07

Date Received: 8/1/15

Analyst: Madeleine Dangazyan

Date Extracted: 8/3/15

Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge

Date Analyzed: 8/5/15

Test Notes:

Final Volume: 1.0 ml

Volume Sampled: 339997 Liter(s)

Dilution Factor: 1.00

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
91-20-3	Naphthalene	7.8	<b>0.023</b>	0.0029	<b>0.0044</b>	0.00056	<b>L</b>
208-96-8	Acenaphthylene	< 0.50	ND	0.0015	ND	0.00024	<b>L</b>
83-32-9	Acenaphthene	2.1	<b>0.0061</b>	0.0015	<b>0.00097</b>	0.00023	<b>L</b>
86-73-7	Fluorene	3.3	<b>0.0097</b>	0.0015	<b>0.0014</b>	0.00022	
85-01-8	Phenanthrene	7.9	<b>0.023</b>	0.0015	<b>0.0032</b>	0.00020	
120-12-7	Anthracene	< 0.50	ND	0.0015	ND	0.00020	
206-44-0	Fluoranthene	1.9	<b>0.0055</b>	0.0015	<b>0.00067</b>	0.00018	
129-00-0	Pyrene	0.77	<b>0.0023</b>	0.0015	<b>0.00027</b>	0.00018	
56-55-3	Benz(a)anthracene	< 0.50	ND	0.0015	ND	0.00016	
218-01-9	Chrysene	< 0.50	ND	0.0015	ND	0.00016	
205-99-2	Benzo(b)fluoranthene	< 0.50	ND	0.0015	ND	0.00014	
207-08-9	Benzo(k)fluoranthene	< 0.50	ND	0.0015	ND	0.00014	
50-32-8	Benzo(a)pyrene	< 0.50	ND	0.0015	ND	0.00014	
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	ND	0.0015	ND	0.00013	
53-70-3	Dibenz(a,h)anthracene	< 0.50	ND	0.0015	ND	0.00013	
191-24-2	Benzo(g,h,i)perylene	< 0.50	ND	0.0015	ND	0.00013	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

L = Laboratory control sample recovery outside the specified limits.

**SURROGATE SPIKE RECOVERY RESULTS**

CAS #	Compound	Spike Amount µg/Sample	Amount Found µg/Sample	% Recovered	Acceptance Limits	Data Qualifier
81103-79-9	Fluorene-d10	5.00	3.73	<b>75</b>	60-120	
1718-52-1	Pyrene-d10	5.00	3.13	<b>63</b>	60-120	
93951-69-0	Fluoranthene-d10	10.0	6.44	<b>64</b>	60-120	
63466-71-7	Benzo[a]pyrene-d12	10.0	6.22	<b>62</b>	60-120	

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 731F-PAH

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503133

ALS Sample ID: P1503133-003

Test Code: EPA TO-13A Modified

Date Collected: 7/31/15

Instrument ID: Agilent 5973N/HP6890A/MS07

Date Received: 8/1/15

Analyst: Madeleine Dangazyan

Date Extracted: 8/3/15

Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge

Date Analyzed: 8/5/15

Test Notes:

Final Volume: 1.0 ml

Volume Sampled: 346390 Liter(s)

Dilution Factor: 1.00

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
91-20-3	Naphthalene	8.1	<b>0.023</b>	0.0029	<b>0.0045</b>	0.00055	<b>L</b>
208-96-8	Acenaphthylene	< 0.50	ND	0.0014	ND	0.00023	<b>L</b>
83-32-9	Acenaphthene	2.1	<b>0.0062</b>	0.0014	<b>0.00098</b>	0.00023	<b>L</b>
86-73-7	Fluorene	3.0	<b>0.0086</b>	0.0014	<b>0.0013</b>	0.00021	
85-01-8	Phenanthrene	7.4	<b>0.021</b>	0.0014	<b>0.0029</b>	0.00020	
120-12-7	Anthracene	< 0.50	ND	0.0014	ND	0.00020	
206-44-0	Fluoranthene	2.1	<b>0.0060</b>	0.0014	<b>0.00073</b>	0.00017	
129-00-0	Pyrene	0.89	<b>0.0026</b>	0.0014	<b>0.00031</b>	0.00017	
56-55-3	Benz(a)anthracene	< 0.50	ND	0.0014	ND	0.00015	
218-01-9	Chrysene	< 0.50	ND	0.0014	ND	0.00015	
205-99-2	Benzo(b)fluoranthene	< 0.50	ND	0.0014	ND	0.00014	
207-08-9	Benzo(k)fluoranthene	< 0.50	ND	0.0014	ND	0.00014	
50-32-8	Benzo(a)pyrene	< 0.50	ND	0.0014	ND	0.00014	
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	ND	0.0014	ND	0.00013	
53-70-3	Dibenz(a,h)anthracene	< 0.50	ND	0.0014	ND	0.00013	
191-24-2	Benzo(g,h,i)perylene	< 0.50	ND	0.0014	ND	0.00013	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

L = Laboratory control sample recovery outside the specified limits.

**SURROGATE SPIKE RECOVERY RESULTS**

CAS #	Compound	Spike Amount µg/Sample	Amount Found µg/Sample	% Recovered	Acceptance Limits	Data Qualifier
81103-79-9	Fluorene-d10	5.00	3.40	<b>68</b>	60-120	
1718-52-1	Pyrene-d10	5.00	3.03	<b>61</b>	60-120	
93951-69-0	Fluoranthene-d10	10.0	6.44	<b>64</b>	60-120	
63466-71-7	Benzo[a]pyrene-d12	10.0	6.71	<b>67</b>	60-120	



**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 731FB-PAH

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503133

ALS Sample ID: P1503133-004

Test Code: EPA TO-13A Modified

Date Collected: 7/31/15

Instrument ID: Agilent 5973N/HP6890A/MS07

Date Received: 8/1/15

Analyst: Madeleine Dangazyan

Date Extracted: 8/3/15

Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge

Date Analyzed: 8/5/15

Test Notes:

Final Volume: 1.0 ml

Volume Sampled: NA Liter(s)

Dilution Factor: 1.00

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
91-20-3	Naphthalene	< 1.0	NA	NA	NA	NA	L
208-96-8	Acenaphthylene	< 0.50	NA	NA	NA	NA	L
83-32-9	Acenaphthene	< 0.50	NA	NA	NA	NA	L
86-73-7	Fluorene	< 0.50	NA	NA	NA	NA	
85-01-8	Phenanthrene	< 0.50	NA	NA	NA	NA	
120-12-7	Anthracene	< 0.50	NA	NA	NA	NA	
206-44-0	Fluoranthene	< 0.50	NA	NA	NA	NA	
129-00-0	Pyrene	< 0.50	NA	NA	NA	NA	
56-55-3	Benz(a)anthracene	< 0.50	NA	NA	NA	NA	
218-01-9	Chrysene	< 0.50	NA	NA	NA	NA	
205-99-2	Benzo(b)fluoranthene	< 0.50	NA	NA	NA	NA	
207-08-9	Benzo(k)fluoranthene	< 0.50	NA	NA	NA	NA	
50-32-8	Benzo(a)pyrene	< 0.50	NA	NA	NA	NA	
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	NA	NA	NA	NA	
53-70-3	Dibenz(a,h)anthracene	< 0.50	NA	NA	NA	NA	
191-24-2	Benzo(g,h,i)perylene	< 0.50	NA	NA	NA	NA	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

L = Laboratory control sample recovery outside the specified limits.

NA = Not applicable.

**SURROGATE SPIKE RECOVERY RESULTS**

CAS #	Compound	Spike Amount µg/Sample	Amount Found µg/Sample	% Recovered	Acceptance Limits	Data Qualifier
81103-79-9	Fluorene-d10	5.00	4.10	<b>82</b>	60-120	
1718-52-1	Pyrene-d10	5.00	3.30	<b>66</b>	60-120	
93951-69-0	Fluoranthene-d10	10.0	7.05	<b>71</b>	60-120	
63466-71-7	Benzo[a]pyrene-d12	10.0	9.96	<b>100</b>	60-120	

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 731sN-PAH

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503133

ALS Sample ID: P1503133-005

Test Code: EPA TO-13A Modified

Date Collected: 7/31/15

Instrument ID: Agilent 5973N/HP6890A/MS07

Date Received: 8/1/15

Analyst: Madeleine Dangazyan

Date Extracted: 8/3/15

Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge

Date Analyzed: 8/5/15

Test Notes:

Final Volume: 1.0 ml

Volume Sampled: 24282 Liter(s)

Dilution Factor: 1.00

Dilution Factor: 10.0

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
91-20-3	Naphthalene	140	<b>5.9</b>	0.41	<b>1.1</b>	0.079	<b>D, L</b>
208-96-8	Acenaphthylene	< 5.0	ND	0.21	ND	0.033	<b>D, L</b>
83-32-9	Acenaphthene	< 5.0	ND	0.21	ND	0.033	<b>D, L</b>
86-73-7	Fluorene	< 5.0	ND	0.21	ND	0.030	<b>D</b>
85-01-8	Phenanthrene	0.56	<b>0.023</b>	0.021	<b>0.0031</b>	0.0028	
120-12-7	Anthracene	< 0.50	ND	0.021	ND	0.0028	
206-44-0	Fluoranthene	< 0.50	ND	0.021	ND	0.0025	
129-00-0	Pyrene	< 0.50	ND	0.021	ND	0.0025	
56-55-3	Benzo(a)anthracene	< 0.50	ND	0.021	ND	0.0022	
218-01-9	Chrysene	< 0.50	ND	0.021	ND	0.0022	
205-99-2	Benzo(b)fluoranthene	< 0.50	ND	0.021	ND	0.0020	
207-08-9	Benzo(k)fluoranthene	< 0.50	ND	0.021	ND	0.0020	
50-32-8	Benzo(a)pyrene	< 0.50	ND	0.021	ND	0.0020	
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	ND	0.021	ND	0.0018	
53-70-3	Dibenz(a,h)anthracene	< 0.50	ND	0.021	ND	0.0018	
191-24-2	Benzo(g,h,i)perylene	< 0.50	ND	0.021	ND	0.0018	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

L = Laboratory control sample recovery outside the specified limits.

D = The reported result is from a dilution.

**SURROGATE SPIKE RECOVERY RESULTS**

CAS #	Compound	Spike Amount µg/Sample	Amount Found µg/Sample	% Recovered	Acceptance Limits	Data Qualifier
81103-79-9	Fluorene-d10	5.00	3.01	<b>60</b>	60-120	
1718-52-1	Pyrene-d10	5.00	3.61	<b>72</b>	60-120	
93951-69-0	Fluoranthene-d10	10.0	7.16	<b>72</b>	60-120	
63466-71-7	Benzo[a]pyrene-d12	10.0	9.13	<b>91</b>	60-120	

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 731sNQ-PAH

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503133

ALS Sample ID: P1503133-006

Test Code: EPA TO-13A Modified

Date Collected: 7/31/15

Instrument ID: Agilent 5973N/HP6890A/MS07

Date Received: 8/1/15

Analyst: Madeleine Dangazyan

Date Extracted: 8/3/15

Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge

Date Analyzed: 8/5/15

Test Notes:

Final Volume: 1.0 ml

Volume Sampled: 20861 Liter(s)

Dilution Factor: 1.00

Dilution Factor: 10.0

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
91-20-3	Naphthalene	15	<b>0.70</b>	0.48	<b>0.13</b>	0.091	<b>D, L</b>
208-96-8	Acenaphthylene	< 5.0	ND	0.24	ND	0.039	<b>D, L</b>
83-32-9	Acenaphthene	< 5.0	ND	0.24	ND	0.038	<b>D, L</b>
86-73-7	Fluorene	< 5.0	ND	0.24	ND	0.035	<b>D</b>
85-01-8	Phenanthrene	< 0.50	ND	0.024	ND	0.0033	
120-12-7	Anthracene	< 0.50	ND	0.024	ND	0.0033	
206-44-0	Fluoranthene	< 0.50	ND	0.024	ND	0.0029	
129-00-0	Pyrene	< 0.50	ND	0.024	ND	0.0029	
56-55-3	Benz(a)anthracene	< 0.50	ND	0.024	ND	0.0026	
218-01-9	Chrysene	< 0.50	ND	0.024	ND	0.0026	
205-99-2	Benzo(b)fluoranthene	< 0.50	ND	0.024	ND	0.0023	
207-08-9	Benzo(k)fluoranthene	< 0.50	ND	0.024	ND	0.0023	
50-32-8	Benzo(a)pyrene	< 0.50	ND	0.024	ND	0.0023	
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	ND	0.024	ND	0.0021	
53-70-3	Dibenz(a,h)anthracene	< 0.50	ND	0.024	ND	0.0021	
191-24-2	Benzo(g,h,i)perylene	< 0.50	ND	0.024	ND	0.0021	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

L = Laboratory control sample recovery outside the specified limits.

D = The reported result is from a dilution.

**SURROGATE SPIKE RECOVERY RESULTS**

CAS #	Compound	Spike Amount µg/Sample	Amount Found µg/Sample	% Recovered	Acceptance Limits	Data Qualifier
81103-79-9	Fluorene-d10	5.00	3.61	<b>72</b>	60-120	
1718-52-1	Pyrene-d10	5.00	3.52	<b>70</b>	60-120	
93951-69-0	Fluoranthene-d10	10.0	7.24	<b>72</b>	60-120	
63466-71-7	Benzo[a]pyrene-d12	10.0	9.97	<b>100</b>	60-120	

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** 731sSQ-PAH

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503133

ALS Sample ID: P1503133-007

Test Code: EPA TO-13A Modified

Date Collected: 7/31/15

Instrument ID: Agilent 5973N/HP6890A/MS07

Date Received: 8/1/15

Analyst: Madeleine Dangazyan

Date Extracted: 8/3/15

Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge

Date Analyzed: 8/5/15

Test Notes:

Final Volume: 10 ml

Volume Sampled: 30994 Liter(s)

Dilution Factor: 1.00

Dilution Factor: 20.0

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
91-20-3	Naphthalene	5,500	<b>180</b>	6.5	<b>34</b>	1.2	<b>D, L</b>
208-96-8	Acenaphthylene	< 100	ND	3.2	ND	0.52	<b>D, L</b>
83-32-9	Acenaphthene	140	<b>4.5</b>	3.2	<b>0.72</b>	0.51	<b>D, L</b>
86-73-7	Fluorene	< 100	ND	3.2	ND	0.47	<b>D</b>
85-01-8	Phenanthrene	< 5.0	ND	0.16	ND	0.022	
120-12-7	Anthracene	< 5.0	ND	0.16	ND	0.022	
206-44-0	Fluoranthene	< 5.0	ND	0.16	ND	0.020	
129-00-0	Pyrene	< 5.0	ND	0.16	ND	0.020	
56-55-3	Benz(a)anthracene	< 5.0	ND	0.16	ND	0.017	
218-01-9	Chrysene	< 5.0	ND	0.16	ND	0.017	
205-99-2	Benzo(b)fluoranthene	< 5.0	ND	0.16	ND	0.016	
207-08-9	Benzo(k)fluoranthene	< 5.0	ND	0.16	ND	0.016	
50-32-8	Benzo(a)pyrene	< 5.0	ND	0.16	ND	0.016	
193-39-5	Indeno(1,2,3-cd)pyrene	< 5.0	ND	0.16	ND	0.014	
53-70-3	Dibenz(a,h)anthracene	< 5.0	ND	0.16	ND	0.014	
191-24-2	Benzo(g,h,i)perylene	< 5.0	ND	0.16	ND	0.014	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

L = Laboratory control sample recovery outside the specified limits.

D = The reported result is from a dilution.

**SURROGATE SPIKE RECOVERY RESULTS**

CAS #	Compound	Spike Amount µg/Sample	Amount Found µg/Sample	% Recovered	Acceptance Limits	Data Qualifier
81103-79-9	Fluorene-d10	5.00	ND	<b>0</b>	60-120	<b>S</b>
1718-52-1	Pyrene-d10	5.00	0.350	<b>7</b>	60-120	<b>S</b>
93951-69-0	Fluoranthene-d10	10.0	0.740	<b>7</b>	60-120	<b>S</b>
63466-71-7	Benzo[a]pyrene-d12	10.0	1.13	<b>11</b>	60-120	<b>S</b>

S = Surrogate recovery not within specified limits.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503133

ALS Sample ID: P150803-MB

Test Code: EPA TO-13A Modified

Date Collected: NA

Instrument ID: Agilent 5973N/HP6890A/MS07

Date Received: NA

Analyst: Madeleine Dangazyan

Date Extracted: 8/03/15

Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge

Date Analyzed: 8/05/15

Test Notes:

Final Volume: 1.0 ml

Volume Sampled: NA Liter(s)

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
91-20-3	Naphthalene	< 1.0	NA	NA	NA	NA	L
208-96-8	Acenaphthylene	< 0.50	NA	NA	NA	NA	L
83-32-9	Acenaphthene	< 0.50	NA	NA	NA	NA	L
86-73-7	Fluorene	< 0.50	NA	NA	NA	NA	
85-01-8	Phenanthrene	< 0.50	NA	NA	NA	NA	
120-12-7	Anthracene	< 0.50	NA	NA	NA	NA	
206-44-0	Fluoranthene	< 0.50	NA	NA	NA	NA	
129-00-0	Pyrene	< 0.50	NA	NA	NA	NA	
56-55-3	Benz(a)anthracene	< 0.50	NA	NA	NA	NA	
218-01-9	Chrysene	< 0.50	NA	NA	NA	NA	
205-99-2	Benzo(b)fluoranthene	< 0.50	NA	NA	NA	NA	
207-08-9	Benzo(k)fluoranthene	< 0.50	NA	NA	NA	NA	
50-32-8	Benzo(a)pyrene	< 0.50	NA	NA	NA	NA	
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	NA	NA	NA	NA	
53-70-3	Dibenz(a,h)anthracene	< 0.50	NA	NA	NA	NA	
191-24-2	Benzo(g,h,i)perylene	< 0.50	NA	NA	NA	NA	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

L = Laboratory control sample recovery outside the specified limits.

NA = Not applicable.

**SURROGATE SPIKE RECOVERY RESULTS**

CAS #	Compound	Spike Amount µg/Sample	Amount Found µg/Sample	% Recovered	Acceptance Limits	Data Qualifier
81103-79-9	Fluorene-d10	5.00	3.44	<b>69</b>	60-120	
1718-52-1	Pyrene-d10	5.00	3.27	<b>65</b>	60-120	

## ALS ENVIRONMENTAL

### LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Duplicate Lab Control Sample  
**Client Project ID:** Bridgeton / 182608020

ALS Project ID: P1503133  
 ALS Sample ID: P150803-DLCS

Test Code: EPA TO-13A Modified  
 Instrument ID: Agilent 5973N/HP6890A/MS07  
 Analyst: Madeleine Dangazyan  
 Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Extracted: 8/3/15  
 Date Analyzed: 8/05/15  
 Volume(s) Analyzed: NA Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		ALS	RPD	RPD	Data
		LCS / DLCS	LCS	DLCS	LCS	DLCS	Acceptance	RPD			
		µg/ml	µg/ml	µg/ml	LCS	DLCS	Limits	Limit	Qualifier		
91-20-3	Naphthalene	5.00	3.13	2.86	<b>63</b>	<b>57</b>	60-120	10	32	<b>L</b>	
208-96-8	Acenaphthylene	5.00	3.06	2.57	<b>61</b>	<b>51</b>	60-120	18	16	<b>L</b>	
83-32-9	Acenaphthene	5.00	3.14	2.83	<b>63</b>	<b>57</b>	60-120	10	16	<b>L</b>	
86-73-7	Fluorene	5.00	3.44	3.13	<b>69</b>	<b>63</b>	60-120	9	22		
85-01-8	Phenanthrene	5.00	3.35	3.83	<b>67</b>	<b>77</b>	60-120	14	14		
120-12-7	Anthracene	5.00	3.07	3.01	<b>61</b>	<b>60</b>	60-120	2	12		
206-44-0	Fluoranthene	5.00	3.27	3.00	<b>65</b>	<b>60</b>	60-120	8	14		
129-00-0	Pyrene	5.00	3.27	3.03	<b>65</b>	<b>61</b>	60-120	6	16		
56-55-3	Benz(a)anthracene	5.00	4.26	3.85	<b>85</b>	<b>77</b>	60-120	10	7	<b>R</b>	
218-01-9	Chrysene	5.00	3.99	3.61	<b>80</b>	<b>72</b>	60-120	11	7	<b>R</b>	
205-99-2	Benzo(b)fluoranthene	5.00	4.78	4.26	<b>96</b>	<b>85</b>	60-120	12	14		
207-08-9	Benzo(k)fluoranthene	5.00	5.52	5.06	<b>110</b>	<b>101</b>	60-120	9	12		
50-32-8	Benzo(a)pyrene	5.00	4.72	4.22	<b>94</b>	<b>84</b>	60-120	11	9	<b>R</b>	
193-39-5	Indeno(1,2,3-cd)pyrene	5.00	5.12	4.34	<b>102</b>	<b>87</b>	60-120	16	20		
53-70-3	Dibenz(a,h)anthracene	5.00	4.25	3.57	<b>85</b>	<b>71</b>	60-120	18	10	<b>R</b>	
191-24-2	Benzo(g,h,i)perylene	5.00	4.08	3.42	<b>82</b>	<b>68</b>	60-120	19	16	<b>R</b>	

L = Laboratory control sample recovery outside the specified limits.

R = Duplicate precision not met.

### SURROGATE/FIELD SPIKE RECOVERY RESULTS

CAS #	Compound	QC Sample	Spike Amount µg/Sample	Amount Found µg/Sample	% Recovered	Acceptance Limits	Data Qualifier
81103-79-9	Fluorene-d10	LCS	5.00	3.79	<b>76</b>	60-120	
1718-52-1	Pyrene-d10	LCS	5.00	3.32	<b>66</b>	60-120	
93951-69-0	Fluoranthene-d10	LCS	5.00	3.31	<b>66</b>	60-120	
63466-71-7	Benzo[a]pyrene-d12	LCS	5.00	4.95	<b>99</b>	60-120	
81103-79-9	Fluorene-d10	DLCS	5.00	3.43	<b>69</b>	60-120	
1718-52-1	Pyrene-d10	DLCS	5.00	3.06	<b>61</b>	60-120	
93951-69-0	Fluoranthene-d10	DLCS	5.00	3.02	<b>60</b>	60-120	
63466-71-7	Benzo[a]pyrene-d12	DLCS	5.00	4.41	<b>88</b>	60-120	

Response Factor Report MS07

Method Path : J:\Ms07\METHODS\  
 Method File : PS101014E.MS07.M  
 Title : TO-13A Modified For PAHs in SIM  
 Last Update : Fri Oct 10 16:54:29 2014  
 Response Via : Initial Calibration

Calibration Files  
 0.5 =10101405.D 1 =10101406.D 5 =10101407.D 10 =10101408.D 20 =10101409.D 40 =10101413.D  
 100 =10101411.D

Compound	0.5	1	5	10	20	40	100	Avg	%RSD
1) I Naphthalene-d8	1.114	1.105	1.025	0.978	1.047	1.141	1.049	1.066	5.37
2) Naphthalene									
3) I Acenaphthene-d10	1.798	1.866	1.924	1.865	1.981	2.093		1.921	5.44
4) Acenaphthylene	1.425	1.334	1.199	1.136	1.195	1.188		1.246	8.79
5) Acenaphthene	1.147	1.099	1.051	1.018	1.101	1.142		1.093	4.63
6) S Fluorene-d10	1.321	1.329	1.334	1.291	1.313	1.531		1.353	6.53
7) Fluorene									
8) I Phenanthrene-d10	1.379	1.392	1.208	1.155	1.254	1.152		1.257	8.48
9) Phenanthrene	1.346	1.406	1.400	1.335	1.361	1.476		1.387	3.75
10) Anthracene	1.016	1.053	1.065	1.040	1.119	1.194		1.081	6.01
11) S Fluoranthene-d10	1.229	1.271	1.287	1.242	1.323	1.389		1.290	4.57
12) Fluoranthene	0.920	0.955	0.979	0.952	1.013	1.079		0.983	5.73
13) S Pyrene-d10	1.291	1.348	1.346	1.295	1.363	1.422		1.344	3.59
14) Pyrene									
15) I Chrysene-d12	1.187	1.126	1.123	1.057	1.130	1.190		1.135	4.33
16) Benzo[a]anthra...	1.466	1.465	1.337	1.263	1.320	1.394		1.374	5.97
17) Chrysene									
18) I Perylene-d12	0.972	0.987	1.046	1.020	1.066	1.098		1.032	4.65
19) Benzo[b]fluora...	1.228	1.255	1.246	1.193	1.205	1.293		1.237	2.92
20) Benzo[k]fluora...	0.760	0.735	0.783	0.750	0.780	0.797		0.767	3.01
21) S Benzo[a]pyrene...	0.990	1.014	1.081	0.971	1.147	1.149		1.059	7.42
22) Benzo[a]pyrene	0.826	0.889	0.910	0.978	1.026	1.095		0.954	10.29
23) Indeno[1,2,3-c...	0.896	0.926	0.963	0.934	0.969	0.986		0.946	3.51
24) Dibenz[a,h]ant...	0.990	1.010	1.019	0.979	0.999	1.033		1.005	1.98
25) Benzo[g,h,i]pe...									

(#) = Out of Range

**ALS Environmental**

**TO-13A Polynuclear Aromatic Hydrocarbons (PAHs) by GC/MS**

Method : TO-13A Modified For PAHs in SIM  
 Client & Job# : Stantec P1503133  
 Analyst : MD

Printed : 8/7/2015  
 Instrument : MS07  
 Date Acquired : 8/5/2015  
 Sample Media: HiVol purif/xad + filter

**SAMPLE RESULT SUMMARIES (ug/ml)**

MDL	%Diff.	ug/ml	% Rec.	ug/ml	% Rec.	%RPD	%RPD	ug/sample	ug/sample	ug/sample	ug/sample
10ug/ml PAHs CCV		LCS 5ug/ml ext.8/3/15 fv=1ml	% Rec. fv=1ml	LCS 5ug/ml ext.8/3/15 fv=1ml	% Rec. fv=1ml	%RPD	%RPD	MB ext.8/3/15 fv=1ml	P1503133-001 ext.8/3/15 fv=1ml	P1503133-002 ext.8/3/15 fv=1ml	P1503133-003 ext.8/3/15 fv=1ml
Dilution Factor		1.0		1.0				1.0	1.0	1.0	1.0
Final Extract Vol. (ml)		1.0		1.0				1.0	1.0	1.0	1.0
Naphthalene	9.9%	9.01	63%	2.86	57%	9%	9%	ND	12.391	7.836	8.109
Acenaphthylene	7.4%	9.26	61%	2.57	51%	17%	17%	ND	ND	ND	ND
Acenaphthene	15.0%	8.51	63%	2.83	57%	10%	10%	ND	2.325	2.081	2.142
Fluorene	6.0%	9.40	69%	3.13	63%	10%	10%	ND	3.100	3.294	2.996
Phenanthrene	20.2%	7.98	67%	3.83	77%	13%	13%	ND	7.438	7.894	7.390
Anthracene	17.0%	8.30	61%	3.01	60%	2%	2%	ND	ND	ND	ND
Fluoranthene	16.5%	8.35	65%	3.00	60%	8%	8%	ND	1.881	1.884	2.090
Pyrene	17.1%	8.29	65%	3.27	61%	8%	8%	ND	0.787	0.770	0.890
Benzo(a)anthracene	0.4%	9.96	85%	4.26	77%	10%	10%	ND	ND	ND	ND
Chrysene	12.9%	8.71	80%	3.99	72%	10%	10%	ND	ND	ND	ND
Benzo(b)fluoranthene	12.3%	11.23	96%	4.78	85%	12%	12%	ND	ND	ND	ND
Benzo(k)fluoranthene	14.5%	11.45	110%	5.52	101%	9%	9%	ND	ND	ND	ND
Benzo(a)pyrene	15.5%	11.55	94%	4.72	84%	11%	11%	ND	ND	ND	ND
Indeno[1,2,3-cd]pyrene	8.0%	10.80	102%	5.12	87%	17%	17%	ND	ND	ND	ND
Dibenz[a,h]anthracene	0.9%	10.09	85%	4.25	71%	17%	17%	ND	ND	ND	ND
Benzo[g,h,i]perylene	6.0%	9.40	82%	4.08	68%	18%	18%	ND	ND	ND	ND

**% Surrogate Spike Recoveries Summary**

Sample Information :	LCS 5ug/ml ext.8/3/15 fv=1ml	LCS 5ug/ml ext.8/3/15 fv=1ml	LCS 5ug/ml ext.8/3/15 fv=1ml	MB ext.8/3/15 fv=1ml	P1503133-001 ext.8/3/15 fv=1ml	P1503133-002 ext.8/3/15 fv=1ml	P1503133-003 ext.8/3/15 fv=1ml
Fluorene-d10	3.79	3.43	3.44	3.44	3.58	3.73	3.40
% Recovery	76%	69%	69%	69%	72%	75%	68%
Pyrene-d10	3.32	3.06	3.27	3.27	3.42	3.13	3.03
% Recovery	66%	61%	65%	65%	68%	63%	61%
Fluorene-d10	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Pyrene-d10	Pass	Pass	Pass	Pass	Pass	Pass	Pass





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[www.alsglobal.com](http://www.alsglobal.com)

August 18, 2015

Service Request No: P1503139

Deborah L. Gray, Ph.D., DABT  
Principal Toxicologist  
Stantec  
1500 Lake Shore Drive, Suite 100  
Columbus, OH, 73204-3800

**Laboratory Results for: Bridgeton / 182608020**

Dear Deborah,

Enclosed are the results of the sample(s) submitted to our Houston laboratory on August 01, 2015. For your reference, these analyses have been assigned our service request number P1503139.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided.

All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the 2009 TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My direct line is 281-575-2284. You may also contact me via email at [Nicole.Brown@alsglobal.com](mailto:Nicole.Brown@alsglobal.com).

Respectfully submitted,

**ALS Group USA Corp. dba ALS Environmental**

Nicole Brown  
Project Manager

Nicole Brown  
Project Manager

*For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com).*



# Certificate of Analysis

**ALS Environmental - Houston HRMS**  
10450 Stancliff Rd, Suite 210, Houston TX 77099  
Phone (713)266-1599 Fax (713)266-0130  
[www.alsglobal.com](http://www.alsglobal.com)

## ALS Environmental

**Client:** Stantec Consulting Services, Inc.  
**Project:** Bridgeton / 182608020  
**Sample Matrix:** Air

**Service Request No.:** P1503139  
**Date Received:** 08/01/15

### CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

#### Sample Receipt

Seven air samples were received for analysis at ALS Environmental in Houston on 08/01/15 and logged in on 08/03/15.

The samples were received at 5.1 °C in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

#### Data Validation Notes and Discussion

##### MS/MSD

EQ1500466: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/MSD for this extraction batch. The matrix spike recovery for 1234789-HpCDF, 123789-HxCDF and OCDF in the LCS was slightly below control limits. The results reported are from the second injection on the instrument. Acceptable recovery was demonstrated in the DLCS.

##### Y flags – Labeled Standards

Quantification of the native 2,3,7,8-substituted congeners is based on isotopic dilution, which automatically corrects for variation in extraction efficiency and provides accurate values even with poor recovery. Samples that had recoveries of labeled standards outside the acceptance limits are qualified with 'Y' flags on the Labeled Compound summary pages. In all cases, the signal-to-noise ratios are greater than 10:1 and detection limits were below the Method Reporting Limits.

##### K flags

EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag.

##### Detection Limits

Detection limits are calculated for each analyte in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

**The TEO Summary results for each sample have been calculated by ALS/Houston to include:**

- WHO-2005 TEFs, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds (M. Van den Berg et al., Toxicological Sciences 93(2):223-241, 2006)
- Non-detected compounds are not included in the 'Total'

*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020

**Service Request:**P1503139

**SAMPLE CROSS-REFERENCE**

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
P1503139-001	728U1-DF	7/28/2015	1746
P1503139-002	728D1-DF	7/28/2015	1913
P1503139-003	728F-DF	7/28/2015	1700
P1503139-004	728Blank-DF	7/28/2015	0000
P1503139-005	731sN-DF	7/31/2015	1340
P1503139-006	731sNQ-DF	7/31/2015	1207
P1503139-007	731sSQ-DF	7/31/2015	1146

## Service Request Summary

**Folder #:** P1503139  
**Client Name:** Stantec Consulting Group, Inc.  
**Project Name:** Bridgeton  
**Project Number:** 182608020  
  
**Report To:** Deborah Gray  
 Stantec Consulting Services, Inc.  
 1500 Lake Shore Drive Suite 100  
 Columbus, OH 43204  
 USA  
**Phone Number:** 614-486-4383  
**Cell Number:** 614-738-0791  
**Fax Number:**  
**E-mail:** deb.gray@stantec.com

**Project Chemist:** Samantha Henningsen  
**Originating Lab:** SIMIVALLEY  
**Logged By:** SHENNINGSEN  
**Date Received:** 08/01/15  
**Internal Due Date:** 8/14/2015  
**QAP:** LAB QAP  
**Qualifier Set:** Lab Standard  
**Formset:** Lab Standard  
**Merged?:** N  
**Report to MDL?:** Y  
**P.O. Number:** 5167916  
**EDD:** No EDD Specified

7 1 each-Cartridge PUF/Filter (High Volume)  
**Location:** E-Disposed  
**Pressure Gas:**

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON Dioxins and Furans/TC-9A
P1503139-001	728U1-DF	Air	07/28/15 1746	III
P1503139-002	728D1-DF	Air	07/28/15 1913	III
P1503139-003	728F-DF	Air	07/28/15 1700	III
P1503139-004	728Blank-DF	Air	07/28/15 0000	III
P1503139-005	731sN-DF	Air	07/31/15 1340	III
P1503139-006	731sNQ-DF	Air	07/31/15 1207	III
P1503139-007	731sSQ-DF	Air	07/31/15 1146	III

## Service Request Summary

**Folder #:** P1503139  
**Client Name:** Stantec Consulting Group, Inc.  
**Project Name:** Bridgeton  
**Project Number:** 182608020  
  
**Report To:** Deborah Gray  
Stantec Consulting Services, Inc.  
1500 Lake Shore Drive Suite 100  
Columbus, OH 43204  
USA  
**Phone Number:** 614-486-4383  
**Cell Number:** 614-738-0791  
**Fax Number:**  
**E-mail:** deb.gray@stantec.com

**Project Chemist:** Samantha Henningsen  
**Originating Lab:** SIMIVALLEY  
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**Date Received:** 08/01/15  
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**QAP:** LAB QAP  
**Qualifier Set:** Lab Standard  
**Formset:** Lab Standard  
**Merged?:** N  
**Report to MDL?:** Y  
**P.O. Number:** 5167916  
**EDD:** No EDD Specified

7 1 each-Cartridge PUF/Filter (High Volume)  
**Location:** E-Disposed  
**Pressure Gas:**

### **Test Comments:**

<b>Group</b>	<b>Test/Method</b>	<b>Samples</b>	<b>Comments</b>
Semivoa GCMS	Dioxins and Furans/TO-9A	7	Subbed to ALS Houston HRMS

# Superset Summary

Service Request: P1503139

SuperSet Reference: 15-0000343109 rev 00

Analytical Method: TO-9A

Calibrations: 06/30/15

**Data Files:**

Raw Data	Begin CCAL	Method Blank	Lab ID
<b>P500686</b>	P500679	P300889	P1503139-004

Calibrations: 07/06/15

**Data Files:**

Raw Data	Begin CCAL	Method Blank	Lab ID
<b>P300889</b>	P300883	P300889	EQ1500466-01
<b>P300902</b>	P300899	P300889	EQ1500466-02
<b>P300804</b>	P300794	P300889	EQ1500466-03
<b>P300879</b>	P300873	P300889	P1503139-001
<b>P300880</b>	P300873	P300889	P1503139-002
<b>P300881</b>	P300873	P300889	P1503139-003
<b>P300891</b>	P300883	P300889	P1503139-005
<b>P300892</b>	P300883	P300889	P1503139-006
<b>P300893</b>	P300883	P300889	P1503139-007



## Data Qualifiers

### HRMS Qualifier Set

- B Indicates the associated analyte was found in the method blank at >1/10th the reported value.
- E Estimated value. The reported concentration is above the calibration range of the instrument.
- H Sample extracted and/or analyzed out of suggested holding time.
- J Estimated value. The reported concentration is below the MRL.
- K The ion abundance ratio between the primary and secondary ions were outside of theoretical acceptance limits. Reported concentration is a conservative estimate, however EMPC correction was not applied.
- P Chlorodiphenyl ether interference was present at the retention time of the target analyte. Reported result should be considered an estimate.
- Q Monitored lock-mass indicates matrix-interference. Reported result is estimated.
- S Signal saturated detector. Result reported from dilution.
- U Compound was analyzed for, but was not detected (ND).
- X See Case Narrative.
- Y Isotopically Labeled Standard recovery outside of acceptance limits. In all cases, the signal-to-nois ratios are greater than 10:1, making the recoveries acceptable.
  - i The MDL/MRL have been elevated due to a matrix interference.

# ALS Laboratory Group

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## Acronyms

Cal	Calibration
Conc	CONCEntration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

### State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01	11/30/2015
Arizona Department of Health Services	AZ0793	5/27/2016
Arkansas Department of Environmental Quality	14-038-0	6/16/2016
California Department of Health Services	2452	2/28/2017
Florida Department of Health	E87611	6/30/2016
Illinois Environmental Protection Agency	200057	10/6/2015
Kansas Department of Health and Environment	E-10406	1/31/2016
Louisiana Department of Environmental Quality	03048	6/30/2016
Louisiana Department of Health and Hospitals	LA150026	12/31/2015
Maine Center for Disease Control and Prevention	2014019	6/5/2016
Maryland Department of the Environment	343	6/30/2016
Michigan Department of Environmental Quality	9971	6/30/2016
Minnesota Department of Health	840911	12/31/2015
Nebraska Department of Health and Human Services	NE-OS-25-13	6/30/2016
New Mexico Environment Department	TX02694	6/30/2016
New York Department of Health	11707	4/1/2016
Oklahoma Department of Environmental Quality	2014 124	8/31/2015
Oregon Environmental Laboratory Accreditation Program	TX200002	3/24/2016
Pennsylvania Department of Environmental Protection	68-03441	6/30/2016
Texas Commission on Environmental Quality	TX104704216-14-5	6/30/2016
United States Department of Agriculture	P330-14-00067	2/21/2017
Washington Department of Health	c819	11/14/2015
West Virginia Department of Environmental Protection	347	6/30/2016

ALS ENVIRONMENTAL – Houston  
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

DB-5MSUI

SPB-Octyl

**First Level - Data Processing - to be filled by person generating the forms**

Date: 08/17/15 Analyst: JPC Samples: 001-003

**Second Level - Data Review – to be filled by person doing peer review**

Date: 08/18/15 Analyst: JPC Samples: 001.003

ALS ENVIRONMENTAL – Houston  
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID P1503139 DB-5 DB-5MSUI DB-225 SPB-Octyl

~~First Level – Data Processing – to be filled by person generating the forms~~

Date:	Analyst:	Samples:
08/18/15	JL	- 004

~~Second Level – Data Review – to be filled by person doing peer review~~

Date:	Analyst:	Samples:
08/18/15	LKL	004

ALS ENVIRONMENTAL – Houston  
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID P1503139 DB-5 DB-5MSUI DB-225 SPB-Octyl

~~First Level - Data Processing - to be filled by person generating the forms~~

Date:	Analyst:	Samples:
08/17/15	JL	-005, -006, -007

~~Second Level - Data Review - to be filled by person doing peer review~~

Date:	Analyst:	Samples:
08/18/15	LKL	005, 006, 007



# Chain of Custody

**ALS Environmental - Houston HRMS**  
10450 Stancliff Rd, Suite 210, Houston TX 77099  
Phone (713)266-1599 Fax (713)266-0130  
[www.alsglobal.com](http://www.alsglobal.com)



2655 Park Center Drive, Suite A  
 Simi Valley, California 93065  
 Phone: (805) 526-7161 Fax: (805) 526-7270

Chain of Custody Record & Analytical Service Request

Requested Turnaround Time in Business Days (Surcharges) Please Circle:  
 1 Day (100%)   2 Day (75%)   3 Day (50%)   4 Day (35%)   5 Day (25%)   10 Day (Standard)

ALS Project No.

Company Name & Address (Reporting Information) Stantec Consulting 1500 Lake Shore Drive Columbus Ohio Project Manager Deb.Gray@Stantec.com Phone 614-643-4362 Email Address for Result Reporting Deb.Gray@Stantec.com				Project Name Bridgeton Project Number 182608020 P.O. # / Billing Information Amy Hargrove/Bridgeton LF Sampler (Print & Sign) N/CJL				ALS Contact: Samantha Henningsen				Analysis Method/Analytes				Comments e.g. Actual Preservative or specific instructions
Chris.lalonde@stantec.com				Chris.lalonde@stantec.com				EPA TO 9a				EPA TO 13				
Client Sample ID	Laboratory ID #	Media ID	Date Collected	Sampling Pump ID	Sampling Start Time (7/28)	Sampling End Time (7/29)	Sample Volume (L)	EPA TO 9a	EPA TO 13							
728U1-DF		302-58-013	7/28/2015	1075	17:46	17:46	353,422	X								
728D1-DF		302-58-014	7/28/2015	1085	19:13	19:13	355,314	X								
728F-DF		302-58-015	7/28/2015	1068	17:00	17:00	361,997	X								
728Blank-DF		302-58-012	7/28/2015	NA	16:00	NA	NA	X						Field Blank		
731sN-DF		302-58-004	7/31/2015	1060	11:40	13:40	29,708	X								
731sNQ-DF		302-58-007	7/31/2015	1075	10:04	12:07	29,455	X								
731sSQ-DF		302-58-001	7/31/2015	1113	9:13	11:46	36,669	X								

\*Bad Sample

**P1503139**     **5**  
 Stantec Consulting Services, Inc.  
 Bridgeton

Report Tier Levels - please select  
 Tier I - (Results/Default if not specified) \_\_\_\_\_  
 Tier II (Results + QC) \_\_\_\_\_  
 Tier III (Data Validation Package) 10% Surcharge X  
 Tier IV (client specified) \_\_\_\_\_  
 EDD required Yes \_\_\_\_\_  
 Type: \_\_\_\_\_  
 Project Requirements (MRLs, QAPP) \_\_\_\_\_

Relinquished by: (Signature)	Date: 7/31/15	Time: 16:00	Received by: (Signature)	Date: 8/11/15	Time: 09:18
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date: 8/31/15	Time: 11:40
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature \_\_\_\_\_ °C

Un-used media to be returned Fedex ground.  
 \*Pump failed sample included do not analyze.

UIC.  
 Temp 16.9°  
 # 4  
 c/f 0.3°



# Intra-Network Chain of Custody

2655 Park Center Drive, Suite A • Simi Valley, CA 93065 • 805-526-7161 • FAX 805-526-7270

ALS Contact: Samantha Henningsen

**Project Name:** Bridgeton  
**Project Number:** 182608020  
**Project Manager:** Deborah Gray  
**Company:** Stantec Consulting Services, Inc.

Dioxins and Furans  
TO-9A

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample		Date Received	Send To	
				Date	Time			
P1503139-001	728U1-DF		Air	7/28/15	1746	8/1/15	HOUSTON	III
P1503139-002	728D1-DF		Air	7/28/15	1913	8/1/15	HOUSTON	III
P1503139-003	728F-DF		Air	7/28/15	1700	8/1/15	HOUSTON	III
P1503139-004	728Blank-DF		Air	7/28/15	0000	8/1/15	HOUSTON	III
P1503139-005	731sN-DF		Air	7/31/15	1340	8/1/15	HOUSTON	III
P1503139-006	731sNQ-DF		Air	7/31/15	1207	8/1/15	HOUSTON	III
P1503139-007	731sSQ-DF		Air	7/31/15	1146	8/1/15	HOUSTON	III

**Test Comments**

Dioxins and Furans - TO-9A

P1503139-001,2,3,4,5,6,7

Subbed to ALS Houston HRMS

<b>Special Instructions/Comments</b> Send report to following email addresses: Samantha.henningsen@alsglobal.com, Deb.gray@stantec.com, Nick.Iannaggi@stantec.com, Chris.LaLonde@stantec.com  Address Report to : Deborah L. Gray, Ph.D., DABT Principal Toxicologist Stantec 1500 Lake Shore Drive, Suite 100 Columbus OH 43204-3800	<b>Turnaround Requirements</b> ___ RUSH (Surcharges Apply)  <b>PLEASE CIRCLE WORK DAYS</b> 1 2 3 4 5  <input checked="" type="checkbox"/> STANDARD  Requested FAX Date: _____ Requested Report Date: <u>08/14/15</u>	<b>Report Requirements</b> ___ I. Results Only ___ II. Results + QC Summaries <input checked="" type="checkbox"/> III. Results + QC and Calibration Summaries ___ IV. Data Validation Report with Raw Data  PQL/MDL/J <u>N</u> EDD <u>N</u>	<b>Invoice Information</b>  PO# 54P1503139  Bill to

Relinquished By: P1503139

Received By: 17 of 643

Airbill Number: \_\_\_\_\_



# Cooler Receipt Form

Project Chemist NB

Client/Project Stantec

Thermometer ID SMO 4

Date/Time Received: AL 8/3/15 8/1/15 Initials: AL

Date/Time Logged in: 8/3/15 Initials AL

1. Method of delivery:  US Mail  Fed Ex  UPS  DHL  Courier  Client
2. Samples received in:  Cooler  Box  Envelope  Other
3. Were custody seals on coolers?  Yes  No  
 Were they intact?  Yes  No  N/A  
 Were they signed and dated?  Yes  No  N/A
4. Packing Material:  Inserts  Baggies  Bubble Wrap  Gel Packs  Wet Ice  Sleeves  Other
5. Foreign or Regulated Soil?  Yes  No Location of Sampling: \_\_\_\_\_

If yes, how many and where?

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
<u>7901 9223 7703</u>		<u>8/3/15</u>	<u>1140</u>	<u>AL</u>	<u>4.9/5.1</u>	<input type="checkbox"/>
						<input type="checkbox"/>
						<input type="checkbox"/>
						<input type="checkbox"/>

6. Were custody papers properly filled out (ink, signed, dated, etc)?  Yes  No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)?  Yes  No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)?  Yes  No
9. Were appropriate bottles/containers and volumes received for the requested tests?  Yes  No
10. Did sample labels and tags agree with custody documents?  Yes  No

Notes, Discrepancies, & Resolutions:

Samples arrived Saturday (8/1/15) stored in Walk-In cooler until Monday AL 8/3/15

Client sent back one Puf that is not to be tested AL 8/3/15

Service request Label:

**P1503139** **5**  
 Stantec Consulting Services, Inc.  
 Bridgeton





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10450 Stancliff Rd., Suite 210  
Houston, TX 77099  
T: +1 713 266 1599  
F: +1 713 266 1599  
[www.alsglobal.com](http://www.alsglobal.com)

## SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

### **Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

### **Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sample. The COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

### **Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

### **Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6°C.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10°C.
- ✓ Air samples are shipped and stored cold, at 0 to 6°C
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report



# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**  
10450 Stancliff Rd., Suite 210, Houston, TX 77099  
Phone (713)266-1599 Fax (713)266-0130  
[www.alsglobal.com](http://www.alsglobal.com)

# Preparation Information Benchsheet

**Prep Run#:** 241782  
**Team:** Semivoa GCMS/LMCCRINK

**Prep WorkFlow:** OrgExtDioxA(7)  
**Prep Method:** Method

**Status:** Prepped  
**Prep Date/Time:** 8/4/15 01:30 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	EQ1500466-01	MB		TO-9A/Dioxins and Furans		Air	0.5000Sample	
2	EQ1500466-02	LCS		TO-9A/Dioxins and Furans		Air	0.5000Sample	
3	EQ1500466-03	DLCS		TO-9A/Dioxins and Furans		Air	0.5000Sample	
4	P1503139-001	728U1-DF	.01	TO-9A/Dioxins and Furans		Air	0.5000Sample	PUF 302-58-013
5	P1503139-002	728D1-DF	.01	TO-9A/Dioxins and Furans		Air	0.5000Sample	PUF 302-58-014
6	P1503139-003	728F-DF	.01	TO-9A/Dioxins and Furans		Air	0.5000Sample	PUF 302-58-015
7	P1503139-004	728Blank-DF	.01	TO-9A/Dioxins and Furans		Air	0.5000Sample	PUF 302-58-011
8	P1503139-005	731sN-DF	.01	TO-9A/Dioxins and Furans		Air	0.5000Sample	PUF 302-58-004
9	P1503139-006	731sNQ-DF	.01	TO-9A/Dioxins and Furans		Air	0.5000Sample	PUF 302-58-007
10	P1503139-007	731sSQ-DF	.01	TO-9A/Dioxins and Furans		Air	0.5000Sample	PUF 302-58-001

## Spiking Solutions

<b>Name:</b> 23/TO-9A Alternate Working Solution	<b>Inventory ID</b> 76655	<b>Logbook Ref:</b> 76655 LM 11/13/14	<b>Expires On:</b> 11/13/2015
--	---------------------------	---------------------------------------	-------------------------------

EQ1500466-01 20.00µL	EQ1500466-02 20.00µL	EQ1500466-03 20.00µL	P1503139-001 20.00µL	P1503139-002 20.00µL	P1503139-003 20.00µL
P1503139-004 20.00µL	P1503139-005 20.00µL	P1503139-006 20.00µL	P1503139-007 20.00µL		

<b>Name:</b> 23/TO-9A Internal Working Solution	<b>Inventory ID</b> 77568	<b>Logbook Ref:</b> 100-200ng/ml 77568 WM 12/23/14	<b>Expires On:</b> 12/23/2015
---	---------------------------	--	-------------------------------

EQ1500466-01 40.00µL	EQ1500466-02 40.00µL	EQ1500466-03 40.00µL	P1503139-001 40.00µL	P1503139-002 40.00µL	P1503139-003 40.00µL
P1503139-004 40.00µL	P1503139-005 40.00µL	P1503139-006 40.00µL	P1503139-007 40.00µL		

<b>Name:</b> 23/TO-9A Surrogate Working Solution	<b>Inventory ID</b> 81721	<b>Logbook Ref:</b> 81721 100 ng/mL LM 6/11/15	<b>Expires On:</b> 06/11/2016
--	---------------------------	--	-------------------------------

EQ1500466-01 40.00µL	EQ1500466-02 40.00µL	EQ1500466-03 40.00µL	P1503139-001 40.00µL	P1503139-002 40.00µL	P1503139-003 40.00µL
P1503139-004 40.00µL	P1503139-005 40.00µL	P1503139-006 40.00µL	P1503139-007 40.00µL		

<b>Name:</b> 1613B Matrix Working Standard	<b>Inventory ID</b> 82970	<b>Logbook Ref:</b> 2-20ng/ml 82970 DE 8/3/15	<b>Expires On:</b> 05/19/2016
--	---------------------------	---	-------------------------------

EQ1500466-02 200.00µL	EQ1500466-03 200.00µL
-----------------------	-----------------------

## Preparation Materials

Carbon, High Purity	AL 07/28/15 (82889)	Ethyl Acetate 99.9% Minimum	AL 07/16/15 (82546)	Glass Wool	AL 04/17/15 (80420)
Sulfuric Acid Reagent Grade H2SO4	LM 3/4/15 (79265)	EtOAc			
Sodium Chloride Reagent Grade NaCl	C2-65-5 (38670)	Hexanes 95%	AL 07/24/15 (82843)	Dichloromethane (Methylene Chloride) 99.9% MeCl2	AL 07/27/15 (82887)
Tridecane (n-Tridecane)	AL 07/23/15 (82774)	Sodium Hydroxide Reagent Grade NaOH	LM 09/02/14 (74232)	Sodium Sulfate Anhydrous Reagent Grade Na2SO4	AL 07/15/15 (82507)
P1503139		Silica Gel Reagent Grade	AL 06/04/15 (81560)	Toluene 99.9% Minimum	AL 07/24/15 (82844)

# Preparation Information Benchsheet

**Prep Run#:** 241782  
**Team:** Semivoa GCMS/LMCCRINK

**Prep WorkFlow:** OrgExtDioxA(7)  
**Prep Method:** Method

**Status:** Prepped  
**Prep Date/Time:** 8/4/15 01:30 PM

### Preparation Steps

Step: Extraction	Step: Acid Clean	Step: Silica Gel Clean	Step: Final Volume
Started: 8/4/15 13:30	Started: 8/6/15 09:00	Started: 8/7/15 11:00	Started: 8/10/15 10:00
Finished: 8/5/15 07:00	Finished: 8/6/15 09:55	Finished: 8/7/15 13:45	Finished: 8/10/15 10:30
By: DEDWARDS	By: CDIAZ	By: CDIAZ	By: CDIAZ
Comments	Comments	Comments	Comments

Comments: \_\_\_\_\_

Reviewed By: ak Date: 8/11/15

### Chain of Custody

Relinquished By: _____	Date: _____	<u>Extracts Examined</u> Yes No
Received By: _____	Date: _____	



# Analytical Results

**ALS Environmental - Houston HRMS**  
10450 Stancliff Rd., Suite 210, Houston, TX 77099  
Phone (713)266-1599 Fax (713)266-0130  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728U1-DF  
**Lab Code:** P1503139-001

**Service Request:** P1503139  
**Date Collected:** 07/28/15 17:46  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300879  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/14/15 17:19  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300873

**Native Analyte Results**

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	3.66	10.0			1
1,2,3,7,8-PeCDD	ND	U	4.96	50.0			1
1,2,3,4,7,8-HxCDD	ND	U	3.76	50.0			1
1,2,3,6,7,8-HxCDD	ND	U	3.78	50.0			1
1,2,3,7,8,9-HxCDD	ND	U	3.43	50.0			1
1,2,3,4,6,7,8-HpCDD	9.72J		2.76	50.0	1.07	1.000	1
OCDD	40.2J		6.66	100	0.80	1.000	1
2,3,7,8-TCDF	ND	U	5.73	10.0			1
1,2,3,7,8-PeCDF	ND	U	16.5	50.0			1
2,3,4,7,8-PeCDF	ND	U	17.6	50.0			1
1,2,3,4,7,8-HxCDF	ND	U	3.45	50.0			1
1,2,3,6,7,8-HxCDF	ND	U	3.24	50.0			1
1,2,3,7,8,9-HxCDF	ND	U	3.63	50.0			1
2,3,4,6,7,8-HxCDF	ND	U	3.56	50.0			1
1,2,3,4,6,7,8-HpCDF	11.0J		3.84	50.0	0.94	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	4.50	50.0			1
OCDF	17.4JK		6.79	100	1.18	1.005	1



**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728U1-DF  
**Lab Code:** P1503139-001

**Service Request:** P1503139  
**Date Collected:** 07/28/15 17:46  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300879  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/14/15 17:19  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300873

**Native Analyte Results**

<b>Analyte Name</b>	<b>Result</b>	<b>Q</b>	<b>EDL</b>	<b>MRL</b>	<b>Ion Ratio</b>	<b>RRT</b>	<b>Dilution Factor</b>
Total Tetra-Dioxins	ND	U	3.66	10.0			1
Total Penta-Dioxins	ND	U	4.96	50.0			1
Total Hexa-Dioxins	ND	U	3.65	50.0			1
Total Hepta-Dioxins	20.9J		2.76	50.0	1.14		1
Total Tetra-Furans	ND	U	5.73	10.0			1
Total Penta-Furans	38.0J		17.0	50.0	1.47		1
Total Hexa-Furans	24.8J		3.46	50.0	1.06		1
Total Hepta-Furans	11.0J		4.14	50.0	0.94		1

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728U1-DF  
**Lab Code:** P1503139-001

**Service Request:** P1503139  
**Date Collected:** 07/28/15 17:46  
**Date Received:** 08/01/15 09:18  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300879  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/14/15 17:19  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300873

**Labeled Standard Results**

<b>Labeled Compounds</b>	<b>Spike Conc.(pg)</b>	<b>Conc. Found (pg)</b>	<b>% Rec</b>	<b>Q</b>	<b>Control Limits</b>	<b>Ion Ratio</b>	<b>RRT</b>
13C-2,3,7,8-TCDD	2000	1255.664	63		50-120	0.76	1.020
13C-1,2,3,7,8-PeCDD	2000	1450.474	73		50-120	1.55	1.183
13C-1,2,3,6,7,8-HxCDD	2000	1663.794	83		50-120	1.24	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1449.888	72		40-120	1.06	1.066
13C-OCDD	4000	2370.653	59		40-120	0.88	1.141
13C-2,3,7,8-TCDF	2000	1306.859	65		50-120	0.78	0.993
13C-1,2,3,7,8-PeCDF	2000	1471.068	74		50-120	1.54	1.141
13C-1,2,3,6,7,8-HxCDF	2000	1666.228	83		50-120	0.51	0.974
13C-1,2,3,4,6,7,8-HpCDF	2000	1453.634	73		40-120	0.44	1.042
37Cl-2,3,7,8-TCDD	2000	2039.082	102		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	2000	1682.928	84		50-120	1.23	0.997
13C-2,3,4,7,8-PeCDF	2000	1821.671	91		50-120	1.55	1.028
13C-1,2,3,4,7,8-HxCDF	2000	1676.638	84		50-120	0.51	0.997
13C-1,2,3,4,7,8,9-HpCDF	2000	1620.715	81		40-120	0.43	1.036
13C-1,2,3,7,8,9-HxCDF	2000	1397.291	70		50-120	0.50	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728U1-DF  
**Lab Code:** P1503139-001

**Service Request:** P1503139  
**Date Collected:** 07/28/15 17:46  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air

**Analysis Method:** TO-9A  
**Prep Method:** Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	3.66	10.0	1	1	
1,2,3,7,8-PeCDD	ND	4.96	50.0	1	1	
1,2,3,4,7,8-HxCDD	ND	3.76	50.0	1	0.1	
1,2,3,6,7,8-HxCDD	ND	3.78	50.0	1	0.1	
1,2,3,7,8,9-HxCDD	ND	3.43	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDD	<b>9.72</b>	2.76	50.0	1	0.01	0.0972
OCDD	<b>40.2</b>	6.66	100	1	0.0003	0.0121
2,3,7,8-TCDF	ND	5.73	10.0	1	0.1	
1,2,3,7,8-PeCDF	ND	16.5	50.0	1	0.03	
2,3,4,7,8-PeCDF	ND	17.6	50.0	1	0.3	
1,2,3,4,7,8-HxCDF	ND	3.45	50.0	1	0.1	
1,2,3,6,7,8-HxCDF	ND	3.24	50.0	1	0.1	
1,2,3,7,8,9-HxCDF	ND	3.63	50.0	1	0.1	
2,3,4,6,7,8-HxCDF	ND	3.56	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDF	<b>11.0</b>	3.84	50.0	1	0.01	0.110
1,2,3,4,7,8,9-HpCDF	ND	4.50	50.0	1	0.01	
OCDF	<b>17.4</b>	6.79	100	1	0.0003	0.00522
Total TEQ						0.225

2005 WHO TEFs, ND = 0

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728D1-DF  
**Lab Code:** P1503139-002

**Service Request:** P1503139  
**Date Collected:** 07/28/15 19:13  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300880  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/14/15 18:07  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300873

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	2.97	10.0			1
1,2,3,7,8-PeCDD	ND	U	3.13	50.0			1
1,2,3,4,7,8-HxCDD	ND	U	1.78	50.0			1
1,2,3,6,7,8-HxCDD	2.16J		1.79	50.0	1.40	1.000	1
1,2,3,7,8,9-HxCDD	ND	U	1.62	50.0			1
1,2,3,4,6,7,8-HpCDD	7.51JK		2.09	50.0	0.80	1.001	1
OCDD	27.7JK		5.44	100	0.71	1.000	1
2,3,7,8-TCDF	ND	U	4.87	10.0			1
1,2,3,7,8-PeCDF	ND	U	2.51	50.0			1
2,3,4,7,8-PeCDF	ND	U	2.69	50.0			1
1,2,3,4,7,8-HxCDF	ND	U	2.74	50.0			1
1,2,3,6,7,8-HxCDF	ND	U	2.57	50.0			1
1,2,3,7,8,9-HxCDF	ND	U	2.88	50.0			1
2,3,4,6,7,8-HxCDF	ND	U	2.83	50.0			1
1,2,3,4,6,7,8-HpCDF	10.1J		2.56	50.0	1.06	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	2.99	50.0			1
OCDF	11.7JK		6.51	100	0.62	1.005	1

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728D1-DF  
**Lab Code:** P1503139-002

**Service Request:** P1503139  
**Date Collected:** 07/28/15 19:13  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300880  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/14/15 18:07  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300873

**Native Analyte Results**

<b>Analyte Name</b>	<b>Result</b>	<b>Q</b>	<b>EDL</b>	<b>MRL</b>	<b>Ion Ratio</b>	<b>RRT</b>	<b>Dilution Factor</b>
Total Tetra-Dioxins	ND	U	2.97	10.0			1
Total Penta-Dioxins	ND	U	3.13	50.0			1
Total Hexa-Dioxins	8.81J		1.73	50.0	1.19		1
Total Hepta-Dioxins	ND	U	2.09	50.0			1
Total Tetra-Furans	ND	U	4.87	10.0			1
Total Penta-Furans	46.1J		2.60	50.0	1.34		1
Total Hexa-Furans	28.2J		2.75	50.0	1.39		1
Total Hepta-Furans	10.1J		2.76	50.0	1.06		1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728D1-DF  
**Lab Code:** P1503139-002

**Service Request:** P1503139  
**Date Collected:** 07/28/15 19:13  
**Date Received:** 08/01/15 09:18  
**Units:** Percent  
**Basis:** NA

Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300880  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/14/15 18:07  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300873

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	2000	1520.541	76		50-120	0.78	1.020
13C-1,2,3,7,8-PeCDD	2000	1581.434	79		50-120	1.57	1.183
13C-1,2,3,6,7,8-HxCDD	2000	1659.258	83		50-120	1.26	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1462.170	73		40-120	1.06	1.066
13C-OCDD	4000	2293.080	57		40-120	0.90	1.141
13C-2,3,7,8-TCDF	2000	1543.306	77		50-120	0.77	0.993
13C-1,2,3,7,8-PeCDF	2000	1614.353	81		50-120	1.56	1.141
13C-1,2,3,6,7,8-HxCDF	2000	1654.555	83		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	2000	1419.355	71		40-120	0.43	1.042
37Cl-2,3,7,8-TCDD	2000	2009.667	100		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	2000	1752.093	88		50-120	1.22	0.997
13C-2,3,4,7,8-PeCDF	2000	1781.262	89		50-120	1.55	1.028
13C-1,2,3,4,7,8-HxCDF	2000	1770.784	89		50-120	0.52	0.997
13C-1,2,3,4,7,8,9-HpCDF	2000	1664.234	83		40-120	0.43	1.036
13C-1,2,3,7,8,9-HxCDF	2000	1455.995	73		50-120	0.51	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728D1-DF  
**Lab Code:** P1503139-002

**Service Request:** P1503139  
**Date Collected:** 07/28/15 19:13  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air

**Analysis Method:** TO-9A  
**Prep Method:** Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	2.97	10.0	1	1	
1,2,3,7,8-PeCDD	ND	3.13	50.0	1	1	
1,2,3,4,7,8-HxCDD	ND	1.78	50.0	1	0.1	
1,2,3,6,7,8-HxCDD	<b>2.16</b>	1.79	50.0	1	0.1	0.216
1,2,3,7,8,9-HxCDD	ND	1.62	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDD	<b>7.51</b>	2.09	50.0	1	0.01	0.0751
OCDD	<b>27.7</b>	5.44	100	1	0.0003	0.00831
2,3,7,8-TCDF	ND	4.87	10.0	1	0.1	
1,2,3,7,8-PeCDF	ND	2.51	50.0	1	0.03	
2,3,4,7,8-PeCDF	ND	2.69	50.0	1	0.3	
1,2,3,4,7,8-HxCDF	ND	2.74	50.0	1	0.1	
1,2,3,6,7,8-HxCDF	ND	2.57	50.0	1	0.1	
1,2,3,7,8,9-HxCDF	ND	2.88	50.0	1	0.1	
2,3,4,6,7,8-HxCDF	ND	2.83	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDF	<b>10.1</b>	2.56	50.0	1	0.01	0.101
1,2,3,4,7,8,9-HpCDF	ND	2.99	50.0	1	0.01	
OCDF	<b>11.7</b>	6.51	100	1	0.0003	0.00351
Total TEQ						0.404

2005 WHO TEFs, ND = 0

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728F-DF  
**Lab Code:** P1503139-003

**Service Request:** P1503139  
**Date Collected:** 07/28/15 17:00  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300881  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/14/15 18:55  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300873

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	2.76	10.0			1
1,2,3,7,8-PeCDD	4.54 <b>JK</b>		2.65	50.0	2.09	1.000	1
1,2,3,4,7,8-HxCDD	ND	U	2.24	50.0			1
1,2,3,6,7,8-HxCDD	ND	U	2.25	50.0			1
1,2,3,7,8,9-HxCDD	ND	U	2.04	50.0			1
1,2,3,4,6,7,8-HpCDD	12.9 <b>J</b>		1.95	50.0	1.17	1.000	1
OCDD	48.6 <b>J</b>		4.79	100	0.90	1.000	1
2,3,7,8-TCDF	ND	U	4.04	10.0			1
1,2,3,7,8-PeCDF	ND	U	2.96	50.0			1
2,3,4,7,8-PeCDF	ND	U	3.16	50.0			1
1,2,3,4,7,8-HxCDF	2.35 <b>JK</b>		1.93	50.0	1.02	0.998	1
1,2,3,6,7,8-HxCDF	3.77 <b>JK</b>		1.82	50.0	1.74	1.000	1
1,2,3,7,8,9-HxCDF	ND	U	2.03	50.0			1
2,3,4,6,7,8-HxCDF	2.69 <b>JK</b>		2.00	50.0	1.88	1.014	1
1,2,3,4,6,7,8-HpCDF	13.9 <b>J</b>		2.01	50.0	1.13	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	2.35	50.0			1
OCDF	15.8 <b>J</b>		5.51	100	0.93	1.005	1



**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728F-DF  
**Lab Code:** P1503139-003

**Service Request:** P1503139  
**Date Collected:** 07/28/15 17:00  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300881  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/14/15 18:55  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300873

**Native Analyte Results**

<b>Analyte Name</b>	<b>Result</b>	<b>Q</b>	<b>EDL</b>	<b>MRL</b>	<b>Ion Ratio</b>	<b>RRT</b>	<b>Dilution Factor</b>
Total Tetra-Dioxins	ND	U	2.76	10.0			1
Total Penta-Dioxins	ND	U	2.65	50.0			1
Total Hexa-Dioxins	13.1J		2.17	50.0	1.36		1
Total Hepta-Dioxins	29.3J		1.95	50.0	1.14		1
Total Tetra-Furans	13.0		4.04	10.0	0.77		1
Total Penta-Furans	85.2		3.05	50.0	1.54		1
Total Hexa-Furans	41.2J		1.94	50.0	1.24		1
Total Hepta-Furans	21.4J		2.17	50.0	1.13		1

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728F-DF  
**Lab Code:** P1503139-003

**Service Request:** P1503139  
**Date Collected:** 07/28/15 17:00  
**Date Received:** 08/01/15 09:18  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300881  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/14/15 18:55  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300873

**Labeled Standard Results**

<b>Labeled Compounds</b>	<b>Spike Conc.(pg)</b>	<b>Conc. Found (pg)</b>	<b>% Rec</b>	<b>Q</b>	<b>Control Limits</b>	<b>Ion Ratio</b>	<b>RRT</b>
13C-2,3,7,8-TCDD	2000	1490.586	75		50-120	0.78	1.020
13C-1,2,3,7,8-PeCDD	2000	1615.641	81		50-120	1.57	1.183
13C-1,2,3,6,7,8-HxCDD	2000	1622.553	81		50-120	1.26	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1483.076	74		40-120	1.05	1.066
13C-OCDD	4000	2397.807	60		40-120	0.90	1.141
13C-2,3,7,8-TCDF	2000	1520.108	76		50-120	0.77	0.993
13C-1,2,3,7,8-PeCDF	2000	1642.313	82		50-120	1.56	1.141
13C-1,2,3,6,7,8-HxCDF	2000	1749.260	87		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	2000	1422.924	71		40-120	0.44	1.042
37Cl-2,3,7,8-TCDD	2000	2023.572	101		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	2000	1890.127	95		50-120	1.24	0.997
13C-2,3,4,7,8-PeCDF	2000	1815.378	91		50-120	1.56	1.028
13C-1,2,3,4,7,8-HxCDF	2000	1744.204	87		50-120	0.51	0.997
13C-1,2,3,4,7,8,9-HpCDF	2000	1534.363	77		40-120	0.44	1.036
13C-1,2,3,7,8,9-HxCDF	2000	1468.012	73		50-120	0.51	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728F-DF  
**Lab Code:** P1503139-003

**Service Request:** P1503139  
**Date Collected:** 07/28/15 17:00  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air

**Analysis Method:** TO-9A  
**Prep Method:** Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	2.76	10.0	1	1	
1,2,3,7,8-PeCDD	<b>4.54</b>	2.65	50.0	1	1	4.54
1,2,3,4,7,8-HxCDD	ND	2.24	50.0	1	0.1	
1,2,3,6,7,8-HxCDD	ND	2.25	50.0	1	0.1	
1,2,3,7,8,9-HxCDD	ND	2.04	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDD	<b>12.9</b>	1.95	50.0	1	0.01	0.129
OCDD	<b>48.6</b>	4.79	100	1	0.0003	0.0146
2,3,7,8-TCDF	ND	4.04	10.0	1	0.1	
1,2,3,7,8-PeCDF	ND	2.96	50.0	1	0.03	
2,3,4,7,8-PeCDF	ND	3.16	50.0	1	0.3	
1,2,3,4,7,8-HxCDF	<b>2.35</b>	1.93	50.0	1	0.1	0.235
1,2,3,6,7,8-HxCDF	<b>3.77</b>	1.82	50.0	1	0.1	0.377
1,2,3,7,8,9-HxCDF	ND	2.03	50.0	1	0.1	
2,3,4,6,7,8-HxCDF	<b>2.69</b>	2.00	50.0	1	0.1	0.269
1,2,3,4,6,7,8-HpCDF	<b>13.9</b>	2.01	50.0	1	0.01	0.139
1,2,3,4,7,8,9-HpCDF	ND	2.35	50.0	1	0.01	
OCDF	<b>15.8</b>	5.51	100	1	0.0003	0.00474
Total TEQ						5.71

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728Blank-DF  
**Lab Code:** P1503139-004

**Service Request:** P1503139  
**Date Collected:** 07/28/15 00:00  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P500686  
**ICAL Date:** 06/30/15

**Date Analyzed:** 08/17/15 16:36  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-07  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P500679

**Native Analyte Results**

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	1.26	10.0			1
1,2,3,7,8-PeCDD	ND	U	1.01	50.0			1
1,2,3,4,7,8-HxCDD	ND	U	0.748	50.0			1
1,2,3,6,7,8-HxCDD	ND	U	0.790	50.0			1
1,2,3,7,8,9-HxCDD	ND	U	0.706	50.0			1
1,2,3,4,6,7,8-HpCDD	2.02 <b>JK</b>		0.584	50.0	1.43	1.001	1
OCDD	6.64 <b>J</b>		1.24	100	0.77	1.000	1
2,3,7,8-TCDF	ND	U	1.20	10.0			1
1,2,3,7,8-PeCDF	ND	U	0.834	50.0			1
2,3,4,7,8-PeCDF	ND	U	0.887	50.0			1
1,2,3,4,7,8-HxCDF	0.468 <b>J</b>		0.396	50.0	1.06	0.997	1
1,2,3,6,7,8-HxCDF	0.870 <b>JK</b>		0.404	50.0	1.44	1.000	1
1,2,3,7,8,9-HxCDF	ND	U	0.454	50.0			1
2,3,4,6,7,8-HxCDF	0.686 <b>JK</b>		0.444	50.0	1.03	1.014	1
1,2,3,4,6,7,8-HpCDF	1.63 <b>J</b>		0.580	50.0	1.04	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	0.606	50.0			1
OCDF	1.98 <b>JK</b>		1.33	100	0.69	1.005	1

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728Blank-DF  
**Lab Code:** P1503139-004

**Service Request:** P1503139  
**Date Collected:** 07/28/15 00:00  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P500686  
**ICAL Date:** 06/30/15

**Date Analyzed:** 08/17/15 16:36  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-07  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P500679

**Native Analyte Results**

<b>Analyte Name</b>	<b>Result</b>	<b>Q</b>	<b>EDL</b>	<b>MRL</b>	<b>Ion Ratio</b>	<b>RRT</b>	<b>Dilution Factor</b>
Total Tetra-Dioxins	ND	U	1.26	10.0			1
Total Penta-Dioxins	ND	U	1.01	50.0			1
Total Hexa-Dioxins	ND	U	0.746	50.0			1
Total Hepta-Dioxins	ND	U	0.584	50.0			1
Total Tetra-Furans	ND	U	1.20	10.0			1
Total Penta-Furans	ND	U	0.860	50.0			1
Total Hexa-Furans	0.468J		0.422	50.0	1.06		1
Total Hepta-Furans	1.63J		0.592	50.0	1.04		1

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728Blank-DF  
**Lab Code:** P1503139-004

**Service Request:** P1503139  
**Date Collected:** 07/28/15 00:00  
**Date Received:** 08/01/15 09:18  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P500686  
**ICAL Date:** 06/30/15

**Date Analyzed:** 08/17/15 16:36  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-07  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P500679

**Labeled Standard Results**

<b>Labeled Compounds</b>	<b>Spike Conc.(pg)</b>	<b>Conc. Found (pg)</b>	<b>% Rec</b>	<b>Q</b>	<b>Control Limits</b>	<b>Ion Ratio</b>	<b>RRT</b>
13C-2,3,7,8-TCDD	2000	1369.324	68		50-120	0.79	1.020
13C-1,2,3,7,8-PeCDD	2000	1601.335	80		50-120	1.58	1.182
13C-1,2,3,6,7,8-HxCDD	2000	1161.904	58		50-120	1.30	0.993
13C-1,2,3,4,6,7,8-HpCDD	2000	1270.349	64		40-120	1.05	1.065
13C-OCDD	4000	2314.371	58		40-120	0.90	1.139
13C-2,3,7,8-TCDF	2000	1294.702	65		50-120	0.79	0.992
13C-1,2,3,7,8-PeCDF	2000	1448.484	72		50-120	1.56	1.141
13C-1,2,3,6,7,8-HxCDF	2000	1175.643	59		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	2000	1135.337	57		40-120	0.45	1.041
37Cl-2,3,7,8-TCDD	2000	2017.258	101		50-120	NA	1.000
13C-1,2,3,4,7,8-HxCDD	2000	2112.748	106		50-120	1.28	0.998
13C-2,3,4,7,8-PeCDF	2000	2065.430	103		50-120	1.57	1.028
13C-1,2,3,4,7,8-HxCDF	2000	1753.076	88		50-120	0.53	0.997
13C-1,2,3,4,7,8,9-HpCDF	2000	1816.231	91		40-120	0.44	1.036
13C-1,2,3,7,8,9-HxCDF	2000	1088.486	54		50-120	0.52	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 728Blank-DF  
**Lab Code:** P1503139-004

**Service Request:** P1503139  
**Date Collected:** 07/28/15 00:00  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air

**Analysis Method:** TO-9A  
**Prep Method:** Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	1.26	10.0	1	1	
1,2,3,7,8-PeCDD	ND	1.01	50.0	1	1	
1,2,3,4,7,8-HxCDD	ND	0.748	50.0	1	0.1	
1,2,3,6,7,8-HxCDD	ND	0.790	50.0	1	0.1	
1,2,3,7,8,9-HxCDD	ND	0.706	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDD	<b>2.02</b>	0.584	50.0	1	0.01	0.0202
OCDD	<b>6.64</b>	1.24	100	1	0.0003	0.00199
2,3,7,8-TCDF	ND	1.20	10.0	1	0.1	
1,2,3,7,8-PeCDF	ND	0.834	50.0	1	0.03	
2,3,4,7,8-PeCDF	ND	0.887	50.0	1	0.3	
1,2,3,4,7,8-HxCDF	<b>0.468</b>	0.396	50.0	1	0.1	0.0468
1,2,3,6,7,8-HxCDF	<b>0.870</b>	0.404	50.0	1	0.1	0.0870
1,2,3,7,8,9-HxCDF	ND	0.454	50.0	1	0.1	
2,3,4,6,7,8-HxCDF	<b>0.686</b>	0.444	50.0	1	0.1	0.0686
1,2,3,4,6,7,8-HpCDF	<b>1.63</b>	0.580	50.0	1	0.01	0.0163
1,2,3,4,7,8,9-HpCDF	ND	0.606	50.0	1	0.01	
OCDF	<b>1.98</b>	1.33	100	1	0.0003	0.000594
Total TEQ						0.241

2005 WHO TEFs, ND = 0

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sN-DF  
**Lab Code:** P1503139-005

**Service Request:** P1503139  
**Date Collected:** 07/31/15 13:40  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300891  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 03:02  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	3.24	10.0			1
1,2,3,7,8-PeCDD	ND	U	3.04	50.0			1
1,2,3,4,7,8-HxCDD	ND	U	3.12	50.0			1
1,2,3,6,7,8-HxCDD	ND	U	3.14	50.0			1
1,2,3,7,8,9-HxCDD	ND	U	2.85	50.0			1
1,2,3,4,6,7,8-HpCDD	2.24J		1.95	50.0	0.95	1.000	1
OCDD	ND	U	6.75	100			1
2,3,7,8-TCDF	ND	U	6.17	10.0			1
1,2,3,7,8-PeCDF	ND	U	2.30	50.0			1
2,3,4,7,8-PeCDF	ND	U	2.46	50.0			1
1,2,3,4,7,8-HxCDF	ND	U	1.40	50.0			1
1,2,3,6,7,8-HxCDF	ND	U	1.31	50.0			1
1,2,3,7,8,9-HxCDF	ND	U	1.47	50.0			1
2,3,4,6,7,8-HxCDF	ND	U	1.44	50.0			1
1,2,3,4,6,7,8-HpCDF	1.86JK		1.60	50.0	0.77	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	1.87	50.0			1
OCDF	ND	U	8.93	100			1



**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sN-DF  
**Lab Code:** P1503139-005

**Service Request:** P1503139  
**Date Collected:** 07/31/15 13:40  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300891  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 03:02  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

**Native Analyte Results**

<b>Analyte Name</b>	<b>Result</b>	<b>Q</b>	<b>EDL</b>	<b>MRL</b>	<b>Ion Ratio</b>	<b>RRT</b>	<b>Dilution Factor</b>
Total Tetra-Dioxins	ND	U	3.24	10.0			1
Total Penta-Dioxins	ND	U	3.04	50.0			1
Total Hexa-Dioxins	ND	U	3.03	50.0			1
Total Hepta-Dioxins	2.24J		1.95	50.0	0.95		1
Total Tetra-Furans	ND	U	6.17	10.0			1
Total Penta-Furans	ND	U	2.38	50.0			1
Total Hexa-Furans	ND	U	1.40	50.0			1
Total Hepta-Furans	ND	U	1.73	50.0			1

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sN-DF  
**Lab Code:** P1503139-005

**Service Request:** P1503139  
**Date Collected:** 07/31/15 13:40  
**Date Received:** 08/01/15 09:18  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300891  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 03:02  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

**Labeled Standard Results**

<b>Labeled Compounds</b>	<b>Spike Conc.(pg)</b>	<b>Conc. Found (pg)</b>	<b>% Rec</b>	<b>Q</b>	<b>Control Limits</b>	<b>Ion Ratio</b>	<b>RRT</b>
13C-2,3,7,8-TCDD	2000	1487.017	74		50-120	0.78	1.020
13C-1,2,3,7,8-PeCDD	2000	1549.676	77		50-120	1.55	1.183
13C-1,2,3,6,7,8-HxCDD	2000	1534.610	77		50-120	1.26	0.993
13C-1,2,3,4,6,7,8-HpCDD	2000	1338.507	67		40-120	1.05	1.066
13C-OCDD	4000	2071.559	52		40-120	0.89	1.141
13C-2,3,7,8-TCDF	2000	1539.446	77		50-120	0.77	0.993
13C-1,2,3,7,8-PeCDF	2000	1596.820	80		50-120	1.55	1.141
13C-1,2,3,6,7,8-HxCDF	2000	1756.835	88		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	2000	1297.989	65		40-120	0.43	1.042
37Cl-2,3,7,8-TCDD	2000	2002.725	100		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	2000	1849.642	92		50-120	1.24	0.998
13C-2,3,4,7,8-PeCDF	2000	1703.285	85		50-120	1.54	1.028
13C-1,2,3,4,7,8-HxCDF	2000	1609.598	80		50-120	0.52	0.997
13C-1,2,3,4,7,8,9-HpCDF	2000	1146.766	57		40-120	0.43	1.036
13C-1,2,3,7,8,9-HxCDF	2000	1301.708	65		50-120	0.52	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sN-DF  
**Lab Code:** P1503139-005

**Service Request:** P1503139  
**Date Collected:** 07/31/15 13:40  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air

**Analysis Method:** TO-9A  
**Prep Method:** Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	3.24	10.0	1	1	
1,2,3,7,8-PeCDD	ND	3.04	50.0	1	1	
1,2,3,4,7,8-HxCDD	ND	3.12	50.0	1	0.1	
1,2,3,6,7,8-HxCDD	ND	3.14	50.0	1	0.1	
1,2,3,7,8,9-HxCDD	ND	2.85	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDD	<b>2.24</b>	1.95	50.0	1	0.01	0.0224
OCDD	ND	6.75	100	1	0.0003	
2,3,7,8-TCDF	ND	6.17	10.0	1	0.1	
1,2,3,7,8-PeCDF	ND	2.30	50.0	1	0.03	
2,3,4,7,8-PeCDF	ND	2.46	50.0	1	0.3	
1,2,3,4,7,8-HxCDF	ND	1.40	50.0	1	0.1	
1,2,3,6,7,8-HxCDF	ND	1.31	50.0	1	0.1	
1,2,3,7,8,9-HxCDF	ND	1.47	50.0	1	0.1	
2,3,4,6,7,8-HxCDF	ND	1.44	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDF	<b>1.86</b>	1.60	50.0	1	0.01	0.0186
1,2,3,4,7,8,9-HpCDF	ND	1.87	50.0	1	0.01	
OCDF	ND	8.93	100	1	0.0003	
Total TEQ						0.0410

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sNQ-DF  
**Lab Code:** P1503139-006

**Service Request:** P1503139  
**Date Collected:** 07/31/15 12:07  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300892  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 03:50  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

**Native Analyte Results**

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	3.81	10.0			1
1,2,3,7,8-PeCDD	ND	U	4.03	50.0			1
1,2,3,4,7,8-HxCDD	ND	U	2.54	50.0			1
1,2,3,6,7,8-HxCDD	ND	U	2.55	50.0			1
1,2,3,7,8,9-HxCDD	ND	U	2.32	50.0			1
1,2,3,4,6,7,8-HpCDD	ND	U	2.41	50.0			1
OCDD	ND	U	6.91	100			1
2,3,7,8-TCDF	ND	U	3.81	10.0			1
1,2,3,7,8-PeCDF	ND	U	2.85	50.0			1
2,3,4,7,8-PeCDF	ND	U	3.04	50.0			1
1,2,3,4,7,8-HxCDF	ND	U	1.43	50.0			1
1,2,3,6,7,8-HxCDF	ND	U	1.34	50.0			1
1,2,3,7,8,9-HxCDF	ND	U	1.50	50.0			1
2,3,4,6,7,8-HxCDF	ND	U	1.47	50.0			1
1,2,3,4,6,7,8-HpCDF	ND	U	1.99	50.0			1
1,2,3,4,7,8,9-HpCDF	ND	U	2.33	50.0			1
OCDF	ND	U	11.0	100			1

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sNQ-DF  
**Lab Code:** P1503139-006

**Service Request:** P1503139  
**Date Collected:** 07/31/15 12:07  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300892  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 03:50  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

**Native Analyte Results**

<b>Analyte Name</b>	<b>Result</b>	<b>Q</b>	<b>EDL</b>	<b>MRL</b>	<b>Ion Ratio</b>	<b>RRT</b>	<b>Dilution Factor</b>
Total Tetra-Dioxins	ND	U	3.81	10.0			1
Total Penta-Dioxins	ND	U	4.03	50.0			1
Total Hexa-Dioxins	ND	U	2.47	50.0			1
Total Hepta-Dioxins	2.86J		2.41	50.0	0.99		1
Total Tetra-Furans	ND	U	3.81	10.0			1
Total Penta-Furans	ND	U	2.94	50.0			1
Total Hexa-Furans	ND	U	1.43	50.0			1
Total Hepta-Furans	ND	U	2.14	50.0			1

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sNQ-DF  
**Lab Code:** P1503139-006

**Service Request:** P1503139  
**Date Collected:** 07/31/15 12:07  
**Date Received:** 08/01/15 09:18  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300892  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 03:50  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

**Labeled Standard Results**

<b>Labeled Compounds</b>	<b>Spike Conc.(pg)</b>	<b>Conc. Found (pg)</b>	<b>% Rec</b>	<b>Q</b>	<b>Control Limits</b>	<b>Ion Ratio</b>	<b>RRT</b>
13C-2,3,7,8-TCDD	2000	1376.792	69		50-120	0.77	1.019
13C-1,2,3,7,8-PeCDD	2000	1380.162	69		50-120	1.58	1.183
13C-1,2,3,6,7,8-HxCDD	2000	1351.334	68		50-120	1.20	0.993
13C-1,2,3,4,6,7,8-HpCDD	2000	1198.802	60		40-120	1.04	1.066
13C-OCDD	4000	1848.540	46		40-120	0.89	1.141
13C-2,3,7,8-TCDF	2000	1497.943	75		50-120	0.77	0.992
13C-1,2,3,7,8-PeCDF	2000	1497.051	75		50-120	1.55	1.140
13C-1,2,3,6,7,8-HxCDF	2000	1636.472	82		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	2000	1171.013	59		40-120	0.44	1.042
37Cl-2,3,7,8-TCDD	2000	1876.631	94		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	2000	1546.307	77		50-120	1.32	0.998
13C-2,3,4,7,8-PeCDF	2000	1256.863	63		50-120	1.53	1.028
13C-1,2,3,4,7,8-HxCDF	2000	1167.469	58		50-120	0.51	0.997
13C-1,2,3,4,7,8,9-HpCDF	2000	431.646	22	Y	40-120	0.40	1.036
13C-1,2,3,7,8,9-HxCDF	2000	1294.769	65		50-120	0.51	1.008

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sNQ-DF  
**Lab Code:** P1503139-006

**Service Request:** P1503139  
**Date Collected:** 07/31/15 12:07  
**Date Received:** 08/01/15 09:18

**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method

**Toxicity Equivalency Quotient**

<b>Analyte Name</b>	<b>Result</b>	<b>DL</b>	<b>MRL</b>	<b>Dilution Factor</b>	<b>TEF</b>	<b>TEF - Adjusted Concentration</b>
2,3,7,8-TCDD	ND	3.81	10.0	1	1	
1,2,3,7,8-PeCDD	ND	4.03	50.0	1	1	
1,2,3,4,7,8-HxCDD	ND	2.54	50.0	1	0.1	
1,2,3,6,7,8-HxCDD	ND	2.55	50.0	1	0.1	
1,2,3,7,8,9-HxCDD	ND	2.32	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDD	ND	2.41	50.0	1	0.01	
OCDD	ND	6.91	100	1	0.0003	
2,3,7,8-TCDF	ND	3.81	10.0	1	0.1	
1,2,3,7,8-PeCDF	ND	2.85	50.0	1	0.03	
2,3,4,7,8-PeCDF	ND	3.04	50.0	1	0.3	
1,2,3,4,7,8-HxCDF	ND	1.43	50.0	1	0.1	
1,2,3,6,7,8-HxCDF	ND	1.34	50.0	1	0.1	
1,2,3,7,8,9-HxCDF	ND	1.50	50.0	1	0.1	
2,3,4,6,7,8-HxCDF	ND	1.47	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDF	ND	1.99	50.0	1	0.01	
1,2,3,4,7,8,9-HpCDF	ND	2.33	50.0	1	0.01	
OCDF	ND	11.0	100	1	0.0003	
<b>Total TEQ</b>						<b>0.00</b>

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sSQ-DF  
**Lab Code:** P1503139-007

**Service Request:** P1503139  
**Date Collected:** 07/31/15 11:46  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300893  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 04:39  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

**Native Analyte Results**

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	3.81	10.0			1
1,2,3,7,8-PeCDD	ND	U	3.59	50.0			1
1,2,3,4,7,8-HxCDD	ND	U	2.39	50.0			1
1,2,3,6,7,8-HxCDD	ND	U	2.40	50.0			1
1,2,3,7,8,9-HxCDD	ND	U	2.18	50.0			1
1,2,3,4,6,7,8-HpCDD	2.87JK		1.75	50.0	0.59	1.000	1
OCDD	10.8J		5.14	100	0.79	1.000	1
2,3,7,8-TCDF	ND	U	4.66	10.0			1
1,2,3,7,8-PeCDF	ND	U	2.90	50.0			1
2,3,4,7,8-PeCDF	ND	U	3.10	50.0			1
1,2,3,4,7,8-HxCDF	ND	U	1.03	50.0			1
1,2,3,6,7,8-HxCDF	ND	U	0.966	50.0			1
1,2,3,7,8,9-HxCDF	ND	U	1.09	50.0			1
2,3,4,6,7,8-HxCDF	ND	U	1.07	50.0			1
1,2,3,4,6,7,8-HpCDF	ND	U	1.64	50.0			1
1,2,3,4,7,8,9-HpCDF	ND	U	1.91	50.0			1
OCDF	ND	U	6.95	100			1



**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sSQ-DF  
**Lab Code:** P1503139-007

**Service Request:** P1503139  
**Date Collected:** 07/31/15 11:46  
**Date Received:** 08/01/15 09:18  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300893  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 04:39  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

**Native Analyte Results**

<b>Analyte Name</b>	<b>Result</b>	<b>Q</b>	<b>EDL</b>	<b>MRL</b>	<b>Ion Ratio</b>	<b>RRT</b>	<b>Dilution Factor</b>
Total Tetra-Dioxins	ND	U	3.81	10.0			1
Total Penta-Dioxins	ND	U	3.59	50.0			1
Total Hexa-Dioxins	ND	U	2.32	50.0			1
Total Hepta-Dioxins	ND	U	1.75	50.0			1
Total Tetra-Furans	ND	U	4.66	10.0			1
Total Penta-Furans	ND	U	3.00	50.0			1
Total Hexa-Furans	ND	U	1.04	50.0			1
Total Hepta-Furans	ND	U	1.76	50.0			1

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sSQ-DF  
**Lab Code:** P1503139-007

**Service Request:** P1503139  
**Date Collected:** 07/31/15 11:46  
**Date Received:** 08/01/15 09:18  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300893  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 04:39  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

**Labeled Standard Results**

<b>Labeled Compounds</b>	<b>Spike Conc.(pg)</b>	<b>Conc. Found (pg)</b>	<b>% Rec</b>	<b>Q</b>	<b>Control Limits</b>	<b>Ion Ratio</b>	<b>RRT</b>
13C-2,3,7,8-TCDD	2000	1324.020	66		50-120	0.79	1.020
13C-1,2,3,7,8-PeCDD	2000	1469.122	73		50-120	1.57	1.183
13C-1,2,3,6,7,8-HxCDD	2000	1463.503	73		50-120	1.26	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1318.640	66		40-120	1.04	1.066
13C-OCDD	4000	2129.484	53		40-120	0.89	1.141
13C-2,3,7,8-TCDF	2000	1392.112	70		50-120	0.77	0.993
13C-1,2,3,7,8-PeCDF	2000	1507.739	75		50-120	1.55	1.141
13C-1,2,3,6,7,8-HxCDF	2000	1707.807	85		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	2000	1232.038	62		40-120	0.44	1.042
37Cl-2,3,7,8-TCDD	2000	2024.990	101		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	2000	1886.868	94		50-120	1.25	0.997
13C-2,3,4,7,8-PeCDF	2000	1705.764	85		50-120	1.54	1.028
13C-1,2,3,4,7,8-HxCDF	2000	1551.599	78		50-120	0.52	0.997
13C-1,2,3,4,7,8,9-HpCDF	2000	932.145	47		40-120	0.44	1.036
13C-1,2,3,7,8,9-HxCDF	2000	1360.708	68		50-120	0.51	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** 731sSQ-DF  
**Lab Code:** P1503139-007

**Service Request:** P1503139  
**Date Collected:** 07/31/15 11:46  
**Date Received:** 08/01/15 09:18

**Units:** pg  
**Basis:** NA

Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air

**Analysis Method:** TO-9A  
**Prep Method:** Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	3.81	10.0	1	1	
1,2,3,7,8-PeCDD	ND	3.59	50.0	1	1	
1,2,3,4,7,8-HxCDD	ND	2.39	50.0	1	0.1	
1,2,3,6,7,8-HxCDD	ND	2.40	50.0	1	0.1	
1,2,3,7,8,9-HxCDD	ND	2.18	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDD	<b>2.87</b>	1.75	50.0	1	0.01	0.0287
OCDD	<b>10.8</b>	5.14	100	1	0.0003	0.00324
2,3,7,8-TCDF	ND	4.66	10.0	1	0.1	
1,2,3,7,8-PeCDF	ND	2.90	50.0	1	0.03	
2,3,4,7,8-PeCDF	ND	3.10	50.0	1	0.3	
1,2,3,4,7,8-HxCDF	ND	1.03	50.0	1	0.1	
1,2,3,6,7,8-HxCDF	ND	0.966	50.0	1	0.1	
1,2,3,7,8,9-HxCDF	ND	1.09	50.0	1	0.1	
2,3,4,6,7,8-HxCDF	ND	1.07	50.0	1	0.1	
1,2,3,4,6,7,8-HpCDF	ND	1.64	50.0	1	0.01	
1,2,3,4,7,8,9-HpCDF	ND	1.91	50.0	1	0.01	
OCDF	ND	6.95	100	1	0.0003	
Total TEQ						0.0319

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** Method Blank  
**Lab Code:** EQ1500466-01

**Service Request:** P1503139  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300889  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 01:24  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

**Native Analyte Results**

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	2.80	10.0			1
1,2,3,7,8-PeCDD	ND	U	4.53	50.0			1
1,2,3,4,7,8-HxCDD	ND	U	2.85	50.0			1
1,2,3,6,7,8-HxCDD	ND	U	2.86	50.0			1
1,2,3,7,8,9-HxCDD	ND	U	2.60	50.0			1
1,2,3,4,6,7,8-HpCDD	ND	U	2.42	50.0			1
OCDD	ND	U	6.19	100			1
2,3,7,8-TCDF	ND	U	3.67	10.0			1
1,2,3,7,8-PeCDF	ND	U	3.67	50.0			1
2,3,4,7,8-PeCDF	ND	U	3.92	50.0			1
1,2,3,4,7,8-HxCDF	ND	U	1.63	50.0			1
1,2,3,6,7,8-HxCDF	ND	U	1.53	50.0			1
1,2,3,7,8,9-HxCDF	ND	U	1.72	50.0			1
2,3,4,6,7,8-HxCDF	ND	U	1.69	50.0			1
1,2,3,4,6,7,8-HpCDF	ND	U	1.33	50.0			1
1,2,3,4,7,8,9-HpCDF	ND	U	1.56	50.0			1
OCDF	ND	U	9.33	100			1

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air  
**Sample Name:** Method Blank  
**Lab Code:** EQ1500466-01

**Service Request:** P1503139  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
**Data File Name:** P300889  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 01:24  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

**Native Analyte Results**

<b>Analyte Name</b>	<b>Result</b>	<b>Q</b>	<b>EDL</b>	<b>MRL</b>	<b>Ion Ratio</b>	<b>RRT</b>	<b>Dilution Factor</b>
Total Tetra-Dioxins	ND	U	2.80	10.0			1
Total Penta-Dioxins	ND	U	4.53	50.0			1
Total Hexa-Dioxins	ND	U	2.76	50.0			1
Total Hepta-Dioxins	ND	U	2.42	50.0			1
Total Tetra-Furans	ND	U	3.67	10.0			1
Total Penta-Furans	ND	U	3.79	50.0			1
Total Hexa-Furans	ND	U	1.64	50.0			1
Total Hepta-Furans	ND	U	1.43	50.0			1

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** Bridgeton/182608020  
**Sample Matrix:** Air

**Service Request:** P1503139  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Method Blank  
**Lab Code:** EQ1500466-01

**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analysis Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 0.5000Sample  
  
**Data File Name:** P300889  
**ICAL Date:** 07/06/15

**Date Analyzed:** 08/15/15 01:24  
**Date Extracted:** 8/4/15  
**Instrument Name:** E-HRMS-05  
**GC Column:** DB-5MSUI  
**Blank File Name:** P300889  
**Cal Ver. File Name:** P300883

**Labeled Standard Results**

<b>Labeled Compounds</b>	<b>Spike Conc.(pg)</b>	<b>Conc. Found (pg)</b>	<b>% Rec</b>	<b>Q</b>	<b>Control Limits</b>	<b>Ion Ratio</b>	<b>RRT</b>
13C-2,3,7,8-TCDD	2000	1408.813	70		50-120	0.78	1.019
13C-1,2,3,7,8-PeCDD	2000	1469.019	73		50-120	1.56	1.183
13C-1,2,3,6,7,8-HxCDD	2000	1580.728	79		50-120	1.26	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1397.341	70		40-120	1.04	1.066
13C-OCDD	4000	2061.543	52		40-120	0.88	1.141
13C-2,3,7,8-TCDF	2000	1437.754	72		50-120	0.78	0.992
13C-1,2,3,7,8-PeCDF	2000	1479.723	74		50-120	1.55	1.141
13C-1,2,3,6,7,8-HxCDF	2000	1633.442	82		50-120	0.51	0.974
13C-1,2,3,4,6,7,8-HpCDF	2000	1357.363	68		40-120	0.43	1.042
37Cl-2,3,7,8-TCDD	2000	2080.307	104		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	2000	1874.256	94		50-120	1.26	0.997
13C-2,3,4,7,8-PeCDF	2000	1847.525	92		50-120	1.55	1.028
13C-1,2,3,4,7,8-HxCDF	2000	1843.509	92		50-120	0.51	0.997
13C-1,2,3,4,7,8,9-HpCDF	2000	1443.855	72		40-120	0.42	1.036
13C-1,2,3,7,8,9-HxCDF	2000	1376.681	69		50-120	0.51	1.008



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## LABORATORY REPORT

October 14, 2015

Deborah Gray  
Stantec Consulting Services, Inc.  
1500 Lake Shore Drive Suite 100  
Columbus, OH 43204

**RE: Bridgeton**

Dear Deborah:

Enclosed are the results of the samples submitted to our laboratory on October 9, 2015. For your reference, these analyses have been assigned our service request number P1504274.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**ALS | Environmental**

By Samantha Henningsen at 3:28 pm, Oct 14, 2015

Samantha Henningsen  
Project Manager



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[www.alsglobal.com](http://www.alsglobal.com)

Client: Stantec Consulting Services, Inc.  
Project: Bridgeton

Service Request No: P1504274

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## CASE NARRATIVE

The samples were received intact under chain of custody on October 9, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

### Fixed Gases Analysis

The samples were analyzed for fixed gases (hydrogen, oxygen/argon, nitrogen, carbon monoxide, methane and carbon dioxide) according to modified EPA Method 3C (single injection) using a gas chromatograph equipped with a thermal conductivity detector (TCD). This procedure is described in laboratory SOP VOA-EPA3C. This method is included on the laboratory's DoD-ELAP scope of accreditation, however it is not part of the NELAP or AIHA-LAP accreditation.

### Sulfur and Total Reduced Sulfur as Hydrogen Sulfide Analysis

The samples were also analyzed for twenty sulfur compounds and total reduced sulfur as hydrogen sulfide (TRS as H<sub>2</sub>S) per ASTM D 5504-12 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). All compounds with the exception of hydrogen sulfide and carbonyl sulfide are quantitated against the initial calibration curve for methyl mercaptan. The TRS as H<sub>2</sub>S results were determined by obtaining the total response for all chromatographic peaks and quantitating the value against the initial calibration curve for hydrogen sulfide thus generating a result specified as "Total Reduced Sulfur as Hydrogen Sulfide". This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

### Volatile Organic Compound Analysis

The samples were also analyzed for volatile organic compounds and tentatively identified compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. The method was modified to include the use of helium as a diluent gas in place of zero-grade air for container pressurization. When necessary, analytical sample volumes were adjusted by a correction factor for containers pressurized with helium. A summary sheet has been included listing the affected samples. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation, however it is not part of the AIHA-LAP accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.





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Client: Stantec Consulting Services, Inc.  
Project: Bridgeton

Service Request No: P1504274

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## CASE NARRATIVE

The canisters were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

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*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*



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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>	101661
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0694
DoD ELAP	<a href="http://www.pjlabs.com/search-accredited-labs">http://www.pjlabs.com/search-accredited-labs</a>	L14-2-R1
Florida DOH (NELAP)	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E871020
Maine DHHS	<a href="http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm">http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm</a>	2014025
Minnesota DOH (NELAP)	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	876241
New Jersey DEP (NELAP)	<a href="http://www.nj.gov/dep/oqa/">http://www.nj.gov/dep/oqa/</a>	CA009
New York DOH (NELAP)	<a href="http://www.wadsworth.org/labcert/elap/elap.html">http://www.wadsworth.org/labcert/elap/elap.html</a>	11221
Oregon PHD (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	4068-001
Pennsylvania DEP	<a href="http://www.depweb.state.pa.us/labs">http://www.depweb.state.pa.us/labs</a>	68-03307 (Registration)
Texas CEQ (NELAP)	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704413-15-6
Utah DOH (NELAP)	<a href="http://www.health.utah.gov/lab/labimp/certification/index.html">http://www.health.utah.gov/lab/labimp/certification/index.html</a>	CA01627201 5-5
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at [www.alsglobal.com](http://www.alsglobal.com), or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

# ALS ENVIRONMENTAL

## DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: Bridgeton

Service Request: P1504274

Date Received: 10/9/2015  
 Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	3C Modified - Fxd Gases Can	ASTM D5504-08 - Sulfur Can	TO-15 Modified - VOC Cans
NQ Source 523	P1504274-001	Air	10/8/2015	13:32	1SC01133	-0.96	11.11	X	X	X
NQ Source 2027	P1504274-002	Air	10/8/2015	13:34	1SC01230	0.79	10.95	X	X	X

**ALS ENVIRONMENTAL**  
**Sample Volume Correction for Helium Pressurization**

**for SCAN Analysis**

<u>Sample ID</u>	<u>Pi</u>	<u>Pf</u>	<u>Sample Volume (L)</u>	<u>Adjusted Volume (L)</u>
P1504274-001	-0.96	11.11	100.000	117
P1504274-002	0.79	10.95	400.000	459
P1504274-001DIL	-0.96	11.11	25.000	29.3



**ALS Environmental  
Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc.

Work order: P1504274

Project: Bridgeton

Sample(s) received on: 10/9/15 Date opened: 10/9/15 by: ADAVID

**Note:** This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- |   | Yes                                 | No                       | N/A                                 |
|---|-------------------------------------|--------------------------|-------------------------------------|
| 1 Were <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 2 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 3 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 4 Did <b>sample container labels</b> and/or tags agree with custody papers?                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 5 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 6 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 7 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?                         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8 Were <b>custody seals</b> on outside of cooler/Box/Container?   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information? | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?                                | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?       | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1504274-001.01	1.0 L Source Can					
P1504274-002.01	1.0 L Source Can					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** NQ Source 523  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P1504274-001

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC01133

Date Collected: 10/8/15  
 Date Received: 10/9/15  
 Date Analyzed: 10/12/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -0.96      Final Pressure (psig): 11.11

Canister Dilution Factor: 1.88

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.19	
7782-44-7	<b>Oxygen*</b>	<b>1.12</b>	0.19	
7727-37-9	<b>Nitrogen</b>	<b>53.8</b>	0.19	
630-08-0	Carbon Monoxide	ND	0.19	
74-82-8	<b>Methane</b>	<b>22.0</b>	0.19	
124-38-9	<b>Carbon Dioxide</b>	<b>23.1</b>	0.19	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

\* = The oxygen result may include argon due to coelution. Ambient air includes 0.93% argon.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** NQ Source 2027  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P1504274-002

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC01230

Date Collected: 10/8/15  
 Date Received: 10/9/15  
 Date Analyzed: 10/12/15  
 Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): 0.79      Final Pressure (psig): 10.95

Canister Dilution Factor: 1.66

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.17	
7782-44-7	<b>Oxygen*</b>	<b>1.39</b>	0.17	
7727-37-9	<b>Nitrogen</b>	<b>98.6</b>	0.17	
630-08-0	Carbon Monoxide	ND	0.17	
74-82-8	Methane	ND	0.17	
124-38-9	Carbon Dioxide	ND	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

\* = The oxygen result may include argon due to coelution. Ambient air includes 0.93% argon.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P151012-MB

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 10/12/15  
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.10	
7782-44-7	Oxygen*	ND	0.10	
7727-37-9	Nitrogen	ND	0.10	
630-08-0	Carbon Monoxide	ND	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

\* = The oxygen result may include argon due to coelution. Ambient air includes 0.93% argon.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P151012-LCS

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Nalini Lall  
 Sample Type: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 10/12/15  
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppmV	Result ppmV	% Recovery	ALS Acceptance Limits	Data Qualifier
1333-74-0	Hydrogen	40,000	<b>43,800</b>	<b>110</b>	83-114	
7782-44-7	Oxygen*	50,000	<b>56,600</b>	<b>113</b>	84-121	
7727-37-9	Nitrogen	50,000	<b>54,700</b>	<b>109</b>	88-122	
630-08-0	Carbon Monoxide	50,000	<b>56,400</b>	<b>113</b>	87-118	
74-82-8	Methane	40,000	<b>44,200</b>	<b>111</b>	85-116	
124-38-9	Carbon Dioxide	50,000	<b>55,300</b>	<b>111</b>	84-117	

\* = The oxygen result may include argon due to coelution. Ambient air includes 0.93% argon.

Response Factor Report GC01

Method Path : I:\GC01\METHODS\  
 Method File : 3C112914.M  
 Title : EPA 3C, ASTM D 1946-90, VOA-EPA3C  
 Last Update : Mon Dec 01 13:41:04 2014  
 Response Via : Initial Calibration

Calibration Files

1 =11291412.D 2 =11291410.D 3 =11291413.D  
 4 =11291414.D 5 =11291415.D 6 =11291421.D

Compound	1	2	3	4	5	6	Avg		%RSD
1) Hydrogen	1.258	1.246	1.311	1.308	1.519		1.328	E1	8.32
2) Oxygen	1.420	1.594	1.603	1.604	1.561	1.649	1.572	E1	5.07
3) Nitrogen	2.029	1.951	1.833	1.829	1.803		1.829	E1	9.36
4) Carbon Monoxide	1.712	1.637	1.814	1.800	1.763		1.745	E1	4.14
5) Methane	1.370	1.329	1.353	1.359	1.332		1.348	E1	1.17
6) Carbon Dioxide	2.104	2.103	2.082	2.080	2.018		2.102	E1	3.20

(#) = Out of Range ### Number of calibration levels exceeded format ###

### Modified EPA Method 3C Daily QC Summary

Client : Stantec Consulting Services, Inc.  
 Analyst : NL  
 Method Name : EPA 3C, ASTM D 1946-90, VOA-EPA3C

Instrument : GC01\_FXG  
 Date Analyzed : 10/12/2015

#### RT Summaries and QC Check (minutes)

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	File ID	Time
ICAL Mean RT	0.708	2.188	2.368	3.076	5.045	6.707		
RT Windows (+/- min)	0.072	0.133	0.146	0.034	0.130	0.145		
std s30-08311502	0.717	2.243	2.419	3.106	5.094	6.752	10121501.D	07:27
+/- 0.33min of ICAL Mean RT	Pass	Pass	Pass	Pass	Pass	Pass		
mb								
lab air		2.163 Pass	2.300 Pass			6.754 Pass	10121502.D	08:07
ics s30-081311504	0.711 Pass	2.228 Pass	2.404 Pass	3.091 Pass	5.081 Pass	6.741 Pass	10121503.D	08:23
icsd s30-081311504	0.710 Pass	2.224 Pass	2.401 Pass	3.087 Pass	5.077 Pass	6.737 Pass	10121505.D	09:06
4274-001		2.206 Pass	2.333 Pass		5.054 Pass	6.716 Pass	10121506.D	09:23
4274-002		2.198 Pass	2.301 Pass				10121515.D	12:07
std s30-08311502	0.712 Pass	2.232 Pass	2.408 Pass	3.095 Pass	5.084 Pass	6.744 Pass	10121516.D	12:24
							10121518.D	13:05

#### Continuing Calibration Standards Summary (ppm)

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	File ID	Time
ACTUAL	39980.0	40030.0	50000.0	49990.0	40020.0	50040.0		
CCV Criteria (+/- %D)	15.0%	10.0%	10.0%	10.0%	10.0%	10.0%		
std s30-08311502	40683.2 1.8%	41859.1 4.6%	53368.1 6.7%	52204.0 4.4%	40596.3 1.4%	49892.4 0.3%	10121501.D	07:27
std s30-08311502	41813.9 4.6%	43007.6 7.4%	54053.5 8.1%	53639.9 7.3%	41842.0 4.6%	51344.0 2.6%	10121518.D	13:05
	####	####	####	####	####	####		
	####	####	####	####	####	####		

#### Lab Dup Summary (ppm, without DF correction and normalization)

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	File ID	Time

#### LCS / LCS Dup Summary (ppm, without DF correction)

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	File ID	Time
LCS Actual Conc. (ppm)	40000.0	50000.0	50000.0	50000.0	40000.0	50000.0		
LCS Criteria (% Range)	83%-114%	84%-121%	88%-122%	87%-118%	85%-116%	84%-117%		
ics s30-081311504	43776.6	56580.2	54737.6	56424.1	44234.8	55278.7	10121505.D	09:06
LCS % Recovery	109% Pass	113% Pass	109% Pass	113% Pass	111% Pass	111% Pass		
icsd s30-081311504	44748.0	57423.4	55373.7	57640.5	45259.9	55647.4	10121506.D	09:23
LCS % Recovery	112% Pass	115% Pass	111% Pass	115% Pass	113% Pass	111% Pass		
Duplicate % RPD	2.2%	1.5%	1.2%	2.1%	2.3%	0.7%		
Duplicate Criteria % RPD	16% Pass	16% Pass	21% Pass	16% Pass	16% Pass	16% Pass		

#### Lab Air QC Summary

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxid	Methane	Carbon Dioxide	Lab Air Criteria Total (90%-110%)
lab air		211829.6	751543.2			529.5	96.4% Pass
Lab Air Normalized (%)		21.97%	77.96%			0.05%	100.0%

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** NQ Source 523  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P1504274-001

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC01133

Date Collected: 10/8/15  
 Time Collected: 13:32  
 Date Received: 10/9/15  
 Date Analyzed: 10/12/15  
 Time Analyzed: 11:07  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -0.96      Final Pressure (psig): 11.11

Canister Dilution Factor: 1.88

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	13	3.9	ND	9.4	2.8	
463-58-1	Carbonyl Sulfide	ND	23	6.0	ND	9.4	2.4	
74-93-1	Methyl Mercaptan	ND	18	5.9	ND	9.4	3.0	
75-08-1	Ethyl Mercaptan	ND	24	7.6	ND	9.4	3.0	
75-18-3	Dimethyl Sulfide	<b>28</b>	24	7.6	<b>11</b>	9.4	3.0	
75-15-0	Carbon Disulfide	ND	15	4.7	ND	4.7	1.5	
75-33-2	Isopropyl Mercaptan	ND	29	9.4	ND	9.4	3.0	
75-66-1	tert-Butyl Mercaptan	ND	35	11	ND	9.4	3.0	
107-03-9	n-Propyl Mercaptan	ND	29	9.4	ND	9.4	3.0	
624-89-5	Ethyl Methyl Sulfide	ND	29	9.4	ND	9.4	3.0	
110-02-1	Thiophene	ND	32	10	ND	9.4	3.0	
513-44-0	Isobutyl Mercaptan	ND	35	11	ND	9.4	3.0	
352-93-2	Diethyl Sulfide	ND	35	11	ND	9.4	3.0	
109-79-5	n-Butyl Mercaptan	ND	35	11	ND	9.4	3.0	
624-92-0	Dimethyl Disulfide	ND	18	5.8	ND	4.7	1.5	
616-44-4	3-Methylthiophene	ND	38	12	ND	9.4	3.0	
110-01-0	Tetrahydrothiophene	ND	34	11	ND	9.4	3.0	
638-02-8	2,5-Dimethylthiophene	ND	43	14	ND	9.4	3.0	
872-55-9	2-Ethylthiophene	ND	43	14	ND	9.4	3.0	
110-81-6	Diethyl Disulfide	ND	23	7.5	ND	4.7	1.5	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** NQ Source 2027  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P1504274-002

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC01230

Date Collected: 10/8/15  
 Time Collected: 13:34  
 Date Received: 10/9/15  
 Date Analyzed: 10/12/15  
 Time Analyzed: 11:23  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): 0.79      Final Pressure (psig): 10.95

Canister Dilution Factor: 1.66

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	12	3.5	ND	8.3	2.5	
463-58-1	Carbonyl Sulfide	ND	20	5.3	ND	8.3	2.2	
74-93-1	Methyl Mercaptan	ND	16	5.2	ND	8.3	2.7	
75-08-1	Ethyl Mercaptan	ND	21	6.7	ND	8.3	2.7	
75-18-3	Dimethyl Sulfide	ND	21	6.7	ND	8.3	2.7	
75-15-0	Carbon Disulfide	ND	13	4.1	ND	4.2	1.3	
75-33-2	Isopropyl Mercaptan	ND	26	8.3	ND	8.3	2.7	
75-66-1	tert-Butyl Mercaptan	ND	31	9.8	ND	8.3	2.7	
107-03-9	n-Propyl Mercaptan	ND	26	8.3	ND	8.3	2.7	
624-89-5	Ethyl Methyl Sulfide	ND	26	8.3	ND	8.3	2.7	
110-02-1	Thiophene	ND	29	9.1	ND	8.3	2.7	
513-44-0	Isobutyl Mercaptan	ND	31	9.8	ND	8.3	2.7	
352-93-2	Diethyl Sulfide	ND	31	9.8	ND	8.3	2.7	
109-79-5	n-Butyl Mercaptan	ND	31	9.8	ND	8.3	2.7	
624-92-0	Dimethyl Disulfide	ND	16	5.1	ND	4.2	1.3	
616-44-4	3-Methylthiophene	ND	33	11	ND	8.3	2.7	
110-01-0	Tetrahydrothiophene	ND	30	9.6	ND	8.3	2.7	
638-02-8	2,5-Dimethylthiophene	ND	38	12	ND	8.3	2.7	
872-55-9	2-Ethylthiophene	ND	38	12	ND	8.3	2.7	
110-81-6	Diethyl Disulfide	ND	21	6.6	ND	4.2	1.3	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274

**Total Reduced Sulfur as Hydrogen Sulfide**

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 1.0 L Summa Canister(s)  
 Test Notes:

Date(s) Collected: 10/8/15  
 Date Received: 10/9/15  
 Date Analyzed: 10/12/15

Client Sample ID	ALS Sample ID	Canister		Time Analyzed	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
		Dilution Factor	Injection Volume ml(s)						
NQ Source 523	P1504274-001	1.88	1.0	11:07	14	13	10	9.4	
NQ Source 2027	P1504274-002	1.66	1.0	11:23	ND	12	ND	8.3	
Method Blank	P151012-MB	1.00	1.0	08:03	ND	7.0	ND	5.0	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P151012-MB

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 10/12/15  
 Time Analyzed: 08:03  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	2.1	ND	5.0	1.5	
463-58-1	Carbonyl Sulfide	ND	12	3.2	ND	5.0	1.3	
74-93-1	Methyl Mercaptan	ND	9.8	3.1	ND	5.0	1.6	
75-08-1	Ethyl Mercaptan	ND	13	4.1	ND	5.0	1.6	
75-18-3	Dimethyl Sulfide	ND	13	4.1	ND	5.0	1.6	
75-15-0	Carbon Disulfide	ND	7.8	2.5	ND	2.5	0.80	
75-33-2	Isopropyl Mercaptan	ND	16	5.0	ND	5.0	1.6	
75-66-1	tert-Butyl Mercaptan	ND	18	5.9	ND	5.0	1.6	
107-03-9	n-Propyl Mercaptan	ND	16	5.0	ND	5.0	1.6	
624-89-5	Ethyl Methyl Sulfide	ND	16	5.0	ND	5.0	1.6	
110-02-1	Thiophene	ND	17	5.5	ND	5.0	1.6	
513-44-0	Isobutyl Mercaptan	ND	18	5.9	ND	5.0	1.6	
352-93-2	Diethyl Sulfide	ND	18	5.9	ND	5.0	1.6	
109-79-5	n-Butyl Mercaptan	ND	18	5.9	ND	5.0	1.6	
624-92-0	Dimethyl Disulfide	ND	9.6	3.1	ND	2.5	0.80	
616-44-4	3-Methylthiophene	ND	20	6.4	ND	5.0	1.6	
110-01-0	Tetrahydrothiophene	ND	18	5.8	ND	5.0	1.6	
638-02-8	2,5-Dimethylthiophene	ND	23	7.3	ND	5.0	1.6	
872-55-9	2-Ethylthiophene	ND	23	7.3	ND	5.0	1.6	
110-81-6	Diethyl Disulfide	ND	12	4.0	ND	2.5	0.80	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
ALS Sample ID: P151012-LCS

Test Code: ASTM D 5504-12  
Instrument ID: Agilent 7890A/GC22/SCD  
Analyst: Mike Conejo  
Sample Type: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 10/12/15  
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
7783-06-4	Hydrogen Sulfide	1,990	<b>1,930</b>	<b>97</b>	65-138	
463-58-1	Carbonyl Sulfide	2,030	<b>1,960</b>	<b>97</b>	60-135	
74-93-1	Methyl Mercaptan	2,020	<b>2,000</b>	<b>99</b>	57-140	

Method Path : J:\GC22\METHODS\  
 Method File : GC22060815.M  
 Title : 20 Sulfurs Initial Calibration  
 Last Update : Tue Jun 09 07:14:43 2015  
 Response Via : Initial Calibration

Calibration Files

1 =06081528.d 2 =06081529.d 3 =06081530.d  
 4 =06081531.d 5 =06081532.d 6 =06081533.d

Compound	1	2	3	4	5	6	Avg	%RSD
1) Z Hydrogen_Sulfide	2.690	1.993	2.266	2.637	2.687	2.210	2.414	E4 12.31
2) W Carbonyl_Sulfide	1.925	2.233	2.495	2.803	2.899	2.376	2.455	E4 14.77
3) T Methyl_Mercaptan	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
4) T Ethyl_Mercaptan	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
5) T Dimethyl_Sulfide	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
6) T Carbon_Disulfide	3.923	3.602	4.339	5.153	5.220	4.542	4.463	E4 14.53
7) T 2-Propyl_Merca...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
8) T t-Butyl_Merca...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
9) T Propyl_Mercaptan	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
10) T Ethyl_Methyl_...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
11) T Thiophene	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
12) T i-Butyl_Merca...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
13) T Diethyl_Sulfide	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
14) T n-Butyl_Merca...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
15) T Dimethyl_Disu...	3.923	3.602	4.339	5.153	5.220	4.542	4.463	E4 14.53
16) T 2-Methylthiop...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
17) T 3-Methylthiop...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
18) T Tetrahydrothi...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
19) T 2,5-Dimethylt...	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
20) T 2-Ethylthiophene	1.962	1.801	2.170	2.576	2.610	2.271	2.232	E4 14.53
21) T Diethyl_Disul...	3.923	3.602	4.339	5.153	5.220	4.542	4.463	E4 14.53
22) T Methyltrisulfide	5.885	5.404	6.509	7.729	7.830	6.813	6.695	E4 14.53

(#) = Out of Range

# ALS Environmental

## REPORT SUMMARY

Method : 20 Suffurs Initial Calibration  
 Client : Stantec Consulting Services, Inc.  
 Analyst : MC

Service Request : P1504274  
 Instrument : GC #22  
 Date Acquired : 10/12/15

Compounds	MDL	RL	MB QC	Dry Wall QC	Lab Dup		Continuing Calibration Standards Summary (ppbv)																
					MB	MB QC	MB	%RSD	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	
Sample Information :	ppb	ppb	mb 1ml			0	0	sid 2000ppb S30- 09021501	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff	ppbv	% Diff
Inj. Vol. (ml)	1.0	1.0	1.00	1.0	1.0	1.0	1.0	0.20		0.20		0.20		0.20		0.20		0.20		0.20		0.20	
Dilution	1.0	1.0	1.00	1.0	1.0	1.0	1.0																
PI:	1.0	1.0	1.0	1.0	1.0	1.0	1.0																
PI:	1.0	1.0	1.0	1.0	1.0	1.0	1.0																
PIPTDF:	1.0	1.0	1.0	1.0	1.0	1.0	1.0																
Hydrogen_Sulfide	2.800	5.000	ND	P				1748.28	13.5%	1662.700	17.7%	1797.356	11.0%										
Carbonyl_Sulfide	2.000	5.000	ND	P				1853.30	7.3%	1811.828	9.4%	1953.451	2.3%										
Methyl_Mercaptan	2.700	5.000	ND	P				1854.33	7.3%	1815.210	9.2%	1958.984	2.1%										
Ethyl_Mercaptan	2.700	5.000	ND	P																			
Dimethyl_Sulfide	2.700	5.000	ND	P				7.27 AM		9.44 AM		1:06 PM											
Carbon_Disulfide	1.400	2.500	ND	P				10121502.d		10121514.d		10121523.d											
2-Propyl_Mercaptan	2.700	5.000	ND	P																			
t-Butyl_Mercaptan	2.700	5.000	ND	P																			
Propyl_Mercaptan	2.700	5.000	ND	P																			
Ethyl_Methyl_Sulfide	2.700	5.000	ND	P																			
Thiophene	2.700	5.000	ND	P																			
i-Butyl_Mercaptan	2.700	5.000	ND	P																			
Diethyl_Sulfide	2.700	5.000	ND	P																			
n-Butyl_Mercaptan	2.700	5.000	ND	P																			
Dimethyl_Disulfide	1.400	2.500	ND	P																			
2-Methylthiophene	2.700	5.000	ND	P																			
3-Methylthiophene	2.700	5.000	ND	P																			
Tetrahydrothiophene	2.700	5.000	ND	P																			
2,5-Dimethylthiophene	2.700	5.000	ND	P																			
2-Ethylthiophene	2.700	5.000	ND	P																			
Diethyl_Disulfide	1.400	2.500	ND	P																			
Methyltrisulfide	1.400	2.500	ND	P																			
Acquisition Time			8:03 AM																				
DataFile			10121506.d																				
LCS / LCS Dup Summary (ppbv)																							
								ppbv	%R	ppbv	%R	ppbv	%R	ppbv	%R	ppbv	%R	ppbv	%R	ppbv	%R	ppbv	%R
Hydrogen_Sulfide								1933.92	97.1%														1992.00
Carbonyl_Sulfide								1960.90	96.5%														2032.00
Methyl_Mercaptan								2004.95	99.2%														2022.00
Acquisition Time								7:31 AM															
DataFile								10121503.d															

*me 10/13/15*

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** NQ Source 523  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P1504274-001

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9  
 Analyst: Simon Cao  
 Sample Type: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC01133

Date Collected: 10/8/15  
 Date Received: 10/9/15  
 Date Analyzed: 10/12 - 10/13/15  
 Volume(s) Analyzed: 0.117 Liter(s)  
 0.0293 Liter(s)

Initial Pressure (psig): -0.96      Final Pressure (psig): 11.11

Canister Dilution Factor: 1.88

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	<b>1,300</b>	8.0	2.2	<b>760</b>	4.7	1.3	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>1,400</b>	32	11	<b>270</b>	6.5	2.2	<b>D</b>
74-87-3	Chloromethane	ND	8.0	2.4	ND	3.9	1.2	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	<b>130</b>	8.0	3.1	<b>19</b>	1.1	0.44	
75-01-4	Vinyl Chloride	<b>590</b>	8.0	2.7	<b>230</b>	3.1	1.1	
106-99-0	1,3-Butadiene	ND	8.0	3.5	ND	3.6	1.6	
74-83-9	Bromomethane	ND	8.0	3.1	ND	2.1	0.79	
75-00-3	Chloroethane	<b>10</b>	8.0	2.7	<b>3.8</b>	3.0	1.0	
64-17-5	Ethanol	<b>19</b>	80	13	<b>10</b>	43	6.8	<b>J</b>
75-05-8	Acetonitrile	ND	8.0	2.9	ND	4.8	1.7	
107-02-8	Acrolein	ND	32	2.7	ND	14	1.2	
67-64-1	Acetone	ND	80	12	ND	34	5.2	
75-69-4	Trichlorofluoromethane	<b>2.8</b>	8.0	2.7	<b>0.51</b>	1.4	0.49	<b>J</b>
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	80	6.7	ND	33	2.7	
107-13-1	Acrylonitrile	ND	8.0	2.7	ND	3.7	1.3	
75-35-4	1,1-Dichloroethene	ND	8.0	2.7	ND	2.0	0.69	
75-09-2	Methylene Chloride	ND	8.0	2.7	ND	2.3	0.79	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	8.0	2.6	ND	2.6	0.82	
76-13-1	Trichlorotrifluoroethane	ND	8.0	2.7	ND	1.0	0.36	
75-15-0	Carbon Disulfide	ND	80	2.4	ND	26	0.77	
156-60-5	trans-1,2-Dichloroethene	ND	8.0	3.1	ND	2.0	0.77	
75-34-3	1,1-Dichloroethane	ND	8.0	2.6	ND	2.0	0.64	
1634-04-4	Methyl tert-Butyl Ether	ND	8.0	2.7	ND	2.2	0.76	
108-05-4	Vinyl Acetate	ND	80	10	ND	23	3.0	
78-93-3	2-Butanone (MEK)	<b>19</b>	80	3.4	<b>6.5</b>	27	1.1	<b>J</b>

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** NQ Source 523

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P1504274-001

Test Code: EPA TO-15 Modified

Date Collected: 10/8/15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: 10/9/15

Analyst: Simon Cao

Date Analyzed: 10/12 - 10/13/15

Sample Type: 1.0 L Summa Canister

Volume(s) Analyzed: 0.117 Liter(s)

Test Notes:

0.0293 Liter(s)

Container ID: 1SC01133

Initial Pressure (psig): -0.96      Final Pressure (psig): 11.11

Canister Dilution Factor: 1.88

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	27	8.0	2.6	6.8	2.0	0.65	
141-78-6	Ethyl Acetate	ND	16	5.6	ND	4.5	1.6	
110-54-3	n-Hexane	260	8.0	2.4	72	2.3	0.68	
67-66-3	Chloroform	38	8.0	2.7	7.9	1.6	0.56	
109-99-9	Tetrahydrofuran (THF)	170	8.0	3.2	58	2.7	1.1	
107-06-2	1,2-Dichloroethane	ND	8.0	2.6	ND	2.0	0.64	
71-55-6	1,1,1-Trichloroethane	ND	8.0	2.7	ND	1.5	0.50	
71-43-2	Benzene	28	8.0	2.6	8.8	2.5	0.81	
56-23-5	Carbon Tetrachloride	ND	8.0	2.4	ND	1.3	0.38	
110-82-7	Cyclohexane	100	16	4.7	30	4.7	1.4	
78-87-5	1,2-Dichloropropane	ND	8.0	2.6	ND	1.7	0.56	
75-27-4	Bromodichloromethane	ND	8.0	2.4	ND	1.2	0.36	
79-01-6	Trichloroethene	ND	8.0	2.2	ND	1.5	0.42	
123-91-1	1,4-Dioxane	ND	8.0	2.6	ND	2.2	0.71	
80-62-6	Methyl Methacrylate	ND	16	5.0	ND	3.9	1.2	
142-82-5	n-Heptane	85	8.0	2.7	21	2.0	0.67	
10061-01-5	cis-1,3-Dichloropropene	ND	8.0	2.2	ND	1.8	0.50	
108-10-1	4-Methyl-2-pentanone	9.4	8.0	2.6	2.3	2.0	0.63	
10061-02-6	trans-1,3-Dichloropropene	ND	8.0	2.6	ND	1.8	0.57	
79-00-5	1,1,2-Trichloroethane	ND	8.0	2.6	ND	1.5	0.47	
108-88-3	Toluene	20	8.0	2.7	5.3	2.1	0.73	
591-78-6	2-Hexanone	ND	8.0	2.6	ND	2.0	0.63	
124-48-1	Dibromochloromethane	ND	8.0	2.6	ND	0.94	0.30	
106-93-4	1,2-Dibromoethane	ND	8.0	2.6	ND	1.0	0.33	
123-86-4	n-Butyl Acetate	11	8.0	2.6	2.2	1.7	0.54	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** NQ Source 523

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P1504274-001

Test Code: EPA TO-15 Modified

Date Collected: 10/8/15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: 10/9/15

Analyst: Simon Cao

Date Analyzed: 10/12 - 10/13/15

Sample Type: 1.0 L Summa Canister

Volume(s) Analyzed: 0.117 Liter(s)

Test Notes:

0.0293 Liter(s)

Container ID: 1SC01133

Initial Pressure (psig): -0.96      Final Pressure (psig): 11.11

Canister Dilution Factor: 1.88

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	16	8.0	2.9	3.3	1.7	0.62	
127-18-4	Tetrachloroethene	2.8	8.0	2.2	0.42	1.2	0.33	J
108-90-7	Chlorobenzene	ND	8.0	2.6	ND	1.7	0.56	
100-41-4	Ethylbenzene	11	8.0	2.6	2.6	1.9	0.59	
179601-23-1	m,p-Xylenes	27	16	4.8	6.3	3.7	1.1	
75-25-2	Bromoform	ND	8.0	2.4	ND	0.78	0.23	
100-42-5	Styrene	ND	8.0	2.4	ND	1.9	0.57	
95-47-6	o-Xylene	9.7	8.0	2.4	2.2	1.9	0.56	
111-84-2	n-Nonane	7.0	8.0	2.4	1.3	1.5	0.46	J
79-34-5	1,1,2,2-Tetrachloroethane	ND	8.0	2.4	ND	1.2	0.35	
98-82-8	Cumene	ND	8.0	2.4	ND	1.6	0.49	
80-56-8	alpha-Pinene	15	8.0	2.2	2.7	1.4	0.40	
103-65-1	n-Propylbenzene	ND	8.0	2.6	ND	1.6	0.52	
622-96-8	4-Ethyltoluene	3.4	8.0	2.6	0.69	1.6	0.52	J
108-67-8	1,3,5-Trimethylbenzene	3.8	8.0	2.6	0.77	1.6	0.52	J
95-63-6	1,2,4-Trimethylbenzene	13	8.0	2.4	2.7	1.6	0.49	
100-44-7	Benzyl Chloride	ND	8.0	1.8	ND	1.6	0.34	
541-73-1	1,3-Dichlorobenzene	2.5	8.0	2.4	0.41	1.3	0.40	J
106-46-7	1,4-Dichlorobenzene	2.4	8.0	2.2	0.40	1.3	0.37	J
95-50-1	1,2-Dichlorobenzene	ND	8.0	2.4	ND	1.3	0.40	
5989-27-5	d-Limonene	9.0	8.0	2.2	1.6	1.4	0.40	
96-12-8	1,2-Dibromo-3-chloropropane	ND	8.0	1.6	ND	0.83	0.16	
120-82-1	1,2,4-Trichlorobenzene	ND	8.0	2.6	ND	1.1	0.35	
91-20-3	Naphthalene	5.1	8.0	2.9	0.97	1.5	0.55	J
87-68-3	Hexachlorobutadiene	ND	8.0	2.2	ND	0.75	0.21	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** NQ Source 523  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P1504274-001

### Tentatively Identified Compounds

Test Code:	EPA TO-15 Modified	Date Collected: 10/8/15
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9	Date Received: 10/9/15
Analyst:	Simon Cao	Date Analyzed: 10/12 - 10/13/15
Sample Type:	1.0 L Summa Canister	Volume(s) Analyzed: 0.117 Liter(s)
Test Notes:	<b>T</b>	0.0293 Liter(s)
Container ID:	1SC01133	

Initial Pressure (psig): -0.96      Final Pressure (psig): 11.11

Canister Dilution Factor: 1.88

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
4.47	2-Methylpropene	<b>1,300</b>	
4.58	n-Butane	<b>3,100</b>	
4.71	1-Butene	<b>270</b>	
4.77	1-Chloro-1-Fluoroethane	<b>210</b>	
5.74	2-Methylbutane	<b>930</b>	
6.30	n-Pentane	<b>1,200</b>	
6.78	2-Methyl-2-butene	<b>410</b>	
7.21	2,2-Dimethylbutane	<b>390</b>	
8.17	2-Methylpentane	<b>550</b>	
8.58	3-Methylpentane	<b>290</b>	

T = Analyte is a tentatively identified compound, result is estimated.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** NQ Source 2027

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P1504274-002

Test Code: EPA TO-15 Modified

Date Collected: 10/8/15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: 10/9/15

Analyst: Simon Cao

Date Analyzed: 10/12/15

Sample Type: 1.0 L Summa Canister

Volume(s) Analyzed: 0.459 Liter(s)

Test Notes:

Container ID: 1SC01230

Initial Pressure (psig): 0.79      Final Pressure (psig): 10.95

Canister Dilution Factor: 1.66

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	ND	1.8	0.51	ND	1.1	0.29	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	1.8	0.61	ND	0.37	0.12	
74-87-3	Chloromethane	ND	1.8	0.54	ND	0.88	0.26	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	1.8	0.69	ND	0.26	0.098	
75-01-4	Vinyl Chloride	ND	1.8	0.61	ND	0.71	0.24	
106-99-0	1,3-Butadiene	ND	1.8	0.80	ND	0.82	0.36	
74-83-9	Bromomethane	ND	1.8	0.69	ND	0.47	0.18	
75-00-3	Chloroethane	ND	1.8	0.61	ND	0.69	0.23	
64-17-5	Ethanol	ND	18	2.9	ND	9.6	1.5	
75-05-8	Acetonitrile	ND	1.8	0.65	ND	1.1	0.39	
107-02-8	Acrolein	ND	7.2	0.61	ND	3.2	0.27	
67-64-1	Acetone	ND	18	2.8	ND	7.6	1.2	
75-69-4	Trichlorofluoromethane	ND	1.8	0.61	ND	0.32	0.11	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	18	1.5	ND	7.4	0.62	
107-13-1	Acrylonitrile	ND	1.8	0.61	ND	0.83	0.28	
75-35-4	1,1-Dichloroethene	ND	1.8	0.61	ND	0.46	0.16	
75-09-2	Methylene Chloride	ND	1.8	0.61	ND	0.52	0.18	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	1.8	0.58	ND	0.58	0.18	
76-13-1	Trichlorotrifluoroethane	ND	1.8	0.61	ND	0.24	0.080	
75-15-0	Carbon Disulfide	ND	18	0.54	ND	5.8	0.17	
156-60-5	trans-1,2-Dichloroethene	ND	1.8	0.69	ND	0.46	0.17	
75-34-3	1,1-Dichloroethane	ND	1.8	0.58	ND	0.45	0.14	
1634-04-4	Methyl tert-Butyl Ether	ND	1.8	0.61	ND	0.50	0.17	
108-05-4	Vinyl Acetate	ND	18	2.4	ND	5.1	0.67	
78-93-3	2-Butanone (MEK)	ND	18	0.76	ND	6.1	0.26	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** NQ Source 2027  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P1504274-002

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9  
 Analyst: Simon Cao  
 Sample Type: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC01230

Date Collected: 10/8/15  
 Date Received: 10/9/15  
 Date Analyzed: 10/12/15  
 Volume(s) Analyzed: 0.459 Liter(s)

Initial Pressure (psig): 0.79      Final Pressure (psig): 10.95

Canister Dilution Factor: 1.66

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	1.8	0.58	ND	0.46	0.15	
141-78-6	Ethyl Acetate	ND	3.6	1.3	ND	1.0	0.35	
110-54-3	n-Hexane	ND	1.8	0.54	ND	0.51	0.15	
67-66-3	Chloroform	ND	1.8	0.61	ND	0.37	0.13	
109-99-9	Tetrahydrofuran (THF)	ND	1.8	0.72	ND	0.61	0.25	
107-06-2	1,2-Dichloroethane	ND	1.8	0.58	ND	0.45	0.14	
71-55-6	1,1,1-Trichloroethane	ND	1.8	0.61	ND	0.33	0.11	
71-43-2	Benzene	ND	1.8	0.58	ND	0.57	0.18	
56-23-5	Carbon Tetrachloride	ND	1.8	0.54	ND	0.29	0.086	
110-82-7	Cyclohexane	ND	3.6	1.0	ND	1.1	0.30	
78-87-5	1,2-Dichloropropane	ND	1.8	0.58	ND	0.39	0.13	
75-27-4	Bromodichloromethane	ND	1.8	0.54	ND	0.27	0.081	
79-01-6	Trichloroethene	ND	1.8	0.51	ND	0.34	0.094	
123-91-1	1,4-Dioxane	ND	1.8	0.58	ND	0.50	0.16	
80-62-6	Methyl Methacrylate	ND	3.6	1.1	ND	0.88	0.27	
142-82-5	n-Heptane	ND	1.8	0.61	ND	0.44	0.15	
10061-01-5	cis-1,3-Dichloropropene	ND	1.8	0.51	ND	0.40	0.11	
108-10-1	4-Methyl-2-pentanone	ND	1.8	0.58	ND	0.44	0.14	
10061-02-6	trans-1,3-Dichloropropene	ND	1.8	0.58	ND	0.40	0.13	
79-00-5	1,1,2-Trichloroethane	ND	1.8	0.58	ND	0.33	0.11	
108-88-3	Toluene	ND	1.8	0.61	ND	0.48	0.16	
591-78-6	2-Hexanone	ND	1.8	0.58	ND	0.44	0.14	
124-48-1	Dibromochloromethane	ND	1.8	0.58	ND	0.21	0.068	
106-93-4	1,2-Dibromoethane	ND	1.8	0.58	ND	0.24	0.075	
123-86-4	n-Butyl Acetate	ND	1.8	0.58	ND	0.38	0.12	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** NQ Source 2027

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P1504274-002

Test Code: EPA TO-15 Modified

Date Collected: 10/8/15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: 10/9/15

Analyst: Simon Cao

Date Analyzed: 10/12/15

Sample Type: 1.0 L Summa Canister

Volume(s) Analyzed: 0.459 Liter(s)

Test Notes:

Container ID: 1SC01230

Initial Pressure (psig): 0.79      Final Pressure (psig): 10.95

Canister Dilution Factor: 1.66

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	1.8	0.65	ND	0.39	0.14	
127-18-4	Tetrachloroethene	ND	1.8	0.51	ND	0.27	0.075	
108-90-7	Chlorobenzene	ND	1.8	0.58	ND	0.39	0.13	
100-41-4	Ethylbenzene	ND	1.8	0.58	ND	0.42	0.13	
179601-23-1	m,p-Xylenes	ND	3.6	1.1	ND	0.83	0.25	
75-25-2	Bromoform	ND	1.8	0.54	ND	0.17	0.052	
100-42-5	Styrene	ND	1.8	0.54	ND	0.42	0.13	
95-47-6	o-Xylene	ND	1.8	0.54	ND	0.42	0.12	
111-84-2	n-Nonane	ND	1.8	0.54	ND	0.34	0.10	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.8	0.54	ND	0.26	0.079	
98-82-8	Cumene	ND	1.8	0.54	ND	0.37	0.11	
80-56-8	alpha-Pinene	ND	1.8	0.51	ND	0.32	0.091	
103-65-1	n-Propylbenzene	ND	1.8	0.58	ND	0.37	0.12	
622-96-8	4-Ethyltoluene	ND	1.8	0.58	ND	0.37	0.12	
108-67-8	1,3,5-Trimethylbenzene	ND	1.8	0.58	ND	0.37	0.12	
95-63-6	1,2,4-Trimethylbenzene	ND	1.8	0.54	ND	0.37	0.11	
100-44-7	Benzyl Chloride	ND	1.8	0.40	ND	0.35	0.077	
541-73-1	1,3-Dichlorobenzene	ND	1.8	0.54	ND	0.30	0.090	
106-46-7	1,4-Dichlorobenzene	ND	1.8	0.51	ND	0.30	0.084	
95-50-1	1,2-Dichlorobenzene	ND	1.8	0.54	ND	0.30	0.090	
5989-27-5	d-Limonene	ND	1.8	0.51	ND	0.32	0.091	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.8	0.36	ND	0.19	0.037	
120-82-1	1,2,4-Trichlorobenzene	ND	1.8	0.58	ND	0.24	0.078	
91-20-3	Naphthalene	ND	1.8	0.65	ND	0.35	0.12	
87-68-3	Hexachlorobutadiene	ND	1.8	0.51	ND	0.17	0.047	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** NQ Source 2027  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
ALS Sample ID: P1504274-002

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified  
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9  
Analyst: Simon Cao  
Sample Type: 1.0 L Summa Canister  
Test Notes:  
Container ID: 1SC01230

Date Collected: 10/8/15  
Date Received: 10/9/15  
Date Analyzed: 10/12/15  
Volume(s) Analyzed: 0.459 Liter(s)

Initial Pressure (psig): 0.79      Final Pressure (psig): 10.95

Canister Dilution Factor: 1.66

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
<hr/> No Compounds Detected <hr/>			

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P151012-MB

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 1.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/12/15

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	ND	0.50	0.14	ND	0.29	0.081	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	0.17	ND	0.10	0.034	
74-87-3	Chloromethane	ND	0.50	0.15	ND	0.24	0.073	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	0.19	ND	0.072	0.027	
75-01-4	Vinyl Chloride	ND	0.50	0.17	ND	0.20	0.067	
106-99-0	1,3-Butadiene	ND	0.50	0.22	ND	0.23	0.099	
74-83-9	Bromomethane	ND	0.50	0.19	ND	0.13	0.049	
75-00-3	Chloroethane	ND	0.50	0.17	ND	0.19	0.064	
64-17-5	Ethanol	ND	5.0	0.80	ND	2.7	0.42	
75-05-8	Acetonitrile	ND	0.50	0.18	ND	0.30	0.11	
107-02-8	Acrolein	ND	2.0	0.17	ND	0.87	0.074	
67-64-1	Acetone	<b>0.78</b>	5.0	0.77	<b>0.33</b>	2.1	0.32	<b>J</b>
75-69-4	Trichlorofluoromethane	ND	0.50	0.17	ND	0.089	0.030	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	0.42	ND	2.0	0.17	
107-13-1	Acrylonitrile	ND	0.50	0.17	ND	0.23	0.078	
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	ND	0.13	0.043	
75-09-2	Methylene Chloride	ND	0.50	0.17	ND	0.14	0.049	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	0.16	ND	0.16	0.051	
76-13-1	Trichlorotrifluoroethane	ND	0.50	0.17	ND	0.065	0.022	
75-15-0	Carbon Disulfide	ND	5.0	0.15	ND	1.6	0.048	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.19	ND	0.13	0.048	
75-34-3	1,1-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	0.17	ND	0.14	0.047	
108-05-4	Vinyl Acetate	ND	5.0	0.65	ND	1.4	0.18	
78-93-3	2-Butanone (MEK)	ND	5.0	0.21	ND	1.7	0.071	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P151012-MB

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 1.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/12/15

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.16	ND	0.13	0.040	
141-78-6	Ethyl Acetate	ND	1.0	0.35	ND	0.28	0.097	
110-54-3	n-Hexane	ND	0.50	0.15	ND	0.14	0.043	
67-66-3	Chloroform	ND	0.50	0.17	ND	0.10	0.035	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	0.20	ND	0.17	0.068	
107-06-2	1,2-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.17	ND	0.092	0.031	
71-43-2	Benzene	ND	0.50	0.16	ND	0.16	0.050	
56-23-5	Carbon Tetrachloride	ND	0.50	0.15	ND	0.080	0.024	
110-82-7	Cyclohexane	ND	1.0	0.29	ND	0.29	0.084	
78-87-5	1,2-Dichloropropane	ND	0.50	0.16	ND	0.11	0.035	
75-27-4	Bromodichloromethane	ND	0.50	0.15	ND	0.075	0.022	
79-01-6	Trichloroethene	ND	0.50	0.14	ND	0.093	0.026	
123-91-1	1,4-Dioxane	ND	0.50	0.16	ND	0.14	0.044	
80-62-6	Methyl Methacrylate	ND	1.0	0.31	ND	0.24	0.076	
142-82-5	n-Heptane	ND	0.50	0.17	ND	0.12	0.041	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	ND	0.11	0.031	
108-10-1	4-Methyl-2-pentanone	ND	0.50	0.16	ND	0.12	0.039	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	ND	0.11	0.035	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.16	ND	0.092	0.029	
108-88-3	Toluene	ND	0.50	0.17	ND	0.13	0.045	
591-78-6	2-Hexanone	ND	0.50	0.16	ND	0.12	0.039	
124-48-1	Dibromochloromethane	ND	0.50	0.16	ND	0.059	0.019	
106-93-4	1,2-Dibromoethane	ND	0.50	0.16	ND	0.065	0.021	
123-86-4	n-Butyl Acetate	ND	0.50	0.16	ND	0.11	0.034	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P151012-MB

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 1.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/12/15

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	0.18	ND	0.11	0.039	
127-18-4	Tetrachloroethene	ND	0.50	0.14	ND	0.074	0.021	
108-90-7	Chlorobenzene	ND	0.50	0.16	ND	0.11	0.035	
100-41-4	Ethylbenzene	ND	0.50	0.16	ND	0.12	0.037	
179601-23-1	m,p-Xylenes	ND	1.0	0.30	ND	0.23	0.069	
75-25-2	Bromoform	ND	0.50	0.15	ND	0.048	0.015	
100-42-5	Styrene	ND	0.50	0.15	ND	0.12	0.035	
95-47-6	o-Xylene	ND	0.50	0.15	ND	0.12	0.035	
111-84-2	n-Nonane	ND	0.50	0.15	ND	0.095	0.029	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.15	ND	0.073	0.022	
98-82-8	Cumene	ND	0.50	0.15	ND	0.10	0.031	
80-56-8	alpha-Pinene	ND	0.50	0.14	ND	0.090	0.025	
103-65-1	n-Propylbenzene	ND	0.50	0.16	ND	0.10	0.033	
622-96-8	4-Ethyltoluene	ND	0.50	0.16	ND	0.10	0.033	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.16	ND	0.10	0.033	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.15	ND	0.10	0.031	
100-44-7	Benzyl Chloride	ND	0.50	0.11	ND	0.097	0.021	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.14	ND	0.083	0.023	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
5989-27-5	d-Limonene	ND	0.50	0.14	ND	0.090	0.025	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	0.099	ND	0.052	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.16	ND	0.067	0.022	
91-20-3	Naphthalene	ND	0.50	0.18	ND	0.095	0.034	
87-68-3	Hexachlorobutadiene	ND	0.50	0.14	ND	0.047	0.013	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
ALS Sample ID: P151012-MB

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified  
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9  
Analyst: Simon Cao  
Sample Type: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 10/12/15  
Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
<hr/> No Compounds Detected <hr/>			

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P151013-MB

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 1.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/13/15

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result	MRL	MDL	Result	MRL	MDL	Data
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	ppbV	Qualifier
115-07-1	Propene	ND	0.50	0.14	ND	0.29	0.081	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	0.17	ND	0.10	0.034	
74-87-3	Chloromethane	ND	0.50	0.15	ND	0.24	0.073	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	0.19	ND	0.072	0.027	
75-01-4	Vinyl Chloride	ND	0.50	0.17	ND	0.20	0.067	
106-99-0	1,3-Butadiene	ND	0.50	0.22	ND	0.23	0.099	
74-83-9	Bromomethane	ND	0.50	0.19	ND	0.13	0.049	
75-00-3	Chloroethane	ND	0.50	0.17	ND	0.19	0.064	
64-17-5	Ethanol	ND	5.0	0.80	ND	2.7	0.42	
75-05-8	Acetonitrile	ND	0.50	0.18	ND	0.30	0.11	
107-02-8	Acrolein	ND	2.0	0.17	ND	0.87	0.074	
67-64-1	Acetone	<b>0.88</b>	5.0	0.77	<b>0.37</b>	2.1	0.32	<b>J</b>
75-69-4	Trichlorofluoromethane	ND	0.50	0.17	ND	0.089	0.030	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	0.42	ND	2.0	0.17	
107-13-1	Acrylonitrile	ND	0.50	0.17	ND	0.23	0.078	
75-35-4	1,1-Dichloroethene	ND	0.50	0.17	ND	0.13	0.043	
75-09-2	Methylene Chloride	ND	0.50	0.17	ND	0.14	0.049	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	0.16	ND	0.16	0.051	
76-13-1	Trichlorotrifluoroethane	ND	0.50	0.17	ND	0.065	0.022	
75-15-0	Carbon Disulfide	ND	5.0	0.15	ND	1.6	0.048	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.19	ND	0.13	0.048	
75-34-3	1,1-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	0.17	ND	0.14	0.047	
108-05-4	Vinyl Acetate	ND	5.0	0.65	ND	1.4	0.18	
78-93-3	2-Butanone (MEK)	ND	5.0	0.21	ND	1.7	0.071	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.



**ALS ENVIRONMENTAL**

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P151013-MB

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 1.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/13/15

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.16	ND	0.13	0.040	
141-78-6	Ethyl Acetate	ND	1.0	0.35	ND	0.28	0.097	
110-54-3	n-Hexane	ND	0.50	0.15	ND	0.14	0.043	
67-66-3	Chloroform	ND	0.50	0.17	ND	0.10	0.035	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	0.20	ND	0.17	0.068	
107-06-2	1,2-Dichloroethane	ND	0.50	0.16	ND	0.12	0.040	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.17	ND	0.092	0.031	
71-43-2	Benzene	ND	0.50	0.16	ND	0.16	0.050	
56-23-5	Carbon Tetrachloride	ND	0.50	0.15	ND	0.080	0.024	
110-82-7	Cyclohexane	ND	1.0	0.29	ND	0.29	0.084	
78-87-5	1,2-Dichloropropane	ND	0.50	0.16	ND	0.11	0.035	
75-27-4	Bromodichloromethane	ND	0.50	0.15	ND	0.075	0.022	
79-01-6	Trichloroethene	ND	0.50	0.14	ND	0.093	0.026	
123-91-1	1,4-Dioxane	ND	0.50	0.16	ND	0.14	0.044	
80-62-6	Methyl Methacrylate	ND	1.0	0.31	ND	0.24	0.076	
142-82-5	n-Heptane	ND	0.50	0.17	ND	0.12	0.041	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.14	ND	0.11	0.031	
108-10-1	4-Methyl-2-pentanone	ND	0.50	0.16	ND	0.12	0.039	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.16	ND	0.11	0.035	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.16	ND	0.092	0.029	
108-88-3	Toluene	ND	0.50	0.17	ND	0.13	0.045	
591-78-6	2-Hexanone	ND	0.50	0.16	ND	0.12	0.039	
124-48-1	Dibromochloromethane	ND	0.50	0.16	ND	0.059	0.019	
106-93-4	1,2-Dibromoethane	ND	0.50	0.16	ND	0.065	0.021	
123-86-4	n-Butyl Acetate	ND	0.50	0.16	ND	0.11	0.034	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P151013-MB

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 1.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/13/15

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	0.18	ND	0.11	0.039	
127-18-4	Tetrachloroethene	ND	0.50	0.14	ND	0.074	0.021	
108-90-7	Chlorobenzene	ND	0.50	0.16	ND	0.11	0.035	
100-41-4	Ethylbenzene	ND	0.50	0.16	ND	0.12	0.037	
179601-23-1	m,p-Xylenes	ND	1.0	0.30	ND	0.23	0.069	
75-25-2	Bromoform	ND	0.50	0.15	ND	0.048	0.015	
100-42-5	Styrene	ND	0.50	0.15	ND	0.12	0.035	
95-47-6	o-Xylene	ND	0.50	0.15	ND	0.12	0.035	
111-84-2	n-Nonane	ND	0.50	0.15	ND	0.095	0.029	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.15	ND	0.073	0.022	
98-82-8	Cumene	ND	0.50	0.15	ND	0.10	0.031	
80-56-8	alpha-Pinene	ND	0.50	0.14	ND	0.090	0.025	
103-65-1	n-Propylbenzene	ND	0.50	0.16	ND	0.10	0.033	
622-96-8	4-Ethyltoluene	ND	0.50	0.16	ND	0.10	0.033	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.16	ND	0.10	0.033	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.15	ND	0.10	0.031	
100-44-7	Benzyl Chloride	ND	0.50	0.11	ND	0.097	0.021	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.14	ND	0.083	0.023	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.15	ND	0.083	0.025	
5989-27-5	d-Limonene	ND	0.50	0.14	ND	0.090	0.025	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	0.099	ND	0.052	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.16	ND	0.067	0.022	
91-20-3	Naphthalene	ND	0.50	0.18	ND	0.095	0.034	
87-68-3	Hexachlorobutadiene	ND	0.50	0.14	ND	0.047	0.013	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P151013-MB

**Tentatively Identified Compounds**

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 1.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 10/13/15

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
No Compounds Detected			

**ALS ENVIRONMENTAL**

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9  
 Analyst: Simon Cao  
 Sample Type: 1.0 L Summa Canister(s)  
 Test Notes:

Date(s) Collected: 10/8/15  
 Date(s) Received: 10/9/15  
 Date(s) Analyzed: 10/12 - 10/13/15

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P151012-MB	<b>94</b>	<b>103</b>	<b>99</b>	70-130	
Method Blank	P151013-MB	<b>92</b>	<b>101</b>	<b>101</b>	70-130	
Lab Control Sample	P151012-LCS	<b>94</b>	<b>100</b>	<b>102</b>	70-130	
Lab Control Sample	P151013-LCS	<b>91</b>	<b>99</b>	<b>104</b>	70-130	
NQ Source 523	P1504274-001	<b>93</b>	<b>98</b>	<b>101</b>	70-130	
NQ Source 2027	P1504274-002	<b>88</b>	<b>103</b>	<b>102</b>	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P151012-LCS

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9  
 Analyst: Simon Cao  
 Sample Type: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 10/12/15  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
115-07-1	Propene	196	162	83	49-131	
75-71-8	Dichlorodifluoromethane (CFC 12)	188	155	82	65-117	
74-87-3	Chloromethane	200	160	80	48-132	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	204	169	83	65-122	
75-01-4	Vinyl Chloride	200	166	83	65-128	
106-99-0	1,3-Butadiene	206	171	83	62-143	
74-83-9	Bromomethane	202	168	83	65-130	
75-00-3	Chloroethane	200	191	96	69-126	
64-17-5	Ethanol	998	1000	100	57-126	
75-05-8	Acetonitrile	212	188	89	51-134	
107-02-8	Acrolein	214	199	93	55-146	
67-64-1	Acetone	1,080	1030	95	57-120	
75-69-4	Trichlorofluoromethane	216	170	79	59-139	
67-63-0	2-Propanol (Isopropyl Alcohol)	418	408	98	59-129	
107-13-1	Acrylonitrile	212	218	103	64-136	
75-35-4	1,1-Dichloroethene	216	210	97	72-123	
75-09-2	Methylene Chloride	222	205	92	63-117	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	218	197	90	50-141	
76-13-1	Trichlorotrifluoroethane	220	201	91	68-118	
75-15-0	Carbon Disulfide	210	173	82	55-143	
156-60-5	trans-1,2-Dichloroethene	210	196	93	69-129	
75-34-3	1,1-Dichloroethane	212	202	95	66-122	
1634-04-4	Methyl tert-Butyl Ether	216	186	86	55-128	
108-05-4	Vinyl Acetate	1,040	1140	110	66-140	
78-93-3	2-Butanone (MEK)	220	215	98	62-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Lab Control Sample

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P151012-LCS

Test Code: EPA TO-15 Modified

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 10/12/15

Sample Type: 1.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
156-59-2	cis-1,2-Dichloroethene	218	206	94	65-125	
141-78-6	Ethyl Acetate	428	453	106	64-132	
110-54-3	n-Hexane	212	205	97	58-126	
67-66-3	Chloroform	224	195	87	68-117	
109-99-9	Tetrahydrofuran (THF)	220	207	94	64-123	
107-06-2	1,2-Dichloroethane	214	190	89	63-124	
71-55-6	1,1,1-Trichloroethane	210	181	86	68-120	
71-43-2	Benzene	226	204	90	61-110	
56-23-5	Carbon Tetrachloride	230	189	82	65-137	
110-82-7	Cyclohexane	424	400	94	68-122	
78-87-5	1,2-Dichloropropane	216	211	98	67-122	
75-27-4	Bromodichloromethane	218	193	89	71-124	
79-01-6	Trichloroethene	216	190	88	71-121	
123-91-1	1,4-Dioxane	210	216	103	67-122	
80-62-6	Methyl Methacrylate	422	411	97	76-130	
142-82-5	n-Heptane	216	206	95	67-125	
10061-01-5	cis-1,3-Dichloropropene	208	200	96	73-131	
108-10-1	4-Methyl-2-pentanone	220	212	96	66-132	
10061-02-6	trans-1,3-Dichloropropene	210	208	99	76-135	
79-00-5	1,1,2-Trichloroethane	216	199	92	73-121	
108-88-3	Toluene	218	194	89	67-117	
591-78-6	2-Hexanone	220	211	96	59-128	
124-48-1	Dibromochloromethane	220	204	93	73-132	
106-93-4	1,2-Dibromoethane	218	209	96	73-128	
123-86-4	n-Butyl Acetate	226	217	96	61-136	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Lab Control Sample

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P151012-LCS

Test Code: EPA TO-15 Modified

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 10/12/15

Sample Type: 1.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
111-65-9	n-Octane	210	195	93	67-124	
127-18-4	Tetrachloroethene	202	180	89	65-126	
108-90-7	Chlorobenzene	220	203	92	68-120	
100-41-4	Ethylbenzene	218	199	91	69-123	
179601-23-1	m,p-Xylenes	428	392	92	67-125	
75-25-2	Bromoform	228	193	85	68-153	
100-42-5	Styrene	222	213	96	68-132	
95-47-6	o-Xylene	210	189	90	67-124	
111-84-2	n-Nonane	204	182	89	60-130	
79-34-5	1,1,2,2-Tetrachloroethane	210	201	96	72-128	
98-82-8	Cumene	208	185	89	67-124	
80-56-8	alpha-Pinene	212	194	92	67-129	
103-65-1	n-Propylbenzene	204	182	89	67-125	
622-96-8	4-Ethyltoluene	214	196	92	66-128	
108-67-8	1,3,5-Trimethylbenzene	214	190	89	65-125	
95-63-6	1,2,4-Trimethylbenzene	218	198	91	62-134	
100-44-7	Benzyl Chloride	220	220	100	74-145	
541-73-1	1,3-Dichlorobenzene	228	204	89	63-133	
106-46-7	1,4-Dichlorobenzene	208	194	93	62-129	
95-50-1	1,2-Dichlorobenzene	220	198	90	62-134	
5989-27-5	d-Limonene	210	193	92	66-137	
96-12-8	1,2-Dibromo-3-chloropropane	218	196	90	71-147	
120-82-1	1,2,4-Trichlorobenzene	230	197	86	60-145	
91-20-3	Naphthalene	218	191	88	56-158	
87-68-3	Hexachlorobutadiene	230	190	83	56-139	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton

ALS Project ID: P1504274  
 ALS Sample ID: P151013-LCS

Test Code: EPA TO-15 Modified  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9  
 Analyst: Simon Cao  
 Sample Type: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 10/13/15  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
115-07-1	Propene	196	154	79	49-131	
75-71-8	Dichlorodifluoromethane (CFC 12)	188	149	79	65-117	
74-87-3	Chloromethane	200	153	77	48-132	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	204	168	82	65-122	
75-01-4	Vinyl Chloride	200	161	81	65-128	
106-99-0	1,3-Butadiene	206	164	80	62-143	
74-83-9	Bromomethane	202	168	83	65-130	
75-00-3	Chloroethane	200	187	94	69-126	
64-17-5	Ethanol	998	962	96	57-126	
75-05-8	Acetonitrile	212	185	87	51-134	
107-02-8	Acrolein	214	192	90	55-146	
67-64-1	Acetone	1,080	1000	93	57-120	
75-69-4	Trichlorofluoromethane	216	167	77	59-139	
67-63-0	2-Propanol (Isopropyl Alcohol)	418	393	94	59-129	
107-13-1	Acrylonitrile	212	212	100	64-136	
75-35-4	1,1-Dichloroethene	216	206	95	72-123	
75-09-2	Methylene Chloride	222	203	91	63-117	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	218	190	87	50-141	
76-13-1	Trichlorotrifluoroethane	220	203	92	68-118	
75-15-0	Carbon Disulfide	210	170	81	55-143	
156-60-5	trans-1,2-Dichloroethene	210	191	91	69-129	
75-34-3	1,1-Dichloroethane	212	197	93	66-122	
1634-04-4	Methyl tert-Butyl Ether	216	173	80	55-128	
108-05-4	Vinyl Acetate	1,040	1130	109	66-140	
78-93-3	2-Butanone (MEK)	220	211	96	62-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.



# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Lab Control Sample

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P151013-LCS

Test Code: EPA TO-15 Modified

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 10/13/15

Sample Type: 1.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
156-59-2	cis-1,2-Dichloroethene	218	201	92	65-125	
141-78-6	Ethyl Acetate	428	442	103	64-132	
110-54-3	n-Hexane	212	200	94	58-126	
67-66-3	Chloroform	224	191	85	68-117	
109-99-9	Tetrahydrofuran (THF)	220	205	93	64-123	
107-06-2	1,2-Dichloroethane	214	184	86	63-124	
71-55-6	1,1,1-Trichloroethane	210	178	85	68-120	
71-43-2	Benzene	226	202	89	61-110	
56-23-5	Carbon Tetrachloride	230	187	81	65-137	
110-82-7	Cyclohexane	424	398	94	68-122	
78-87-5	1,2-Dichloropropane	216	208	96	67-122	
75-27-4	Bromodichloromethane	218	191	88	71-124	
79-01-6	Trichloroethene	216	191	88	71-121	
123-91-1	1,4-Dioxane	210	214	102	67-122	
80-62-6	Methyl Methacrylate	422	409	97	76-130	
142-82-5	n-Heptane	216	204	94	67-125	
10061-01-5	cis-1,3-Dichloropropene	208	198	95	73-131	
108-10-1	4-Methyl-2-pentanone	220	208	95	66-132	
10061-02-6	trans-1,3-Dichloropropene	210	204	97	76-135	
79-00-5	1,1,2-Trichloroethane	216	199	92	73-121	
108-88-3	Toluene	218	190	87	67-117	
591-78-6	2-Hexanone	220	201	91	59-128	
124-48-1	Dibromochloromethane	220	200	91	73-132	
106-93-4	1,2-Dibromoethane	218	205	94	73-128	
123-86-4	n-Butyl Acetate	226	208	92	61-136	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

**Client:** Stantec Consulting Services, Inc.

**Client Sample ID:** Lab Control Sample

**Client Project ID:** Bridgeton

ALS Project ID: P1504274

ALS Sample ID: P151013-LCS

Test Code: EPA TO-15 Modified

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 10/13/15

Sample Type: 1.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
111-65-9	n-Octane	210	189	90	67-124	
127-18-4	Tetrachloroethene	202	178	88	65-126	
108-90-7	Chlorobenzene	220	199	90	68-120	
100-41-4	Ethylbenzene	218	195	89	69-123	
179601-23-1	m,p-Xylenes	428	382	89	67-125	
75-25-2	Bromoform	228	190	83	68-153	
100-42-5	Styrene	222	209	94	68-132	
95-47-6	o-Xylene	210	184	88	67-124	
111-84-2	n-Nonane	204	174	85	60-130	
79-34-5	1,1,2,2-Tetrachloroethane	210	196	93	72-128	
98-82-8	Cumene	208	181	87	67-124	
80-56-8	alpha-Pinene	212	189	89	67-129	
103-65-1	n-Propylbenzene	204	177	87	67-125	
622-96-8	4-Ethyltoluene	214	191	89	66-128	
108-67-8	1,3,5-Trimethylbenzene	214	185	86	65-125	
95-63-6	1,2,4-Trimethylbenzene	218	193	89	62-134	
100-44-7	Benzyl Chloride	220	213	97	74-145	
541-73-1	1,3-Dichlorobenzene	228	200	88	63-133	
106-46-7	1,4-Dichlorobenzene	208	191	92	62-129	
95-50-1	1,2-Dichlorobenzene	220	194	88	62-134	
5989-27-5	d-Limonene	210	185	88	66-137	
96-12-8	1,2-Dibromo-3-chloropropane	218	192	88	71-147	
120-82-1	1,2,4-Trichlorobenzene	230	192	83	60-145	
91-20-3	Naphthalene	218	185	85	56-158	
87-68-3	Hexachlorobutadiene	230	184	80	56-139	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

Method Path : I:\MS09\Methods\  
 Method File : R9090115.M  
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)  
 Last Update : Wed Sep 02 09:10:52 2015  
 Response Via : Initial Calibration

9/2/15

Calibration Files  
 0.08=09011503.D 0.10=09011504.D 0.20=09011505.D 0.40=09011506.D 1.0 =09011507.D 5.0 =09011508.D 25 =09011509.D  
 50 =09011510.D 100 =09011511.D

Compound	0.08	0.10	0.20	0.40	1.0	5.0	25	50	100	Avg	%RSD
-----ISTD-----											
1) IR Bromochloromethane...											
2) T Propene	2.413	2.176	2.028	1.885	1.772	1.578	1.739	1.700	1.801	1.899	13.83
3) T Dichlorodifluo...	3.937	3.913	3.677	3.555	3.561	3.195	3.332	3.242	3.020	3.493	9.15
4) T Chloromethane	3.826	3.631	3.247	3.037	3.039	2.715	2.920	2.599	2.154	3.019	16.99
5) T 1,2-Dichloro-1...	2.077	1.927	1.801	1.755	1.760	1.625	1.726	1.695	1.502	1.763	9.41
6) T Vinyl Chloride	3.320	2.998	2.781	2.719	2.737	2.541	2.672	2.625	2.255	2.739	10.78
7) T 1,3-Butadiene	2.499	2.421	2.167	2.063	2.073	1.922	2.060	1.997	1.541	2.083	13.40
8) T Bromomethane	1.619	1.738	1.628	1.619	1.568	1.414	1.560	1.507	1.342	1.555	7.70
9) T Chloroethane	1.254	1.237	1.181	1.227	1.076	1.146	1.046	1.022	1.072	1.140	7.80
10) T Ethanol	1.292	1.191	1.266	1.264	1.024	0.936	1.053	1.011	0.995	1.114	12.35
11) T Acetonitrile	3.401	3.640	3.244	3.135	2.758	2.440	2.619	2.570	2.606	2.935	14.59
12) T Acrolein	1.046	0.883	0.935	0.902	0.867	0.803	0.888	0.857	0.809	0.888	8.18
13) T Acetone	1.404	1.283	1.150	1.113	1.041	0.958	0.989	0.945	0.920	1.089	15.21
14) T Trichlorofluor...	3.059	2.812	2.657	2.555	2.542	2.313	2.445	2.392	2.361	2.571	9.36
15) T 2-Propanol (Is...	4.640	4.174	3.969	3.792	3.683	3.397	3.715	3.473	3.332	3.797	10.95
16) T Acrylonitrile	1.782	1.725	1.647	1.787	1.876	1.749	1.891	1.826	1.917	1.800	4.84
17) T 1,1-Dichloroet...	1.520	1.419	1.338	1.309	1.330	1.212	1.301	1.258	1.305	1.332	6.77
18) T 2-Methyl-2-Pro...	4.254	4.011	3.850	3.778	3.736	3.372	3.631	2.949	2.023	3.512	19.11
19) T Methylene Chlo...				1.767	1.522	1.269	1.334	1.290	1.321	1.417	13.66
20) T 3-Chloro-1-pro...	2.502	2.524	2.368	2.282	2.161	2.069	2.123	2.074	2.213	2.257	7.72
21) T Trichlorotrifl...	1.377	1.214	1.135	1.165	1.185	1.089	1.159	1.126	1.111	1.174	7.27
22) T Carbon Disulfide	7.108	6.548	5.605	5.552	5.497	5.088	5.431	5.258	5.505	5.733	11.44
23) T trans-1,2-Dich...	2.357	2.188	2.047	2.030	2.052	1.919	2.070	2.022	2.140	2.092	5.96
24) T 1,1-Dichloroet...	2.899	2.724	2.673	2.521	2.581	2.392	2.565	2.488	2.665	2.612	5.68
25) T Methyl tert-Bu...	4.867	4.765	4.457	4.264	4.263	3.947	4.228	4.097	4.135	4.336	7.07
26) T Vinyl Acetate	0.332	0.301	0.274	0.292	0.315	0.305	0.335	0.322	0.338	0.313	6.94
27) T 2-Butanone (MEK)	0.952	1.042	0.926	0.948	0.953	0.858	0.930	0.896	0.964	0.941	5.35
28) T cis-1,2-Dichlo...	2.065	2.148	1.937	1.897	1.931	1.784	1.933	1.876	2.042	1.957	5.63
29) T Diisopropyl Ether	1.417	1.503	1.375	1.254	1.196	1.048	1.102	1.056	1.109	1.229	13.70
30) T Ethyl Acetate	0.537	0.509	0.521	0.507	0.519	0.484	0.514	0.490	0.532	0.513	3.42
31) T n-Hexane	2.989	2.831	2.599	2.472	2.398	2.150	2.201	2.136	2.309	2.454	12.32
32) T Chloroform	2.951	2.864	2.480	2.442	2.398	2.217	2.368	2.306	2.426	2.495	9.93
33) S 1,2-Dichloroet...	1.692	1.689	1.703	1.682	1.655	1.668	1.672	1.685	1.678	1.680	0.85
34) T Tetrahydrofura...	1.097	1.143	1.021	0.929	0.909	0.856	0.922	0.897	0.876	0.961	10.58
35) T Ethyl tert-But...	1.917	1.774	1.856	1.698	1.700	1.585	1.693	1.649	1.706	1.731	5.93
36) T 1,2-Dichloroet...	2.106	1.896	1.753	1.785	1.813	1.669	1.795	1.743	1.634	1.799	7.70
-----ISTD-----											
37) IR 1,4-Difluorobenzen...											
38) T 1,1,1-Trichlor...	0.487	0.463	0.434	0.437	0.431	0.396	0.435	0.420	0.419	0.436	6.05
39) T Isopropyl Acetate	0.185	0.188	0.162	0.168	0.172	0.156	0.168	0.158	0.173	0.170	6.45
40) T 1-Butanol			0.318	0.302	0.267	0.247	0.285	0.271	0.295	0.284	8.45
41) T Benzene	1.309	1.293	1.081	1.065	1.046	0.952	1.013	0.974	1.048	1.087	11.83
42) T Carbon Tetrach...	0.414	0.380	0.372	0.357	0.368	0.344	0.377	0.366	0.369	0.372	5.14

Method Path : I:\MS09\Methods\  
 Method File : R9090115.M

Title	: EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)										
43) T Cyclohexane	0.511	0.466	0.413	0.428	0.424	0.395	0.424	0.406	0.421	0.432	8.20
44) T tert-Amyl Meth...	0.975	0.914	0.841	0.835	0.830	0.766	0.833	0.801	0.834	0.848	7.25
45) T 1,2-Dichloropr...	0.296	0.314	0.298	0.282	0.283	0.263	0.287	0.276	0.296	0.288	5.06
46) T Bromodichlorom...	0.470	0.417	0.370	0.381	0.379	0.353	0.390	0.378	0.386	0.391	8.70
47) T Trichloroethene	0.378	0.327	0.301	0.303	0.313	0.281	0.305	0.297	0.301	0.312	8.86
48) T 1,4-Dioxane	0.244	0.238	0.204	0.224	0.221	0.200	0.223	0.216	0.225	0.222	6.40
49) T 2,2,4-Trimethy...	1.473	1.372	1.255	1.221	1.235	1.149	1.240	1.185	1.310	1.271	7.85
50) T Methyl Methacr...	0.108	0.115	0.108	0.110	0.111	0.103	0.113	0.109	0.110	0.110	3.03
51) T n-Heptane	0.324	0.318	0.282	0.280	0.278	0.250	0.269	0.260	0.280	0.282	8.60
52) T cis-1,3-Dichlo...	0.502	0.428	0.426	0.446	0.454	0.429	0.470	0.453	0.465	0.453	5.40
53) T 4-Methyl-2-pen...	0.279	0.285	0.272	0.260	0.260	0.244	0.267	0.257	0.273	0.266	4.73
54) T trans-1,3-Dich...	0.370	0.374	0.347	0.372	0.395	0.388	0.436	0.422	0.440	0.394	8.21
55) T 1,1,2-Trichlor...	0.332	0.301	0.276	0.283	0.275	0.252	0.277	0.268	0.272	0.282	8.17
56) IR Chlorobenzene-d5	(...)										
57) S Toluene-d8 (SS2)	2.424	2.433	2.415	2.415	2.389	2.338	2.329	2.323	2.402	2.385	1.82
58) T Toluene	3.737	3.448	2.978	2.902	2.833	2.506	2.683	2.588	2.629	2.923	14.21
59) T 2-Hexanone	1.862	1.771	1.599	1.508	1.502	1.389	1.514	1.436	1.612	1.577	9.78
60) T Dibromochlorom...	0.805	0.877	0.777	0.773	0.784	0.716	0.789	0.762	0.800	0.787	5.43
61) T 1,2-Dibromoethane	0.799	0.840	0.749	0.740	0.783	0.699	0.761	0.729	0.773	0.764	5.42
62) T n-Butyl Acetate	2.078	1.857	1.718	1.698	1.697	1.554	1.694	1.614	1.714	1.736	8.76
63) T n-Octane	0.788	0.692	0.641	0.561	0.561	0.561	0.598	0.573	0.609	0.638	12.50
64) T Tetrachloroethene	0.965	0.849	0.830	0.807	0.797	0.721	0.780	0.758	0.762	0.808	8.76
65) T Chlorobenzene	2.182	2.074	1.822	1.868	1.828	1.647	1.773	1.754	1.815	1.863	8.86
66) T Ethylbenzene	3.876	3.480	3.200	3.172	3.196	2.857	3.082	3.108	3.082	3.228	9.04
67) T m- & p-Xylenes	3.015	2.875	2.518	2.508	2.527	2.295	2.494	2.535	2.485	2.584	8.52
68) T Bromoform	0.779	0.706	0.648	0.618	0.671	0.682	0.635	0.706	0.717	0.693	6.12
69) T Styrene	2.114	2.003	1.775	1.842	1.844	1.726	1.886	1.999	1.873	1.896	6.44
70) T o-Xylene	3.166	3.073	2.618	2.600	2.539	2.357	2.539	2.608	2.641	2.682	9.79
71) T n-Nonane	1.985	1.812	1.743	1.575	1.515	1.371	1.463	1.746	1.496	1.634	12.13
72) T 1,1,2,2-Tetrac...	1.483	1.405	1.232	1.301	1.229	1.161	1.274	1.303	1.292	1.298	7.42
73) S Bromofluoroben...	0.812	0.804	0.837	0.819	0.823	0.834	0.837	0.914	0.821	0.834	3.87
74) T Cumene	3.835	3.748	3.428	3.389	3.294	2.992	3.240	3.765	3.177	3.430	8.56
75) T alpha-Pinene	1.915	1.784	1.749	1.671	1.651	1.506	1.641	1.977	1.610	1.723	8.71
76) T n-Propylbenzene	4.987	4.980	4.500	4.104	4.149	3.710	4.000	4.821	3.863	4.346	11.26
77) T 3-Ethyltoluene	3.783	3.564	3.336	3.167	3.188	2.930	3.153	3.782	3.051	3.328	9.38
78) T 4-Ethyltoluene	3.587	3.506	3.258	3.087	3.057	2.793	3.028	3.570	2.974	3.207	8.97
79) T 1,3,5-Trimethy...	3.082	3.001	2.846	2.652	2.612	2.410	2.590	3.085	2.550	2.759	9.09
80) T alpha-Methylst...	1.597	1.556	1.454	1.419	1.409	1.335	1.432	1.695	1.386	1.476	7.84
81) T 2-Ethyltoluene	3.646	3.445	3.326	3.129	3.075	2.798	3.018	3.606	2.894	3.215	9.50
82) T 1,2,4-Trimethy...	3.191	3.051	2.825	2.659	2.630	2.407	2.675	3.256	2.522	2.802	10.71
83) T n-Decane	2.042	1.995	1.861	1.625	1.598	1.430	1.679	1.972	1.369	1.730	14.37
84) T Benzyl Chloride	2.234	2.232	2.232	2.053	2.125	2.124	2.611	3.042	2.355	2.334	13.35
85) T 1,3-Dichlorobe...	1.677	1.639	1.591	1.481	1.463	1.329	1.555	1.723	1.416	1.542	8.40
86) T 1,4-Dichlorobe...	1.773	1.687	1.624	1.545	1.496	1.378	1.686	1.773	1.473	1.604	8.66
87) T sec-Butylbenzene	4.170	3.970	3.974	3.532	3.549	3.194	3.890	4.145	3.182	3.734	10.23
88) T 4-Isopropyltol...	3.979	3.814	3.567	3.309	3.335	3.011	3.836	4.016	3.225	3.566	10.17
89) T 1,2,3-Trimethy...	3.232	3.308	2.974	2.766	2.715	2.495	3.199	3.410	2.777	2.986	10.56
90) T 1,2-Dichlorobe...	1.660	1.605	1.538	1.454	1.423	1.283	1.693	1.676	1.392	1.525	9.49
91) T d-Limonene	1.246	1.263	1.189	1.086	1.088	0.982	1.367	1.372	1.051	1.183	11.81
92) T 1,2-Dibromo-3-...	0.660	0.551	0.596	0.559	0.608	0.497	0.632	0.663	0.539	0.589	9.67
93) T n-Undecane	2.531	2.113	1.998	1.724	2.006	1.484	1.737	2.055	1.587	1.915	16.66
94) T 1,2,4-Trichlor...	1.283	1.208	1.095	1.067	1.019	0.895	1.159	1.264	1.040	1.114	11.31

Method Path : I:\MS09\Methods\  
 Method File : R9090115.M

Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95) T	Naphthalene	4.433	4.491	3.617	3.549	3.481	3.051	4.114	4.494	3.496	3.858	13.83
96) T	n-Dodecane		2.111	1.660	1.629	1.406	1.681	1.995	1.409	1.699	1.699	15.83
97) T	Hexachlorobuta...	0.702	0.706	0.684	0.671	0.652	0.537	0.664	0.706	0.601	0.658	8.54
98) T	Cyclohexanone	1.216	1.110	0.948	0.962	0.913	0.850	0.925	0.973	0.919	0.980	11.55
99) T	tert-Butylbenzene	3.016	2.861	2.753	2.580	2.560	2.345	2.568	3.071	2.380	2.682	9.72
100) T	n-Butylbenzene	3.373	3.413	3.192	2.922	3.090	2.557	3.252	3.418	2.677	3.099	10.27

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 (#) = Out of Range

Evaluate Continuing Calibration Report

Data File: I:\MS09\Data\2015 10\12\10121502.D

Acq On : 12 Oct 2015 10:22

Operator: SC

Sample : CCV R9101215 25ng

Misc : S29-08241505/S29-09251511 (10/24)

ALS Vial : 16 Sample Multiplier: 1

*SC* 10/12/15

Quant Time: Oct 12 10:47:31 2015

Quant Method : I:\MS09\Methods\R9090115.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Sep 02 09:10:52 2015

Response via : Initial Calibration

DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev (min)
1 IR Bromochloromethane (IS1)	1.000	1.000	0.0	79	-0.02
2 T Propene	1.899	1.610	15.2	74	0.00
3 T Dichlorodifluoromethane (CF)	3.493	3.026	13.4	72	0.00
4 T Chloromethane	3.019	2.539	15.9	69	0.00
5 T 1,2-Dichloro-1,1,2,2-tetra	1.763	1.564	11.3	72	0.00
6 T Vinyl Chloride	2.739	2.396	12.5	71	0.00
7 T 1,3-Butadiene	2.083	1.875	10.0	72	0.00
8 T Bromomethane	1.555	1.418	8.8	72	0.00
9 T Chloroethane	1.140	1.152	-1.1	88	0.00
10 T Ethanol	1.114	1.197	-7.5	90	-0.03
11 T Acetonitrile	2.935	2.916	0.6	88	-0.02
12 T Acrolein	0.888	0.930	-4.7	83	0.00
13 T Acetone	1.089	1.108	-1.7	89	-0.02
14 T Trichlorofluoromethane	2.571	2.409	6.3	78	0.00
15 T 2-Propanol (Isopropanol)	3.797	3.913	-3.1	84	-0.02
16 T Acrylonitrile	1.800	2.015	-11.9	85	-0.02
17 T 1,1-Dichloroethene	1.332	1.364	-2.4	83	0.00
18 T 2-Methyl-2-Propanol (tert-B	3.512	3.530	-0.5	77	-0.02
19 T Methylene Chloride	1.417	1.409	0.6	84	-0.01
20 T 3-Chloro-1-propene (Allyl C	2.257	2.170	3.9	81	0.00
21 T Trichlorotrifluoroethane	1.174	1.155	1.6	79	0.00
22 T Carbon Disulfide	5.733	5.729	0.1	84	0.00
23 T trans-1,2-Dichloroethene	2.092	2.084	0.4	80	0.00
24 T 1,1-Dichloroethane	2.612	2.632	-0.8	82	0.00
25 T Methyl tert-Butyl Ether	4.336	4.011	7.5	75	0.00
26 T Vinyl Acetate	0.313	0.363	-16.0	86	-0.02
27 T 2-Butanone (MEK)	0.941	0.980	-4.1	84	-0.01
28 T cis-1,2-Dichloroethene	1.957	1.961	-0.2	81	-0.01
29 T Diisopropyl Ether	1.229	1.181	3.9	85	0.00
30 T Ethyl Acetate	0.513	0.580	-13.1	90	-0.02
31 T n-Hexane	2.454	2.581	-5.2	93	0.00
32 T Chloroform	2.495	2.351	5.8	79	-0.02
33 S 1,2-Dichloroethane-d4 (SS1)	1.680	1.580	6.0	75	-0.01
34 T Tetrahydrofuran (THF)	0.961	0.968	-0.7	83	0.00
35 T Ethyl tert-Butyl Ether	1.731	1.708	1.3	80	0.00
36 T 1,2-Dichloroethane	1.799	1.686	6.3	75	-0.01
37 IR 1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	83	0.00
38 T 1,1,1-Trichloroethane	0.436	0.396	9.2	75	-0.01
39 T Isopropyl Acetate	0.170	0.180	-5.9	89	-0.01
40 T 1-Butanol	0.284	0.314	-10.6	91	-0.03
41 T Benzene	1.087	1.027	5.5	84	0.00
42 T Carbon Tetrachloride	0.372	0.340	8.6	75	-0.01
43 T Cyclohexane	0.432	0.432	0.0	84	0.00
44 T tert-Amyl Methyl Ether	0.848	0.807	4.8	80	0.00
45 T 1,2-Dichloropropane	0.288	0.296	-2.8	85	-0.01
46 T Bromodichloromethane	0.391	0.371	5.1	79	-0.01
47 T Trichloroethene	0.312	0.299	4.2	81	0.00
48 T 1,4-Dioxane	0.222	0.228	-2.7	84	-0.01
49 T 2,2,4-Trimethylpentane (Iso	1.271	1.250	1.7	84	0.00
50 T Methyl Methacrylate	0.110	0.113	-2.7	83	-0.01
51 T n-Heptane	0.282	0.287	-1.8	89	0.00
52 T cis-1,3-Dichloropropene	0.453	0.464	-2.4	82	-0.01
53 T 4-Methyl-2-pentanone	0.266	0.274	-3.0	85	0.00
54 T trans-1,3-Dichloropropene	0.394	0.416	-5.6	79	0.00

Evaluate Continuing Calibration Report

Data File: I:\MS09\Data\2015 10\12\10121502.D  
 Acq On : 12 Oct 2015 10:22  
 Sample : CCV R9101215 25ng  
 Misc : S29-08241505/S29-09251511 (10/24)  
 ALS Vial : 16 Sample Multiplier: 1

Operator: SC

Quant Time: Oct 12 10:47:31 2015  
 Quant Method : I:\MS09\Methods\R9090115.M  
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)  
 QLast Update : Wed Sep 02 09:10:52 2015  
 Response via : Initial Calibration  
 DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55 T	1,1,2-Trichloroethane	0.282	0.276	2.1	83	0.00
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	80	0.00
57 S	Toluene-d8 (SS2)	2.385	2.399	-0.6	82	0.00
58 T	Toluene	2.923	2.784	4.8	83	0.00
59 T	2-Hexanone	1.577	1.578	-0.1	83	-0.01
60 T	Dibromochloromethane	0.787	0.775	1.5	79	0.00
61 T	1,2-Dibromoethane	0.764	0.785	-2.7	82	-0.01
62 T	n-Butyl Acetate	1.736	1.756	-1.2	83	0.00
63 T	n-Octane	0.638	0.639	-0.2	85	-0.01
64 T	Tetrachloroethene	0.808	0.772	4.5	79	0.00
65 T	Chlorobenzene	1.863	1.832	1.7	83	0.00
66 T	Ethylbenzene	3.228	3.151	2.4	82	0.00
67 T	m- & p-Xylenes	2.584	2.521	2.4	81	-0.01
68 T	Bromoform	0.693	0.691	0.3	78	-0.01
69 T	Styrene	1.896	1.932	-1.9	82	0.00
70 T	o-Xylene	2.682	2.587	3.5	81	-0.01
71 T	n-Nonane	1.634	1.549	5.2	85	0.00
72 T	1,1,2,2-Tetrachloroethane	1.298	1.362	-4.9	85	-0.01
73 S	Bromofluorobenzene (SS3)	0.834	0.849	-1.8	81	0.00
74 T	Cumene	3.430	3.299	3.8	81	0.00
75 T	alpha-Pinene	1.723	1.678	2.6	82	0.00
76 T	n-Propylbenzene	4.346	4.157	4.3	83	0.00
77 T	3-Ethyltoluene	3.328	3.222	3.2	82	0.00
78 T	4-Ethyltoluene	3.207	3.112	3.0	82	-0.01
79 T	1,3,5-Trimethylbenzene	2.759	2.628	4.7	81	-0.01
80 T	alpha-Methylstyrene	1.476	1.446	2.0	81	0.00
81 T	2-Ethyltoluene	3.215	3.133	2.6	83	0.00
82 T	1,2,4-Trimethylbenzene	2.802	2.769	1.2	83	-0.01
83 T	n-Decane	1.730	1.666	3.7	79	0.00
84 T	Benzyl Chloride	2.334	2.501	-7.2	77	-0.01
85 T	1,3-Dichlorobenzene	1.542	1.514	1.8	78	-0.01
86 T	1,4-Dichlorobenzene	1.604	1.567	2.3	74	-0.01
87 T	sec-Butylbenzene	3.734	3.608	3.4	74	0.00
88 T	4-Isopropyltoluene (p-Cymen)	3.566	3.475	2.6	72	-0.01
89 T	1,2,3-Trimethylbenzene	2.986	2.890	3.2	72	-0.01
90 T	1,2-Dichlorobenzene	1.525	1.488	2.4	70	-0.01
91 T	d-Limonene	1.183	1.130	4.5	66	0.00
92 T	1,2-Dibromo-3-Chloropropane	0.589	0.594	-0.8	75	0.00
93 T	n-Undecane	1.915	1.710	10.7	79	0.00
94 T	1,2,4-Trichlorobenzene	1.114	1.144	-2.7	79	0.00
95 T	Naphthalene	3.858	4.010	-3.9	78	0.00
96 T	n-Dodecane	1.699	1.611	5.2	77	0.00
97 T	Hexachlorobutadiene	0.658	0.635	3.5	76	0.00
98 T	Cyclohexanone	0.980	0.941	4.0	81	-0.02
99 T	tert-Butylbenzene	2.682	2.667	0.6	83	-0.01
100 T	n-Butylbenzene	3.099	2.945	5.0	72	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Data File: I:\MS09\Data\2015 10\13\10131501.D  
 Acq On : 13 Oct 2015 6:40  
 Sample : CCV R9101315 25ng  
 Misc : S29-08241505/S29-09251511 (10/24)  
 ALS Vial : 16 Sample Multiplier: 1

Operator: SC

*10/13/15*

Quant Time: Oct 13 09:39:04 2015  
 Quant Method : I:\MS09\Methods\R9090115.M  
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)  
 QLast Update : Wed Sep 02 09:10:52 2015  
 Response via : Initial Calibration  
 DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1 IR Bromochloromethane (IS1)	1.000	1.000	0.0	84	-0.02
2 T Propene	1.899	1.474	22.4	71	-0.01
3 T Dichlorodifluoromethane (CF	3.493	2.786	20.2	70	0.00
4 T Chloromethane	3.019	2.274	24.7	65	-0.02
5 T 1,2-Dichloro-1,1,2,2-tetra	1.763	1.485	15.8	72	-0.01
6 T Vinyl Chloride	2.739	2.222	18.9	70	-0.02
7 T 1,3-Butadiene	2.083	1.522	26.9	62	-0.02
8 T Bromomethane	1.555	1.314	15.5	70	-0.02
9 T Chloroethane	1.140	1.070	6.1	86	-0.02
10 T Ethanol	1.114	1.089	2.2	87	-0.04
11 T Acetonitrile	2.935	2.654	9.6	85	-0.03
12 T Acrolein	0.888	0.851	4.2	80	-0.02
13 T Acetone	1.089	1.024	6.0	87	-0.03
14 T Trichlorofluoromethane	2.571	2.232	13.2	76	-0.01
15 T 2-Propanol (Isopropanol)	3.797	3.536	6.9	80	-0.03
16 T Acrylonitrile	1.800	1.856	-3.1	82	-0.03
17 T 1,1-Dichloroethene	1.332	1.283	3.7	82	-0.02
18 T 2-Methyl-2-Propanol (tert-B	3.512	3.062	12.8	71	-0.03
19 T Methylene Chloride	1.417	1.329	6.2	83	-0.03
20 T 3-Chloro-1-propene (Allyl C	2.257	1.986	12.0	78	-0.02
21 T Trichlorotrifluoroethane	1.174	1.099	6.4	79	0.00
22 T Carbon Disulfide	5.733	5.344	6.8	82	-0.01
23 T trans-1,2-Dichloroethene	2.092	1.940	7.3	78	-0.02
24 T 1,1-Dichloroethane	2.612	2.449	6.2	80	-0.02
25 T Methyl tert-Butyl Ether	4.336	3.483	19.7	69	-0.01
26 T Vinyl Acetate	0.313	0.341	-8.9	85	-0.03
27 T 2-Butanone (MEK)	0.941	0.921	2.1	83	-0.02
28 T cis-1,2-Dichloroethene	1.957	1.812	7.4	78	-0.02
29 T Diisopropyl Ether	1.229	1.117	9.1	85	-0.01
30 T Ethyl Acetate	0.513	0.541	-5.5	88	-0.02
31 T n-Hexane	2.454	2.384	2.9	91	-0.01
32 T Chloroform	2.495	2.205	11.6	78	-0.02
33 S 1,2-Dichloroethane-d4 (SS1)	1.680	1.528	9.0	76	-0.02
34 T Tetrahydrofuran (THF)	0.961	0.912	5.1	83	-0.01
35 T Ethyl tert-Butyl Ether	1.731	1.607	7.2	79	-0.01
36 T 1,2-Dichloroethane	1.799	1.556	13.5	72	-0.02
37 IR 1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	86	-0.01
38 T 1,1,1-Trichloroethane	0.436	0.372	14.7	74	-0.01
39 T Isopropyl Acetate	0.170	0.170	0.0	87	-0.01
40 T 1-Butanol	0.284	0.294	-3.5	89	-0.03
41 T Benzene	1.087	0.980	9.8	84	-0.01
42 T Carbon Tetrachloride	0.372	0.322	13.4	74	-0.01
43 T Cyclohexane	0.432	0.413	4.4	84	-0.01
44 T tert-Amyl Methyl Ether	0.848	0.764	9.9	79	-0.01
45 T 1,2-Dichloropropane	0.288	0.280	2.8	84	-0.01
46 T Bromodichloromethane	0.391	0.352	10.0	78	-0.01
47 T Trichloroethene	0.312	0.289	7.4	82	-0.01
48 T 1,4-Dioxane	0.222	0.216	2.7	84	-0.01
49 T 2,2,4-Trimethylpentane (Iso	1.271	1.180	7.2	82	-0.01
50 T Methyl Methacrylate	0.110	0.109	0.9	83	-0.01
51 T n-Heptane	0.282	0.271	3.9	87	-0.01
52 T cis-1,3-Dichloropropene	0.453	0.439	3.1	81	-0.01
53 T 4-Methyl-2-pentanone	0.266	0.257	3.4	83	-0.01
54 T trans-1,3-Dichloropropene	0.394	0.393	0.3	78	-0.01



Evaluate Continuing Calibration Report

Data File: I:\MS09\Data\2015 10\13\10131501.D

Acq On : 13 Oct 2015 6:40

Operator: SC

Sample : CCV R9101315 25ng

Misc : S29-08241505/S29-09251511 (10/24)

ALS Vial : 16 Sample Multiplier: 1

Quant Time: Oct 13 09:39:04 2015

Quant Method : I:\MS09\Methods\R9090115.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Wed Sep 02 09:10:52 2015

Response via : Initial Calibration

DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55 T	1,1,2-Trichloroethane	0.282	0.263	6.7	82	-0.01
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	87	0.00
57 S	Toluene-d8 (SS2)	2.385	2.333	2.2	87	0.00
58 T	Toluene	2.923	2.536	13.2	82	-0.01
59 T	2-Hexanone	1.577	1.404	11.0	81	-0.01
60 T	Dibromochloromethane	0.787	0.707	10.2	78	0.00
61 T	1,2-Dibromoethane	0.764	0.719	5.9	82	-0.01
62 T	n-Butyl Acetate	1.736	1.560	10.1	80	0.00
63 T	n-Octane	0.638	0.576	9.7	84	-0.01
64 T	Tetrachloroethene	0.808	0.707	12.5	79	0.00
65 T	Chlorobenzene	1.863	1.679	9.9	83	0.00
66 T	Ethylbenzene	3.228	2.873	11.0	81	0.00
67 T	m- & p-Xylenes	2.584	2.295	11.2	80	-0.01
68 T	Bromoform	0.693	0.635	8.4	78	-0.01
69 T	Styrene	1.896	1.769	6.7	82	0.00
70 T	o-Xylene	2.682	2.340	12.8	80	-0.01
71 T	n-Nonane	1.634	1.379	15.6	82	0.00
72 T	1,1,2,2-Tetrachloroethane	1.298	1.241	4.4	85	-0.01
73 S	Bromofluorobenzene (SS3)	0.834	0.881	-5.6	92	0.00
74 T	Cumene	3.430	2.995	12.7	81	0.00
75 T	alpha-Pinene	1.723	1.525	11.5	81	0.00
76 T	n-Propylbenzene	4.346	3.761	13.5	82	0.00
77 T	3-Ethyltoluene	3.328	2.947	11.4	82	0.00
78 T	4-Ethyltoluene	3.207	2.820	12.1	81	-0.01
79 T	1,3,5-Trimethylbenzene	2.759	2.397	13.1	81	-0.01
80 T	alpha-Methylstyrene	1.476	1.315	10.9	80	0.00
81 T	2-Ethyltoluene	3.215	2.851	11.3	82	0.00
82 T	1,2,4-Trimethylbenzene	2.802	2.509	10.5	82	-0.01
83 T	n-Decane	1.730	1.498	13.4	78	-0.01
84 T	Benzyl Chloride	2.334	2.240	4.0	75	-0.01
85 T	1,3-Dichlorobenzene	1.542	1.380	10.5	77	-0.02
86 T	1,4-Dichlorobenzene	1.604	1.433	10.7	74	-0.01
87 T	sec-Butylbenzene	3.734	3.280	12.2	74	0.00
88 T	4-Isopropyltoluene (p-Cymen)	3.566	3.152	11.6	72	-0.01
89 T	1,2,3-Trimethylbenzene	2.986	2.613	12.5	71	-0.01
90 T	1,2-Dichlorobenzene	1.525	1.355	11.1	70	-0.01
91 T	d-Limonene	1.183	1.015	14.2	65	0.00
92 T	1,2-Dibromo-3-Chloropropane	0.589	0.542	8.0	75	0.00
93 T	n-Undecane	1.915	1.549	19.1	78	0.00
94 T	1,2,4-Trichlorobenzene	1.114	1.047	6.0	79	0.00
95 T	Naphthalene	3.858	3.669	4.9	78	0.00
96 T	n-Dodecane	1.699	1.478	13.0	77	0.00
97 T	Hexachlorobutadiene	0.658	0.575	12.6	76	0.00
98 T	Cyclohexanone	0.980	0.848	13.5	80	-0.02
99 T	tert-Butylbenzene	2.682	2.420	9.8	82	-0.01
100 T	n-Butylbenzene	3.099	2.666	14.0	72	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

# APPENDIX C – DATA VALIDATION OF LABORATORY ANALYTICAL RESULTS

**Stantec Analytical Validation Report/Checklist**
**Report No. 090415-EC-04**

Project Name: Bridgeton, MO		Project Number: 182608020	
Stantec Validator: Elizabeth A. Crowley		Laboratory: ALS –Semi-Valley, CA	
Date Validated: 08/30/15		Laboratory Project Number: P1503123	
Sample Start-End Date: 07/28-07/30/15		Laboratory Report Date: 08/14/15	
Parameters Validated: Aldehydes by TO-11A, Ammonia by OSHA ID-188/164-Modified, Carboxylic Acids by GCMS, Amines by GC/NPD, Hydrogen Cyanide by NIOSH 6010 modified and Mercury by NIOSH 6009.			
Samples Validated: 82 air field samples and 6 Field Blanks			
<b>VALIDATION CRITERIA CHECK</b>			
Validation Flags Applicable to this Review:			
<b>U</b>	The analyte was analyzed for, but not detected above the reported sample quantitation limit.		
<b>J</b>	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.		
<b>UJ</b>	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.		
<b>NJ</b>	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.		
<b>B</b>	The analyte was detected in the method, field, and/or trip blank.		
<b>R</b>	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.		
1.	Were all the analyses requested for the samples submitted with each COC completed by the lab?	Yes X	No
Comments:			
2.	Did the laboratory identify any non-conformances related to the analytical result?	Yes	No X
Comments:			
3.	Were sample Chain-of-Custody forms complete?	Yes X	No
Comments:			
4.	Were samples received in good condition and at the appropriate temperature?	Yes X	No
Comments:			
5.	Were sample holding times met?	Yes X	No
Comments:			
6.	Were correct concentration units reported?	Yes X	No
Comments:			
7.	Were detections found in laboratory blank samples?	Yes	No X

Comments:		
8. Were detections found in field blank, equipment rinse blank, and/or trip blank samples?	Yes	No X
Comments:		
9. Were instrument calibrations within method criteria?	Yes	No X
Comments: GC/NPD Continuing calibration dated 08/03/15 - %R below limits Dimethylamine.  Associated sample results flagged "J" if positive or "UJ" if non-detect and are biased low. Reason Code – CCAL		
10. Were surrogate recoveries within control limits?	Yes	No
NA		
Comments: Surrogates not required by methods.		
11. Were laboratory control (LC/LD) sample recoveries within control limits?	Yes X	No
Comments:		
12. Were site specific matrix spike (MS/MD) recoveries within control limits?	Yes	No
NA		
Comment: No matrix sample data required. No qualifying action required.		
13. Were RPDs within control limits?	Yes X	No
Comments:		
14. Were dilutions required on any samples?	Yes	No X
Comments:		
15. Were Tentatively Identified Compounds (TIC) present?	Yes	No X
Comments:		
16. Were organic system performance criteria met?	Yes	No
NA		
Comments: No data provided.		
17. Were GC/MS internal standards within method criteria?	Yes	No
NA		
Comments: No data provided.		
18. Were inorganic system performance criteria met?	Yes	No
NA		
Comments: No data provided.		
19. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	Yes X	No

Duplicate Sample Nos.  
 728DUP01 728UI-Ald (Pair 1)  
 728DUP03 728f-Carbox2 (Pair 2)  
 729DUP05 729sN-Amine (Pair 3)  
 729DUP06 729sNQ-SNH3 (Pair 4)  
 728DUP02 728D1-Hg (Pair 5)  
 729DUP04 729sF-HCN (Pair 6)

Comments: Pair 1 – RPDs within limits except Butyraldehyde. Associated result flagged “J” if positive or “UJ” if non-detect for duplicate sample pair only.  
 Pair 2- RPDs within limits except Acetic Acid and Butanoic Acid. Associated results flagged “J” if positive or “UJ” if non-detect.  
 Pair 3 – Results non-detect, RPD within limits.  
 Pair 4 – Results non-detect, RPDs within limits.  
 Pair 5 - Results non-detect, RPDs within limits.  
 Pair 6 - Results non-detect, RPDs within limits.  
 Reason Code - FDUP

20. Were at least 10 percent of the hard copy results compared to the Electronic Data Deliverable Results?	Yes X	No	Initials EAC
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Comments:

21. Other:	Yes X	No
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Comments: TO-11A aldehydes and GC/MS carboxylic acids – The laboratory noted breakthrough of analytes during elution. Associated results flagged “J”.  
 Reason Code - BT

**PRECISION, ACCURACY, METHOD COMPLIANCE AND COMPLETENESS ASSESSMENT**

Precision:	Acceptable X	Unacceptable	Initials EAC
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Comments:

Sensitivity:	Acceptable X	Unacceptable	Initials EAC
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Comments:

Accuracy:	Acceptable X	Unacceptable	Initials EAC
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Comments:

Representativeness:	Acceptable X	Unacceptable	Initials EAC
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Comments:

Method Compliance:	Acceptable X	Unacceptable	Initials EAC
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Comments:

Completeness:	Acceptable X	Unacceptable	Initials EAC
Comments:			

**Stantec Analytical Validation Report/Checklist**

**Report No. 090415-EC-03**

Project Name: Bridgeton, MO	Project Number: 182608020		
Stantec Validator: Elizabeth A. Crowley	Laboratory: ALS –Semi-Valley, CA		
Date Validated: 08/31/15	Laboratory Project Number: P1503125		
Sample Start-End Date: 07/28-07/30/15	Laboratory Report Date: 08/14/15		
Parameters Validated: Volatile Organic Compounds by EPA TO-15 modified, Atmosphere Gases by EPA Method 3C modified and Sulfur Compounds by ASTM D5504-12			
Samples Validated: 16 summa air field samples and 2 Trip Blanks			
<b>VALIDATION CRITERIA CHECK</b>			
Validation Flags Applicable to this Review:			
<b>U</b>	The analyte was analyzed for, but not detected above the reported sample quantitation limit.		
<b>J</b>	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.		
<b>UJ</b>	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.		
<b>NJ</b>	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.		
<b>B</b>	The analyte was detected in the method, field, and/or trip blank.		
<b>R</b>	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.		
1.	Were all the analyses requested for the samples submitted with each COC completed by the lab?	Yes X	No
Comments:			
2.	Did the laboratory identify any non-conformances related to the analytical result?	Yes	No X
Comments:			
3.	Were sample Chain-of-Custody forms complete?	Yes X	No
Comments:			
4.	Were samples received in good condition and at the appropriate temperature?	Yes X	No
Comments: Trip Blank 730TB-Summa received by the laboratory pressurized. The canister was not opened by the sampling team. The results of the sample are invalid and not used.			
Sample 729sNQ-Summa was collected on 7/29/15. The canister valve was not fully opened during sampling therefore not enough sample volume was collected. The results of the sample are invalid and not used.			
5.	Were sample holding times met?	Yes X	No
Comments:			
6.	Were correct concentration units reported?	Yes X	No

Comments:		
7. Were detections found in laboratory blank samples?	Yes	No X
Comments:		
8. Were detections found in field blank, equipment rinse blank, and/or trip blank samples?	Yes X	No
<p>Comments: 730TB-G Summa – Oxygen and Argon = 0.179 % v/v, Nitrogen = 0.650 % v/v and Hexamethylcyclotrisiloxane = 290 µg/m<sup>3</sup>.</p> <p>Associated results below the blank concentration are validated to non-detect and flagged “UJB”. Sample results greater than the blank concentration but less than 10 times the blank concentration are flagged “JB”. The detection limit is changed to the blank concentration. Results greater than 10 times the blank concentration require no qualifying.</p> <p>Reason Code - TB</p>		
9. Were instrument calibrations within method criteria?	Yes	No X
<p>Comments: Continuing calibration dated 08/10/15 - %D above ±25% limit for Vinyl Acetate at +28%. Continuing calibration dated 08/11/15 - %D above ±25% limit for Vinyl Acetate at +29%. Associated positive sample results flagged “J” and are biased high.</p> <p>Reason Code – CCAL</p>		
10. Were surrogate recoveries within control limits?	Yes X	No
Comments:		
11. Were laboratory control (LC/LD) sample recoveries within control limits?	Yes X	No
Comments:		
12. Were site specific matrix spike (MS/MD) recoveries within control limits?	Yes NA	No
Comment: No matrix sample data required. No qualifying action required.		
13. Were RPDs within control limits?	Yes X	No
Comments:		
14. Were dilutions required on any samples?	Yes X	No
Comments: Samples analyzed at multiple dilutions. No qualifying action required.		
15. Were Tentatively Identified Compounds (TIC) present?	Yes X	No
Comments: Sample results below the reporting limit do not possess the degree of qualitative or quantitative confidence required. The value may be a false positive and is an estimated value and is flagged “J” by the laboratory.		
16. Were organic system performance criteria met?	Yes	No



NA			
Comments: No data provided.			
17. Were GC/MS internal standards within method criteria?	Yes	No	
NA			
Comments: No data provided.			
18. Were inorganic system performance criteria met?	Yes	No	
X			
Comments:			
19. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	Yes	No	
X			
Duplicate Sample Nos. 729U1-Summa 729-DUPE11 (Pair 1) 728D1-Summa 728-DUPE10 (Pair 2)			
Comments: Pair 1 – RPDs within limits for EPA 3C and ASTM D15504. TO-15 analyte RPDs within limits except Acetone, Ethyl Acetate, 1,4-Dioxane, Toluene and n-Butyl Acetate.			
Pair 2 - RPDs within limits for EPA 3C and ASTM D15504. TO-15 analyte RPDs within limits except Toluene, Ethylbenzene, m,p-Xylene, 1,2,4-Trimethylbenzene and Naphthalene.			
Associated results flagged "J" if positive or "UJ" if non-detect for duplicate samples only. Reason Code – FDUP			
20. Were at least 10 percent of the hard copy results compared to the Electronic Data Deliverable Results?	Yes	No	Initials
X			
EAC			
Comments:			
21. Other:	Yes	No	
X			
Comments:			
<b>PRECISION, ACCURACY, METHOD COMPLIANCE AND COMPLETENESS ASSESSMENT</b>			
Precision:	Acceptable	Unacceptable	Initials EAC
X			
Comments:			
Sensitivity:	Acceptable	Unacceptable	Initials EAC
X			
Comments:			
Accuracy:	Acceptable	Unacceptable	Initials EAC
X			
Comments:			
Representativeness:	Acceptable	Unacceptable	Initials EAC
X			
Comments:			

Method Compliance:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Completeness:	Acceptable X	Unacceptable	Initials EAC
Comments:			

**Stantec Analytical Validation Report/Checklist**

**Report No. 090415-EC-02**

Project Name: Bridgeton, MO	Project Number: 182608020		
Stantec Validator: Elizabeth A. Crowley	Laboratory: ALS –Semi-Valley, CA		
Date Validated: 09/01/15	Laboratory Project Number: P1503133		
Sample Start-End Date: 07/30/15	Laboratory Report Date: 08/17/15		
Parameters Validated: Poly Aromatic Hydrocarbons by EPA TO-13A			
Samples Validated: 7 air field samples			
<b>VALIDATION CRITERIA CHECK</b>			
Validation Flags Applicable to this Review:			
<b>U</b>	The analyte was analyzed for, but not detected above the reported sample quantitation limit.		
<b>J</b>	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.		
<b>UJ</b>	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.		
<b>NJ</b>	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.		
<b>B</b>	The analyte was detected in the method, field, and/or trip blank.		
<b>R</b>	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.		
1.	Were all the analyses requested for the samples submitted with each COC completed by the lab?	Yes X	No
Comments:			
2.	Did the laboratory identify any non-conformances related to the analytical result?	Yes	No X
Comments:			
3.	Were sample Chain-of-Custody forms complete?	Yes X	No
Comments:			
4.	Were samples received in good condition and at the appropriate temperature?	Yes X	No
Comments:			
5.	Were sample holding times met?	Yes X	No
Comments:			
6.	Were correct concentration units reported?	Yes X	No
Comments:			
7.	Were detections found in laboratory blank samples?	Yes	No X
Comments:			
8.	Were detections found in field blank, equipment rinse	Yes	No

blank, and/or trip blank samples?			X
Comments:			
9. Were instrument calibrations within method criteria?		Yes X	No
Comments:			
10. Were surrogate recoveries within control limits?		Yes	No X
Comments: The %R for 3 of 4 surrogates below 10% and 4 <sup>th</sup> surrogate below 60 to 120% limits at 11%. Associated results flagged "J" if positive or "R" if non-detect for 731sSQ-PAH only. Reason Code – SUR			
11. Were laboratory control (LC/LD) sample recoveries within 60 to 120% control limits?		Yes	No X
Comments: Batch P150803 - %Rs below limits for Acenaphthylene (51%), Acenaphthene (57%) and Naphthalene (57%). Associated sample results flagged "J" if positive or "UJ" if non-detect. Reason Code – LCS			
12. Were site specific matrix spike (MS/MD) recoveries within control limits?	NA	Yes	No
Comment: No matrix sample data required. No qualifying action required.			
13. Were RPDs within 10% control limits?		Yes	No X
Comments: Laboratory duplicate RPD above limits for Benzo(a)Anthracene, Chrysene, Benzo(a)Pyrene, Dibenz(a,h)Anthracene and Benzo(g,h,i)Perylene. Associated sample results non-detect. No qualifying action required.			
14. Were dilutions required on any samples?		Yes X	No
Comments: Samples analyzed at multiple dilutions. No qualifying action required.			
15. Were Tentatively Identified Compounds (TIC) present?		Yes	No X
Comments:			
16. Were organic system performance criteria met?	NA	Yes	No
Comments: No data provided.			
17. Were GC/MS internal standards within method criteria?	NA	Yes	No
Comments: No data provided.			
18. Were inorganic system performance criteria met?	NA	Yes	No
Comments: No inorganic analysis requested.			
19. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.		Yes	No X

Duplicate Sample Nos.			
Comments:			
20. Were at least 10 percent of the hard copy results compared to the Electronic Data Deliverable Results?	Yes X	No	Initials EAC
Comments:			
21. Other:		Yes	No X
Comments:			
<b>PRECISION, ACCURACY, METHOD COMPLIANCE AND COMPLETENESS ASSESSMENT</b>			
Precision:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Sensitivity:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Accuracy:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Representativeness:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Method Compliance:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Completeness:	Acceptable X	Unacceptable	Initials EAC
Comments:			

**Stantec Analytical Validation Report/Checklist**

**Report No. 090415-EC-01**

Project Name: Bridgeton, MO	Project Number: 182608020		
Stantec Validator: Elizabeth A. Crowley	Laboratory: ALS –Semi-Valley, CA		
Date Validated: 09/02/15	Laboratory Project Number: P1503139		
Sample Start-End Date: 07/28-07/31/15	Laboratory Report Date: 08/18/15		
Parameters Validated: Dioxins and Furans by EPA TO-9A			
Samples Validated: 7 air field samples			
<b>VALIDATION CRITERIA CHECK</b>			
Validation Flags Applicable to this Review:			
<b>U</b>	The analyte was analyzed for, but not detected above the reported sample quantitation limit.		
<b>J</b>	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.		
<b>UJ</b>	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.		
<b>NJ</b>	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.		
<b>B</b>	The analyte was detected in the method, field, and/or trip blank.		
<b>R</b>	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.		
1.	Were all the analyses requested for the samples submitted with each COC completed by the lab?	Yes X	No
Comments:			
2.	Did the laboratory identify any non-conformances related to the analytical result?	Yes	No X
Comments:			
3.	Were sample Chain-of-Custody forms complete?	Yes X	No
Comments:			
4.	Were samples received in good condition and at the appropriate temperature?	Yes X	No
Comments:			
5.	Were sample holding times met?	Yes X	No
Comments:			
6.	Were correct concentration units reported?	Yes X	No
Comments:			
7.	Were detections found in laboratory blank samples?	Yes	No X
Comments:			
8.	Were detections found in field blank, equipment rinse	Yes	No

blank, and/or trip blank samples?	X	
<p>Comments: 128Blank-DF – 1,2,3,4,6,7,8-HpCDD = 2.02 pg, OCDD = 6.64 pg, 1,2,3,4,7,8-PeCDF = 0.468 pg, 1,2,3,6,7,8-HxCDF = 0.870 pg, 2,3,4,6,7,8-HxCDF = 0.686 pg, 1,2,3,4,6,7,8-HpCDF = 1.63 pg, OCDF = 1.98 pg, Total Hexa-Furans = 0.468 pg and Total Hepta-Furans = 1.63 pg.</p> <p>Associated sample results below the blank concentration are validated to non-detect and flagged “UJB”. Sample results greater than the blank concentration are flagged “NJB”. The detection limit is changed to the blank concentration. Sample results greater than 10 times the blank concentration required no qualifying.</p> <p>Reason Code – EB</p>		
9. Were instrument calibrations within method criteria?	Yes X	No
Comments:		
10. Were surrogate recoveries within control limits?	Yes X	No
Comments:		
11. Were laboratory control (LC/LD) sample recoveries within control limits?	Yes	No X
<p>Comments: LC sample EQ1500466-2 - %Rs below ±30% limit for 1,2,3,7,8,9-HxCDF at 67%, 1,2,3,4,7,8,9-HpCDF at 62% and OCDF at 67%. All sample results flagged “J” if positive or “UJ” if non-detect.</p> <p>Reason Code – LCS</p>		
12. Were site specific matrix spike (MS/MD) recoveries within control limits?	Yes NA	No
Comment: No matrix sample data required. No qualifying action required.		
13. Were RPDs within control limits?	Yes	No X
<p>Comments: Laboratory Control RPDs for EC1500466-2 and EC1500466-3 above 30% limit for 1,2,3,7,8,9-HxCDF at 30%, 1,2,3,4,7,8,9-HpCFD at 40% and OCDF at 38%. Associated positive results flagged “J” if positive.</p> <p>Reason Code – LCD</p>		
14. Were dilutions required on any samples?	Yes	No X
Comments:		
15. Were Tentatively Identified Compounds (TIC) present?	Yes X	No X
<p>Comments: Sample results below the reporting limit do not possess the degree of qualitative or quantitative confidence required. The value may be a false positive and is an estimated value and is flagged “NJ”.</p> <p>Reason Code – SQL</p>		
16. Were organic ion abundance ratio performance criteria met?	Yes	No X

Comments: Ion abundance ratios were out of limits for: 128UI-DF for OCDF; 128D1-DF for PeCDD, HpCDD, OCDD and OCDF; 128F-DF for PeCDD AND HxCDF; 728Blank-DF for HPCDD, HxCDF and OCDF; .731sN-DF for HpCDF; and 731sSQ-DF for HpCDD. Associated sample results flagged "J". Reason Code – IAR			
17. Were GC/MS internal standards within method criteria?	Yes	No	
		X	
Comments: The %R for Internal Standard 13C-1,2,3,4,7,8,9-HpCDF is below $\pm 50\%$ limit at 22% for 731sNQ-DF. Associated result flagged "UJ" for 731sNQ-DF only. Reason Code – IS			
18. Were inorganic system performance criteria met?	Yes	No	
	NA		
Comments: No inorganic analysis requested.			
19. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	Yes	No	
		X	
Duplicate Sample Nos.			
Comments:			
20. Were at least 10 percent of the hard copy results compared to the Electronic Data Deliverable Results?	Yes	No	Initials
	X		EAC
Comments:			
21. Other:	Yes	No	
		X	
Comments:			
<b>PRECISION, ACCURACY, METHOD COMPLIANCE AND COMPLETENESS ASSESSMENT</b>			
Precision:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Sensitivity:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Accuracy:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Representativeness:	Acceptable X	Unacceptable	Initials EAC



Comments:			
Method Compliance:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Completeness:	Acceptable X	Unacceptable	Initials EAC
Comments:			

**Stantec Analytical Validation Report/Checklist**

**Report No. 101815-EC-01**

Project Name: Bridgeton, MO	Project Number: 182608020		
Stantec Validator: Elizabeth A. Crowley	Laboratory: ALS –Semi-Valley, CA		
Date Validated: 10/18/15	Laboratory Project Number: P1504274		
Sample Start-End Date: 10/08/15	Laboratory Report Date: 10/14/15		
Parameters Validated: Volatile Organic Compounds by EPA TO-15 modified, Atmosphere Gases by EPA Method 3C modified and Sulfur Compounds by ASTM D5504-12			
Samples Validated: 1 summa air field sample and 1 source gas sample-train purge sample			
<b>VALIDATION CRITERIA CHECK</b>			
Validation Flags Applicable to this Review:			
<b>U</b>	The analyte was analyzed for, but not detected above the reported sample quantitation limit.		
<b>J</b>	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.		
<b>UJ</b>	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.		
<b>NJ</b>	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.		
<b>B</b>	The analyte was detected in the method, field, and/or trip blank.		
<b>R</b>	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.		
1.	Were all the analyses requested for the samples submitted with each COC completed by the lab?	Yes X	No
Comments:			
2.	Did the laboratory identify any non-conformances related to the analytical result?	Yes	No X
Comments:			
3.	Were sample Chain-of-Custody forms complete?	Yes	No X
Comments: Relinquished by signature, date and time are missing from the CofC. No qualifying action required.			
4.	Were samples received in good condition and at the appropriate temperature?	Yes X	No
Comments:			
5.	Were sample holding times met?	Yes X	No
Comments:			
6.	Were correct concentration units reported?	Yes X	No
Comments:			
7.	Were detections found in laboratory blank samples?	Yes X	No

Comments: TO-15 method blank dated 101215 – Acetone = 0.78 µg/m³/0.33 ppbV. Method blank dated 101315 – Acetone = 0.88 µg/m³/0.37 ppbV.  Associated sample results non-detect. No qualifying action required.		
8. Were detections found in field blank, equipment rinse blank, and/or trip blank samples?	Yes	No X
Comments:		
9. Were instrument calibrations within method criteria?	Yes X	No
Comments:		
10. Were surrogate recoveries within control limits?	Yes X	No
Comments:		
11. Were laboratory control (LC/LD) sample recoveries within control limits?	Yes X	No
Comments:		
12. Were site specific matrix spike (MS/MD) recoveries within control limits?	NA	Yes No
Comment: No matrix sample data required. No qualifying action required.		
13. Were RPDs within control limits?	Yes X	No
Comments:		
14. Were dilutions required on any samples?	Yes X	No
Comments: Samples analyzed at multiple dilutions. No qualifying action required.		
15. Were Tentatively Identified Compounds (TIC) present?	Yes X	No
Comments: Sample results below the reporting limit do not possess the degree of qualitative or quantitative confidence required. The value may be a false positive and is an estimated value and is flagged "J" by the laboratory.		
16. Were organic system performance criteria met?	NA	Yes No
Comments: No data provided.		
17. Were GC/MS internal standards within method criteria?	NA	Yes No
Comments: No data provided.		
18. Were inorganic system performance criteria met?	Yes X	No
Comments:		

19. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	Yes	No	
		X	
Duplicate Sample Nos.			
Comments:			
20. Were at least 10 percent of the hard copy results compared to the Electronic Data Deliverable Results?	Yes	No	Initials
	X		EAC
Comments:			
21. Other:	Yes	No	
		X	
Comments:			
<b>PRECISION, ACCURACY, METHOD COMPLIANCE AND COMPLETENESS ASSESSMENT</b>			
Precision:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Sensitivity:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Accuracy:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Representativeness:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Method Compliance:	Acceptable X	Unacceptable	Initials EAC
Comments:			
Completeness:	Acceptable X	Unacceptable	Initials EAC
Comments:			

# APPENDIX D – HISTORICAL SUMMARY TABLES OF DETECTED COMPOUNDS

Table D1: Comprehensive Sampling Events 2012 through 2015 – Bridgeton Landfill  
Upwind Comparison of Detected Compounds  
Concentration in Ambient Air – All Units µg/m<sup>3</sup>

Analyte	Screening Levels		Upwind Perimeter Sample Locations																	
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	Grassy Knoll Center	Grassy Knoll West	Grassy Knoll North	Grassy Knoll Center	Grassy Knoll West	Grassy Knoll North	Grassy Knoll Lower Level	Grassy Knoll Upper Level	Pond	Grassy Knoll Lower Level	Grassy Knoll Upper Level	Grassy Knoll Lower Level	Grassy Knoll Lower Level	Corner of East Fence & Retention Pond	Upwind Grab – Grassy Knoll	South Fence	Grassy Knoll Upper Level	
			August - 2012							May - 2013			July - 2014			January - 2015			July - 2015	
			16-Aug	16-Aug	16-Aug	17-Aug	17-Aug	17-Aug	7-May	7-May	8-May	29-Jul	30-Jul	31-Jul	27-Jan	28-Jan	29-Jan	28-Jul	29-Jul	
<b>Aldehydes/Carbonyl Compounds – Method: EPA TO-11a</b>																				
2,5-Dimethylbenzaldehyde	NA <sup>3</sup>	NA	-- <sup>4</sup>	--	--	0.41 <sup>5</sup>	0.51	0.81	0.4	0.4	--	--	--	NS <sup>6</sup>	--	NS	--	--	--	
Acetaldehyde	5.6	1.3	17 <sup>7</sup>	19	18	1.3	1.2	1.2	1.3	1.1	1.3	1.1	2.5	NS	0.92 (1.2) <sup>8</sup>	1.1	NS	2.4J <sup>9</sup> (2.3J)	1.4J	
Benzaldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.46 (0.44)	0.70	
Butyraldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.35UJ <sup>10,11</sup> (1.8UJ)	1.2	
Formaldehyde	0.94	0.22	--	--	--	2.9	3.1	3.2	2.3	2.4	2.9	2.4	2.6	NS	0.93 (0.92)	1.1	NS	12 (12)	4.2	
n-Hexaldehyde	NA	NA	--	--	--	--	--	--	0.3	--	0.8	--	0.51	NS	0.56 (0.46)	0.62	NS	--	--	
<b>Hydrogen Cyanide – Method: NIOSH 6010</b>																				
Hydrogen Cyanide	3.5	0.83	--	--	--	--	--	--	--	--	--	--	NS	NS	--	NS	NS	--	NS	
<b>Amine Compounds – Method: NIOSH 2010m</b>																				
No Compounds Detected	NA	NA	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	
<b>Hydrogen Chloride – NIOSH 7903</b>																				
Hydrogen Chloride	8.8	2.1	NS	NS	NS	NS	NS	NS	11	--	--	NS	NS	NS	NS	NS	NS	NS	NS	
<b>Sulfur Dioxide – Method: OSHA ID 200</b>																				
Sulfur Dioxide	NA	NA	NS	NS	NS	NS	NS	NS	--	--	--	NS	NS	NS	NS	NS	NS	NS	NS	
<b>Mercury – Method: NIOSH 6009</b>																				
Mercury	1.3	0.31	--	--	--	--	--	--	--	--	--	--	--	NS	--	NS	NS	--	NS	
<b>Ammonia – Method: OSHA ID 188</b>																				
Ammonia	440	100	--	--	--	--	--	--	--	--	--	NS	--	NS	--	--	NS	--	--	
<b>Carboxylic Acid Compounds – Method: CAS AQL 102</b>																				
Acetic Acid	NA	NA	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	22	--	
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs – Standard Analyte List</b>																				
1,2,4-Trimethylbenzene	31	7.3	--	--	--	--	--	--	--	--	--	--	--	--	--	0.82 (<0.67)	--	--	0.42J (<0.78)	
1,2-Dichloroethane	0.47	0.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.61J (<0.78)	
1,3,5-Trimethylbenzene	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	0.73 (<0.67)	--	--	--	
1,4-Dioxane	2.5	0.56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13J (<0.78UJ)	
2-Butanone (MEK)	22,000	5,200	--	--	--	--	--	--	--	--	--	0.64	0.56	--	0.42J	0.43J (0.41J)	--	1.8J	1.3J (0.91J)	
Isopropyl Alcohol	31,000	7,300	--	--	--	--	--	--	--	--	--	1.1	--	--	4.3J,B <sup>12</sup>	--	--	7.0J	1.1J (0.73J)	
4-Methyl-2-pentanone	13000	3100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.92 (0.48J)	
Acetone	140,000	32	12	13	21	--	--	--	--	6.5	7.5	9	--	4.2J,B	3.7J,B (3.5J,B)	4.1 J,B	14	34J (9.3J)		
Acetonitrile	260	63	--	--	--	0.78	--	0.88	4.8	6	0.79	12	0.43	--	240 D	--	--	0.64J	0.52J (0.34J)	
Acrolein	0.088	0.021	--	--	--	--	--	--	--	--	--	0.34	0.27	--	--	--	--	0.47J	0.71J (0.29J)	
Benzene	1.6	0.36	--	--	--	--	--	--	--	--	--	0.23	--	--	0.38 J,B	1.9 J (0.65J,B)	--	0.95	--	
Carbon Disulfide	3,100	730	--	--	--	--	--	--	--	--	--	--	--	--	--	0.88J	--	--	0.29J (<7.8)	
Carbon Tetrachloride	2	0.47	--	--	--	--	--	--	--	--	--	0.48	0.45	--	0.49J	0.48J (0.51J)	--	0.39J	0.47J (0.45J)	
Chloromethane	390	94	--	--	--	--	--	--	--	--	--	0.34	0.45	--	0.50J	0.49J (0.49J)	0.76J	--	<0.92 (0.25J)	
Cyclohexane	26,000	6,300	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4 J (<1.3 UJ)	--	--	--	
Dichlorodifluoromethane (CFC 12)	440	100	2.1	2.2	2.2	2.1	2.2	2.2	2.5	2.8	2	2.1	2	2.3	2.3	2.2 (2.1)	2.4	2.0	2.4 (2.3)	
d-Limonene	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.35J	--	
Ethanol	NA	NA	--	--	--	--	--	--	--	--	--	2.7	3.8	--	1.9J	1.9J (1.9J)	--	5.7J	4.4J (3.5J)	
Ethyl Acetate	310	73	2.6	3	2.7	--	--	--	--	--	--	5.2	4.6	--	6.8	1.5 (1.3J)	--	2.5	5.2J (3.0J)	
Ethylbenzene	4.9	1.1	--	--	--	--	--	--	--	--	--	--	--	--	--	0.52J (<0.67)	--	--	--	
m,p-Xylenes	880	200	--	--	--	--	--	--	--	--	--	0.41	--	--	--	5.2 J (<1.3 UJ)	--	--	--	
Methyl Methacrylate	3,100	730	--	--	--	--	--	--	--	--	--	--	--	--	--	1.9J (<1.3UJ)	--	--	--	
Methylene Chloride	1,200	100	--	--	--	--	--	--	6.6	4.7	0.68	1.7	1.5	--	3.4	0.35J (0.38J)	0.85J	0.54J	0.76J (0.37J)	
n-Butyl Acetate	NA	NA	--	--	--	--	--	--	1.5	--	--	--	--	--	--	--	--	--	1.5J (<0.78J)	
n-Heptane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	4.2 J (0.27)	--	--	--	
n-Hexane	3,100	730	--	--	--	--	--	--	--	--	--	0.2	--	--	0.50J	3.5 J (0.70 J)	--	0.76J	0.45J (<0.78)	
n-Nonane	88	21	--	--	--	--	--	--	--	--	--	--	--	--	--	3.1 (<0.67 UJ)	--	--	0.33J (<0.78)	
n-Octane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	3.9J (<0.67UJ)	--	--	0.40J (<0.78)	
o-Xylene	440	100	--	--	--	--	--	--	--	--	--	--	--	--	--	0.85 J (<0.67 UJ)	--	--	--	
Propene	13,000	3,100	--	--	--	--	--	--	--	--	1.1	0.72	--	2.1	2	--	--	4.7	<0.92 (0.52J)	
Tetrachloroethene	47	11	1.4	--	--	--	1.8	--	--	--	--	--	--	--	--	--	--	--	--	
Toluene	22,000	5,200	1	1.4	1.1	--	--	--	3.1	--	1.4	2.2	0.87	1.8	0.88J	6.1 J (0.95 J)	--	1.2	14J (0.57J)	

**Table D1: Comprehensive Sampling Events 2012 through 2015 – Bridgeton Landfill  
Upwind Comparison of Detected Compounds  
Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels		Upwind Perimeter Sample Locations																
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	Grassy Knoll Center	Grassy Knoll West	Grassy Knoll North	Grassy Knoll Center	Grassy Knoll West	Grassy Knoll North	Grassy Knoll Lower Level	Grassy Knoll Upper Level	Pond	Grassy Knoll Lower Level	Grassy Knoll Upper Level	Grassy Knoll Lower Level	Grassy Knoll Lower Level	Corner of East Fence & Retention Pond	Upwind Grab – Grassy Knoll	South Fence	Grassy Knoll Upper Level
			August - 2012							May - 2013			July - 2014			January - 2015			July - 2015
	16-Aug	16-Aug	16-Aug	17-Aug	17-Aug	17-Aug	7-May	7-May	8-May	29-Jul	30-Jul	31-Jul	27-Jan	28-Jan	29-Jan	28-Jul	29-Jul		
Trichloroethene	0.88	0.21	--	--	--	--	--	--	--	0.97	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane	3,100	730	--	--	--	--	--	--	--	--	1.1	1.2	--	1.3	1.3 (1.3)	1.3J	1.1	1.1 (1.1)	
Trichlorotrifluoroethane	130,000	31,000	1.1	1.2	1.1	1.1	1.1	1.1	--	--	1	0.52	0.54	--	0.47J	0.53J (0.51J)	--	0.45J	0.54J (0.49J)
Vinyl Acetate	880	210	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.3J	--
<b>Volatile Organic Compounds (VOCs) –Method: EPA TO15 + TICs - Tentatively Identified Compounds<sup>13</sup></b>																			
n-Pentane	4,400	1,000	--	--	--	--	--	--	50	--	--	--	--	--	--	3.1	--	--	--
Chlorodifluoromethane	220000	52000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-- (4.2)
Sulfur Dioxide	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	>26! <sup>14</sup>	--	--
Isopentane	NA	NA	--	--	--	--	--	--	--	--	3.2	--	--	--	--	--	--	--	--
Isoprene	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.9 (3.5)
Propane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6 (3.4)	--	--	12 (-)
n-Butane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	3.8 (3.0)	--	--	7.1 (-)
2-Methylpentane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4	--	--	--
Methylcyclopentane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6	--	--	--
Methylcyclohexane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	12	--	--	--
Dimethylcyclohexane isomer	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	3.3	--	--	--
Ethyl propionate	NA	NA	5	4.7	5.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethyl butyrate	NA	NA	7.6	6.5	7.9	5.4	6	5.6	--	--	--	--	--	--	--	--	--	--	--
Trimethylsilanol	NA	NA	--	--	--	--	--	--	--	--	--	2.9	3.2	--	--	--	--	16	17 (3.1)
Acetic Acid	NA	NA	--	3.7	--	--	--	--	--	--	--	--	--	--	--	--	--	6.7	-- (5.1)
Benzaldehyde	NA	NA	--	--	3.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexamethylcyclotrisiloxane	NA	NA	3.3	--	12	--	--	--	--	14	--	4.2	26	--	--	3.9	16	86UJB	4.4UJB (7.6 UJB)
n-Decane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	2.7	--	--	--
n-Octanal	NA	NA	--	--	--	--	--	--	8.7	15	--	--	5	--	--	--	--	--	--
n-Nonanal	NA	NA	--	--	--	--	--	--	24	19	3.5	4.2	24	--	--	--	--	3.8	--
2-Ethylhexylacetate	NA	NA	--	--	--	--	--	--	15	19	--	--	--	--	--	--	--	--	--
2-Ethyl-1-hexanol	NA	NA	--	--	--	--	--	--	34	21	--	--	--	--	--	--	--	--	--
n-Decanal	NA	NA	--	--	--	--	--	--	17	--	--	--	22	--	--	--	--	--	--
C13H28 Branched Alkane	NA	NA	--	--	--	--	--	--	5.8,5.6	--	--	--	--	--	--	--	--	--	--
Unidentified Siloxane	NA	NA	--	--	--	--	--	--	13	21	--	8.9	--	--	--	--	--	--	--
C14H30 Branched Alkane	NA	NA	--	--	--	--	--	--	8.5	--	--	--	--	--	--	--	--	--	--
unknown (9.48)	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.2	-- (4.0)
unknown (23.04)	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6	--
unknown siloxane (20.11)	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	21	--
unknown siloxane (21.82)	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13	--
Unidentified Siloxane	NA	NA	--	--	--	--	--	--	11	14	--	13	98	--	--	--	--	--	--
C15H32 Branched Alkane	NA	NA	--	--	--	--	--	--	7.2	--	--	--	--	--	--	--	--	--	--
Unidentified Siloxane	NA	NA	--	--	--	--	--	--	--	--	--	3.4	2.7	--	--	4.7	--	--	--
Unidentified Compound	NA	NA	3.3	--	4.6	--	--	--	6.1	--	5.9	3.7	20	--	--	--	--	--	--
Unidentified Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	3.3	--	--	--	--	--	--
<b>Reduced Sulfur Compound – ASTM D5504</b>																			
No Compounds Detected	NA	NA	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>Polynuclear Aromatic Hydrocarbons - Method: EPA TO13a Modified</b>																			
Acenaphthene	NA	NA	NS	NS	NS	NS	NS	NS	NS	0.0036	NS	0.008	NS	NS	--	NS	NS	0.0076 J	NS
Fluoranthene	NA	NA	NS	NS	NS	NS	NS	NS	NS	0.0038	NS	0.0032	NS	NS	--	NS	NS	0.0061	NS
Fluorene	NA	NA	NS	NS	NS	NS	NS	NS	NS	0.0056	NS	0.0088	NS	NS	--	NS	NS	0.01	NS
Naphthalene	0.36	0.072	NS	NS	NS	NS	NS	NS	NS	0.048	NS	0.067	NS	NS	0.031	NS	NS	0.04 J	NS
Phenanthrene	NA	NA	NS	NS	NS	NS	NS	NS	NS	0.016	NS	0.022	NS	NS	0.0032	NS	NS	0.024	NS
Pyrene	NA	NA	NS	NS	NS	NS	NS	NS	NS	0.0016	NS	--	NS	NS	--	NS	NS	0.0026	NS
<b>Polychlorinated Dibenzo-p-Dioxins, Dibenzofurans – EPA Method TO-9A</b>																			
2,3,7,8-TCDD	3.20E-07	6.40E-08	1.94E-08	NS	NS	NS	NS	NS	NS	1.22E-08	NS	2.74E-10	NS	NS	5.05E-10	NS	NS	6.37E-10	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. "NA" = Not Available  
4. "--": Compound not detected

**Table D1: Comprehensive Sampling Events 2012 through 2015 – Bridgeton Landfill**  
**Upwind Comparison of Detected Compounds**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels		Upwind Perimeter Sample Locations																	
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	Grassy Knoll Center	Grassy Knoll West	Grassy Knoll North	Grassy Knoll Center	Grassy Knoll West	Grassy Knoll North	Grassy Knoll Lower Level	Grassy Knoll Upper Level	Pond	Grassy Knoll Lower Level	Grassy Knoll Upper Level	Grassy Knoll Lower Level	Grassy Knoll Lower Level	Corner of East Fence & Retention Pond	Upwind Grab – Grassy Knoll	South Fence	Grassy Knoll Upper Level	
			August - 2012							May - 2013			July - 2014			January - 2015			July - 2015	
			16-Aug	16-Aug	16-Aug	17-Aug	17-Aug	17-Aug	7-May	7-May	8-May	29-Jul	30-Jul	31-Jul	27-Jan	28-Jan	29-Jan	28-Jul	29-Jul	

5. Bold indicates that compound was detected above MRL  
6. "NS" = Not Sampled  
7. Shading indicates that the detected concentration exceeds the United States Environmental Protection Agency Regional Screening Level for *Residential Air or Industrial Air*.  
8. Values in parenthesis are duplicate sample concentrations.  
9. J = The result is an estimated concentration that is less than the MRL but great than or equal to the Method Detection Limit (MDL).  
10. "<": Compound concentration not detected above Method Reporting Limit (MRL). This are presented only with duplicate samples.  
11. UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.  
12. B = Compound detected in Trip Blank or Laboratory Method Blank  
13. Tentatively Identified compounds – under EPA Method TO-15 + TICs, the reported concentrations are estimated.  
14. "!=" Previous studies shown that EPA Method TO-15 is not an appropriate method for quantifying Sulfur Dioxide.

NOTE: Trip Blanks were analyzed for each analyte . Analytical results for compounds detected in any trip blank have been amended with applicable data qualifiers.



Table D2: Comprehensive Sampling Events 2012 through 2015 - Bridgeton Landfill  
Downwind Comparison of Detected Compounds  
Concentration in Ambient Air - All Units µg/m³

Analyte	Screening Levels		Downwind Perimeter Sample Locations																									
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	Pond Center	Pond East	Pond West	East Fence #1	East Fence #2	South Fence	MSD Lift Stn.	Materiologic East End	Northwest Auto Repair	Southeast Corner	East Fence	Retention Pond	East Fence	Republic Fueling	SW Corner of Landfill	Corner of East Fence & Retention Pond	East Fence	Grassy Knoll North of Pipe Staging Area	Grassy Knoll North of Asphalt Plant West of Pipe Staging Area	Grab South Quarry	Grab - Across from MSD Lift Station	Fence by Republic Parking Lot	Upper Road by Neck	East Fence Near Flare Station	Fence by Retention Pond	
			August - 2012					May - 2013			July - 2014					January - 2015					July - 2015							
			8/16	8/16	8/16	8/17	8/17	8/17	5/7	5/7	5/8	7/29	7/29	7/30	7/30	7/31	1/27	1/27	1/28	1/28	1/28	1/28	1/29	7/28 <sup>3</sup>	7/28	7/29	7/29	
Aldehydes/Carbonyl Compounds - Method: EPA TO-11a																												
2,5-Dimethylbenzaldehyde	NA <sup>4</sup>	NA	0.94 <sup>5</sup>	0.91	0.86	-- <sup>6</sup>	--	--	1.2	--	--	--	--	--	NS <sup>7</sup>	NS	--	--	--	--	NS	NS	--	--	--	--	--	
Acetaldehyde	5.6	1.3	1.7 <sup>8</sup>	1.5	1.6	10	8.3	1.1	3	2.1	1.7	1.2	1.2	0.87	0.82	NS	NS	1.8	1.8	1.2	1.3	NS	NS	3.0J <sup>9</sup>	2.6J	1.2	1.4J	
Benzaldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	NS	0.6	0.44	1.1	--	--	
Butyraldehyde	NA	NA	--	--	--	--	--	--	0.5	--	--	--	--	--	NS	NS	--	--	--	--	NS	NS	1.8	2.4J	1.3	1.7J	--	
Crotonaldehyde, Total	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	NS	--	--	--	--	--	
Formaldehyde	0.94	0.22	6.3	6.2	6.2	--	--	1.5	3	2.6	3.3	2.3	3.1	2.9	2.4	NS	NS	1.8	1.1	1.6	1.9	NS	NS	12	14	4.4	5	
Isovaleraldehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	NS	--	--	--	--	--	
m,p-Tolualdehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	NS	--	--	--	--	--	
n-Hexaldehyde	NA	NA	--	--	--	--	--	--	0.5	0.4	1.4	0.45	0.36	0.43	0.36	NS	NS	0.44	--	0.48	0.68	NS	NS	--	--	--	--	
o-Tolualdehyde	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	NS	--	--	--	--	--	
Propionaldehyde	35	8.3	--	--	--	--	--	--	0.4	--	--	--	--	--	NS	NS	--	--	--	--	NS	NS	0.67	--	--	--	--	
Valeraldehyde	NA	NA	0.47	0.62	0.46	--	--	--	--	--	--	--	1.1	--	NS	NS	--	--	--	--	NS	NS	--	--	--	--	--	
Hydrogen Cyanide - Method: NIOSH 6010																												
Hydrogen Cyanide	3.5	0.83	--	--	--	--	--	--	--	--	--	--	NS	NS	NS	NS	--	--	NS	NS	NS	NS	--	NS	NS	NS	NS	
Amine Compounds - Method: NIOSH 2010m																												
No Compounds Detected	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	NS	--	--	--	--	--	
Hydrogen Chloride - NIOSH 7903																												
Hydrogen Chloride	88	21	NS	NS	NS	NS	NS	NS	21	--	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sulfur Dioxide - Method: OSHA ID 200																												
Sulfur Dioxide	NA	NA	NS	NS	NS	NS	NS	NS	--	--	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Mercury - Method: NIOSH 6009																												
Mercury	1.3	0.31	--	--	--	--	--	--	--	--	--	--	NS	NS	NS	NS	--	--	NS	NS	NS	NS	--	NS	NS	NS	NS	
Ammonia - Method: OSHA ID 188																												
Ammonia	440	100	--	--	--	--	--	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	NS	--	--	--	--	--	
Carboxylic Acid Compounds - Method: CAS AQL 102																												
Acetic Acid	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	NS	22	--	--	--	--	
Butanoic Acid (Butyric)	NA	NA	--	--	--	--	--	--	--	--	--	--	6.5	--	NS	NS	--	--	--	--	NS	NS	--	--	--	--	--	
Hexanoic Acid (Caproic)	NA	NA	--	--	--	--	--	--	--	--	--	--	2.8	--	NS	NS	--	--	--	--	NS	NS	--	--	--	--	--	
Volatile Organic Compounds (VOCs) - Method: EPA TO15 + TICs - Standard Analyte List																												
1,2,4-Trimethylbenzene	31	7.3	--	--	--	--	--	--	--	--	--	6.1	--	--	--	--	--	<0.73 <sup>10</sup> (0.63J) <sup>11</sup>	--	--	NS	NS	<0.85UJ <sup>12</sup> (0.9J)	--	--	--	NS	
1,3,5-Trimethylbenzene	NA	NA	--	--	--	--	--	--	--	--	--	3.6	--	--	--	--	--	<0.73 (0.53J)	--	--	NS	NS	--	--	--	--	NS	
1,3-Butadiene	0.41	0.094	--	--	--	--	--	--	--	--	--	--	38	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	
2-Butanone (MEK)	22,000	5,200	--	--	--	--	--	--	--	--	1.8J	20	0.73J	1.4J	0.55J	--	0.51J (0.38J)	0.43J	0.84J	NS	NS	2.7J	--	2.1J (2.2J)	2.1J	1.3J	NS	
Isopropyl Alcohol	31,000	7,300	--	--	--	--	--	--	--	--	1.0J	15J	4.3J	3.5J	--	--	0.79J B <sup>13</sup> (<0.78)	--	0.73J B	NS	NS	1.6J B	--	1.4J (1.9J)	--	0.84J	NS	
4-Ethyltoluene	NA	NA	--	--	--	--	--	--	--	--	--	12	--	--	--	--	--	--	--	--	NS	NS	--	--	<0.85 (0.46J)	--	--	NS
4-Methyl-2-pentanone	13,000	3,100	--	--	--	--	--	--	--	--	--	55	--	--	--	--	--	--	--	--	NS	NS	--	--	0.54J (<0.8)	--	--	NS
Acetone	140,000	32,000	17	18	13	11	--	21	18	12	9	9.2	53	8.6	14	8.2J	--	4.7J B (4.1J B)	3.9J B	6.6J	NS	NS	--	2.8J B	16 (17)	15	10	NS
Acetonitrile	260	63	0.82	--	--	0.88	14	1.9	35	5	4.2	0.83	45	0.71J	2.3	--	--	8.1 (<0.78UJ)	--	--	NS	NS	--	0.5J (0.43J)	7.1	0.96	NS	
Acrolein	0.088	0.021	--	--	--	--	--	--	--	--	--	--	0.42J	--	--	--	--	0.29J (<0.78)	--	--	NS	NS	--	0.58J (0.56J)	0.38J	0.46J	NS	
alpha-Pinene	NA	NA	--	--	--	1.1	--	--	1.6	1	--	--	--	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	
Benzene	1.6	0.36	10	10	16	11	--	6.1	25	12	0.79	1.7	370	0.35J	1.6	--	--	2.0 (2.3)	0.52J B	0.98 J B	NS	NS	2.4	0.87J B	0.53J (0.55J)	0.38J	0.55J	NS
Carbon Disulfide	3,100	730	--	--	--	--	--	--	--	--	--	--	1.7J	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	
Carbon Tetrachloride	2	0.47	--	--	--	--	--	--	--	--	--	0.48	--	0.48J	0.51J	0.44J	--	0.49J (0.47J)	0.49J	0.51J	NS	NS	--	--	0.45J (0.45J)	0.45J	0.45J	NS
Chloroethane	44,000	10,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.73 (0.48J)	--	--	NS	NS	--	--	--	--	NS	
Chloromethane	390	94	--	--	--	--	--	--	--	--	--	0.41J	0.55J	0.5J	0.44J	0.46J	--	0.52J (<0.78)	0.50J	0.56J	NS	NS	0.83J	0.79J	0.26J (0.26J)	0.26J	0.3J	NS
Cumene	1,800	420	--	--	--	--	--	--	--	--	--	11	--	--	--	--	--	--	--	--	NS	NS	--	--	--	--	NS	
Cyclohexane	26,000	6,300	--	--	--	--	--	--	--	--	--	14	--	--	--	--	--	<1.5 (1.1J)	--	--	NS	NS	--	--	--	--	NS	
Dichlorodifluoromethane (CFC 12)	440	100	2.2	2.7	2.3	2.2	2.2	2.3	2.1	2.1	1.9	2.1	2	2.1	2.1	2.1	2.2	2.1 (2.2)	2.3	2.3	NS	NS	2.1	2.2	2.3 (2.3)	2.3	2.3	NS
d-Limonene	NA	NA	0.099	--	--	--	--	--	1.8	1.1	--	--	49	0.22J	0.21J	--	--	--	--	--	NS	NS	--	--	--	--	NS	
Ethanol	NA	NA	--	--	--	12	--	--	--	7.7	--	6.0J	12J	6J	6.8J	4.6J	--	2.6J (2.1J)	1.7J	7.8	NS	NS	6.0J	--	6.7J (7.2J)	5.9J	6.0J	NS
Ethyl Acetate	310	73	17	5	8.7	--	--	--	--	--	--	9.1	--	5.3	8.7	15	--	1.9 J (1.8)	2.3	1.3J	NS	NS	--	--	9.4 (10)	6.2	3.7	NS
Ethylbenzene	4.9	1.1	0.72	0.83	0.91	--	--	--	1.8	0.97	--	140	--	0.27J	--	--	--	<0.73 (0.40J)	--	0.37J	NS	NS	--	--	<0.85UJ (0.83J)	--	--	NS
m,p-Xylenes	880	200	1.5	1.7	3.2	--	--	--	3.2	1.7	--	150	--	0.45J	--	--	--	0.60J (3.5 J)	--	1.2J	NS	NS	--	--	<1.7UJ (3.3J)	--	--	NS
Methylene Chloride	1,200	100	--	--	--	0.94	0.79	2.1	4	2.6	1.1	0.40J	--	0.58J	0.55J	0.84J	--	0.43J (0.44J)	0.41J	0.63J	NS	NS	--	--	0.48J (0.5J)	0.49J	0.48J	NS
Naphthalene	0.36	0.083	--	--	--	--	--	--	--	--	--	0.74J	--	--	--	--	--	0.50J (<0.78 UJ)	--	--	NS	NS	--	--	<0.85UJ (1.3J)	0.57J	--	NS
n-Butyl Acetate	NA	NA	--	--	--	--	--	--	--	--	--	0.45J	--	0.37J	0.73J	--	--	--	--	--	NS	NS	--	--	--	--	0.29J	NS
n-Heptane	NA	NA	--	--	--	--	--	--	--	--	--	40	--	--	--	--	--	<0.73 J (1.3 J)	--	0.85	NS	NS	--	--	--	--	--	NS
n-Hexane	3,100	730	--	--	--	--	--	--	--	--	--	0.9	34	--	--	--	--	0.66J (1.6 J)	0.46J	1.1	NS	NS	--	--	0.62J (0.59J)	0.45J	0.29J	NS
n-Nonane	880	210	--	--	--	--	--	--	0.76	--	--	6.7	--	0.24J	--	--	--	<0.73 UJ (2.2 J)	--	0.33J	NS	NS	--	--	--	--	--	NS
n-Octane	NA	NA	--	--																								

Table D2: Comprehensive Sampling Events 2012 through 2015 - Bridgeton Landfill  
Downwind Comparison of Detected Compounds  
Concentration in Ambient Air - All Units µg/m³

Analyte	Screening Levels		Downwind Perimeter Sample Locations																											
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	Pond Center	Pond East	Pond West	East Fence #1	East Fence #2	South Fence	MSD Lift Stn.	Materiologic East End	Northwest Auto Repair	Southeast Corner	East Fence	Retention Pond	East Fence	Republic Fueling	SW Corner of Landfill	Corner of East Fence & Retention Pond	East Fence	Grassy Knoll North of Pipe Staging Area	Grassy Knoll North of Asphalt Plant West of Pipe Staging Area	Grab South Quarry	Grab - Across from MSD Lift Station	Fence by Republic Parking Lot	Upper Road by Neck	East Fence Near Flare Station	Fence by Retention Pond			
																												August - 2012		
			8/16	8/16	8/16	8/17	8/17	8/17	5/7	5/7	5/8	7/29	7/29	7/30	7/30	7/30	7/31	1/27	1/27	1/28	1/28	1/28	1/29	7/28 <sup>3</sup>	7/28	7/29	7/29			
Trichloroethene	0.88	0.21	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	NS	--	--	--	--	NS					
Trichlorofluoromethane	3,100	730	1.2	1.4	1.3	1.1	1.1	1.1	--	0.97	0.95	1.2	1.1J	2	2.3	1.7	--	1.3 (1.2)	1.3	1.3	NS	1.2J	1.3J	1.2 (1.2)	1.2	1.1	NS			
Trichlorotrifluoroethane	130,000	31,000	--	--	--	--	--	--	--	--	--	0.51J	--	0.54J	0.55J	0.53J	--	0.53J (0.49J)	0.55J	0.50J	NS	--	--	0.51J (0.5J)	0.5J	0.51J	NS			
Vinyl Acetate	880	210	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	2.3J (1.7J)	1.6J	--	NS			
Volatile Organic Compounds (VOCs) - Method: EPA TO15 + TICs - Tentatively Identified Compounds <sup>14</sup>																														
Chlorodifluoromethane	220000	52000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	4.1	--	--	NS			
Propane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6	--	NS	--	--	--	--	--	NS			
Isobutane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.9	NS	--	--	--	--	--	NS			
n-butane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4	NS	--	--	--	--	--	NS			
Isobutene	NA	NA	--	--	2.9	--	--	--	--	--	--	510	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Isopentane	NA	NA	--	--	--	--	--	--	--	--	2.8	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Isoprene	NA	NA	--	--	--	--	--	--	--	--	--	610	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Ethyl propionate	NA	NA	14	7.1	11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Cyclopentene	NA	NA	--	--	--	--	--	--	--	--	--	76	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Ethyl butyrate	NA	NA	14	8.4	11	3.9	--	4.9	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
2-butoxyethanol	NA	NA	--	--	--	--	--	--	--	--	--	15	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Furan	NA	NA	3.4	4.7	--	3.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Dimethylsilanediol	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	4.8 (5.6)	4.7	--	NS			
Dimethyl sulfide	NA	NA	4.5	4.4	2.8	5.2	--	7.5	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Methylcyclohexane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
2-Methylfuran	NA	NA	3.7	5.4	--	3.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Methylfuran isomer	NA	NA	--	--	--	--	--	--	8.8	5.3	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Methylcyclopentene Isomer+1-Butanol	NA	NA	--	--	--	--	--	--	6.3	3.7	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Acetic Acid	NA	NA	--	4.7	--	--	--	--	--	--	4.4	--	--	--	--	--	--	--	--	--	NS	--	--	4.4 (-)	--	--	NS			
2-Butanol	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Hexamethylcyclotrisiloxane	NA	NA	12	3.5	3.4	15	--	--	4.8	8.4	5.3	--	4	16	6.7	--	--	--	--	--	NS	--	--	34UJB (5.5 ND UJB)	11UJB	6.1UJB	NS			
n-Octanal	NA	NA	--	--	--	--	--	--	26	7.7	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
n-Nonanal	NA	NA	--	--	--	--	--	--	18	24	5	--	--	6.5	--	11	--	--	--	--	NS	--	--	3.7 (8.7)	7.4	3.4	NS			
Trimethylsilanol	NA	NA	--	--	--	--	--	--	--	2.5	3	--	--	5.1	--	--	--	--	--	--	NS	--	--	26 (5.9)	4.3	13	NS			
2-Ethylhexylacetate	NA	NA	--	--	--	--	--	--	18	18	--	--	--	--	--	--	--	--	--	--	NS	--	--	4.7 (-)	--	--	NS			
2-Ethyl-1-hexanol	NA	NA	3.2	--	--	--	--	--	37	38	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
n-Decanal	NA	NA	--	--	--	--	--	--	10	14	--	--	--	6.5	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C5H10 Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	160	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C5H10 Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	52	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C5H10 Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	640	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C5H8 Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	69	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C6H12 Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	120	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C6H12 Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	110	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C6H12 Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	130	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C6H12 Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	170	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C7H14 Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	69	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C8H16 + C7H12 Compounds	NA	NA	--	--	--	--	--	--	--	--	--	--	120	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C8H16 Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	49	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
C7H12 Compound	NA	NA	--	--	--	--	--	--	--	--	--	--	140	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
unknown (9.48)	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	7.3 (5.8)	3.3	--	NS			
unknown (16.42)	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	3.8 (-)	--	--	NS			
unknown siloxane (20.11)	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	6.4 (-)	4.3	--	NS			
unknown siloxane (21.82)	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	6.7 (-)	43	--	NS			
unknown siloxane (23.32)	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	51	--	NS			
unknown siloxane (24.93)	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	20	--	NS			
Unidentified Siloxane	NA	NA	--	--	--	--	--	--	15	6.3	--	5.6	--	4.7	7.4	4.7	--	--	5.3	--	NS	--	--	--	--	--	NS			
Unidentified Siloxane	NA	NA	--	--	--	--	--	--	8.7	6	--	4.1	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Unidentified Siloxane	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Unidentified Compound	NA	NA	4.1	4	3.3	3.1	--	--	4.9	7.7	3.5	--	--	5.5	--	--	--	--	3	--	NS	--	--	--	--	--	NS			
Unidentified Compound	NA	NA	--	--	--	--	--	--	4.2	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Reduced Sulfur Compound - ASIM D5504																														
Dimethyl sulfide	NA	NA	--	NS	NS	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	--	--	--	NS			
Polynuclear Aromatic Hydrocarbons - Method: EPA TO13a Modified																														
Acenaphthene	NA	NA	NS	NS	NS	0.004	NS	NS	0.002	NS	NS	0.0096	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0061 J	NS	NS	NS
Fluoranthene	NA	NA	NS	NS	NS	0.0021	NS	NS	--	NS	NS	0.0036	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0055	NS	NS	NS
Fluorene	NA	NA	NS	NS	NS	0.0038	NS																							

Table D2: Comprehensive Sampling Events 2012 through 2015 - Bridgeton Landfill  
 Downwind Comparison of Detected Compounds  
 Concentration in Ambient Air - All Units µg/m<sup>3</sup>

Analyte	Screening Levels		Downwind Perimeter Sample Locations																									
	Ind. RSL <sup>1</sup>	Res. RSL <sup>2</sup>	Pond Center	Pond East	Pond West	East Fence #1	East Fence #2	South Fence	MSD Lift Stn.	Materiologic East End	Northwest Auto Repair	Southeast Corner	East Fence	Retention Pond	East Fence	Republic Fueling	SW Corner of Landfill	Corner of East Fence & Retention Pond	East Fence	Grassy Knoll North of Pipe Staging Area	Grassy Knoll North of Asphalt Plant West of Pipe Staging Area	Grab South Quarry	Grab - Across from MSD Lift Station	Fence by Republic Parking Lot	Upper Road by Neck	East Fence Near Flare Station	Fence by Retention Pond	
			August - 2012						May - 2013				July - 2014						January - 2015						July - 2015			
			8/16	8/16	8/16	8/17	8/17	8/17	5/7	5/7	5/8	7/29	7/29	7/30	7/30	7/30	7/31	1/27	1/27	1/28	1/28	1/28	1/28	1/29	1/28 <sup>3</sup>	7/28	7/29	7/29

4. "NA" = Not Available  
 5. Bold indicates that compound concentration was detected above laboratory reporting limits.  
 6. "--": Compound not detected  
 7. "NS" = Not Sampled  
 8. Shading indicates that the detected concentration exceeds the United States Environmental Protection Agency Regional Screening Level for Residential Air or Industrial Air.  
 9. J = The result is an estimated concentration that is less than the MRL but great than or equal to the Method Detection Limit (MDL).  
 10. "<": Compound concentration not detected above Method Reporting Limit (MRL). This are presented only with duplicate samples.  
 11. Values in parenthesis are for duplicate sample concentrations.  
 12. UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.  
 13. B = Compound detected in Trip Blank or Laboratory Method Blank  
 14. Tentatively Identified compounds - under EPA Method TO-15 + TICs, the reported concentrations are estimated. Retention times for unknown compounds are presented in parentheses  
 NOTE: Trip Blanks were analyzed for each analyte. Analytical results for compounds detected in any trip blank have been amended with applicable data qualifiers.

Table D3: Comprehensive Sampling Events 2012 through 2015 - Bridgeton Landfill  
 Onsite Comparison of Detected Compounds  
 Concentration in Ambient Air – All Units µg/m<sup>3</sup>

Analyte	Screening Levels			Upwind Perimeter Sample Locations																
	Ind. RSL <sup>1</sup>	OSHA PELs <sup>2</sup>	ACGIH TLVs <sup>3</sup>	2 <sup>nd</sup> Tier	Amphitheater	East Face	Amphitheater	2 <sup>nd</sup> Tier	Flare Station	South Quarry	Neck	North Quarry	Flare Station	South Quarry	Neck	North Quarry	Flare Station	South Quarry	Neck	North Quarry
				August-2012			April/May-2013		July-2014			January-2015				July-2015				
				8/16/12	8/16/12	8/17/12	4/16/15	5/8/13	7/29/14	7/29/14	7/30/14	7/30/14	1/27/15	1/27/15	1/28/15	1/28/15	7/28/15	7/28/15	7/29/15	7/29/15
Aldehydes/Carbonyl Compounds – Method: EPA TO-11a																				
2,5-Dimethylbenzaldehyde	NA <sup>4</sup>	NA	NA	0.9 <sup>5</sup>	-- <sup>6</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acetaldehyde	5.6	360,000	45,000	1.5	19 <sup>7</sup>	1.5	4.4	3.1	1.3	0.78	0.91	0.88	2.3	1.8	1.1	1.5	2.3J <sup>8</sup>	2.3J	1.7J	1.2
Benzaldehyde	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	0.43	0.36	--	--
Butyraldehyde	NA	NA	NA	--	--	--	--	0.49	--	--	--	--	--	--	--	--	2.0J	2.3J	1.7	1.8
Formaldehyde	0.94	1,000	400	6.1	--	1.7	1.8	3.9	2.5	2.5	2.9	2.8	1.2	1.1	1.3	1.5	12	13	4.9	4.7
n-Hexaldehyde	NA	NA	NA	--	--	--	--	1	0.65	0.37	--	--	0.68	0.45	0.55	0.48	--	--	0.55	0.38
Propionaldehyde	3.5	NA	47,500	--	--	--	--	0.41	--	--	--	--	--	--	--	--	--	--	--	--
Hydrogen Cyanide – Method: NIOSH 6010																				
Hydrogen Cyanide	3.5	11,000	5,000	--	--	--	--	--	--	--	--	NS <sup>9</sup>	--	--	--	--	--	--	--	--
Amine Compounds – Method: NIOSH 2010m																				
No Compounds Detected	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydrogen Chloride – NIOSH 7903																				
Hydrogen Chloride	8.8	7,000	3,000	NS	NS	NS	1.8ug	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sulfur Dioxide – Method: OSHA ID 200																				
Sulfur Dioxide	NA	13,000	NA	NS	NS	NS	--	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Mercury – Method: NIOSH 6009																				
Mercury	1.3	100	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia – Method: OSHA ID 188																				
Ammonia	440	35,000	17,500	--	--	--	--	--	130	--	--	--	--	--	--	--	--	--	--	--
Carboxylic Acid Compounds – Method: CAS AQL 102																				
Acetic Acid	NA	25,000	27,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-- (25J)	--	23
Hexanoic Acid (Caproic)	NA	NA	NA	--	--	--	--	11	--	--	--	--	--	--	--	--	--	--	--	--
Pentanoic Acid (Valeric)	NA	NA	NA	--	--	--	--	4.4	--	--	--	--	--	--	--	--	--	--	--	--
Butanoic Acid (Butyric)	NA	NA	NA	--	--	--	--	12	--	--	--	--	--	4.2 (4.0) <sup>10</sup>	--	--	--	-- (2.7J)	--	--
Propionic Acid (Propanoic)	NA	NA	NA	--	--	--	--	5.6	--	--	--	--	--	-- (3.1)	--	--	--	--	--	--
Volatile Organic Compounds (VOCs) – Method: EPA TO15 + TICs – Standard Analyte List																				
1,2,4-Trimethylbenzene	31	NA	NA	--	--	--	--	2.4	--	0.32	--	--	--	--	0.18J	0.30J	--	--	--	--
1,2-Dichloroethane	0.47	200,000	40,000	--	--	--	--	--	--	--	--	--	--	--	--	--	170D	--	--	--
1,4-Dichlorobenzene	1.1	450,000	60,000	--	--	--	--	2.4	--	--	--	--	--	--	--	--	--	0.27J	--	--
1,4-Dioxane	2.5	360,000	72,000	--	--	--	--	--	--	--	--	--	--	--	--	--	700D	0.26J	--	--
2-Butanone (MEK)	22,000	590,000	590,000	--	--	11	32	9.5	1.1	3.3	0.92	0.8	--	2.5J	1.2J	0.42J	2.1J	3.0J	1.5J	1.1J
4-Methyl-2-pentanone	NA	NA	NA	--	--	--	2.1	--	--	--	--	--	--	--	--	--	--	--	--	--
Isopropyl Alcohol	31,000	980,000	490,000	--	--	--	38	--	1.9	2.2	1.7	1.6	--	1.2J	2.1J	--	2.6J	0.92J	4.2J	1.2J
Acetone	140,000	2,400,000	1,200,000	13	14	19	66	18	10	17	10	8.8	4.4J	6.7J	8.7	4.1J	15	17	14	9.5J
Acetonitrile	260	70,000	35,000	--	0.76	--	--	5.4	2.6	1.4	0.43	11	9.1	0.8	0.95	--	1.1	1.8	7.0	0.43J
Acrolein	0.088	250	250	--	--	--	--	--	--	0.81	0.43	0.31	--	--	0.30J	--	1.7J	0.42J	0.38J	--
alpha-Pinene	NA	550,000	100,000	--	--	--	1.4	0.9	--	--	--	--	--	--	0.42J	--	--	--	--	--
Benzene	1.6	32,000	1,600	--	1.1	6.2	27	9.7	0.42	0.71	0.47	0.28	0.60J	0.55J	1.8 J,B <sup>11</sup>	0.8 J,B	0.49J	0.52J	0.37J	--
Carbon Disulfide	3,100	60,000	3,000	--	--	--	--	--	--	0.27	--	--	--	--	--	--	--	--	0.31J	--
Carbon Tetrachloride	2	30,000	15,000	--	--	--	--	--	0.47	0.51	0.43	0.5	0.49J	0.50J	0.51J	0.53J	0.44J	0.45J	0.44J	0.46J
Chloromethane	390	200,000	100,000	--	--	--	--	--	0.36	0.36	0.37	0.43	0.54J	0.45J	0.37J	0.50J	0.24J	0.27J	0.27J	--
Cyclohexane	26,000	1,050,000	350,000	--	--	--	--	--	--	0.58	--	--	--	0.75J	0.70J	0.40J	--	--	--	--
Dichlorodifluoromethane (CFC 12)	440	4,950,000	4,950,000	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.3	2.4
d-Limonene	NA	NA	NA	--	--	--	1.3	1.7	0.44	0.54	--	--	--	0.20J	1.4	--	0.37J	--	0.66J	--
Ethanol	NA	1,900,000	1,900,000	--	16	8.5	58	11	7.8	18	6.6	7.2	3.0J	9.1	20	3.5J	6.8J	8.0	27	10J
Ethyl Acetate	310	1,400,000	1,400,000	8	3.1	1.6	4.9	--	11	9.3	5.1	9.9	2.4	11	74	1.2J	4.6	4.2	3.2	3.3
Ethylbenzene	4.9	435,000	87,000	--	--	--	2	1.9	--	0.48	--	--	--	--	0.20J	--	--	--	--	--
m,p-Xylenes	880	870,000	870,000	--	--	--	3.9	3.7	--	1	--	--	--	--	0.75J	1.1J	0.48J	--	--	--



**Table D3: Comprehensive Sampling Events 2012 through 2015 - Bridgeton Landfill**  
**Onsite Comparison of Detected Compounds**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels			Upwind Perimeter Sample Locations																
	Ind. RSL <sup>1</sup>	OSHA PELs <sup>2</sup>	ACGIH TLVs <sup>3</sup>	2 <sup>nd</sup> Tier	Amphitheater	East Face	Amphitheater	2 <sup>nd</sup> Tier	Flare Station	South Quarry	Neck	North Quarry	Flare Station	South Quarry	Neck	North Quarry	Flare Station	South Quarry	Neck	North Quarry
				August-2012			April/May-2013		July-2014				January-2015				July-2015			
				8/16/12	8/16/12	8/17/12	4/16/15	5/8/13	7/29/14	7/29/14	7/30/14	7/30/14	1/27/15	1/27/15	1/28/15	1/28/15	7/28/15	7/28/15	7/29/15	7/29/15
2-Butanol	NA	455,000	303,000	--	--	--	15	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexamethylcyclotrisiloxane	NA	NA	NA	--	--	--	--	--	5.9	3.2	2.8	3.7	--	--	--	--	5.5UJ <sup>13</sup> B	10UJB	5.1UJB	7.4UJB
n-Octanal	NA	NA	NA	--	--	--	--	3.6	--	4.8	--	--	--	--	--	--	--	--	--	--
n-Nonanal	NA	NA	NA	--	--	--	10	17	9.6	11	7.2	7.7	--	2.8	2.6	--	--	11	4.0	--
p-Cymene	NA	NA	NA	--	--	--	--	14	--	--	--	--	--	--	--	--	--	--	--	--
n-Undecane	NA	NA	NA	--	--	--	--	9.9	--	--	--	--	--	--	--	--	--	--	--	--
n-Dodecane	NA	NA	NA	--	--	--	--	5.3	--	--	--	--	--	--	--	--	--	--	--	--
Trimethylsilanol	NA	NA	NA	--	--	--	--	--	5.6	7.5	--	3.1	--	--	--	--	--	--	--	--
2-Ethylhexylacetate	NA	NA	NA	--	--	--	--	3.4	--	--	--	--	--	--	--	--	--	--	--	--
1-Butanol	NA	300,000	60,000	--	--	--	17	6.1	--	4	--	--	--	--	--	--	--	4.3	--	--
2-Ethylhexylacetate	NA	NA	NA	--	--	--	--	--	6.3	--	--	--	--	--	4.6	--	--	--	--	--
2-Ethyl-1-hexanol	NA	NA	NA	--	--	--	5.6	14	--	--	--	--	--	--	--	--	--	--	--	--
n-Decanal	NA	NA	NA	--	--	--	5.5	8.1	9.2	7.7	4.7	5.4	--	--	--	--	--	9.2	3.9	--
C6-C10 Alkene (13.0 RT)	NA	NA	NA	--	--	4.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C13H28 Branched Alkane	NA	NA	NA	--	--	--	--	--	--	3.1	--	--	--	--	--	--	--	--	--	--
unknown siloxane (20.11)	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.4	--	--
unknown (20.24)	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	13	--	--	--
2-Ethyl-1-hexanol	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.4	--	--
unknown (20.91)	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	6.5	--	--	--
unknown (21.16)	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	6.2	--	--	--
Bis(2-chloroethyl) ether	0.037	90,000	30,000	--	--	--	--	--	--	--	--	--	--	--	--	--	28	--	--	--
unknown siloxane (21.82)	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	48	--	4.8
unknown (22.62)	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	13	--	--	--
unknown siloxane (23.32)	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	49	--	--
unknown siloxane (24.93)	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14	--	--
Unidentified Siloxane	NA	NA	NA	--	--	--	--	--	5.6	13	--	4.7	--	3.2	3.4	--	--	--	--	--
Unidentified Compound	NA	NA	NA	--	--	--	--	3.3	--	2.7	4.1	--	--	--	--	--	--	--	--	--
Reduced Sulfur Compound – ASTM D5504																				
Dimethyl disulfide	NA	NA	NA	--	--	--	26	--	--	--	--	--	--	--	--	--	--	--	--	--
Dimethyl sulfide	NA	NA	NA	--	--	33	37	--	--	--	--	--	--	--	--	--	--	--	--	--
Polynuclear Aromatic Hydrocarbons - Method: EPA TO13a Modified																				
Acenaphthene	NA	NA	NA	0.0076	NS	NS	0.013	NS	0.01	NS	NS	NS	--	NS	NS	NS	0.0062 J	NS	NS	NS
Fluoranthene	NA	NA	NA	0.004	NS	NS	0.005	NS	0.0042	NS	NS	NS	--	NS	NS	NS	0.006	NS	NS	NS
Fluorene	NA	NA	NA	0.0089	NS	NS	0.014	NS	0.013	NS	NS	NS	--	NS	NS	NS	0.0086	NS	NS	NS
Naphthalene	0.36	50,000	50,000	0.089	NS	NS	0.13	NS	0.035	NS	NS	NS	0.049	NS	NS	NS	0.023 J	NS	NS	NS
Phenanthrene	NA	NA	NA	0.023	NS	NS	0.024	NS	0.032	NS	NS	NS	0.0041	NS	NS	NS	0.021	NS	NS	NS
Pyrene	NA	NA	NA	0.002	NS	NS	0.003	NS	0.0019	NS	NS	NS	--	NS	NS	NS	0.0026	NS	NS	NS
Polychlorinated Dibenzo-p-Dioxins, Dibenzofurans – EPA Method TO-9A																				
2,3,7,8-TCDD	3.20E-07	NA	NA	1.49E-08	NS	NS	6.31E-09	NS	3.12E-10	NS	NS	NS	5.88E-10	NS	NS	NS	1.58E-08	NS	NS	NS

1. United States Environmental Protection Agency Regional Screening Levels for Industrial Air  
2. Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit.  
3. American Conference of Governmental Industrial Hygienists – Threshold Limit Value.  
4. "NA" = Not Available  
5. Bold indicates that compound concentration was detected above laboratory reporting limits.  
6. "--": Compound not detected  
7. Shading indicates that the detected concentration exceeds the United States Environmental Protection Agency Regional Screening Level for *Industrial Air*.  
8. J = The result is an estimated concentration that is less than the MRL but great than or equal to the Method Detection Limit (MDL).  
9. "NS" = Not Sampled

**Table D3: Comprehensive Sampling Events 2012 through 2015 - Bridgeton Landfill**  
**Onsite Comparison of Detected Compounds**  
**Concentration in Ambient Air – All Units µg/m<sup>3</sup>**

Analyte	Screening Levels			Upwind Perimeter Sample Locations																
	Ind. RSL <sup>1</sup>	OSHA PELs <sup>2</sup>	ACGIH TLVs <sup>3</sup>	2 <sup>nd</sup> Tier	Amphitheater	East Face	Amphitheater	2 <sup>nd</sup> Tier	Flare Station	South Quarry	Neck	North Quarry	Flare Station	South Quarry	Neck	North Quarry	Flare Station	South Quarry	Neck	North Quarry
				August-2012			April/May-2013		July-2014				January-2015				July-2015			
				8/16/12	8/16/12	8/17/12	4/16/15	5/8/13	7/29/14	7/29/14	7/30/14	7/30/14	1/27/15	1/27/15	1/28/15	1/28/15	7/28/15	7/28/15	7/29/15	7/29/15

10. Values in parenthesis are for duplicate sample concentrations.

11. B = Compound detected in Trip Blank or Laboratory Method Blank

12. Tentatively Identified Compounds – under Method: EPA TO15 + TICs. The reported concentrations for TICs are estimated. Retention time is located in parentheses next to unknown compounds and identical compounds with different retention times.

13. UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

NOTE: Trip Blanks were analyzed for each analyte. Analytical results for compounds detected in any trip blank have been amended with applicable data qualifiers.

**Table D4 - Comprehensive Sampling Events 2012 Through 2015 - Bridgeton Landfill**  
**Source Gas Comparison Table**  
**Detected Compound Concentrations in Source Gas - All Units µg/m³**

Analyte	Sample Locations																	
	Amphitheater	Second Tier	East Face	Amphitheater	Second Tier	East Face	Neck	North Quarry	South Quarry	Flare Inlet	Neck	North Quarry	South Quarry	Flare Inlet	Neck	North Quarry <sup>1</sup>	South Quarry	Flare Inlet (A / B) <sup>2</sup>
	August - 2012			April/May - 2013			July - 2014			January - 2015			July - 2015					
<b>Aldehydes/Carbonyl Compounds – Method: EPA TO-11a</b>																		
Acetaldehyde	1,200	--	350	3,400	120	--	64	49	1,600	3,000	64	45	130	9,500	51	--	490J <sup>+</sup>	13,000J
Benzaldehyde	2,300	140	990	2,100	--	--	--	--	270	3,100	--	--	--	--	--	--	1,500	3,000
Butyraldehyde	3,000	--	1,500	6,000	1,100	560	--	--	10,000	6,900	2	--	480	23,000	--	--	5,000J	24,000J
Propionaldehyde	660	--	140	1,700	180	280	--	--	1,300	1,700	--	--	59	6,100	--	--	660J	6,100J
Isovaleraldehyde	--	120	--	340	--	--	--	--	--	--	--	--	--	26,000	--	--	--	--
m,p-Tolualdehyde	--	--	--	5,500	21,000	--	--	--	--	4,000	--	--	4,200	6,800	--	--	--	--
n-Hexaldehyde	--	--	--	1,700	--	840	--	--	450	--	--	--	--	95	--	--	--	--
2,5-Dimethylbenzaldehyde	720	--	960	--	--	--	--	--	110	--	--	--	--	--	--	--	--	--
Formaldehyde	--	--	--	--	--	--	--	--	--	78	--	--	--	--	--	--	--	--
o-Tolualdehyde	--	340	92	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Valeraldehyde	--	1,200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>Mercury – Method: NIOSH 6009</b>																		
Mercury	--	--	--	--	--	--	--	--	--	70	--	--	--	480	--	--	--	63
<b>Carboxylic Acid Compounds – Method: CAS AQL 102</b>																		
2-Ethylhexanoic Acid	4,800	--	1,800	1,300	480	1,000	--	--	260	18,000	--	--	--	--	--	--	2,000J	5,900J
2-Methylbutanoic Acid	--	--	--	17,000	51,000	19,000	--	--	12,000	25,000	--	--	2,200	49,000	--	--	17,000J	23,000J
2-Methylpentanoic Acid	--	--	--	1,900	--	950	--	--	1,700	4,700	--	--	160	4,000	--	--	3,100J	3,200J
2-Methylpropanoic Acid (Isobutyric)	--	--	--	46,000	170,000	73,000	--	--	40,000	88,000	--	--	9,300	110,000	--	--	39,000J	51,000J
2-Methylpropionic Acid	12,000	--	13,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3-Methylbutanoic Acid (Isovaleric)	11,000	--	9,000	28,000	89,000	34,000	--	--	20,000	41,000	--	--	3,200	80,000	--	--	29,000J	36,000J
3-Methylpentanoic Acid	610	--	--	350	--	--	--	--	340	2,900	--	--	--	--	--	--	720J	800J
4-Methylpentanoic Acid (Isocaproic)	1,100	--	--	2,000	--	--	--	--	800	6,800	--	--	--	--	--	--	1,400J	--
Acetic Acid	11,000	--	--	94,000	99,000	53,000	--	--	35,000	100,000	--	--	13,000	210,000	--	--	37,000J	83,000J
Benzoic Acid	--	--	--	--	--	--	--	--	150	1,200	--	--	--	--	--	--	--	--
Butanoic Acid (Butyric)	56,000	--	41,000	290,000	590,000	200,000	--	--	200,000	750,000	--	170	24,000	800,000	--	--	150,000J	370,000J
Heptanoic Acid (Enanthoic)	2,900	--	--	3,600	290	320	--	--	--	25,000	--	--	--	--	--	--	260	6,500J
Hexanoic Acid (Caproic)	53,000	--	1,200	110,000	15,000	13,000	--	--	10,000	440,000	--	--	650	130,000	--	--	23,000J	120,000J
Nonanoic Acid (Pelargonic)	--	--	--	--	--	--	--	--	--	1,000	--	--	--	--	--	--	--	220
Octanoic Acid (Caprylic)	690	--	--	320	--	--	--	--	--	15,000	--	--	--	--	--	--	--	2,600
Pentanoic Acid (Valeric)	23,000	--	3,800	84,000	58,000	24,000	--	--	28,000	220,000	--	--	2,200	200,000	--	--	33,000J	110,000J
Propionic Acid (Propanoic)	13,000	--	9,200	100,000	140,000	89,000	--	--	41,000	150,000	--	--	11,000	180,000	--	--	34,000J	95,000J
<b>Volatile Organic Compounds (VOCs) – Method: EPA TO15 – Standard Analyte List</b>																		
1,1-Dichloroethane	--	--	--	--	--	--	--	--	--	--	--	1.1J	--	--	--	--	--	--
1,2-Dichloroethane	--	--	--	--	--	--	--	--	4,200J	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	19,000	--	8,300	5,100	--	3,800	380	860	75,000	95,000	230	3.4	3,800	4,000J	82	13	28,000	26,000 / 35,000
1,2-Dichloro-1,1,2,2-tetrafluoroethane	--	--	--	--	--	--	--	43J	--	--	--	28	--	--	67	130	--	--
1,3,5-Trimethylbenzene	6,700	--	3,500	--	--	--	810	970	29,000	29,000	720	2.7	1,200	1,500J	360	3.8	8,800	7,900 / 10,000
1,3-Butadiene	590	--	--	3,800	--	4,000	210J	150	8,100J	6,900	430	8.1	740	3,400J	66	--	1,200J	2,100J / 3,200J
1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19J	2.5	--	--
1,4-Dichlorobenzene	10,000	--	3,200	--	--	--	2,100	180	21,000	68,000	900	1.7	1,600	2,200J	3,300	2.4	14,000	22,000 / 31,000
1,4-Dioxane	4,100	--	--	5,400	--	--	--	--	--	27,000	--	--	290J	5,300	--	--	2,600	21,000 / 26,000
2-Butanone (MEK)	340,000	--	89,000	440,000	1,300,000	91,000	--	--	2,300,000	1,400,000	--	3.8J	27,000	600,000	77J	19	260,000	660,000 / 930,000
2-Hexanone	11,000	--	3,100	9,500	17,000	--	--	--	48,000	38,000	--	--	720	6,700	--	--	13,000	20,000 / 26,000
2-Propanol (Isopropyl Alcohol)	60,000	--	--	110,000	480,000	--	--	--	1,600,000	590,000	--	--	12,000	140,000	--	--	31,000	320,000 / 400,000
4-Ethyltoluene	4,900	--	2,900	--	--	--	300	340	31,000	26,000	240	1.2J	1,000	1,600J	150	3.4	8,500	7,600 / 10,000



**Table D4 - Comprehensive Sampling Events 2012 Through 2015 - Bridgeton Landfill**  
**Source Gas Comparison Table**  
**Detected Compound Concentrations in Source Gas - All Units µg/m<sup>3</sup>**

Analyte	Sample Locations																	
	Amphitheater	Second Tier	East Face	Amphitheater	Second Tier	East Face	Neck	North Quarry	South Quarry	Flare Inlet	Neck	North Quarry	South Quarry	Flare Inlet	Neck	North Quarry <sup>1</sup>	South Quarry	Flare Inlet (A / B) <sup>2</sup>
	August - 2012			April/May - 2013			July - 2014			January - 2015			July - 2015					
4-Methyl-2-pentanone	30,000	--	16,000	15,000	140,000	5,100	--	--	160,000	72,000	--	--	2,100	18,000	--	9.4	30,000	31,000 / 42,000
Acetone	500,000	--	72,000	600,000	980,000	88,000	940J	--	2,600,000	2,000,000	470J	9.9 J,B <sup>o</sup>	31,000	930,000	2,500	--	260,000	1,100,000 / 1,500,000
Acetonitrile	--	--	--	--	--	--	120J	190	--	--	--	--	--	--	--	--	--	--
alpha-Pinene	12,000	53,000	16,000	6,400	180,000	5,700	2,800	570	380,000	100,000	2,600	5.6	7,700	11,000	1,200	15	44,000	19,000 / 25,000
Benzene	120,000	620,000	390,000	370,000	2,000,000	360,000	40,000	9,200	1,500,000	880,000	12,000	12	87,000	460,000	1,200	28	150,000	320,000 / 450,000
Carbon Disulfide	--	--	--	--	--	--	--	--	--	2,000	--	12J	--	--	38J	--	760J	1,200J / 1,700J
Chlorobenzene	3,000	--	--	--	--	--	1,100	2,700	7,700J	6,200	860	4.2	220J	--	92	--	1,800	2,400J / 3,400J
Chloroethane	--	5600	--	--	--	--	--	--	6,500J	4,900	--	8.5	390J	2,500J	--	10	--	1,600J / 2,300J
Chloroform	--	--	--	--	--	--	--	--	--	--	--	1.1J	--	--	--	38	--	--
Chloromethane	--	--	2,700	7,100	--	8,200	--	--	20,000	16,000	60J	--	480J	10,000	--	--	4,100	6,100 / 8,400
cis-1,2-Dichloroethene	--	--	--	--	--	--	--	53	--	--	--	1.1J	--	--	--	27	--	--
Cumene	6,000	5,200	4,300	--	19,000	--	750	730	43,000	29,000	120	2	1,200	2,800J	280	--	11,000	8,500 / 11,000
Cyclohexane	1,100	--	--	--	--	--	560	410	--	--	310	140	--	--	400	100	--	--
Dichlorodifluoromethane (CFC 12)	--	--	--	--	--	--	110	92	--	--	88J	140	--	--	190	1,400	--	--
d-Limonene	22,000	22,000	21,000	4,000	46,000	6,700	580	--	300,000	200,000	530	1.8	12,000	8,300	--	9	81,000	50,000 / 67,000
Ethanol	99,000	--	--	290,000	--	--	--	--	510,000	1,800,000	--	--	4,700J	500,000	--	19	5,200J	1,200,000 / 1,500,000
Ethyl Acetate	4,800	--	--	29,000	120,000	--	--	--	250,000	280,000	--	--	--	130,000	--	--	38,000 M1	120,000 / 180,000
Ethylbenzene	27,000	32,000	22,000	18,000	160,000	16,000	2,400	1,700	200,000	120,000	640	3.4	5,000	19,000	150	11	38,000	38,000 / 51,000
m,p-Xylenes	57,000	37,000	40,000	31,000	260,000	21,000	5,100	4,000	390,000	220,000	2,100	6.8	9,400	31,000	410	27	62,000	66,000 / 88,000
Methyl tert-Butyl Ether	--	--	--	--	--	--	210	110	--	1,800J	110J	--	--	--	100	--	1,300J	--
Methylene Chloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	56J	--	--	--
Naphthalene	510	--	--	--	--	--	--	--	--	2,900J	--	--	--	--	--	5.1	--	2,200J / 2,600J
n-Butyl Acetate	12,000	--	--	25,000	54,000	--	--	--	200,000	230,000	--	--	1,100	42,000	--	11	27,000	81,000 / 110,000
n-Heptane	3,200	8,000	3,300	5,300	13,000	6,000	1,100	850	--	--	640	56	800	4,200	460	85	3,400	3,800J / 5,800
n-Hexane	2,100	--	2,900	4,200	--	7,600	1,600	930	11,000	6,400	1,100	100	950	4,100J	1,100	260	3,600	4,400 / 6,000
n-Nonane	16,000	17,000	9,000	8,600	76,000	5,900	850	820	110,000	60,000	1,100	1.6J	2,600	8,300	220	7	17,000	16,000 / 20,000
n-Octane	9,500	17,000	13,000	12,000	59,000	10,000	2,500	1,400	58,000	36,000	1,300	4.9	2,400	11,000	--	16	9,200	12,000 / 17,000
n-Propylbenzene	3,800	--	2,200	--	--	--	140J	290	24,000	19,000	--	0.99J	770	--	--	--	6,300	5,500 / 7,300
o-Xylene	20,000	12,000	16,000	9,700	72,000	9,900	2,400	1,500	150,000	88,000	2,600	4	4,000	9,900	210	9.7	28,000	25,000 / 33,000
Propene	27,000	95,000	37,000	160,000	200,000	160,000	16,000	12,000	140,000	170,000	21,000	1,500 D <sup>o</sup>	25,000	94,000	11,000	1,300	55,000	83,000 / 130,000
Styrene	1,200	--	--	--	--	--	--	--	13,000	8,600	--	--	250J	--	--	--	960J	1,900J / 2,500J
Tetrachloroethene	--	--	--	--	--	--	--	--	2,900J	--	--	1.5J	--	--	20J	2.8	--	--
Tetrahydrofuran (THF)	170,000	39,000	70,000	190,000	1,400,000	92,000	1,700	540	2,800,000	920,000	1,900	--	28,000	340,000	31J	170	300,000	430,000 / 610,000
Toluene	43,000	100,000	48,000	53,000	420,000	40,000	3,800	1,000	270,000	200,000	1,800	2.5	9,600	60,000	61J	20	53,000	79,000 / 110,000
Trichloroethene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	580J	-- / 1,400J
Trichlorofluoromethane	--	--	--	--	--	--	72J	43J	--	--	--	6.8	--	--	--	2.8	--	--
Vinyl Acetate	--	--	--	--	--	--	--	--	--	7,600J	--	--	--	--	--	--	--	6,100J / --
Vinyl Chloride	--	--	--	--	--	--	--	130	--	--	--	200	--	--	26J	590	--	--
<b>Volatile Organic Compounds (VOCs) - Method: EPA TO15 - Tentatively Identified Compounds</b>																		
[C12H26] Alkane: Straight-Chain (20.82)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5,300	--	--	--
[C12H26] Alkane: Straight-Chain (21.04)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4,300	--	--	--
1-Butene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	270	--	--
1-Chloro-1-Fluoroethane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	210	--	--
1-Butanol	73,000	--	--	140,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1-Propanol (9.59)	--	--	--	--	--	--	--	--	--	3,200,000	--	--	--	79,000	--	--	--	230,000 / 290,000
2-Butanol (10.95)	--	--	--	--	440,000	--	--	--	14,000,000	4,700,000	--	--	11,000	100,000	--	--	40,000	240,000 / 320,000





**Table D4 - Comprehensive Sampling Events 2012 Through 2015 - Bridgeton Landfill**  
**Source Gas Comparison Table**  
**Detected Compound Concentrations in Source Gas - All Units µg/m<sup>3</sup>**

Analyte	Sample Locations																	
	Amphitheater	Second Tier	East Face	Amphitheater	Second Tier	East Face	Neck	North Quarry	South Quarry	Flare Inlet	Neck	North Quarry	South Quarry	Flare Inlet	Neck	North Quarry <sup>1</sup>	South Quarry	Flare Inlet (A / B) <sup>2</sup>
	August - 2012			April/May - 2013			July - 2014			January - 2015			July - 2015					
Carbon Disulfide	190	180	2,300	170	250	38	28	25	1,200	1,600	--	--	--	--	24	--	450	--
Carbonyl Sulfide	--	150	150	--	190	--	--	--	1,300	1,100	--	--	--	--	--	--	--	--
Dimethyl Disulfide	4,100	20,000	54,000	82,000	26,000	130,000	330	1,100	110,000	210,000	2,400	--	9,800	79,000	120	28	110,000	140,000 / 320,000
Dimethyl Sulfide	240,000	600,000	570,000	740,000	1,400,000	920,000	2,100	4,900	1,100,000	2,400,000	28,000	--	51,000	990,000	77	--	450,000	580,000 / 1,100,000
Ethyl Mercaptan	460	130	17	1,600	3,200	370	--	--	--	2,200	--	--	--	1,900	--	--	--	--
Ethyl Methyl Sulfide	12,000	4,000	5,100	8,900	35,000	12,000	44	52	9,400	18,000	120	--	730	7,300	--	--	4,900	5,200 / 10,000
Hydrogen Sulfide	--	27	--	4,500	38,000	1,600	--	--	--	320	--	--	--	34,000	--	--	--	--
Isobutyl Mercaptan	--	420	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isopropyl Mercaptan	210	170	--	880	2,700	150	--	--	--	--	--	--	--	--	--	--	--	--
Methyl Mercaptan	490	4,000	260	25,000	60,000	54,000	--	--	2,400	210,000	--	--	730	260,000	--	--	11,000	1,300 / 1,400
n-Butyl Mercaptan	2,100	710	1,400	2,600	13,000	3,400	--	--	2,800	5,200	--	--	300	3,100	--	--	1,800	--
n-Propyl Mercaptan	--	--	--	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--
tert-Butyl Mercaptan	380	29	--	220	1,200	--	--	--	--	--	--	--	--	--	--	--	--	--
Tetrahydrothiophene	--	210	380	3,400	7,900	4,700	--	180	5,400	8,600	--	--	240	3,300	--	--	4,700	-- / 6,200
Thiophene	11,000	5,000	19,000	14,000	56,000	31,000	1,700	1,200	15,000	30,000	630	--	1,600	18,000	--	--	9,300	9,100 / 20,000
<b>Total Sulfur - ASTM D 5504-12<sup>o</sup></b>																		
Total Sulfur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	140	14	350,000	440,000 / 870,00
<b>Fixed Gases - EPA 3Cm<sup>7</sup></b>																		
Hydrogen	--	--	--	4.43	18.8	5.73	--	--	22.3	12.4	--	--	0.872	9.81	--	--	2.08	8.61 / 9.77
Oxygen + Argon	--	--	--	11.1	0.114	0.175	3.67	3.52	2.62	5.14	3.26	7.63	18.6	9.46	1.09 J,B	1.12	14.8	10.4 / 8.99
Nitrogen	--	--	--	39.3	0.551	5.84	31.7	22.4	9.68	21.6	46.5	59	67.4	35.1	47.8	53.8	61.8	39.9 / 35.5
Methane	--	--	--	7.6	15.3	27.2	32	39.3	7.14	11.7	21.5	18.9	5.02	8.87	21.7	22	3.95	8.75 / 9.45
Carbon Monoxide	--	--	--	--	0.186	0.111	--	--	0.232	0.16	--	--	--	--	--	--	--	--
Carbon Dioxide	--	--	--	37.5	65	60.9	32.7	38	58	49	28.7	14.4	8.13	36.6	29.4	23.1	17.4	32.3 / 36.2
<b>Polynuclear Aromatic Hydrocarbons - Method: EPA TO13a Modified</b>																		
Naphthalene	35	7.9	13	220	30	120	5.1	--	300	NS <sup>10</sup>	18 D	0.19	230 D	NS	5.9 D,J	0.7 D,J	180 D,J	NS
Acenaphthene	4.5	0.23	0.22	35	0.18	5.4	0.074	--	0.95	NS	--	--	--	NS	--	--	4.5 D,J	NS
Phenanthrene	0.21	0.44	0.19	1	0.029	--	--	--	--	NS	--	--	--	NS	0.023	--	--	NS
Anthracene	0.19	0.022	0.041	--	--	--	--	--	--	NS	--	--	--	NS	--	--	--	NS
Fluoranthene	--	0.019	0.026	--	--	--	--	--	--	NS	--	--	--	NS	--	--	--	NS
Fluorene	3.4	0.2	0.18	12	0.051	1.3	--	--	0.16	NS	--	--	--	NS	--	--	--	NS
Pyrene	--	0.021	0.016	--	--	--	--	--	--	NS	--	--	--	NS	--	--	--	NS
<b>Polychlorinated Dibenzo-p-Dioxins, Dibenzofurans - EPA Method TO-9A</b>																		
2,3,7,8-TCDD	1.52E-08	1.03E-08	3.00E-08	8.68E-08	1.49E-07	1.05E-07	--	5.13E-11	3.36E-11	NS	0	0	0	NS	1.38E-09	0.00E+00	8.71E-10	NS
<b>Amine Compounds - AQL 101</b>																		
Diisopropylamine	--	--	--	--	5,700	--	--	--	--	--	--	--	--	--	--	--	--	--
Isopropylamine	--	--	--	2,400	--	--	--	--	--	--	--	--	--	--	--	--	--	--
sec-Butylamine	--	--	--	2,700	6,200	2,100	--	--	--	--	--	--	--	--	--	--	--	--
Trimethylamine	--	--	--	--	1,700	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>Sulfur Dioxide - Method: OSHA ID 200</b>																		
Sulfur Dioxide	NS	NS	NS	2,600	9,100	1,600	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
<b>Hydrochloric Acid - NIOSH 7903</b>																		
Hydrogen Chloride	NS	NS	NS	1,100	1,100	1,600	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

1. North Quarry source gas VOC, Reduced Sulfurs, and Fixed Gases sample was collected on 10/8/2015 due to failed sample collection during the July 2015 event.

2. Two samples were collected sequentially at the Flare Inlet and distinguished as Flare A and Flare B.

Table D4 - Comprehensive Sampling Events 2012 Through 2015 - Bridgeton Landfill  
 Source Gas Comparison Table  
 Detected Compound Concentrations in Source Gas - All Units  $\mu\text{g}/\text{m}^3$

Analyte	Sample Locations																	
	Amphitheater	Second Tier	East Face	Amphitheater	Second Tier	East Face	Neck	North Quarry	South Quarry	Flare Inlet	Neck	North Quarry	South Quarry	Flare Inlet	Neck	North Quarry <sup>1</sup>	South Quarry	Flare Inlet (A / B) <sup>2</sup>
	August - 2012			April/May - 2013			July - 2014			January - 2015			July - 2015					

3. "--" = Compound not detected
4. J = The result is an estimated concentration that is less than the Method Reporting Limit (MRL) but greater than or equal to the Method Detection Limit (MDL).
5. B = Analyte detected in both the sample and associated method blank.
6. D = The reported result is from a dilution
7. Tentatively Identified Compounds – under Method: EPA TO15 + TICs. The reported concentrations for TICs are estimated. Retention time is located in parentheses next to Unknown compounds and identical compounds with different retention times.
8. A laboratory analysis for total sulfur (ASTM D 5504-12) was not conducted prior to the July 2015 event.
9. Units for fixed gases are volume analyte/volume of air %.
10. "NS" = Not Sampled