

# **Bridgeton Landfill Air and Landfill Gas Sampling August 2012: Summary of Findings**

**Bridgeton Landfill, LLC  
13570 St. Charles Rock Road  
Bridgeton, MO 63044**

**October 19, 2012**



**Stantec**




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## Sign-Off Sheet


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## Executive Summary

On Thursday, August 16 and Friday, August 17, 2012, Stantec Consulting Services Inc. (Stantec) conducted an extensive study of airborne and landfill gases and vapors on and around the Bridgeton Landfill, 13570 St. Charles Rock Road, Bridgeton, Missouri (the landfill). The study was conducted to determine and document the presence and concentration of a large number of chemical compounds which may be present from landfill decomposition and related biological and chemical phenomena occurring or potentially occurring in the landfill. These chemical compounds may potentially contribute to odors reportedly detected by residential, commercial and industrial neighbors of the landfill property, and were also evaluated for their potential contribution to occupational and community health.

In advance of the air sampling event, Stantec and Bridgeton Landfill, LLC coordinated with the Missouri Department of Natural Resources (MDNR) to develop a sampling plan to thoroughly characterize the ambient air and landfill gas/vapor; and to answer questions posed by the interested stakeholders and members of the public. The final "Air Sampling Work Plan" (the "Work Plan"), approved by MDNR was issued August 14, 2012 and served as the basis for the sampling event.

As requested and approved by MDNR in the Work Plan, samples of air and landfill gas were analyzed for the following individual constituents and analytical groupings that are of potential concern for occupational and community health, some of which may contribute to the odor. Analytical methods selected and utilized were specified by US EPA, the Occupational Safety and Health Administration (OSHA), the National Institute of Occupational Safety and Health (NIOSH), the American Society for Testing and Materials (ASTM), and methods developed by Columbia Analytical Laboratories (AQL) specifically for odor investigations. All methods were presented in the Work Plan and approved by MDNR.

- Fixed Gases: EPA 3C (hydrogen, oxygen + argon, nitrogen, carbon monoxide, carbon dioxide, methane)
- Ammonia: OSHA ID-188
- Mercury and Compounds: NIOSH 6009
- Hydrogen Cyanide: NIOSH 6010
- Reduced Sulfur Compounds: ASTM D5504
- Volatile Organic Compounds and Tentatively Identified Compounds: EPA TO-15
- Aldehydes (Carbonyl Compounds): EPA TO-11A
- Amines (Aliphatic): AQL 101

- Carboxylic Acids: AQL 102
- Polycyclic Aromatic Hydrocarbons (PAHs): EPA TO-13A
- Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans (Dioxins/Dibenzofurans): EPA TO-9

Samples of gas from under the flexible membrane liner (FML) in the Amphitheater, Second Tier, and East Face were found to contain numerous VOCs and TICs, aldehydes, reduced sulfur compounds, carboxylic acids (none detected in the sample from the second tier), naphthalene and coal-tar pitch volatile PAHs, and PCDD/PCDF. The variability in the concentrations of specific compounds found in gas from the three FML locations may help to explain the perceptible differences in odors across the landfill.

Samples of ambient air obtained from various locations on or adjacent the landfill were found to have detectable levels of several target compounds present, but at concentrations significantly below those detected under the FML.

The analytical results for ambient air were compared to occupational standards promulgated by OSHA and guidelines developed by NIOSH and ACGIH. No constituent detected in samples of ambient air from locations on the active areas of the landfill and downwind at the fence line exceeded or even approached applicable occupational standards or guidelines.

Analytical results for the ambient air samples were also compared to risk-based US EPA Regional Screening Level (RSL) concentrations for industrial and residential exposure. Of the compounds detected in samples of ambient air from locations on the active areas of the landfill and downwind at the fence line, only benzene and formaldehyde were present at concentrations exceeding the respective risk-based US EPA Regional Screening Levels (RSLs) for industrial and residential exposure. The RSLs for both of these compounds are very close to the laboratory method reporting limits. Formaldehyde was not found in landfill gas and is consistent with ambient background as evidenced by similar concentrations found in the upwind samples. Although benzene was not detected in the upwind samples, it is a common constituent in ambient air from urban/industrial areas.

The likely contributors to the odor observed at off-site locations are reduced sulfur compounds (e.g., dimethyl sulfide and mercaptans) and carboxylic acids (e.g., butyric acid and valeric acid) that have extremely low odor thresholds. It should be recognized that the odors of many of the reduced sulfur compounds and carboxylic acids are perceptible to the human nose at concentrations that are well below levels that present a health risk.

The results of the extensive sampling conducted in August support the conclusion that although some landfill emissions have resulted and may result in a perceptible odor, there were no compounds at concentrations of health concern to members of the surrounding community or to the people working on the landfill.



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## **1.0 Introduction**

On Thursday, August 16 and Friday, August 17, 2012, Stantec Consulting Services Inc. (Stantec) conducted an extensive study of airborne and landfill gases and vapors on and around the Bridgeton Landfill, 13570 St. Charles Rock Road, Bridgeton, Missouri (the landfill). The study was conducted to determine and document the presence and concentration of a large number of chemical compounds which may be present from landfill decomposition and related biological and chemical phenomena occurring or potentially occurring in the landfill. These chemical compounds may potentially contribute to odors reportedly detected by residential, commercial and industrial neighbors of the landfill property, and were also evaluated for their potential contribution to occupational and community health.

The study was planned, developed, scheduled, and directed by professional Stantec personnel from Columbus, Ohio and Mequon and Green Bay, Wisconsin, and included the expertise of a Ph.D., Board Certified Toxicologist (DABT) and a Board Certified (ABIH) Industrial Hygienist (CIH). In advance of the air sampling event, Stantec and Bridgeton Landfill, LLC coordinated with the Missouri Department of Natural Resources (MDNR) to develop a sampling plan to thoroughly characterize constituents in the ambient air and landfill gas/vapor, and answer questions posed by the interested stakeholders and members of the public. The final Air Sampling Work Plan (the "Work Plan"), as approved by MDNR was issued on August 14, 2012 and served as the basis for the sampling event.

Once the Work Plan was approved by Bridgeton Landfill, LLC and MDNR, the onsite air and landfill gas sampling tasks were conducted on August 16 and 17 by the Stantec professionals, field staff and appropriate senior staff, in cooperation with landfill management and employees, MDNR personnel, and onsite landfill contractors.

## **2.0 Constituents of Interest in Landfill Gas and Air**

As requested and approved by MDNR in the Work Plan samples of air and landfill gas were analyzed for the following individual constituents and analytical groupings that are of potential concern for occupational and community health, some of which may contribute to the odor. The protocols for collecting samples for the analyses listed below are found in Table 1. Analytical methods selected and utilized were specified by US EPA, the Occupational Safety and Health Administration (OSHA), the National Institute of Occupational Safety and Health (NIOSH), the American Society for Testing and Materials (ASTM), and methods developed by Columbia Analytical Laboratories (AQL) specifically for odor investigations. All methods were presented in the Work Plan and approved by MDNR.

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### **3.0 Sampling Methodology**

#### **3.1 COLLECTION OF LANDFILL GAS SAMPLES**

The major objective of collecting samples from beneath the flexible membrane liner (FML) was to characterize the chemical constituents in the gas being produced from the landfill at various locations, and to evaluate that gas without interference from other sources of the same constituents, especially the motor vehicles and diesel powered equipment operating on and near the landfill. As described below, air-tight sampling ports were designed and utilized to ensure only gas from below the FML was collected.

With the exception of samples for quantification of PAHs and Dioxins/Dibenzofurans, very small volumes of gas were required and could be easily acquired through a small air-tight sampling port inserted through the FML fabric. For these “under FML” samples, the sample apparatus was connected directly to these small, barbed, air-tight ports. In order to make certain that adequate volumes of gas would be present for sample collection, “chambers” were created beneath the FML at the selected locations. The methods used to construct the chambers reflected the differences in materials underlying the FML in the three locations and accounted for the volume of air required for the analytical methods. For example, the gravel and rock beneath the FML in the Amphitheater allowed rapid accumulation and movement of gas; whereas the other two areas had less porous surfaces beneath the FML. Photograph 1 shows Stantec and MDNR personnel collecting VOC samples from one of the sampling ports. Photographs 2, 3, and 4 show high volume sampling of source gas from under the FML on the amphitheater, second tier, and East face, respectively.

Characterization of PAHs and Dioxins/Dibenzofurans require large quantities of air (or gas) that are drawn through special Polyurethane Foam (PUF) filters using a high-volume sampling pump over (generally) a 24-hour period. In order to ensure a continuous supply of gas beneath the FML for the high-volume samplers, box-like structures were constructed beneath the FML and fitted with a manifold allowing two samplers to operate simultaneously. Manifolds were fabricated in the landfill shop to facilitate the movement of gas from under the FML directly to the intake ports of the high-volume samplers. These tubing structures provided a means to draw gas directly from under the FML into the sampler with minimum interference or influence from ambient air.

The high-volume samplers require an uninterrupted AC power supply to run the pumps. Electrical power was accessible for the locations on the landfill and along the fence line. A gasoline powered generator positioned approximately 50 feet away, and downwind of the sample intake, was used to supply power to the high-volume sampler in the upwind/background locations. The generator was tended throughout the 24-hour sample period to make certain that air collection was not interrupted. Photographs 5, 6, and 7 show the apparatus used to collect ambient air or source gas for PAH and Dioxin/Dibenzofuran analysis.

### **3.2 COLLECTION OF AMBIENT AIR SAMPLES**

Ambient air samples were collected at “breathing zone” height by mounting the sampling apparatus and SUMMA canisters on a tower constructed of plastic milk crates so that the sample collection intake ports were approximately 3 to 6 feet above the ground surface. Photographs 8, 9, and 10 show the sample collection structures and pump assemblies. Each set of ambient air samples at each location included instruments and collection media for collection of fixed gases (hydrogen, oxygen + argon, nitrogen, carbon monoxide, carbon dioxide, methane), ammonia, mercury, hydrogen cyanide, reduced sulfur compounds, volatile organic compounds, aldehydes, amines, and carboxylic acids. All of the samples in each set were collected for approximately 3 to 5 hours, with the exception of the set of samples collected at the Amphitheater location of the landfill where the concentration of the sampled compounds was expected to be potentially greater than other ambient locations. This set of air samples from the Amphitheater was collected for approximately 2 hours. It should also be noted that air was drawn into the Tedlar™ Bags for 15-20 minutes to avoid over-inflating the bags and subsequent rupture prior to being shipped to the laboratory. In all instances, sample flow rates and sample durations were optimally selected for best analytical detection and reporting limits. Also, durations were intentionally long to provide some assurance that if the presence of compound(s) was sporadic the sample would be collecting, or running, when the compound(s) appeared.

### **3.3 QUALITY ASSURANCE PROCEDURES FOR SAMPLE COLLECTION**

Sample 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; elimination of potential cross contamination, elimination of collection of interfering compounds or materials.

All sampling pumps were pre-calibrated using a BIOS Defender Model 510-M revC1 (*BIOS International, Mesa Labs, Butler, New Jersey*) mechanical/digital calibration device traceable to the National Bureau of Standards (NTIS) with representative sampling media in place for each type of sample. After sample collection, and prior to collecting the next set of samples, the pumps were post-calibrated using the same calibration device, and with the actual sample in place. Where discrepancies between pre- and post-samples were noted, the change was assumed to be linear over time, and the sample volume provided to the analytical lab and used in determining concentration was the arithmetic average of the pre- and post-calibration values (consistent with industry standard methods).

Contemporary sampling media provides little opportunity for cross-contamination or external contamination. Media does not off-gas materials that could be collected in another sample and interfere with accurate analysis or reporting. Similarly, media is well protected by its manufactured configuration at all times so that external dirt, debris, or other materials cannot be readily introduced. All media, including Tedlar™ sample bags, were virgin materials. SUMMA™ canisters were cleaned and prepared by the analytical laboratory in a manner consistent and appropriate for re-use. After sampling, samples were capped and air-tightly secured, labeled

with sample location identifier letter (A through N and A/U through C/U) and pump ID letter, and placed in a plastic sealable bag which was also labeled with the sample location identifier letter. Sets of samples in sealable bags were stored in the landfill office refrigerator until shipped to the laboratory for analysis to reduce volatilization or de-adsorption from the media. In addition, all samples 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.

## **4.0 Sampling Locations**

Figure 1 shows an aerial view of the Bridgeton Landfill and immediately adjacent properties. Locations where air and landfill gas samples were collected are indicated – and were located using the GPS coordinates provided by MDNR at the time the samples were collected. All sample locations were mutually agreed upon by MDNR, Bridgeton Landfill, LLC, Stantec and on the days that the samples were collected. The sample locations on Figure 1 correspond to the GPS coordinates provided by MDNR.

### **4.1 LOCATIONS UNDER FML**

At the request of MDNR, three areas of the landfill were investigated to characterize constituents in the gas being generated in those specific locations. The three representative locations selected jointly by MDNR, landfill personnel, and Stantec, were previously, and remain, covered with FML. As shown on Figure 1, the locations where samples of gas were collected from under the FML are designated as:

- the “Amphitheater” a relatively level area on the northwest of the landfill near the concrete batch plant;
- the “Second Tier” which is at a slightly higher elevation on the landfill than the Amphitheater; and
- the “East Face” which is a large area on the eastern slope of the landfill.

### **4.2 LOCATIONS ON THE LANDFILL AND DOWNWIND AT THE FENCE LINE**

The three ambient air sample locations designated as “the Amphitheater”, the “Summit”, and “Summit Valley”, were selected as representative of the active remediation area where people were working and where the odor was present. The air sample from the Amphitheater was collected at breathing zone height at the same location as the sample from under the FML also designated as Amphitheater. It was postulated that constituents present in the air at those locations would likely reflect both the air moving across the landfill property from upwind and from fugitive gas emissions from the landfill.

Six ambient air sample locations along the facility fence line were selected to capture constituents in air moving from the landfill towards off-site receptors. The odor was present at the fence line locations at the time sampling was initiated.

Ambient air sample locations designated as “Pond Center”, “Pond West” and “Pond East” were along the chain-link fence that separates the landfill from the adjacent Republic Services and other commercial properties to the north north/east of the landfill that are along the southwest side of St. Charles Rock Road. The flare for the landfill gas collection system is approximately 100 feet to the north of the Pond West sampling location.



It had been reported that odors were frequently observed in the topographically low area in the southeast corner of the landfill property. Two sampling locations designated “East Fence #1” and “East Fence #2,” across the construction road from the east face of the landfill where FML was being installed were selected with the concurrence of MDNR.. These two ambient air sample locations were along the chain link fence that forms the boundary between the landfill property and the Boenker Farm property to the southeast. The FML sample designated as East Face was collected approximately 500 feet to the north of East Fence #2. The ambient air sample location designated as “South Fence” was along the chain link fence in a low lying area adjacent to Boenker Lane.

### **4.3 UPWIND/BACKGROUND LOCATIONS**

Ambient air samples designated as “Grassy Knoll Center”, “Grassy Knoll West”, and “Grassy Knoll North” were collected in an open grassy field in the northern portion of the landfill property. This area is on a slight rise or knoll. No odor was present on the days that the samples were collected. Air was moving from off-site across the grassy knoll towards the active areas of the landfill where construction was occurring

## **5.0 Analytical Results**

### **5.1 LANDFILL GAS FROM UNDER THE FML**

Table 2 presents a summary of the analytical results for all compounds detected in samples of gas from the three locations under the FML.

#### **5.1.1 Analytes Not Detected in Any Sample**

The following analytes were not detected in any of the gas samples collected from the three locations under the FML: carbon monoxide; ammonia; hydrogen cyanide; mercury; and amines. Benzo(a)pyrene and the related carcinogenic PAHs associated with incomplete combustion of organic matter were also not found in any of the gas samples.

#### **5.1.2 Fixed Gases**

The gas from under the FML in the Amphitheater was found to contain: oxygen + argon (7.68%); nitrogen (35.7%); methane (9.94%); and carbon dioxide (46.7%). Gas from under the FML on the Second Tier was found to contain: hydrogen (1.29%); oxygen + argon (7.92%); nitrogen (47.0%); methane (8.70%); and carbon dioxide (35.0%). Gas from under the FML on the East Face was found to contain: hydrogen (2.03%); oxygen + argon (8.04%); nitrogen (47.7%); methane (10.7%); and carbon dioxide (31.4%).

#### **5.1.3 Volatile Organic Compounds**

Thirty five (35) target analytes and twenty eight (28) Tentatively Identified Compounds (TICs) were found in at least one of the three samples taken from under the FML. As summarized in Table 2, it is apparent that the three FML locations had somewhat different profiles with respect to the specific compounds that were detected and the concentrations of those compounds. The following VOCs were found in all three locations: propene; tetrahydrofuran; benzene; n-heptane; toluene; n-octane; ethylbenzene; m, p- and o-xylenes; n-nonane; cumene; alpha-pinene; and d-limonene. The following TICs were found in all three locations: furan; dimethyl sulfide; and 2-methylfuran.

#### **5.1.4 Aldehydes**

Formaldehyde was not found in any of the samples collected under the FML. Acetaldehyde, propionaldehyde, butyraldehyde, o-tolualdehyde, and 2,5-dimethylbenzaldehyde were found in two samples; and isovaleraldehyde, and valeraldehyde were found in one sample.

#### **5.1.5 Reduced Sulfur Compounds**

Hydrogen sulfide was detected in the sample from under the FML on the Second Tier, and was undetected in the other two "under FML" locations. The following reduced sulfur compounds were detected in all three under FML samples: dimethyl sulfide; methyl mercaptan; ethyl mercaptan; carbon disulfide; ethyl methyl sulfide; thiophene; dimethyl disulfide; and 3-methyl thiophene. The following compounds were detected in one or two of the samples: carbonyl sulfide; isopropyl mercaptan; t-butyl mercaptan; isobutyl mercaptan; 3-methyl thiophene; 2,5-

dimethyl thiophene; and 2-ethyl thiophene. Dimethyl sulfide and dimethyl disulfide were the reduced sulfur compounds detected at the highest concentrations.

### **5.1.6 Carboxylic Acids**

No carboxylic acid compounds were detected in the gas from under the FML on the Second Tier. All carboxylic acid target analytes were found in gas from under the FML on the Amphitheater: acetic acid; propionic acid; 2-methylpropionic acid; butanoic acid; 2-methylbutanoic acid; pentanoic acid; 3-methylpentanoic acid; 4-methylpentanoic acid; hexanoic acid; heptanoic acid; 2-ethylhexanoic acid; and octanoic acid. All of the same analytes were found in gas from under the FML on the East Face except: acetic acid; 3-methylpentanoic acid; 4-methylpentanoic acid; and octanoic acid.

### **5.1.7 PAHs**

With the exception of fluoranthene and pyrene which were not found in gas from under the FML in the Amphitheater, the following PAHs were found in gas from under the FML in all three locations: naphthalene; acenaphthene; fluorine; phenanthrene; anthracene; fluoranthene; and pyrene. It is significant to note that benzo(a)pyrene and related carcinogenic PAHs associated with incomplete combustion of organic matter were not found in any of the samples of gas from under the FML.

### **5.1.8 Dioxins/Dibenzofurans**

Table 3 presents the concentrations of individual PCDD and PCDF isomers measured in samples of gas from the three locations under the FML. Consistent with US EPA guidance, the detected concentrations of the individual dioxin and dibenzofuran isomers were converted to a 2,3,7,8-TCDD Toxicity Equivalent Concentration (TEQ) using the Toxicity Equivalence Factors (TEFs) recommended by US EPA (December 2010). The TCDD TEQ concentrations for the individual isomers were added to yield a single TCDD TEQ concentration for the sample. The TCDD TEQs for gas from each of the under FML samples were: Amphitheater (1.28E-08  $\mu\text{g}/\text{m}^3$ ); Second Tier (1.03E-08  $\mu\text{g}/\text{m}^3$ ); and East Face (3.00E-08  $\mu\text{g}/\text{m}^3$ ).

## **5.2 AMBIENT AIR FROM LOCATIONS ON THE LANDFILL AND DOWNWIND AT THE FENCE LINE**

As described in Section 4, (shown on Figure 1), ambient air samples were collected from three locations within the active remediation area on the landfill where a strong odor was evident. These three locations are designated as the Amphitheater, the Summit and the Summit Valley. Samples were collected at six locations along the fence line that were downwind of the active areas of the landfill and where the odor was present at the time the samples were taken. Table 4 presents a summary of the analytical results for locations on the landfill and downwind at the fence line.

### **5.2.1 Analytes Not Detected in Any Sample**

The following analytes were not detected in any samples of air from locations on the landfill or downwind at the fence line: ammonia, hydrogen cyanide; mercury; amines; carboxylic acids;

and reduced sulfur compounds with the exception of dimethyl sulfide. Benzo(a)pyrene and the related carcinogenic PAHs associated with incomplete combustion of organic matter were also not found in any of the air samples from locations on the landfill and downwind at the fence line.

### **5.2.2 Fixed Gases**

The sample bags for the Pond East and Pond West locations were deflated when they arrived at the analytical laboratory and consequently there are no results for these two locations. For all of the other locations on the landfill where samples for fixed gases were collected, the percentage of oxygen + argon was 21.5% and the percentage of nitrogen was 78.4 to 78.5%. Hydrogen, carbon monoxide, methane and carbon dioxide were not detected in measurable concentrations.

### **5.2.3 Volatile Organic Compounds**

Twenty (20) Target Analyte VOCs and sixteen (16) TICs were found in low  $\mu\text{g}/\text{m}^3$  concentrations in one or more of the downwind locations on the landfill. The Target Analytes detected were: propene; dichlorodifluoromethane; ethanol; acetonitrile; acetone; trichlorofluoromethane; methylene chloride; 2-butanone (methyl ethyl ketone); ethyl acetate; tetrahydrofuran; benzene; toluene; n-octane; tetrachloroethene; ethylbenzene; m,p-xylenes; o-xylene; n-nonane; alpha-pinene and d-limonene. The TICs were: furan; dimethyl sulfide; methyl acetate; 2-methylfuran; methylpropionate; ethylpropionate; methylbutyrate; ethyl butyrate; isobutene; hexamethylcyclotrisiloxane; 2-ethyl-1-hexanol; acetic acid; 2-butoxyethanol; isopentane and a C6-H10 alkene. No VOC or TIC was found at concentrations exceeding occupational exposure standards. Only benzene was present at concentrations exceeding the very conservative US EPA risk-based RSLs for residential and industrial exposure. Table 4 presents the concentrations of VOCs and TICs detected in air samples from the six downwind locations and on the landfill. US EPA RSLs, OSHA PELs, and ACGIH TLVs are presented for comparison.

It should be noted that two SUMMA™ canisters were collected from the South Fence line location because the first canister South Fence #1 lost vacuum within the first hour and was considered potentially unreliable. A second canister, designated as South Fence #2 was activated and collected air for a duration of 4 hours. The analytical results from both canisters are presented in Table 4.

### **5.2.4 Aldehydes**

Acetaldehyde was detected in all of the samples, and was the only aldehyde detected in air samples from the Amphitheater and East Fence line locations 1 & 2. As shown on the tables, acetaldehyde was detected in the landfill and downwind samples at concentrations similar to those found in upwind samples. Acetaldehyde, formaldehyde, valeraldehyde and 2,5-dimethylbenzaldehyde were found in a number of locations at concentrations similar to those detected in the upwind samples (except valeraldehyde which was not found in the upwind samples).

### **5.2.5 Reduced Sulfur Compounds**

Dimethyl sulfide was the only reduced sulfur compound found in air from locations on the landfill and downwind along the fence line. As noted in the discussion of fixed gases (Section 5.2.2), the sample bags for the Pond East and Pond West locations were deflated when they arrived at the analytical laboratory and consequently there are no results for these two locations.

### **5.2.6 PAHs**

High volume samples for determination of PAHs were taken from the Summit and the downwind location designated as East Fence #1. The following PAH compounds were detected in these samples: naphthalene; acenaphthene; fluorine; phenanthrene; and pyrene (summit only). Benzo(a)pyrene and other related carcinogenic PAHs were not detected in any sample.

### **5.2.7 Dioxins/Dibenzofurans**

High volume samples for determination of dioxins/dibenzofurans were also collected from the Summit and East Fence #1. Table 5 shows the concentrations of the individual polychlorinated dibenzo-p-dioxins and dibenzofuran (dioxins/dibenzofurans) isomers that were detected. Consistent with the US EPA guidance, the detected concentrations of the individual dioxins and dibenzofuran isomers were converted to 2, 3, 7, 8-TCDD TEQs. The total TCDD TEQ calculated for dioxins in the sample collected at the summit was 1.49E-08  $\mu\text{g}/\text{m}^3$ ; and the total TCDD TEQ calculated for dioxins in the sample collected at the east fence #1 was 7.88E-09  $\mu\text{g}/\text{m}^3$ .

## **5.3 AMBIENT AIR FROM UPWIND/BACKGROUND LOCATIONS**

As described previously, background samples were collected from three specific locations in an area on the northwestern portion of the landfill property referred to as the Grassy Knoll. This area was upwind of the active remediation areas of the landfill on both August 16 and 17; and no discernible odor was present. Samples were collected for all analytical suites except for PAHs. One of the high-volume sampling units arrived from the vendor in a non-functional condition and could not be repaired until the next day when repair parts were received. Given the aggressive schedule for collecting samples and the desirable 24-hour collection time required for both the PAH and Dioxin/Dibenzofuran analytical methods, it was decided to sacrifice the PAH analysis of background air. Table 6 presents a summary of analytical results for all compounds detected in at least one upwind/background sample.

### **5.3.1 Analytes Not Detected in Any Sample**

The following analytes were not detected in any of the samples collected from the upwind locations on the Grassy Knoll: ammonia; hydrogen cyanide; mercury; amines; carboxylic acids; and reduced sulfur compounds.

### **5.3.2 Fixed Gases**

The sample bag from the Grassy Knoll Center collected on August 16, 2012 was deflated upon arrival at the laboratory, thus the sample was not valid. All other sample bags arrived intact and

were analyzed. Hydrogen, carbon monoxide and methane were not detected in any of the upwind samples. A low concentration of carbon dioxide was reported in the August 17, 2012 sample from the Grassy Knoll West. The percentage of oxygen + argon was 21.5% in all samples; and the percentage of nitrogen was 78.4 to 78.5%.

### **5.3.3 Volatile Organic Compounds**

Seven (7) Target Analyte VOCs were detected in one or more of the upwind samples: acetone; acetonitrile; dichlorodifluoromethane; ethyl acetate; tetrachloroethene; trichlorofluoromethane; and toluene. Six (6) TICs were detected in one or more of the upwind samples: acetic acid; ethyl butyrate; ethyl propionate; hexamethylcyclotrisiloxane; and an unidentified compound with retention time of 9.41 minutes. The concentrations of all VOCs and TICs are presented by location along with corresponding US EPA RSL and occupational standard/guideline concentrations. All reported concentrations of VOCs were below US EPA RSL concentrations for both residential and industrial air.

### **5.3.4 Aldehydes**

Three common aldehyde compounds were reported at low  $\mu\text{g}/\text{m}^3$  concentrations in one or more of the upwind samples: acetaldehyde; formaldehyde; and 2, 5-dimethylbenzaldehyde. Both acetaldehyde and formaldehyde were reported at concentrations higher than the US EPA RSL concentrations for residential and industrial air. As will be further discussed in section 6.2.2, the conservative risk-based RSLs are very close to, and in some cases less than, standard laboratory method reporting limits. Consequently, it is common for detected concentrations of these two compounds to exceed screening levels.

### **5.3.5 Dioxins/Dibenzofurans**

One high-volume sample was collected from the Grassy Knoll Center to characterize upwind/background concentrations of the polychlorinated dioxins and dibenzofurans. Consistent with US EPA guidance, the concentrations of the individual dioxin and dibenzofuran isomers were converted to 2,3,7,8-TCDD TEQs and evaluated as a single concentration of the index compound. As can be seen from Table 7, a number of Dioxin and Dibenzofuran isomers were found to be present at extremely low concentrations in the upwind sample. The TCDD TEQ concentration of  $1.94\text{E-}08 \mu\text{g}/\text{m}^3$  was consistent with the US EPA RSL for residential air ( $6.4\text{E-}08 \mu\text{g}/\text{m}^3$ ) and less than the RSL for industrial air ( $3.2\text{E-}07 \mu\text{g}/\text{m}^3$ ).

## **6.0 Discussion of Sampling Results**

### **6.1 COMPARISON OF COMPOUNDS DETECTED BY LOCATION**

#### **6.1.1 Downwind on Landfill Compared to Gas from Under FML**

The following compounds were detected in the gas samples from under the FML and the ambient air from locations on the landfill and at the downwind fence line locations, but not in the upwind samples: propene; ethanol; 2-butanone (MEK); tetrahydrofuran; benzene; n-octane; ethylbenzene; xylenes; n-nonane; alpha-pinene; d-limonene; furan; dimethyl sulfide; methyl acetate; 2-methyl furan; methyl propionate; methyl butyrate; isobutene; C7-H12 alkene; ethyl propionate; and isopentane.

#### **6.1.2 Downwind on Landfill Compared to Upwind/Background**

The compounds that were detected in both upwind air and landfill/downwind fence line locations were: dichlorodifluoromethane; acetonitrile; acetone; trichlorofluoromethane; ethyl acetate; toluene; tetrachloroethene; acetaldehyde and formaldehyde. The concentrations of each detected compound were similar among all samples. The two chlorofluorocarbon compounds (Freons), tetrachloroethene, acetaldehyde, and formaldehyde appear to be constituents in the regional air mass moving across the landfill during the times that the samples were collected.

## **6.2 APPLICABLE OCCUPATIONAL AND PUBLIC HEALTH STANDARDS**

### **6.2.1 Occupational Exposure Standards**

Occupational Exposure Limits (OELs) published as OSHA PELs (Permissible Exposure Limits) and ACGIH TLVs (Threshold Limit Values) are presented on Tables 4 and 6 for all constituents for which occupational exposure standards or guidelines were available. In a few instances where OSHA PELs and ACGIH TLVs have not been developed, AIHA Workplace Environmental Exposure Levels (WEEL) were applied. Note that gas from under the FML is not an exposure environment, thus no comparison is made to occupational or risk-based concentrations.

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. AIHA WEELs are also similar to TVLs and have been developed for compounds for which there are no TLVs or PELs but for which AIHA believes there is significant potential workplace exposure.

The concentrations of all detected compounds in ambient air on the landfill, downwind at the fence line and upwind were low, well below occupational exposure limits. In fact, no constituent detected in samples of ambient air from locations on the active areas of the landfill and downwind at the fence line exceeded or even approached applicable occupational standards or guidelines. The highest concentration of compounds compared to their respective OELs were benzene in the Pond West sample, dimethyl sulfide in the Summit Valley sample, and



formaldehyde in the Pond Center, Pond East, Pond West, and Summit samples. These compounds were detected in concentrations less than 2% of their OEL. Most detected sample concentrations were below 0.01% of their OELs.

As a special case, a unique TLV for VOCs that may cause similar toxicological effects was developed. It is an additive TLV based on the sum of all of the detected concentrations divided by its respective TVL; this sum is compared to one (1). The highest VOC mixture exposure was 1% of the mixture TLV, in the Pond West sample. This is well below the mixture TLV even with a 20% addition to account for detected compounds that may cause similar toxicological effects as the other detected VOCs, but that have no OELs.

It is clear that detected concentrations of the significant number and variety of compounds collected in ambient air samples on and around the landfill are well below applicable occupational exposure limits. In addition, concentrations and exposures to mixtures of the detected volatile organic compounds (presumed additive synergist relationship) are well below the mixture TLV. Total adjusted concentrations of dioxin and furan compounds are also well below the OEL and RSLs.

### **6.2.2 Risk-Based Screening Levels**

US EPA risk-based Regional Screening Level (RSL) concentrations for exposure to constituents in air in residential and industrial settings are presented on Tables 4 and 6. 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 (receptor) who is assumed to be exposed to that concentration on an ongoing basis over an extended period of time (25 years for industrial and 30 years for residential). RSLs for chemicals that produce adverse non-cancer effects are concentrations that are very unlikely to produce health effects in people who are exposed over many years. Concentrations of constituents below applicable RSL concentrations are generally not considered to be of concern for public health. Concentrations above RSLs do not necessarily mean that adverse health effects will occur, but do indicate that additional evaluation may be appropriate.

The vast majority of detections were much lower than the RSL concentrations. However, the concentrations of benzene found in air from all three of the downwind fence line locations along the Pond, East Fence line #1, and South Fence line #1 and 2; and on the landfill at the Amphitheater and Summit Valley locations were higher than the conservative RSL for residential exposure ( $0.31 \mu\text{g}/\text{m}^3$ ), with detected concentrations ranging from 1.5 up to  $16 \mu\text{g}/\text{m}^3$ . The highest concentrations of benzene were found in the three Pond West, Pond Center and Pond east samples. Benzene was not detected in the air at the Summit or at the downwind East Fence line #2 location. The concentrations of benzene found in the air on the Amphitheater ( $1.1 \mu\text{g}/\text{m}^3$ ) and the downwind East Fence line #1 location ( $1.5 \mu\text{g}/\text{m}^3$ ) were similar to the RSL for industrial exposure ( $1.6 \mu\text{g}/\text{m}^3$ ). It is not uncommon to find concentrations of benzene exceeding the conservative RSLs in air samples in urban/industrial settings.



All concentrations of formaldehyde found in upwind locations and in samples from locations on the landfill and the downwind fence line locations were greater than the RSL concentrations; as were the majority of the acetaldehyde concentrations. As indicated previously, the residential and industrial RSLs for formaldehyde (0.19 and 0.94  $\mu\text{g}/\text{m}^3$ ) and acetaldehyde (1.1 and 5.6  $\mu\text{g}/\text{m}^3$ ), are close to the laboratory MRLs for these compounds in ambient air (0.32 – 0.70  $\mu\text{g}/\text{m}^3$ ). Acetaldehyde and formaldehyde have a number of common sources such as motor vehicle emissions and are frequently found in ambient air in urban settings.

### **6.3 ODOR THRESHOLDS**

Table 8 presents the lowest published odor threshold for constituents found in gas from under the FML in comparison to the range of concentrations found in ambient air from locations on the landfill and downwind at the fence line. 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 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.

As indicated on Table 8, the lowest published odor threshold is near or below the laboratory Method Reporting Limits for the ambient air samples for the following compounds present in gas from under the FML: ethyl acetate; acetaldehyde; hydrogen sulfide; dimethyl sulfide; dimethyl disulfide; methyl mercaptan; ethyl mercaptan; isopropyl mercaptan; t-butyl mercaptan; isobutyl mercaptan; n-butyl mercaptan; thiophene; butanoic (butyric) acid; and pentanoic (valeric) acid.

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.

As mentioned previously, the majority of the Tedlar™ bags for the ambient samples were deflated upon arrival at the analytical laboratory, although they were intact when shipped from the landfill office. Consequently, there is little data for reduced sulfur compounds. Dimethyl sulfide was the only sulfur compound detected in the usable ambient air samples from locations on the landfill. Dimethyl sulfide and dimethyl disulfide were the two sulfur compounds found at the highest concentrations in the samples of gas from under the FML. Because the odor thresholds for many of the reduced sulfur compounds are below laboratory MRLs, it is not unreasonable to assume that other reduced sulfur compounds found in gas samples from under the FML may also be present in ambient air. It is very likely that reduced sulfur compounds were significant contributors to the odor.

The carboxylic acids as a group have odors that are commonly described as “sour”, “perspiration”, “body odor”, and “cheesy”. A number of carboxylic acids were found in gas from under the FML from the amphitheater and the east face, but not the second tier, with the

greatest number of individual compounds and highest concentrations detected in the sample from the amphitheater. Although no carboxylic acids were detected in the air samples from locations on the landfill and the downwind fence line, it is reasonable to assume that low concentrations of some of these compounds may have been presented and contributed to the odor.

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 have contributed to the perception of odor.

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.

## 7.0 Summary and Conclusions

Samples of gas from under the FML in the Amphitheater, Second Tier, and East Face were found to contain numerous VOCs and TICs, aldehydes, reduced sulfur compounds, carboxylic acids (none detected in the sample from the second tier), naphthalene and coal-tar pitch volatile PAHs, and Dioxins/Dibenzofurans. The differences in the concentrations of specific compounds found in gas from the three FML locations may help to explain the perceptible differences in odors across the landfill.

It is not appropriate to compare the concentrations of constituents found in samples of gas from under the FML with occupational exposure standards or risk-based screening levels because the area below FML is not an exposure environment.

No constituent detected in samples of ambient air from locations on the active areas of the landfill and downwind at the fence line exceeded or even approached applicable occupational standards or guidelines established by the Occupational Safety and Health Administration (OSHA), the National Institutes for Occupational Safety and Health (NIOSH), or the American Council of Governmental and Industrial Hygienists (ACGIH).

Of those compounds detected in samples of ambient air from locations on the active areas of the landfill and downwind at the fence line, only benzene, acetaldehyde, and formaldehyde were present at concentrations exceeding the respective risk-based US EPA RSLs for industrial and residential exposure. The RSLs for these compounds are very close to the laboratory method reporting limits. Formaldehyde was not found in landfill gas and is consistent with ambient background as evidenced by the presence of this compound in the upwind air samples. The concentrations of acetaldehyde found in samples from locations on the landfill and downwind at the fence line were similar to the concentrations found in the upwind samples. Benzene, formaldehyde and acetaldehyde are frequently detected at low concentrations in ambient air in urban/industrial areas. These compounds have a number of common sources such as motor vehicle emissions.

The downwind fence line sample locations were very close to the areas of the landfill where FML was being installed to control gas emissions. Thus the downwind fence line samples represent the maximum concentrations of constituents moving from the landfill towards off-site receptors at the time the samples were collected. The concentrations of potentially landfill-related constituents in air at the Boenker Farm and in the surrounding neighborhood are not known, but are expected to decrease with increasing distance from the landfill.

The likely contributors to the odor observed at off-site locations are reduced sulfur compounds (e.g., dimethyl sulfide and mercaptans) and carboxylic acids (e.g., butyric acid and valeric acid) that have extremely low odor thresholds. As discussed in section 6.3, the individual members of these two groups of compounds have been described as having odors that many people find objectionable. However, the majority of these odorous compounds are of low order of toxicity.

The results of the extensive sampling conducted in August support the conclusion that although there was an odor, there are no compounds in the fugitive emissions from the landfill at concentrations of health concern to members of the surrounding community or to the people working on the landfill.

## **8.0 Tables, Figures, Photographs**

Table 1. Sample collection protocols

Table 2. Summary of analytical results for all compounds detected under the FML

Table 3. Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) detected under the FML

Table 4. Summary of analytical results for all compounds detected in ambient air samples from the downwind locations and on the landfill

Table 5. Individual polychlorinated dibenzo-p-dioxin and dibenzofurans (PCDD/PCDF) isomers and conversion to 2,3,7,8-TCDD toxicity equivalents (TEQs); on landfill and downwind

Table 6. Summary of analytical results for all compounds detected in at least one upwind/background sample

Table 7. Individual polychlorinated dibenzo-p-dioxin and dibenzofurans (PCDD/PCDF) isomers and conversion to 2,3,7,8-TCDD toxicity equivalents (TEQs); in upwind samples

Table 8. Summary of compounds detected under the FML with associated odor thresholds, and concentrations detected in downwind and landfill ambient air samples

Figure1. Air Sampling Locations

Photographs

## **9.0 References**

American Industrial Hygiene Association, *Odor Thresholds for Chemicals with Established Occupational Health Standards*, 1997 edition.

Ruth, J.H., *Odor Thresholds and Irritation Levels of Several Chemical Substances: A Review*, Am. Ind. Hyg. J., 47: A-142 through A-151, March 1986.

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.

US EPA Regional Screening Levels Summary Table, April/May 2012 on-line

Occupational Safety and Health Administration (OSHA), 29CFR1910.1000, *Occupational Safety and Health Standards, Subpart Z – Toxic and Hazardous Substances, Table Z-1 Limits for Air Contaminants* (also includes Table Z-1-A, Z-2, and Z-3)

American Conference of Governmental Industrial Hygienists (ACGIH), *TLVs® and BEIs® Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices*, 2012 & 2013 edition

American Industrial Hygiene Association (AIHA), *Workplace Environmental Exposure Limits (WEELs)*, 2012 edition

TOXNET, *Toxicology Data Network*, US National Library of Medicine, Sep 2012 on-line

## **Tables**

**Table 1**  
Sample collection protocols  
Bridgeton Landfill

<i>Analyte group</i>	<i>Sample location</i>	<i>Analytical method</i>	<i>Collection method</i>	<i>Sample duration and flow rate</i>	<i>Link to methodology</i>
Volatile organic compounds	Source and under FML <sup>(1)</sup>	EPA <sup>(3)</sup> TO-15	1 Liter Summa canisters	<30 sec, <30 sec total evacuation time by regulator	<a href="http://www.cdc.gov/niosh/docs/2003-154/pdfs/2549.pdf">http://www.cdc.gov/niosh/docs/2003-154/pdfs/2549.pdf</a>
	Ambient <sup>(2)</sup> on landfill and off landfill	EPA TO-15	6 Liter Summa canisters	240 min, 240 minute total evacuation time by regulator	<a href="http://www.epa.gov/ttnamti1/files/ambient/airtox/to-15r.pdf">http://www.epa.gov/ttnamti1/files/ambient/airtox/to-15r.pdf</a>
Reduced sulfur compounds	Source and under FML	ASTM <sup>(4)</sup> D5504	1 liter Tedlar <sup>(5)</sup> bag, partial fill	Low flow sampling pump; max. 10-15 min @ 0.050 lpm <sup>(6)</sup>	<a href="http://www.astm.org/Standards/D5504.htm">http://www.astm.org/Standards/D5504.htm</a>
	Ambient on landfill and off landfill	ASTM D5504	20 liter Tedlar bag, partial fill	Low flow sampling pump; 240 min @ 0.050 lpm	<a href="http://www.caslab.com/Forms-Downloads/Flyers/REDUCED_SULFUR_BROCHURE.pdf">http://www.caslab.com/Forms-Downloads/Flyers/REDUCED_SULFUR_BROCHURE.pdf</a>
Carboxylic acids	Source and under FML	Columbia Analytical AQL Method 102	Treated silica gel sorbent tube	Low flow sampling pump; max. 15 min @ 1.0 lpm	<a href="http://www.caslab.com/Forms-Downloads/Flyers/CARBOXYLIC_SAMPLING_FLYER.pdf">http://www.caslab.com/Forms-Downloads/Flyers/CARBOXYLIC_SAMPLING_FLYER.pdf</a>
	Ambient on landfill and off landfill	Columbia Analytical AQL Method 102	Treated silica gel sorbent tube	Low flow sampling pump; 240 min @ 0.40 lpm	
Amines	Source and under FML	Columbia Analytical AQL Method 101	Specially treated sorbent tube	Low flow sampling pump; max. 15 min @ 1.0 lpm	<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>
	Ambient on landfill and off landfill	Columbia Analytical AQL Method 101	Specially treated sorbent tube	Low flow sampling pump; 240 min @ 0.40 lpm	
Ammonia	Source and under FML	OSHA <sup>(7)</sup> ID-188	Carbon beads	Low flow sampling pump; max. 15 min @ 0.50 lpm	<a href="http://www.osha.gov/dts/sltc/methods/inorganic/id188/id188.html">http://www.osha.gov/dts/sltc/methods/inorganic/id188/id188.html</a>
	Ambient on landfill and off landfill	OSHA ID-188	Carbon beads	Low flow sampling pump; 240 min @ 0.50 lpm	
Aldehydes	Source and under FML	EPA TO-11A	2,4-DNPH <sup>(8)</sup> coated sorbent tube	Low flow sampling pump; max. 30 min @ 1.2 lpm	<a href="http://www.epa.gov/ttnamti1/files/ambient/airtox/to-11ar.pdf">http://www.epa.gov/ttnamti1/files/ambient/airtox/to-11ar.pdf</a>
	Ambient on landfill and off landfill	EPA TO-11A	2,4-DNPH coated sorbent tube	Low flow sampling pump; 240 min @ 1.2 lpm	
Dioxins and furans	Source and under FML	EPA TO-9	High volume sample, PUF <sup>(9)</sup> sorbent	High volume pump; 24 hours @ >200 LPM	<a href="http://www.epa.gov/ttnamti1/files/ambient/airtox/to-9arr.pdf">http://www.epa.gov/ttnamti1/files/ambient/airtox/to-9arr.pdf</a>
	Ambient on landfill and off landfill	EPA TO-9	High volume sample, PUF sorbent	High volume pump; 24 hours @ >200 LPM	
Polynuclear aromatic hydrocarbons	Source and under FML	EPA TO-13A	High volume sample, PUF sorbent	High volume pump; 24 hours @ >200 LPM	<a href="http://www.epa.gov/ttnamti1/files/ambient/airtox/to-13arr.pdf">http://www.epa.gov/ttnamti1/files/ambient/airtox/to-13arr.pdf</a>
	Ambient on landfill and off landfill	EPA TO-13A	High volume sample, PUF sorbent	High volume pump; 24 hours @ >200 LPM	

**Table 1**  
Sample collection protocols  
Bridgeton Landfill

<i>Analyte group</i>	<i>Sample location</i>	<i>Analytical method</i>	<i>Collection method</i>	<i>Sample duration and flow rate</i>	<i>Link to methodology</i>
Hydrogen cyanide	Source and under FML	NIOSH <sup>(10)</sup> 6010	Soda lime sorbent tube	Low flow sampling pump; max. 15 min @ 0.05 lpm	<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>
	Ambient on landfill and off landfill	NIOSH 6010	Soda lime sorbent tube	Low flow sampling pump; 240 min @ 0.04 lpm	
Mercury compounds	Source and under FML	NIOSH 6009	Anasorb sorbent tube	Low flow sampling pump; max. 30 min @ 0.20 lpm	<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>
	Ambient on landfill and off landfill	NIOSH 6009	Anasorb sorbent tube	Low flow sampling pump; 240 min @ 0.20 lpm	
Fixed gases (hydrogen, methane, carbon monoxide, carbon dioxide)	Source and under FML	EPA Method 3C	1 liter Tedlar bag, partial fill	Low flow sampling pump; max. 10-15 min @ 0.050 lpm	<a href="http://www.epa.gov/ttn/emc/promgate/m-03c.pdf">http://www.epa.gov/ttn/emc/promgate/m-03c.pdf</a>
	Ambient on landfill and off landfill	EPA Method 3C	20 liter Tedlar bag, partial fill	Low flow sampling pump; 240 min @ 0.050 lpm	

**Footnotes**

- 1) FML - flexible membrane liner covering specific areas of the surface of the landfill
- 2) Ambient - ambient air samples are collected in open air, as opposed to from sources such as under the FML
- 3) EPA - U.S. Environmental Protection Agency
- 4) ASTM - American Society for Testing Materials
- 5) Tedlar - trademarked flexible material used for sample collection bags; impervious to small molecular weight gases and vapors for known periods of time (holding times)
- 6) LPM - liters per minute
- 7) OSHA - U.S. Occupational Safety and Health Administration
- 8) 2,4-DNPH - 2,4-dinitrophenylhydrazine
- 9) PUF - polyurethane foam
- 10) NIOSH - U.S. National Institute of Occupational Safety and Health



**Table 2**

Summary of analytical results for all compounds detected under the FML<sup>(1)</sup>  
Bridgeton Landfill

<i>Compounds/analytes</i>	<i>Concentrations in µg/m<sup>3(2)</sup></i>					
	<i>Amphitheater</i>		<i>Second Tier</i>		<i>East Face</i>	
	<i>Stantec</i>	<i>MDNR<sup>(3)</sup></i>	<i>Stantec</i>	<i>MDNR</i>	<i>Stantec</i>	<i>MDNR</i>
<b><i>Volatile Organic Compounds</i></b>						
Propene	27,000	22,546	95,000	168,919	37,000	74,332
Chloromethane	ND <sup>(4)</sup>		ND		2,700	
1,3-Butadiene	590		ND		ND	
Chloroethane	ND		5600		ND	
Ethanol	99,000		ND		ND	
Acetone	500,000	672,255	ND	91,455	72,000	124,712
2-Propanol	60,000		ND		ND	
2-Butanone (MEK)	340,000		ND		89,000	
Ethyl acetate	4,800		ND		ND	
n-Hexane	2,100		ND		2,900	
Tetrahydrofuran	170,000	180,816	39,000	ND	70,000	62,828
Benzene	120,000	130,663	620,000	837,007	390,000	450,450
Cyclohexane	1,100		ND		ND	
1,4-Dioxane	4,100		ND		ND	
n-Heptane	3,200		8,000		3,300	
4-methyl-2-pentanone	30,000	20,565	ND	ND	16,000	16,181
Toluene	43,000	44,845	100,000	128,129	48,000	73,109
2-Hexanone	11,000		ND		3,100	
n-Butyl acetate	12,000		ND		ND	
n-Octane	9,500		17,000		13,000	
Chlorobenzene	3,000		ND		ND	
Ethylbenzene	27,000	38,700	32,000	42,942	22,000	29,699

**Table 2**

Summary of analytical results for all compounds detected under the FML<sup>(1)</sup>  
Bridgeton Landfill

<i>Compounds/analytes</i>	<i>Concentrations in µg/m<sup>3(2)</sup></i>					
	<i>Amphitheater</i>		<i>Second Tier</i>		<i>East Face</i>	
	<i>Stantec</i>	<i>MDNR<sup>(3)</sup></i>	<i>Stantec</i>	<i>MDNR</i>	<i>Stantec</i>	<i>MDNR</i>
m,p-Xylenes	57,000	39,511	37,000	31,566	40,000	34,475
o-Xylene	20,000	13,460	12,000	18,106	16,000	24,836
Styrene	1,200		ND		ND	
n-Nonane	16,000		17,000		9,000	
Cumene	6,000		5,200		4,300	
Alpha-Pinene	12,000		53,000		16,000	
n-Propylbenzene	3,800		ND		2,200	
4-Ethyltoluene	4,900		ND		2,900	
1,3,5-Trimethylbenzene	6,700		ND		3,500	
1,2,4-Trimethylbenzene	19,000	23,989	ND	ND	8,300	19,466
1,4-Dichlorobenzene	10,000		ND		3,200	
d-Limonene	22,000		22,000		21,000	
Naphthalene	510		ND		ND	
<b><i>Tentatively Identified Compounds</i></b>						
Furan	46,000		120,000		300,000	
Dimethyl sulfide	68,000		83,000		280,000	
Methyl acetate	44,000		ND		ND	
2-Methylfuran	68,000		380,000		240,000	
Methyl propionate	45,000		ND		ND	
1-Butanol	73,000		ND		ND	
2-Pentanone	59,000		ND		ND	
Methyl butyrate	110,000		ND		ND	
Dimethyl disulfide	70,000		ND		42,000	

**Table 2**

Summary of analytical results for all compounds detected under the FML<sup>(1)</sup>  
Bridgeton Landfill

<i>Compounds/analytes</i>	<i>Concentrations in <math>\mu\text{g}/\text{m}^3</math><sup>(2)</sup></i>					
	<i>Amphitheater</i>		<i>Second Tier</i>		<i>East Face</i>	
	<i>Stantec</i>	<i>MDNR<sup>(3)</sup></i>	<i>Stantec</i>	<i>MDNR</i>	<i>Stantec</i>	<i>MDNR</i>
2-Methyl cyclopentanone	51,000		ND		ND	
Methyl hexanoate	43,000		ND		ND	
2-Ethyl cyclopentanone	41,000		ND		ND	
n-Decane	40,000		ND		ND	
p-Isopropyltoluene	120,000		ND		42,000	
n-Undecane	46,000		ND		ND	
Dimethyl ether	ND		120,000		ND	
Isobutene	ND		140,000		85,000	
n-Butane	ND		41,000		35,000	
C4-H8 Alkene (5.51 RT)	ND		83,000		33,000	
C4-H8 Alkene (5.80 RT)	ND		90,000		34,000	
Isopentene	ND		42,000		ND	
Cyclopentene	ND		41,000		33,000	
C6-H10 Alkene (13.0 RT)	ND		110,000		74,000	
C10-H12 Alkene (14.58 RT)	ND		92,000		71,000	
C10-H12 Alkene (14.63 RT)	ND		110,000		93,000	
3-Methyl-3-heptene	ND		27,000		29,000	
C8-H14 Alkene (16.96 RT)	ND		22,000		ND	
C8-H14 Alkene (16.89 RT)	ND		ND		31,000	
<b><i>Aldehydes</i></b>						
Formaldehyde	ND		ND		ND	
Acetaldehyde	1,200		ND		350	
Propionaldehyde	660		ND		140	

**Table 2**

Summary of analytical results for all compounds detected under the FML<sup>(1)</sup>  
Bridgeton Landfill

<i>Compounds/analytes</i>	<i>Concentrations in µg/m<sup>3</sup>(2)</i>					
	<i>Amphitheater</i>		<i>Second Tier</i>		<i>East Face</i>	
	<i>Stantec</i>	<i>MDNR<sup>(3)</sup></i>	<i>Stantec</i>	<i>MDNR</i>	<i>Stantec</i>	<i>MDNR</i>
Butyraldehyde	3,000		ND		1,500	
Benzaldehyde	2,300		140		990	
Isovaleraldehyde	ND		120		ND	
Valeraldehyde	ND		1,200		ND	
o-Tolualdehyde	ND		340		92	
2,5-Dimethyl-benzaldehyde	720		ND		960	
<b><i>Reduced Sulfur Compounds</i></b>						
Hydrogen sulfide	ND		27		ND	
Carbonyl sulfide	ND		150		150	
Methyl mercaptan	490		4,000		260	
Ethyl mercaptan	460		130		17	
Dimethyl sulfide	240,000		600,000		570,000	
Carbon disulfide	190		180		2,300	
Isopropyl mercaptan	210		170		ND	
t-Butyl mercaptan	380		29		ND	
Ethyl methyl sulfide	12,000		4,000		5,100	
Thiophene	11,000		5,000		19,000	
Isobutyl mercaptan	ND		420		ND	
n-Butyl mercaptan	2,100		710		1,400	
Dimethyl disulfide	4,100		20,000		54,000	
3-Methylthiophene	840		330		900	
Tetrahydrothiophene	ND		210		380	
2,5-Dimethylthiophene	ND		ND		800	

**Table 2**

Summary of analytical results for all compounds detected under the FML<sup>(1)</sup>  
Bridgeton Landfill

<i>Compounds/analytes</i>	<i>Concentrations in µg/m<sup>3(2)</sup></i>					
	<i>Amphitheater</i>		<i>Second Tier</i>		<i>East Face</i>	
	<i>Stantec</i>	<i>MDNR<sup>(3)</sup></i>	<i>Stantec</i>	<i>MDNR</i>	<i>Stantec</i>	<i>MDNR</i>
2-Ethylthiophene	ND		ND		840	
<b><i>Carboxylic Acids</i></b>						
Acetic Acid	11,000		ND		ND	
Propionic Acid	13,000		ND		9,200	
2-Methylpropionic Acid	12,000		ND		13,000	
Butanoic Acid	56,000		ND		41,000	
3-Methylbutanoic Acid	11,000		ND		9,000	
Pentanoic Acid	23,000		ND		3,800	
3-Methylpentanoic Acid	610		ND		ND	
4-Methylpentanoic Acid	1,100		ND		ND	
Hexanoic Acid	53,000		ND		1,200	
Heptanoic Acid	2,900		ND		ND	
2-Ethylhexanoic Acid	4,800		ND		1,800	
Octanoic Acid	690		ND		ND	
<b><i>PAHs</i></b>						
Naphthalene	35		7.9		13	
Acenaphthene	4.5		0.23		0.22	
Fluorene	3.4		0.2		0.18	
Phenanthrene	0.21		0.44		0.19	
Anthracene	0.19		0.022		0.041	
Fluoranthene	ND		0.019		0.026	
Pyrene	ND		0.021		0.016	

**Table 2**

Summary of analytical results for all compounds detected under the FML<sup>(1)</sup>  
Bridgeton Landfill

<i>Compounds/analytes</i>	<i>Concentrations in <math>\mu\text{g}/\text{m}^3</math><sup>(2)</sup></i>					
	<i>Amphitheater</i>		<i>Second Tier</i>		<i>East Face</i>	
	<i>Stantec</i>	<i>MDNR<sup>(3)</sup></i>	<i>Stantec</i>	<i>MDNR</i>	<i>Stantec</i>	<i>MDNR</i>
<i>TCDD TEQ</i>	1.52E-08		1.03E-08		3.00E-08	

**Footnotes**

- 1) FML - flexible membrane liner covering specific areas of the surface of the landfill
- 2)  $\mu\text{g}/\text{m}^3$  - micrograms per cubic meter
- 3) Missouri Department of Natural Resources
- 4) ND - not detected
- 5) Refer to Figure 1, Location of Samples, for location descriptions

**Table 3**  
 Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) detected under the FML<sup>(1)</sup>  
 Bridgeton Landfill

<i>ID</i> <sup>(2)</sup>	<i>Sample #</i>	<i>Date collected</i>	<i>Location/description</i>	<i>2,3,7,8-TCDD</i> (µg/m <sup>3</sup> )	<i>1,2,3,7,8-PeCDD</i> (µg/m <sup>3</sup> )	<i>1,2,3,4,7,8-HxCDD</i> (µg/m <sup>3</sup> )	<i>1,2,3,6,7,8-HxCDD</i> (µg/m <sup>3</sup> )	<i>1,2,3,7,8,9-HxCDD</i> (µg/m <sup>3</sup> )	<i>1,2,3,4,6,7,8-HpCDD</i> (µg/m <sup>3</sup> )	<i>OCDD</i> (µg/m <sup>3</sup> )	<i>2,3,7,8-TCDF</i> (µg/m <sup>3</sup> )
A/U	1425	8/17/2012	Amphitheater, under FML	ND <sup>(3)</sup>	ND	ND	ND	8.74E-09	8.14E-08	5.07E-07	2.34E-08
B/U	1422	8/17/2012	Second Tier of LF, under FML	ND	ND	ND	ND	ND	4.58E-08	1.61E-07	ND
C/U	1423	8/17/2012	East Face of Landfill, under FML	1.76E-08	ND	ND	ND	3.49E-08	6.11E-08	ND	1.53E-08

<i>ID</i>	<i>Sample #</i>	<i>Date collected</i>	<i>Location/description</i>	<i>2,3,4,7,8-PeCDF</i> (µg/m <sup>3</sup> )	<i>1,2,3,4,7,8-HxCDF</i> (µg/m <sup>3</sup> )	<i>1,2,3,6,7,8-HxCDF</i> (µg/m <sup>3</sup> )	<i>1,2,3,7,8,9-HxCDF</i> (µg/m <sup>3</sup> )	<i>2,3,4,6,7,8-HxCDF</i> (µg/m <sup>3</sup> )	<i>1,2,3,4,6,7,8-HpCDF</i> (µg/m <sup>3</sup> )	<i>1,2,3,4,7,8,9-HpCDF</i> (µg/m <sup>3</sup> )	<i>OCDF</i>
A/U	1425	8/17/2012	Amphitheater, under FML	1.41E-08	3.56E-08	1.53E-08	ND	ND	1.21E-07	ND	3.65E-07
B/U	1422	8/17/2012	Second Tier of LF, under FML	1.22E-08	3.41E-08	1.19E-08	ND	ND	9.90E-08	ND	4.23E-07
C/U	1423	8/17/2012	East Face of Landfill, under FML	ND	2.98E-08	1.57E-08	ND	ND	1.44E-07	ND	1.25E-06

<i>ID</i>	<i>Sample #</i>	<i>Date collected</i>	<i>Location/description</i>	<i>Total Tetra-dioxins</i>	<i>Total Penta-dioxins</i>	<i>Total Hexa-dioxins</i>	<i>Total Hepta-dioxins</i>	<i>Total Tetra-furans</i>	<i>Total Penta-furans</i>	<i>Total Hexa-furans</i>	<i>Total Hepta-furans</i>
A/U	1425	8/17/2012	Amphitheater, under FML	ND	8.57E-09	1.93E-08	8.14E-08	ND	3.76E-08	5.66E-08	1.21E-07
B/U	1422	8/17/2012	Second Tier of LF, under FML	ND	ND	ND	1.34E-07	ND	2.94E-08	6.16E-08	1.47E-07
C/U	1423	8/17/2012	East Face of Landfill, under FML	ND	ND	3.49E-08	1.22E-07	2.93E-08	3.18E-08	5.87E-08	ND

**Footnotes**

- 1) FML - flexible membrane liner covering specific areas of the surface of the landfill
- 2) ID is common location identifier. Each sample location is assigned a unique letter or combination of letters
- 3) ND - not detected

**Table 3**

Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) detected under the FML<sup>(1)</sup>  
Bridgeton Landfill

<i>ID<sup>(2)</sup></i>	<i>Sample #</i>	<i>Date collected</i>	<i>Location/description</i>	<i>1,2,3,7,8-PeCDF (µg/m3)</i>
A/U	1425	8/17/2012	Amphitheater, under FML	1.43E-08
B/U	1422	8/17/2012	Second Tier of LF, under FML	1.54E-08
C/U	1423	8/17/2012	East Face of Landfill, under FML	1.29E-08

<i>ID</i>	<i>Sample #</i>	<i>Date collected</i>	<i>Location/description</i>
A/U	1425	8/17/2012	Amphitheater, under FML
B/U	1422	8/17/2012	Second Tier of LF, under FML
C/U	1423	8/17/2012	East Face of Landfill, under FML

<i>ID</i>	<i>Sample #</i>	<i>Date collected</i>	<i>Location/description</i>
A/U	1425	8/17/2012	Amphitheater, under FML
B/U	1422	8/17/2012	Second Tier of LF, under FML
C/U	1423	8/17/2012	East Face of Landfill, under FML

**Footnotes**

- 1) FML - flexible membrane liner covering spe
- 2) ID is common location identifier. Each sam
- 3) ND - not detected



**Table 4**

Summary of analytical results for all compounds detected in ambient air <sup>(1)</sup> samples from the downwind locations and on the landfill  
Bridgeton Landfill

Compounds/analytes	RSL ind. <sup>(2)</sup>	RSL Res. <sup>(3)</sup>	OSHA PEL <sup>(4)</sup>	ACGIH TLV <sup>(5)</sup>	Concentrations in µg/m <sup>3(6)</sup>									
					Pond Center	Pond East	Pond West	Summit	Amphi- theater	East Fenceline #1	East Fenceline #2	South Fenceline #1	South Fenceline #2	Summit valley
<b>Volatile organic compounds</b>														
Propene	13,000	3,100	—	8.61E+05	1.6	1.8	2	ND <sup>(7)</sup>	ND	1.8	1.1	0.86	2.2	1.8
Dichlorofluoromethane	440	100	4.21E+06	4.21E+04	2.2	2.7	2.3	2.2	2.1	2.2	2.2	0.86	2.2	1.8
Ethanol	140,000	32,000	1.88E+06	1.88E+06	ND	ND	ND	ND	16	ND	12	ND	ND	8.5
Acetonitrile	260	63	6.72E+04	3.36E+04	0.82	ND	ND	ND	0.76	0.88	14	ND	1.9	ND
Acetone	140,000	32,000	2.38E+06	1.19E+06	17	18	13	13	14	11	ND	8.9	21	ND
Trichlorofluoromethane	3,100	730	5.62E+06	5.62E+06	1.2	1.4	1.3	1.3	1.1	1.1	1.1	1.1	ND	1.1
Methylene chloride	1,200	96	8.68E+04	1.74E+05	ND	ND	ND	ND	ND	0.94	0.79	ND	2.1	0.88
2-Butanone (MEK)	22,000	5,200	5.90E+05	5.90E+05	ND	ND	ND	ND	ND	ND	ND	ND	ND	11
Ethyl acetate	NA	NA	1.44E+06	1.44E+06	17	5	8.7	8	3.1	ND	ND	ND	ND	1.6
Tetrahydrofuran	8,800	2,100	5.90E+05	1.47E+05	2.7	2.6	3	ND	ND	2.5	1.2	ND	2	4.7
Benzene	1.6	0.31	3.19E+03	1.60E+03	10	10	16	ND	1.1	11	ND	1.5	6.1	6.2
Toluene	22,000	5,200	7.54E+05	7.54E+04	3.7	3.3	3.4	1.7	1.6	2	ND	1.1	2.6	1.6
n-Octane	NA	NA	2.34E+06	1.40E+06	ND	ND	0.98	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	47	9.4	6.78E+05	1.70E+05	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND
Ethylbenzene	4.9	0.97	4.34E+05	8.68E+04	0.72	0.83	0.91	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	440	100	4.34E+05	4.34E+05	1.5	1.7	3.2	ND	ND	ND	ND	ND	ND	ND
O-Xylene	440	100	4.34E+05	4.34E+05	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND
n-Nonane	880	210	1.05E+06	1.05E+06	ND	ND	0.87	ND	ND	ND	ND	ND	ND	ND
Alpha-Pinene	NA	NA	5.57E+05	1.11E+05	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND
d-Limonene	NA	NA	1.67E+05 (AIHA WEEL <sup>(8)</sup> )		0.99	ND	ND	ND	ND	ND	ND	ND	ND	ND

**Table 4**

Summary of analytical results for all compounds detected in ambient air <sup>(1)</sup> samples from the downwind locations and on the landfill  
Bridgeton Landfill

Compounds/analytes	RSL ind. <sup>(2)</sup>	RSL Res. <sup>(3)</sup>	OSHA PEL <sup>(4)</sup>	ACGIH TLV <sup>(5)</sup>	Concentrations in $\mu\text{g}/\text{m}^3$ <sup>(6)</sup>									
					Pond Center	Pond East	Pond West	Summit	Amphi- theater	East Fenceline #1	East Fenceline #2	South Fenceline #1	South Fenceline #2	Summit valley
<b>Tentatively Identified Compounds</b>														
Furan	NA	NA	---	---	3.4	4.7	ND	ND	ND	3.5	ND	ND	ND	13
Dimethyl sulfide	NA	NA	---	2.54E+04	4.5	4.4	2.8	ND	ND	5.2	ND	ND	ND	12
Methyl acetate	NA	NA	6.06E+05	6.06E+05	ND	ND	ND	ND	ND	ND	ND	ND	ND	10
2-Methylfuran	NA	NA	---	---	3.7	5.4	ND	ND	ND	3.9	ND	ND	ND	14
Methyl propionate	NA	NA	---	---	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.5
Methyl butyrate	NA	NA	---	---	ND	ND	ND	ND	ND	ND	ND	ND	ND	12
Isobutene	NA	NA	---	---	ND	2.9	ND	ND	ND	ND	ND	ND	ND	ND
C6-H10 Alkene (13.0 RT)	NA	NA	---	---	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6
Unidentified (9.41 RT)	NA	NA	---	---	4.1	4	3.3	ND	ND	3.1	ND	ND	ND	ND
Ethyl propionate	NA	NA	---	---	14	7.1	11	9.9	4.1	ND	ND	ND	ND	ND
Ethyl butyrate	NA	NA	---	---	14	8.4	11	9.7	5.9	3.9	ND	4.9	ND	4.5
Hexamethylcyclotrisiloxane	NA	NA	---	---	12	3.5	3.4	ND	ND	15	ND	ND	ND	ND
2-Ethyl-1-hexanol	NA	NA	---	---	3.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetic acid	NA	NA	2.46E+04	3.68E+04	ND	4.7	ND	ND	ND	ND	ND	ND	ND	ND
2-Butoxyethanol	NA	NA	2.42E+05	9.60E+04	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND
Isopentane	NA	NA	---	---	ND	ND	ND	ND	4.9	ND	ND	ND	ND	ND
<b>Aldehydes</b>														
Formaldehyde	0.94	0.19	9.21E+02	3.68E+02	6.3	6.2	6.2	6.1	ND	ND	ND	1.5	1.7	NS
Acetaldehyde	5.6	1.1	3.31E+04	4.50E+04	1.7	1.5	1.6	1.5	19	10	8.3	1.1	1.5	NS
Valeraldehyde	NA	NA	---	1.76E+05	0.47	0.62	0.46	ND	ND	ND	ND	ND	0.47	NS

**Table 4**

Summary of analytical results for all compounds detected in ambient air <sup>(1)</sup> samples from the downwind locations and on the landfill  
Bridgeton Landfill

Compounds/analytes	RSL ind. <sup>(2)</sup>	RSL Res. <sup>(3)</sup>	OSHA PEL <sup>(4)</sup>	ACGIH TLV <sup>(5)</sup>	Concentrations in $\mu\text{g}/\text{m}^3$ <sup>(6)</sup>									
					Pond Center	Pond East	Pond West	Summit	Amphi-theater	East Fenceline #1	East Fenceline #2	South Fenceline #1	South Fenceline #2	Summit valley
2,5-Dimethylbenzaldehyde	NA	NA	---	---	0.94	0.91	0.86	0.9	ND	ND	ND	ND	0.94	NS
<b>Reduced sulfur compounds</b>														
Dimethyl sulfide	NA	NA	---	1.93E+03	NS	NS	NS	NS	NS	19	NS	NS	33	NS
<b>PAHs</b>														
Naphthalene	0.36	0.072	5.24E+04	5.24E+04	NS	NS	NS	0.089	NS	0.029	NS	NS	NS	NS
Acenaphthene	NA	NA	---	---	NS	NS	NS	0.0076	NS	0.004	NS	NS	NS	NS
Fluorene	NA	NA	---	---	NS	NS	NS	0.0089	NS	0.0038	NS	NS	NS	NS
Phenanthrene	NA	NA	2.00E+02	2.00E+02	NS	NS	NS	0.023	NS	0.011	NS	NS	NS	NS
Fluoranthene	NA	NA	2.00E+02	2.00E+02	NS	NS	NS	0.004	NS	0.0021	NS	NS	NS	NS
Pyrene	NA	NA	2.00E+02	2.00E+02	NS	NS	NS	0.002	NS	ND	NS	NS	NS	NS
<b>TCDD TEQ <sup>(9)</sup></b>	3.20E-07	6.40E-08	2.0E-04 (Leung HW <sup>(10)</sup> )		--	--	--	1.49E-08	--	7.88E-09	--	--	--	--

**Footnotes**

- 1) Ambient air samples are collected in open air, as opposed to from sources such as under the FML
- 2) RSL Ind. U.S. Regional Risk-based Screening Level for industrial/commercial reference
- 3) RSL Res. U.S. Regional Risk-based Screening Level for residential reference
- 4) U.S. Occupational Safety and Health Administration Permissible Exposure Limit
- 5) American Conference of Governmenta Industrial Hygienists Threshold Limit Value
- 6)  $\mu\text{g}/\text{m}^3$  - micrograms per cubic meter
- 7) ND - not detected
- 8) American Industrial Hygiene Association Workplace Environmental Exposure Level

**Table 4**

Summary of analytical results for all compounds detected in ambient air <sup>(1)</sup> samples from the downwind locations and on the landfill  
Bridgeton Landfill

<i>Compounds/analytes</i>	<i>RSL ind.<sup>(2)</sup></i>	<i>RSL Res.<sup>(3)</sup></i>	<i>OSHA PEL<sup>(4)</sup></i>	<i>ACGIH TLV<sup>(5)</sup></i>	<i>Concentrations in µg/m<sup>3(6)</sup></i>									
					<i>Pond Center</i>	<i>Pond East</i>	<i>Pond West</i>	<i>Summit</i>	<i>Amphi- theater</i>	<i>East Fenceline #1</i>	<i>East Fenceline #2</i>	<i>South Fenceline #1</i>	<i>South Fenceline #2</i>	<i>Summit valley</i>

9) U.S. EPA recommended 2,3,7,8-TCDD Toxicity Equivalent Concentration (TEQ) using the Toxicity Equivalence Factors (TEFs) (U.S. EPA, December 2010), see also Table 5

10) Lueng HW et al, Am Ind Hyg Assoc J, 1988

**Table 5**

Individual polychlorinated dibenzo-p-dioxin and dibenzofuran (PCDD/PCDF) isomers and conversion to 2, 3, 7, 8-TCDD toxicity equivalents (TEQs); on landfill and downwind  
Bridgeton Landfill

<i>Analyte</i>	<i>TEF<sup>(3)</sup></i>	<i>Concentrations in ambient air<sup>(1)</sup> on Landfill, in <math>\mu\text{g}/\text{m}^3</math><sup>(2)</sup></i>			
		<i>Summit</i>		<i>East Fenceline #1</i>	
		<i>Measured</i>	<i>TEQ<sup>(4)</sup></i>	<i>Measured</i>	<i>TEQ</i>
2378-TCDD	1	3.58E-09	3.58E-09	ND	NA
12378-PeCDD	1	5.2E-09	5.2E-09	3.62E-09	3.62E-09
123478-HxCDD	0.1	ND	NA	2.66E-09	2.66E-10
123678-HxCDD	0.1	3.98E-09	3.98E-10	6.07E-09	6.07E-10
123789-HxCDD	0.1	6.35E-09	6.35E-10	8.4E-09	8.4E-10
1234678-HpCDD	0.01	3.87E-08	3.87E-10	3.84E-08	3.84E-10
OCDD	0.0003	1.96E-07	5.88E-11	1.57E-07	4.71E-11
2378-TCDF	0.1	1.80E-08	1.8E-09	6.64E-09	6.64E-10
12378-PeCDF	0.03	4.19E-09	1.257E-10	ND	NA
23478-PeCDF	0.3	4.14E-09	1.242E-09	ND	NA
123478-HxCDF	0.1	6.60E-09	6.6E-10	8.64E-09	8.64E-10
123678-HxCDF	0.1	4.89E-09	4.89E-10	2.88E-09	2.88E-10
123789-HxCDF	0.1	ND	NA	ND	NA
234678-HxCDF	0.1	ND	NA	ND	NA
1234678-HpCDF	0.01	2.70E-08	2.7E-10	2.71E-08	2.71E-10
1234789-HpCDF	0.01	ND	NA	ND	NA
OCDF	0.0003	1.09E-07	3.27E-11	8.70E-08	2.61E-11
<b>Total TEQ</b>			<b>1.49E-08</b>		<b>7.88E-09</b>

US EPA, Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010

#### Footnotes

- 1) Ambient air samples are collected in open air, as opposed to from sources such as under the FML
- 2)  $\mu\text{g}/\text{m}^3$  - micrograms per cubic meter
- 3) TEF - Toxicity Equivalence Factor
- 4) TEQ - Toxicity Equivalent Concentration

**Table 6**  
Summary of analytical results for all compounds detected in at least one upwind/background sample  
Bridgeton Landfill

Compounds/analytes	RSL ind. <sup>(2)</sup>	RSL Res. <sup>(3)</sup>	OSHA PEL <sup>(4)</sup>	ACGIH TLV <sup>(5)</sup>	Concentrations in $\mu\text{g}/\text{m}^3$ <sup>(1)</sup>					
					Grassy Knoll Center (1)	Grassy Knoll Center (2)	Grassy Knoll West (1)	Grassy Knoll West (2)	Grassy Knoll North (1)	Grassy Knoll North (2)
<b>Volatile organic compounds</b>										
Dichlorofluoromethane	440	100	4.21E+06	4.21E+06	2.1	2.1	2.2	2.2	2.2	2.2
Acetonitrile	260	63	6.72E+04	3.36E+04	ND <sup>(6)</sup>	0.78	ND	ND	ND	0.88
Acetone	140,000	32,000	2.86E+06	1.19E+06	12	ND	13	ND	21	ND
Trichlorofluoromethane	3,100	730	5.62E+06	5.62E+06	1.1	1.1	1.2	1.1	1.1	1.1
Ethyl acetate	NA	NA	1.44E+06	1.44E+06	2.6	ND	3	ND	2.7	ND
Toluene	22,000	5,200	7.54E+5	7.54E+04	1	ND	1.4	ND	1.1	ND
Tetrachloroethene	47	9.4	6.78E+05	1.70E+05	1.4	ND	ND	1.8	ND	ND
<b>Tentatively Identified Compounds</b>										
Unidentified (9.41 RT)	NA	NA	---	---	3.3	ND	ND	ND	4.6	ND
Ethyl propionate	NA	NA	---	---	5	ND	4.7	ND	5.2	ND
Ethyl butyrate	NA	NA	---	---	7.6	5.4	6.5	ND	7.9	ND
Hexamethylcyclotrisiloxane	NA	NA	---	---	3.3	ND	ND	ND	12	ND
Acetic acid	NA	NA	2.46E+4	3.68E+04	ND	ND	3.7	ND	ND	ND
<b>Aldehydes</b>										
Benzaldehyde	NA	NA	8.69E+03		ND	ND	ND	ND	3.4	ND
Formaldehyde	0.94	0.19	9.21E+02	3.68E+02	ND	2.9	ND	3.1	ND	3.2
Acetaldehyde	5.6	1.1	3.31E+04	4.50E+04	17	1.3	19	1.2	18	1.2
2,5-Dimethylbenzaldehyde	NA	NA	---	1.76E+05	ND	0.41	ND	0.51	ND	0.81
<b>TCDD TEQ</b>	3.20E-07	6.40E-08	2.0E-04 (Leung HW <sup>(7)</sup> )		1.94E-08	--	--	--	--	--

**Footnotes**

- 1)  $\mu\text{g}/\text{m}^3$  - micrograms per cubic meter
- 2) RSL Ind. U.S. Regional Risk-based Screening Level for industrial/commercial reference
- 3) RSL Res. U.S. Regional Risk-based Screening Level for residential reference
- 4) U.S. Occupational Safety and Health Administration Permissible Exposure Limit
- 5) American Conference of Governmental Industrial Hygienists Threshold Limit Value
- 6) ND - not detected
- 7) U.S. EPA recommended 2,3,7,8-TCDD Toxicity Equivalent Concentration (TEQ) using the Toxicity Equivalence Factors (TEFs) (U.S. EPA, December 2010), see also Table 5
- 8) Lueng HW et al, Am Ind Hyg Assoc J, 1988

**Table 7**

Individual polychlorinated dibenzo-p-dioxin and dibenzofuran (PCDD/PCDF) isomers and conversion to 2, 3, 7, 8-TCDD toxicity equivalents (TEQs); in upwind samples  
Bridgeton Landfill

<i>Analyte</i>	<i>TEF</i>	<i>Concentrations in ambient air<sup>(1)</sup> on Landfill, in µg/m<sup>3</sup><sup>(2)</sup></i>	
		<i>Grassy Knoll Center</i>	
		<i>Measured</i>	<i>TEQ</i>
2378-TCDD	1	ND	NA
12378-PeCDD	1	7.51E-09	7.51E-09
123478-HxCDD	0.1	4.85E-09	4.85E-10
123678-HxCDD	0.1	4.33E-09	4.33E-10
123789-HxCDD	0.1	1.08E-08	1.08E-09
1234678-HpCDD	0.01	4.11E-08	4.11E-10
OCDD	0.0003	1.39E-07	4.17E-11
2378-TCDF	0.1	2.65E-08	2.65E-09
12378-PeCDF	0.03	8.53E-09	2.559E-10
23478-PeCDF	0.3	9.90E-09	2.97E-09
123478-HxCDF	0.1	1.64E-08	1.64E-09
123678-HxCDF	0.1	9.18E-09	9.18E-10
123789-HxCDF	0.1	ND	NA
234678-HxCDF	0.1	6.52E-09	6.52E-10
1234678-HpCDF	0.01	3.02E-08	3.02E-10
1234789-HpCDF	0.01	ND	NA
OCDF	0.0003	1.16E-07	3.48E-11
<b>Total TEQ</b>			<b>1.94E-08</b>

**Footnotes**

- 1) Ambient air samples are collected in open air, as opposed to from sources such as under the FML
- 2) µg/m<sup>3</sup> - micrograms per cubic meter
- 3) TEF - Toxicity Equivalence Factor

**Table 7**

Individual polychlorinated dibenzo-p-dioxin and dibenzofuran (PCDD/PCDF) isomers and conversion to 2, 3, 7, 8-TCDD toxicity equivalents (TEQs); in upwind samples  
Bridgeton Landfill

4) TEQ - Toxicity Equivalent Concentration



**Table 8**

Summary of compounds detected under the FML with associated odor thresholds, and concentrations detected in downwind and landfill ambient air samples  
Bridgeton Landfill

<i>Compounds/analytes</i>	<i>Odor Threshold</i>	<i>Concentration, in <math>\mu\text{g}/\text{m}^3</math> <sup>(8)</sup></i>			<i>Characterization of Odor</i>
		<i>Laboratory MRL <sup>(7)</sup> (range)</i>	<i>Concentration detected in landfill and downwind ambient air samples (range) <sup>6</sup></i>		
<b><i>Volatile Organic Compounds</i></b>					
Propene	39,584 <sup>(3)</sup>	0.69 - 1.4	1.1 - 2.2		Grassy, aromatic
Chloromethane	NP <sup>(4)</sup>	0.69 - 1.4	ND <sup>(5)</sup>		Ether
1,3-Butadiene	220 <sup>(1)</sup>	0.69 - 1.4	ND		Aromatic, rubber
Chloroethane	NP	0.69 - 1.4	ND		
Ethanol	342 <sup>(2)</sup>	0.69 - 1.4	8.5 - 16		Sweet alcohol
Acetone	47,500 <sup>(2)</sup>	0.69 - 1.4	8.9 - 21		Sweet minty, chemical
2-Propanol	105,697 <sup>(3)</sup>	0.69 - 1.4	ND		Rubbing alcohol
2-Butanone (MEK)	750 <sup>(1)</sup>	0.69 - 1.4	11		Sweet
Ethyl acetate	1.0 <sup>(1)</sup>	1.4 - 2.8	1.6 - 17		Fruity, pleasant
n-Hexane	NP <sup>(3)</sup>	0.69 - 1.4	ND		Gasoline
Tetrahydrofuran	7,375 <sup>(2)</sup>	0.69 - 1.4	1.2 - 4.7		Ether-like
Benzene	4,500 <sup>(2)</sup>	0.69 - 1.4	1.1 - 16		Sweet solvent
Cyclohexane	1,435 <sup>(2)</sup>	1.4 - 2.8	ND		Sweet aromatic
1,4-Dioxane	10.8 <sup>(2)</sup>	0.69 - 1.4	ND		Ether-like
n-Heptane	200,000 <sup>(2)</sup>	0.69 - 1.4	ND		Gasoline
4-methyl-2-pentanone	410 <sup>(2)</sup>	0.69 - 1.4	ND		Sweet, sharp
Toluene	1,000 <sup>(1)</sup>	0.69 - 1.4	1.1 - 3.7		Rubbery mothballs
2-Hexanone	NP	0.69 - 1.4	ND		Sweet, paint
n-Butyl acetate	2,993 <sup>(3)</sup>	0.69 - 1.4	ND		Sweet banana
n-Octane	725,000 <sup>(2)</sup>	0.69 - 1.4	0.98		Gasoline
Chlorobenzene	980 <sup>(2)</sup>	0.69 - 1.4	ND		Almond-like, shoe polish
Ethylbenzene	400 <sup>(1)</sup>	0.69 - 1.4	0.72 - 0.91		Oily solvent
m,p-Xylenes	1,000 <sup>(1)</sup>	0.69 - 1.4	1.5 - 3.2		
O-Xylene	1,000 <sup>(1)</sup>	0.69 - 1.4	1.1		
Styrene	430 <sup>(2)</sup>	0.69 - 1.4	ND		Solvent, rubbery
n-Nonane	3,412,500 <sup>(2)</sup>	0.69 - 1.4	0.87		
Cumene	39.2 <sup>(2)</sup>	0.69 - 1.4	ND		Sharp
Alpha-Pinene	NP	0.69 - 1.4	1.1		
n-Propylbenzene	NP	0.69 - 1.4	ND		
4-Ethyltoluene	NP	0.69 - 1.4	ND		
1,3,5-Trimethylbenzene	10,815 <sup>(3)</sup>	0.69 - 1.4	ND		
1,2,4-Trimethylbenzene	11,798 <sup>(3)</sup>	0.69 - 1.4	ND		
1,4-Dichlorobenzene	722 <sup>(3)</sup>	0.69 - 1.4	ND		Mothballs
d-Limonene	NP	0.69 - 1.4	0.99		Citrus

**Table 8**

Summary of compounds detected under the FML with associated odor thresholds, and concentrations detected in downwind and landfill ambient air samples  
Bridgeton Landfill

<i>Compounds/analytes</i>	<i>Odor Threshold</i>	<i>Concentration, in <math>\mu\text{g}/\text{m}^3</math> <sup>(8)</sup></i>		<i>Characterization of Odor</i>
		<i>Laboratory MRL <sup>(7)</sup> (range)</i>	<i>Concentration detected in landfill and downwind ambient air samples (range) <sup>6</sup></i>	
Naphthalene	50 <sup>(1)</sup>	0.69 - 1.4	ND	Mothballs
<b><i>Tentatively Identified Compounds</i></b>				
Furan	NP	NA	3.4 - 13	
Dimethyl sulfide	2.5 <sup>(2)</sup>	NA	2.8 - 12	Decayed cabbage
Methyl acetate	412 <sup>(2)</sup>	NA	10	Sweet ester
2-Methylfuran	90,450 <sup>(2)</sup>	NA	3.7 - 14	
Methyl propionate	NP	NA	5.5	
1-Butanol	2,638 <sup>(3)</sup>	NA	ND	Sweet alcohol
2-Pentanone	27,125 <sup>(3)</sup>	NA	ND	
Methyl butyrate	52.8 <sup>(2)</sup>	NA	12	Body odor
Dimethyl disulfide	0.1 <sup>(2)</sup>	5.2 - 7.5	ND	
2-Methyl cyclopentanone	NP	NA	ND	
Methyl hexanoate	NP	NA	ND	
2-Ethyl cyclopentanone	NP	NA	ND	
n-Decane	NP	NA	ND	
p-Isopropyltoluene	NP	NA	ND	
n-Undecane	NP	NA	ND	
Dimethyl ether	NP	NA	ND	
Isobutene	NP	NA	2.9	
n-Butane	NP	NA	ND	
C4-H8 Alkene (5.51 RT)	NP	NA	ND	
C4-H8 Alkene (5.80 RT)	NP	NA	ND	
Isopentene	NP	NA	ND	
Cyclopentene	NP	NA	ND	
C6-H10 Alkene (13.0 RT)	NP	NA	4.6	
C10-H12 Alkene (14.58 RT)	NP	NA	ND	
C10-H12 Alkene (14.63 RT)	NP	NA	ND	
3-Methyl-3-heptene	NP	NA	ND	
C8-H14 Alkene (16.96 RT)	NP	NA	ND	
C8-H14 Alkene (16.89 RT)	NP	NA	ND	
<b><i>Aldehydes</i></b>				
Acetaldehyde	0.2 <sup>(2)</sup>	0.32 - 0.70	1.1 - 19	
Propionaldehyde	10 <sup>(1)</sup>	0.32 - 0.70	ND	

**Table 8**

Summary of compounds detected under the FML with associated odor thresholds, and concentrations detected in downwind and landfill ambient air samples  
Bridgeton Landfill

<i>Compounds/analytes</i>	<i>Odor Threshold</i>	<i>Concentration, in <math>\mu\text{g}/\text{m}^3</math> <sup>(8)</sup></i>		<i>Characterization of Odor</i>
		<i>Laboratory MRL <sup>(7)</sup> (range)</i>	<i>Concentration detected in landfill and downwind ambient air samples (range) <sup>6</sup></i>	
Butyraldehyde	13.6 <sup>(2)</sup>	0.32 - 0.70	ND	
Benzaldehyde	8 <sup>(2)</sup>	0.32 - 0.70	ND	
Isovaleraldehyde	NP	0.32 - 0.70	ND	
Valeraldehyde	NP	0.32 - 0.70	0.47 - 0.62	Decayed, rancid
o-Tolualdehyde	NP	0.65 - 1.4	ND	
2,5-Dimethylbenzaldehyde	NP	0.32 - 0.70	0.86 - 0.94	
<b>Reduced Sulfur Compounds</b>				
Hydrogen sulfide	0.7 <sup>(2)</sup>	7	ND	Rotten eggs
Carbonyl sulfide	24.3 <sup>(2)</sup>	12	ND	
Methyl mercaptan	0.04 <sup>(2)</sup>	9.8	ND	Sulfide-like
Ethyl mercaptan	0.0032 <sup>(2)</sup>	13	ND	Garlic
Dimethyl sulfide	2.5 <sup>(2)</sup>	13	19 - 33	Decayed cabbage
Carbon disulfide	24.3 <sup>(2)</sup>	7.8	ND	Disagreeable
Isopropyl mercaptan	0.2 <sup>(2)</sup>	16	ND	
t-Butyl mercaptan	1.6 <sup>(2)</sup>	18	ND	
Ethyl methyl sulfide	48.7 <sup>(2)</sup>	16	ND	
Thiophene	2.6 <sup>(2)</sup>	17	ND	Aromatic
Isobutyl mercaptan	2.0 <sup>(2)</sup>	18	ND	
n-Butyl mercaptan	1.6 <sup>(2)</sup>	18	ND	
Dimethyl disulfide	0.1 <sup>(2)</sup>	9.6	ND	
3-Methylthiophene	NP	20	ND	
Tetrahydrothiophene	NP	18	ND	
2,5-Dimethylthiophene	NP	23	ND	
2-Ethylthiophene	NP	23	ND	
<b>Carboxylic Acid Compounds</b>				
Acetic Acid	2,500 <sup>(2)</sup>	20	ND	Sour, vinegar
Propionic Acid	200 <sup>(3)</sup>	2.4	ND	Sour
2-Methylpropionic Acid	NP	2.5	ND	
Butanoic Acid	1.0 <sup>(2)</sup>	2.4	ND	Sour, perspiration
3-Methylbutanoic Acid	52.8 <sup>(2)</sup>	2.4	ND	Body odor
Pentanoic (Valeric) Acid	2.6 <sup>(2)</sup>	2.5	ND	
3-Methylpentanoic Acid	NP	2.5	ND	
4-Methylpentanoic Acid	NP	2.5	ND	
Hexanoic (Caproic) Acid	NP	2.5	ND	

**Table 8**

Summary of compounds detected under the FML with associated odor thresholds, and concentrations detected in downwind and landfill ambient air samples  
Bridgeton Landfill

<i>Compounds/analytes</i>	<i>Odor Threshold</i>	<i>Concentration, in <math>\mu\text{g}/\text{m}^3</math> <sup>(8)</sup></i>		<i>Characterization of Odor</i>
		<i>Laboratory MRL <sup>(7)</sup> (range)</i>	<i>Concentration detected in landfill and downwind ambient air samples (range) <sup>6</sup></i>	
Heptanoic Acid	NP	2.4	ND	
2-Ethylhexanoic Acid	NP	2.5	ND	
Octanoic (Caprylic) Acid	NP	2.4	ND	
<b>PAHs</b>				
Naphthalene	50 <sup>(1)</sup>	0.011 - 0.015	0.029 - 0.089	Mothballs
Acenaphthene	505 <sup>(2)</sup>	0.011 - 0.015	0.004 - 0.0076	
Fluorene	6,000 <sup>(2)</sup>	0.011 - 0.015	0.0038 - 0.0089	
Phenanthrene	NP	0.011 - 0.015	0.011 - 0.023	
Anthracene	NP	0.011 - 0.015	ND	
Fluoranthene	NP	0.011 - 0.015	0.0021 - 0.004	
Pyrene	NP	0.011 - 0.015	0.002	
TCDD TEQ <sup>(10)</sup>	NP	NA <sup>(9)</sup>	7.88E-09 - 1.49E-08	

**Footnotes**

- 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
- 4) NP - not published
- 5) ND - not detected
- 6) Does not include samples where the compound was undetected (ND)
- 7) MRL - Minimum Reporting Limit
- 8)  $\mu\text{g}/\text{m}^3$  - micrograms per cubic meter
- 9) NA - not available
- 10) U.S. EPA recommended 2,3,7,8-TCDD Toxicity Equivalent Concentration (TEQ) using the Toxicity Equivalence Factors (TEFs) (U.S. EPA, December 2010), see also Table 5
- 11) Odor descriptions for the individual compounds as given in the source reference

## **Figures**



**Legend**

**Air Sampling Locations**

**Sample Type**

- + Ambient on Landfill
- Ambient Downwind
- Ambient Upwind
- ▲ Landfill Gas under FML



**Stantec**

**Bridgeton Landfill, LLC**

13570 St. Charles Rock Road, Bridgeton, MO 63044



## **Photographs**

**Bridgeton Landfill Air and Landfill Gas Sampling  
August 2012**

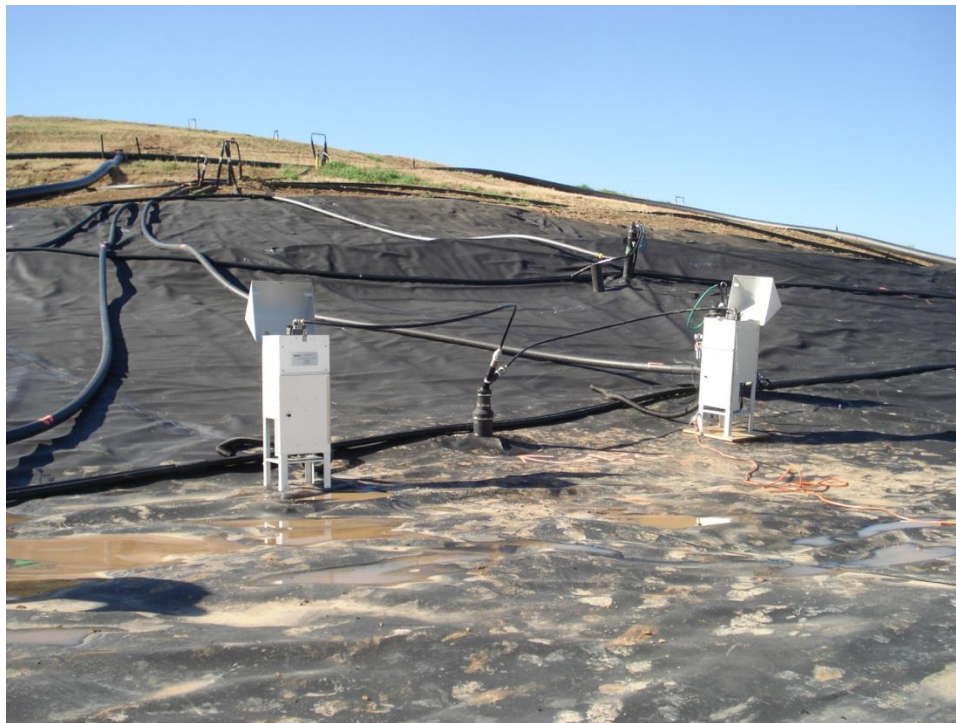
**PHOTOGRAPHS**





**Figure 1**

Stantec and MDNR personnel collecting VOC samples from one of the sampling ports beneath the FML.



**Figure 2**

High volume sampling of source gas from under the FML on the amphitheater, second tier, and east face



**Figure 3**

High volume sampling of source gas from under the FML on the second tier



**Figure 4**

High volume sampling of source gas from under the FML on the east face





**Figure 5**

Apparatus used to collect ambient air or source gas for PAH and Dioxin/Dibenzofuran analysis



**Figure 6**

Apparatus used to collect ambient air or source gas for PAH and Dioxin/Dibenzofuran analysis



**Figure 7**

Apparatus used to collect ambient air or source gas for PAH and Dioxin/Dibenzofuran analysis



**Figure 8**

Ambient air sample collection structures and pump assemblies





**Figure 9**

Ambient air sample collection structures and pump assemblies



**Figure 10**  
Ambient air sample collection structures and pump assemblies

## LABORATORY REPORT

September 5, 2012

John Reiter  
Stantec Consulting Services, Inc.  
12075 Corporate Pkwy, Ste. 200  
Mequon, WI 53092

**RE: 182608005**

Dear John:

Enclosed are the results of the samples submitted to our laboratory on August 24, 2012. For your reference, these analyses have been assigned our service request number P1203486.

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.caslab.com](http://www.caslab.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

**ALS | Environmental**

Samantha Henningsen  
Project Manager

Client: Stantec Consulting Services, Inc.  
Project: 182608005

Service Request No: P1203486

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### CASE NARRATIVE

The samples were received intact under chain of custody on August 24, 2012 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 samples were analyzed for aldehydes according to EPA Method TO-11A using high performance liquid chromatography (HPLC).

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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 Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of Columbia Analytical Services, Inc. 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 AALS 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.*



DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: 182608005

Service Request: P1203486

Date Received: 8/24/2012  
 Time Received: 09:45

TO-11A - Carbonyls

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	TO-11A - Carbonyls
1309	P1203486-001	Air	8/21/2012	00:00	X
1317	P1203486-002	Air	8/21/2012	00:00	X
1325	P1203486-003	Air	8/21/2012	00:00	X
1330	P1203486-004	Air	8/21/2012	00:00	X
1342	P1203486-005	Air	8/21/2012	00:00	X
1345	P1203486-006	Air	8/21/2012	00:00	X
1355	P1203486-007	Air	8/21/2012	00:00	X
1358	P1203486-008	Air	8/21/2012	00:00	X
1373	P1203486-009	Air	8/21/2012	00:00	X
1383	P1203486-010	Air	8/21/2012	00:00	X
1392	P1203486-011	Air	8/21/2012	00:00	X
1396	P1203486-012	Air	8/21/2012	00:00	X
1401	P1203486-013	Air	8/21/2012	00:00	X
1410	P1203486-014	Air	8/21/2012	00:00	X
1418	P1203486-015	Air	8/21/2012	00:00	X
1425	P1203486-016	Air	8/21/2012	00:00	X
1432	P1203486-017	Air	8/21/2012	00:00	X
1438	P1203486-018	Air	8/21/2012	00:00	X
1441	P1203486-019	Air	8/21/2012	00:00	X
1442	P1203486-020	Air	8/21/2012	00:00	X

P1203486



Stantec Consulting Services, Inc.  
12075 Corporate Parkway, Suite 200  
Mequon, Wisconsin 53092

Date: Tuesday, August 21, 2012

Project number: 182608005  
(262) 643-9154  
(262) 241-4901 fax

Please email sample results to:  
John Reiter, CIH  
john.reiter@stantec.com


Laboratory/Sample Transmittal - Analysis Request

<b>To:</b> Columbia Analytical Services 2655 Park Center Drive, Suite A Simi Valley, California 93065 <b>Attention:</b> Samantha Henningsen	<b>Services requested:</b> Evaluation of the enclosed samples as requested below  <b>Project No. 182608005</b>
--	--

Sample #	Compound/parameter/contaminant	Duration (minutes)	Volume (liters)	Special instructions
1309	Aldehydes	228	273.6	EPA TO-11A
1317	Aldehydes	231	277.2	
1325	Aldehydes	236	283.2	
1330	Aldehydes	248	297.6	
1342	Aldehydes	119	142.8	
1345	Aldehydes	186	223.2	
1355	Aldehydes	183	219.6	
1358	Aldehydes	180	216.0	
1373	Aldehydes	212	254.4	
1383	Aldehydes	207	248.4	
1392	Aldehydes	199	238.8	
1396	Aldehydes	174	208.8	
1401	Aldehydes	256	307.2	
1410	Aldehydes	258	309.6	
1418	Aldehydes	254	304.8	
1425	Aldehydes	1	1.2	
1432	Aldehydes	1	1.2	
1438	Aldehydes	1	1.2	
1441	Aldehydes	—	—	Field blank
1442	Aldehydes	—	—	Field blank

Routine handling

Please contact our office with email results by:  
Wednesday, September 5, 2012

  
signed: John E. Reiter, CIH, Stantec

Wtanner still in 0935  
21°C bottle

**Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc. Work order: P1203486

Project: 182608005

Sample(s) received on: 8/24/12 Date opened: 8/24/12 by: MZAMORA

**Note:** This form is used for all samples received by CAS. 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.

- |    |   | <u>Yes</u>                          | <u>No</u>                           | <u>N/A</u>                          |
|----|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 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 CAS</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: 21° C Blank Temperature: ° C | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
|    | <b>Gel Packs</b>  |                                     |                                     |                                     |
| 9  | Was a <b>blank</b> received?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 10 | Were <b>custody seals</b> on outside of cooler/Box?<br>Location of seal(s)? _____ Sealing Lid?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input 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"/> |
|    | Were custody seals on outside of sample container?<br>Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input 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
P1203486-001.01	Silica Gel DNPH Tube					
P1203486-002.01	Silica Gel DNPH Tube					
P1203486-003.01	Silica Gel DNPH Tube					
P1203486-004.01	Silica Gel DNPH Tube					
P1203486-005.01	Silica Gel DNPH Tube					
P1203486-006.01	Silica Gel DNPH Tube					
P1203486-007.01	Silica Gel DNPH Tube					
P1203486-008.01	Silica Gel DNPH Tube					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 The times of sample collection were not indicated on the COC. \_\_\_\_\_



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1309  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-001

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 273.6 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	1,700	<b>6.3</b>	0.37	<b>5.1</b>	0.30	
75-07-0	Acetaldehyde	470	<b>1.7</b>	0.37	<b>0.95</b>	0.20	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.37	ND	0.15	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.37	ND	0.13	
123-72-8	Butyraldehyde	< 100	ND	0.37	ND	0.12	
100-52-7	Benzaldehyde	< 100	ND	0.37	ND	0.084	
590-86-3	Isovaleraldehyde	< 100	ND	0.37	ND	0.10	
110-62-3	Valeraldehyde	130	<b>0.47</b>	0.37	<b>0.13</b>	0.10	
529-20-4	o-Tolualdehyde	< 100	ND	0.37	ND	0.074	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.73	ND	0.15	
66-25-1	n-Hexaldehyde	< 100	ND	0.37	ND	0.089	
5779-94-2	2,5-Dimethylbenzaldehyde	260	<b>0.94</b>	0.37	<b>0.17</b>	0.067	

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RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1317  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-002

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 277.2 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	1,700	<b>6.2</b>	0.36	<b>5.1</b>	0.29	
75-07-0	Acetaldehyde	430	<b>1.5</b>	0.36	<b>0.86</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	< 100	ND	0.36	ND	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	170	<b>0.62</b>	0.36	<b>0.18</b>	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	0.088	
5779-94-2	2,5-Dimethylbenzaldehyde	250	<b>0.91</b>	0.36	<b>0.17</b>	0.066	

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

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RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1325  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-003

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
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	1,800	<b>6.2</b>	0.35	<b>5.1</b>	0.29	
75-07-0	Acetaldehyde	470	<b>1.6</b>	0.35	<b>0.91</b>	0.20	<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	< 100	ND	0.35	ND	0.081	
590-86-3	Isovaleraldehyde	< 100	ND	0.35	ND	0.10	
110-62-3	Valeraldehyde	130	<b>0.46</b>	0.35	<b>0.13</b>	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	240	<b>0.86</b>	0.35	<b>0.16</b>	0.064	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1330  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-004

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 297.6 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	1,800	<b>6.1</b>	0.34	<b>5.0</b>	0.27	
75-07-0	Acetaldehyde	440	<b>1.5</b>	0.34	<b>0.81</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	< 100	ND	0.34	ND	0.11	
100-52-7	Benzaldehyde	< 100	ND	0.34	ND	0.077	
590-86-3	Isovaleraldehyde	< 100	ND	0.34	ND	0.095	
110-62-3	Valeraldehyde	< 100	ND	0.34	ND	0.095	
529-20-4	o-Tolualdehyde	< 100	ND	0.34	ND	0.068	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.67	ND	0.14	
66-25-1	n-Hexaldehyde	< 100	ND	0.34	ND	0.082	
5779-94-2	2,5-Dimethylbenzaldehyde	270	<b>0.90</b>	0.34	<b>0.16</b>	0.061	

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RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1342  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-005

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 142.8 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	< 100	ND	0.70	ND	0.57	
75-07-0	Acetaldehyde	2,700	<b>19</b>	0.70	<b>11</b>	0.39	
123-38-6	Propionaldehyde	< 100	ND	0.70	ND	0.29	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.70	ND	0.24	
123-72-8	Butyraldehyde	< 100	ND	0.70	ND	0.24	
100-52-7	Benzaldehyde	< 100	ND	0.70	ND	0.16	
590-86-3	Isovaleraldehyde	< 100	ND	0.70	ND	0.20	
110-62-3	Valeraldehyde	< 100	ND	0.70	ND	0.20	
529-20-4	o-Tolualdehyde	< 100	ND	0.70	ND	0.14	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	1.4	ND	0.29	
66-25-1	n-Hexaldehyde	< 100	ND	0.70	ND	0.17	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.70	ND	0.13	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1345  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-006

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 223.2 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	< 100	ND	0.45	ND	0.36	
75-07-0	Acetaldehyde	3,800	<b>17</b>	0.45	<b>9.3</b>	0.25	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.45	ND	0.19	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.45	ND	0.16	
123-72-8	Butyraldehyde	< 100	ND	0.45	ND	0.15	
100-52-7	Benzaldehyde	< 100	ND	0.45	ND	0.10	
590-86-3	Isovaleraldehyde	< 100	ND	0.45	ND	0.13	
110-62-3	Valeraldehyde	< 100	ND	0.45	ND	0.13	
529-20-4	o-Tolualdehyde	< 100	ND	0.45	ND	0.091	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.90	ND	0.18	
66-25-1	n-Hexaldehyde	< 100	ND	0.45	ND	0.11	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.45	ND	0.082	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1355  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-007

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 219.6 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	< 100	ND	0.46	ND	0.37	
75-07-0	Acetaldehyde	4,200	<b>19</b>	0.46	<b>11</b>	0.25	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.46	ND	0.19	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.46	ND	0.16	
123-72-8	Butyraldehyde	< 100	ND	0.46	ND	0.15	
100-52-7	Benzaldehyde	< 100	ND	0.46	ND	0.10	
590-86-3	Isovaleraldehyde	< 100	ND	0.46	ND	0.13	
110-62-3	Valeraldehyde	< 100	ND	0.46	ND	0.13	
529-20-4	o-Tolualdehyde	< 100	ND	0.46	ND	0.093	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.91	ND	0.19	
66-25-1	n-Hexaldehyde	< 100	ND	0.46	ND	0.11	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.46	ND	0.083	

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RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1358  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-008

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 216.0 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	< 100	ND	0.46	ND	0.38	
75-07-0	Acetaldehyde	3,800	<b>18</b>	0.46	<b>9.9</b>	0.26	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.46	ND	0.19	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.46	ND	0.16	
123-72-8	Butyraldehyde	< 100	ND	0.46	ND	0.16	
100-52-7	Benzaldehyde	< 100	ND	0.46	ND	0.11	
590-86-3	Isovaleraldehyde	< 100	ND	0.46	ND	0.13	
110-62-3	Valeraldehyde	< 100	ND	0.46	ND	0.13	
529-20-4	o-Tolualdehyde	< 100	ND	0.46	ND	0.094	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.93	ND	0.19	
66-25-1	n-Hexaldehyde	< 100	ND	0.46	ND	0.11	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.46	ND	0.084	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1373  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-009

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 254.4 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	0.39	ND	0.32	
75-07-0	Acetaldehyde	2,600	10	0.39	5.7	0.22	BT
123-38-6	Propionaldehyde	< 100	ND	0.39	ND	0.17	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.39	ND	0.14	
123-72-8	Butyraldehyde	< 100	ND	0.39	ND	0.13	
100-52-7	Benzaldehyde	< 100	ND	0.39	ND	0.091	
590-86-3	Isovaleraldehyde	< 100	ND	0.39	ND	0.11	
110-62-3	Valeraldehyde	< 100	ND	0.39	ND	0.11	
529-20-4	o-Tolualdehyde	< 100	ND	0.39	ND	0.080	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.79	ND	0.16	
66-25-1	n-Hexaldehyde	< 100	ND	0.39	ND	0.096	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.39	ND	0.072	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1383  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-010

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 248.4 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	0.40	ND	0.33	
75-07-0	Acetaldehyde	2,100	<b>8.3</b>	0.40	<b>4.6</b>	0.22	<b>BT</b>
123-38-6	Propionaldehyde	< 100	ND	0.40	ND	0.17	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.40	ND	0.14	
123-72-8	Butyraldehyde	< 100	ND	0.40	ND	0.14	
100-52-7	Benzaldehyde	< 100	ND	0.40	ND	0.093	
590-86-3	Isovaleraldehyde	< 100	ND	0.40	ND	0.11	
110-62-3	Valeraldehyde	< 100	ND	0.40	ND	0.11	
529-20-4	o-Tolualdehyde	< 100	ND	0.40	ND	0.082	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.81	ND	0.16	
66-25-1	n-Hexaldehyde	< 100	ND	0.40	ND	0.098	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.40	ND	0.073	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1392  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-011

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 238.8 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	350	1.5	0.42	1.2	0.34	
75-07-0	Acetaldehyde	260	1.1	0.42	0.61	0.23	BT
123-38-6	Propionaldehyde	< 100	ND	0.42	ND	0.18	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.42	ND	0.15	
123-72-8	Butyraldehyde	< 100	ND	0.42	ND	0.14	
100-52-7	Benzaldehyde	< 100	ND	0.42	ND	0.097	
590-86-3	Isovaleraldehyde	< 100	ND	0.42	ND	0.12	
110-62-3	Valeraldehyde	< 100	ND	0.42	ND	0.12	
529-20-4	o-Tolualdehyde	< 100	ND	0.42	ND	0.085	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.84	ND	0.17	
66-25-1	n-Hexaldehyde	< 100	ND	0.42	ND	0.10	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.42	ND	0.076	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1396  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-012

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 208.8 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	350	1.7	0.48	1.4	0.39	
75-07-0	Acetaldehyde	310	1.5	0.48	0.83	0.27	BT
123-38-6	Propionaldehyde	< 100	ND	0.48	ND	0.20	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.48	ND	0.17	
123-72-8	Butyraldehyde	< 100	ND	0.48	ND	0.16	
100-52-7	Benzaldehyde	< 100	ND	0.48	ND	0.11	
590-86-3	Isovaleraldehyde	< 100	ND	0.48	ND	0.14	
110-62-3	Valeraldehyde	< 100	ND	0.48	ND	0.14	
529-20-4	o-Tolualdehyde	< 100	ND	0.48	ND	0.097	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.96	ND	0.19	
66-25-1	n-Hexaldehyde	< 100	ND	0.48	ND	0.12	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.48	ND	0.087	

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.



RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1401  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-013

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 307.2 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	880	2.9	0.33	2.3	0.27	
75-07-0	Acetaldehyde	390	1.3	0.33	0.71	0.18	
123-38-6	Propionaldehyde	< 100	ND	0.33	ND	0.14	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.33	ND	0.11	
123-72-8	Butyraldehyde	< 100	ND	0.33	ND	0.11	
100-52-7	Benzaldehyde	< 100	ND	0.33	ND	0.075	
590-86-3	Isovaleraldehyde	< 100	ND	0.33	ND	0.092	
110-62-3	Valeraldehyde	< 100	ND	0.33	ND	0.092	
529-20-4	o-Tolualdehyde	< 100	ND	0.33	ND	0.066	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.65	ND	0.13	
66-25-1	n-Hexaldehyde	< 100	ND	0.33	ND	0.079	
5779-94-2	2,5-Dimethylbenzaldehyde	130	0.41	0.33	0.075	0.059	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1410  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
 CAS Sample ID: P1203486-014

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

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 309.6 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	950	<b>3.1</b>	0.32	<b>2.5</b>	0.26	
75-07-0	Acetaldehyde	380	<b>1.2</b>	0.32	<b>0.68</b>	0.18	
123-38-6	Propionaldehyde	< 100	ND	0.32	ND	0.14	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.32	ND	0.11	
123-72-8	Butyraldehyde	< 100	ND	0.32	ND	0.11	
100-52-7	Benzaldehyde	< 100	ND	0.32	ND	0.074	
590-86-3	Isovaleraldehyde	< 100	ND	0.32	ND	0.092	
110-62-3	Valeraldehyde	< 100	ND	0.32	ND	0.092	
529-20-4	o-Tolualdehyde	< 100	ND	0.32	ND	0.066	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.65	ND	0.13	
66-25-1	n-Hexaldehyde	< 100	ND	0.32	ND	0.079	
5779-94-2	2,5-Dimethylbenzaldehyde	160	<b>0.51</b>	0.32	<b>0.092</b>	0.059	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1418  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-015

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 304.8 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	980	3.2	0.33	2.6	0.27	
75-07-0	Acetaldehyde	350	1.2	0.33	0.64	0.18	
123-38-6	Propionaldehyde	< 100	ND	0.33	ND	0.14	
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.33	ND	0.11	
123-72-8	Butyraldehyde	< 100	ND	0.33	ND	0.11	
100-52-7	Benzaldehyde	< 100	ND	0.33	ND	0.076	
590-86-3	Isovaleraldehyde	< 100	ND	0.33	ND	0.093	
110-62-3	Valeraldehyde	< 100	ND	0.33	ND	0.093	
529-20-4	o-Tolualdehyde	< 100	ND	0.33	ND	0.067	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	0.66	ND	0.13	
66-25-1	n-Hexaldehyde	< 100	ND	0.33	ND	0.080	
5779-94-2	2,5-Dimethylbenzaldehyde	250	0.81	0.33	0.15	0.060	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1425  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-016

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 1.2 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	< 100	ND	83	ND	68	
75-07-0	Acetaldehyde	1,400	<b>1,200</b>	83	<b>660</b>	46	<b>BT</b>
123-38-6	Propionaldehyde	790	<b>660</b>	83	<b>280</b>	35	<b>BT</b>
4170-30-3	Crotonaldehyde, Total	< 100	ND	83	ND	29	
123-72-8	Butyraldehyde	3,500	<b>3,000</b>	83	<b>1,000</b>	28	<b>BT</b>
100-52-7	Benzaldehyde	2,800	<b>2,300</b>	83	<b>530</b>	19	
590-86-3	Isovaleraldehyde	< 100	ND	83	ND	24	
110-62-3	Valeraldehyde	< 100	ND	83	ND	24	
529-20-4	o-Tolualdehyde	< 100	ND	83	ND	17	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	170	ND	34	
66-25-1	n-Hexaldehyde	< 100	ND	83	ND	20	
5779-94-2	2,5-Dimethylbenzaldehyde	860	<b>720</b>	83	<b>130</b>	15	<b>BT</b>

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1432  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-017

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 1.2 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	< 100	ND	83	ND	68	
75-07-0	Acetaldehyde	< 100	ND	83	ND	46	
123-38-6	Propionaldehyde	< 100	ND	83	ND	35	
4170-30-3	Crotonaldehyde, Total	< 100	ND	83	ND	29	
123-72-8	Butyraldehyde	< 100	ND	83	ND	28	
100-52-7	Benzaldehyde	160	<b>140</b>	83	<b>31</b>	19	
590-86-3	Isovaleraldehyde	140	<b>120</b>	83	<b>33</b>	24	
110-62-3	Valeraldehyde	1,400	<b>1,200</b>	83	<b>340</b>	24	
529-20-4	o-Tolualdehyde	410	<b>340</b>	83	<b>69</b>	17	<b>BT</b>
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	170	ND	34	
66-25-1	n-Hexaldehyde	< 100	ND	83	ND	20	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	83	ND	15	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1438  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P1203486-018

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

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 1.2 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	< 100	ND	83	ND	68	
75-07-0	Acetaldehyde	420	<b>350</b>	83	<b>190</b>	46	<b>BT</b>
123-38-6	Propionaldehyde	170	<b>140</b>	83	<b>58</b>	35	
4170-30-3	Crotonaldehyde, Total	< 100	ND	83	ND	29	
123-72-8	Butyraldehyde	1,900	<b>1,500</b>	83	<b>530</b>	28	<b>BT</b>
100-52-7	Benzaldehyde	1,200	<b>990</b>	83	<b>230</b>	19	
590-86-3	Isovaleraldehyde	< 100	ND	83	ND	24	
110-62-3	Valeraldehyde	< 100	ND	83	ND	24	
529-20-4	o-Tolualdehyde	110	<b>92</b>	83	<b>19</b>	17	<b>BH</b>
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	170	ND	34	
66-25-1	n-Hexaldehyde	< 100	ND	83	ND	20	
5779-94-2	2,5-Dimethylbenzaldehyde	1,200	<b>960</b>	83	<b>180</b>	15	<b>BT</b>

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.

BH = Results indicate breakthrough; back section of tube greater than front section.

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

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1441  
**Client Project ID:** 182608005

**CAS Project ID:** P1203486  
**CAS Sample ID:** P1203486-019

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

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1442  
**Client Project ID:** 182608005

**CAS Project ID:** P1203486  
**CAS Sample ID:** P1203486-020

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

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**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.



## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank (12:29)  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
 CAS Sample ID: P120829-MB

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

**Date Collected:** NA  
**Date Received:** NA  
**Date Analyzed:** 08/29/12  
**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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank (16:24)  
**Client Project ID:** 182608005

CAS Project ID: P1203486  
CAS Sample ID: P120829-MB

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

Date Collected: NA  
Date Received: NA  
Date Analyzed: 08/29/12  
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.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1309

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 273.6

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	1,700	<b>6.3</b>	0.37	<b>5.1</b>	0.30
75-07-0	Acetaldehyde	470	<b>1.7</b>	0.37	<b>0.95</b>	0.20
123-38-6	Propionaldehyde	< 100	ND	0.37	ND	0.15
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.37	ND	0.13
123-72-8	Butyraldehyde	< 100	ND	0.37	ND	0.12
100-52-7	Benzaldehyde	< 100	ND	0.37	ND	0.084
590-86-3	Isovaleraldehyde	< 100	ND	0.37	ND	0.10
110-62-3	Valeraldehyde	130	<b>0.47</b>	0.37	<b>0.13</b>	0.10
529-20-4	o-Tolualdehyde	< 100	ND	0.37	ND	0.074
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.73	ND	0.15
66-25-1	n-Hexaldehyde	< 100	ND	0.37	ND	0.089
5779-94-2	2,5-Dimethylbenzaldehyde	260	<b>0.94</b>	0.37	<b>0.17</b>	0.067

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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

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

**Client Sample ID:** 1317

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 277.2

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	1,700	<b>6.2</b>	0.36	<b>5.1</b>	0.29
75-07-0	Acetaldehyde	430	<b>1.5</b>	0.36	<b>0.86</b>	0.20
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	< 100	ND	0.36	ND	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	170	<b>0.62</b>	0.36	<b>0.18</b>	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	0.088
5779-94-2	2,5-Dimethylbenzaldehyde	250	<b>0.91</b>	0.36	<b>0.17</b>	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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1325

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 283.2

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	1,800	<b>6.2</b>	0.35	<b>5.1</b>	0.29
75-07-0	Acetaldehyde	470	<b>1.6</b>	0.35	<b>0.91</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	< 100	ND	0.35	ND	0.12
100-52-7	Benzaldehyde	< 100	ND	0.35	ND	0.081
590-86-3	Isovaleraldehyde	< 100	ND	0.35	ND	0.10
110-62-3	Valeraldehyde	130	<b>0.46</b>	0.35	<b>0.13</b>	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	240	<b>0.86</b>	0.35	<b>0.16</b>	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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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

**Client Sample ID:** 1330

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 297.6

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	1,800	<b>6.1</b>	0.34	<b>5.0</b>	0.27
75-07-0	Acetaldehyde	440	<b>1.5</b>	0.34	<b>0.81</b>	0.19
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	< 100	ND	0.34	ND	0.11
100-52-7	Benzaldehyde	< 100	ND	0.34	ND	0.077
590-86-3	Isovaleraldehyde	< 100	ND	0.34	ND	0.095
110-62-3	Valeraldehyde	< 100	ND	0.34	ND	0.095
529-20-4	o-Tolualdehyde	< 100	ND	0.34	ND	0.068
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.67	ND	0.14
66-25-1	n-Hexaldehyde	< 100	ND	0.34	ND	0.082
5779-94-2	2,5-Dimethylbenzaldehyde	270	<b>0.90</b>	0.34	<b>0.16</b>	0.061

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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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

**Client Sample ID:** 1342

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 142.8

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	< 100	ND	0.70	ND	0.57
75-07-0	Acetaldehyde	2,700	<b>19</b>	0.70	<b>11</b>	0.39
123-38-6	Propionaldehyde	< 100	ND	0.70	ND	0.29
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.70	ND	0.24
123-72-8	Butyraldehyde	< 100	ND	0.70	ND	0.24
100-52-7	Benzaldehyde	< 100	ND	0.70	ND	0.16
590-86-3	Isovaleraldehyde	< 100	ND	0.70	ND	0.20
110-62-3	Valeraldehyde	< 100	ND	0.70	ND	0.20
529-20-4	o-Tolualdehyde	< 100	ND	0.70	ND	0.14
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	1.4	ND	0.29
66-25-1	n-Hexaldehyde	< 100	ND	0.70	ND	0.17
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.70	ND	0.13

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

BC = Results reported are not blank corrected.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

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

**Client Sample ID:** 1345

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 223.2

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	< 100	ND	0.45	ND	0.36
75-07-0	Acetaldehyde	3,800	<b>17</b>	0.45	<b>9.3</b>	0.25
123-38-6	Propionaldehyde	< 100	ND	0.45	ND	0.19
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.45	ND	0.16
123-72-8	Butyraldehyde	< 100	ND	0.45	ND	0.15
100-52-7	Benzaldehyde	< 100	ND	0.45	ND	0.10
590-86-3	Isovaleraldehyde	< 100	ND	0.45	ND	0.13
110-62-3	Valeraldehyde	< 100	ND	0.45	ND	0.13
529-20-4	o-Tolualdehyde	< 100	ND	0.45	ND	0.091
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.90	ND	0.18
66-25-1	n-Hexaldehyde	< 100	ND	0.45	ND	0.11
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.45	ND	0.082

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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

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

**Client Sample ID:** 1355

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 219.6

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	< 100	ND	0.46	ND	0.37
75-07-0	Acetaldehyde	4,200	<b>19</b>	0.46	<b>11</b>	0.25
123-38-6	Propionaldehyde	< 100	ND	0.46	ND	0.19
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.46	ND	0.16
123-72-8	Butyraldehyde	< 100	ND	0.46	ND	0.15
100-52-7	Benzaldehyde	< 100	ND	0.46	ND	0.10
590-86-3	Isovaleraldehyde	< 100	ND	0.46	ND	0.13
110-62-3	Valeraldehyde	< 100	ND	0.46	ND	0.13
529-20-4	o-Tolualdehyde	< 100	ND	0.46	ND	0.093
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.91	ND	0.19
66-25-1	n-Hexaldehyde	< 100	ND	0.46	ND	0.11
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.46	ND	0.083

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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

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

**Client Sample ID:** 1358

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 216.0

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	< 100	ND	0.46	ND	0.38
75-07-0	Acetaldehyde	3,800	<b>18</b>	0.46	<b>9.9</b>	0.26
123-38-6	Propionaldehyde	< 100	ND	0.46	ND	0.19
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.46	ND	0.16
123-72-8	Butyraldehyde	< 100	ND	0.46	ND	0.16
100-52-7	Benzaldehyde	< 100	ND	0.46	ND	0.11
590-86-3	Isovaleraldehyde	< 100	ND	0.46	ND	0.13
110-62-3	Valeraldehyde	< 100	ND	0.46	ND	0.13
529-20-4	o-Tolualdehyde	< 100	ND	0.46	ND	0.094
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.93	ND	0.19
66-25-1	n-Hexaldehyde	< 100	ND	0.46	ND	0.11
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.46	ND	0.084

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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

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

**Client Sample ID:** 1373

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 254.4

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	< 100	ND	0.39	ND	0.32
75-07-0	Acetaldehyde	2,600	<b>10</b>	0.39	<b>5.7</b>	0.22
123-38-6	Propionaldehyde	< 100	ND	0.39	ND	0.17
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.39	ND	0.14
123-72-8	Butyraldehyde	< 100	ND	0.39	ND	0.13
100-52-7	Benzaldehyde	< 100	ND	0.39	ND	0.091
590-86-3	Isovaleraldehyde	< 100	ND	0.39	ND	0.11
110-62-3	Valeraldehyde	< 100	ND	0.39	ND	0.11
529-20-4	o-Tolualdehyde	< 100	ND	0.39	ND	0.080
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.79	ND	0.16
66-25-1	n-Hexaldehyde	< 100	ND	0.39	ND	0.096
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.39	ND	0.072

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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1383

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 248.4

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	< 100	ND	0.40	ND	0.33
75-07-0	Acetaldehyde	2,100	<b>8.3</b>	0.40	<b>4.6</b>	0.22
123-38-6	Propionaldehyde	< 100	ND	0.40	ND	0.17
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.40	ND	0.14
123-72-8	Butyraldehyde	< 100	ND	0.40	ND	0.14
100-52-7	Benzaldehyde	< 100	ND	0.40	ND	0.093
590-86-3	Isovaleraldehyde	< 100	ND	0.40	ND	0.11
110-62-3	Valeraldehyde	< 100	ND	0.40	ND	0.11
529-20-4	o-Tolualdehyde	< 100	ND	0.40	ND	0.082
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.81	ND	0.16
66-25-1	n-Hexaldehyde	< 100	ND	0.40	ND	0.098
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.40	ND	0.073

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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1392

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 238.8

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	350	<b>1.5</b>	0.42	<b>1.2</b>	0.34
75-07-0	Acetaldehyde	260	<b>1.1</b>	0.42	<b>0.61</b>	0.23
123-38-6	Propionaldehyde	< 100	ND	0.42	ND	0.18
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.42	ND	0.15
123-72-8	Butyraldehyde	< 100	ND	0.42	ND	0.14
100-52-7	Benzaldehyde	< 100	ND	0.42	ND	0.097
590-86-3	Isovaleraldehyde	< 100	ND	0.42	ND	0.12
110-62-3	Valeraldehyde	< 100	ND	0.42	ND	0.12
529-20-4	o-Tolualdehyde	< 100	ND	0.42	ND	0.085
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.84	ND	0.17
66-25-1	n-Hexaldehyde	< 100	ND	0.42	ND	0.10
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.42	ND	0.076

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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1396

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 208.8

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	350	<b>1.7</b>	0.48	<b>1.4</b>	0.39
75-07-0	Acetaldehyde	310	<b>1.5</b>	0.48	<b>0.83</b>	0.27
123-38-6	Propionaldehyde	< 100	ND	0.48	ND	0.20
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.48	ND	0.17
123-72-8	Butyraldehyde	< 100	ND	0.48	ND	0.16
100-52-7	Benzaldehyde	< 100	ND	0.48	ND	0.11
590-86-3	Isovaleraldehyde	< 100	ND	0.48	ND	0.14
110-62-3	Valeraldehyde	< 100	ND	0.48	ND	0.14
529-20-4	o-Tolualdehyde	< 100	ND	0.48	ND	0.097
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.96	ND	0.19
66-25-1	n-Hexaldehyde	< 100	ND	0.48	ND	0.12
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	0.48	ND	0.087

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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

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

**Client Sample ID:** 1401

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 307.2

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	880	<b>2.9</b>	0.33	<b>2.3</b>	0.27
75-07-0	Acetaldehyde	390	<b>1.3</b>	0.33	<b>0.71</b>	0.18
123-38-6	Propionaldehyde	< 100	ND	0.33	ND	0.14
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.33	ND	0.11
123-72-8	Butyraldehyde	< 100	ND	0.33	ND	0.11
100-52-7	Benzaldehyde	< 100	ND	0.33	ND	0.075
590-86-3	Isovaleraldehyde	< 100	ND	0.33	ND	0.092
110-62-3	Valeraldehyde	< 100	ND	0.33	ND	0.092
529-20-4	o-Tolualdehyde	< 100	ND	0.33	ND	0.066
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.65	ND	0.13
66-25-1	n-Hexaldehyde	< 100	ND	0.33	ND	0.079
5779-94-2	2,5-Dimethylbenzaldehyde	130	<b>0.41</b>	0.33	<b>0.075</b>	0.059

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

BC = Results reported are not blank corrected.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

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

**Client Sample ID:** 1410

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 309.6

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	950	<b>3.1</b>	0.32	<b>2.5</b>	0.26
75-07-0	Acetaldehyde	380	<b>1.2</b>	0.32	<b>0.68</b>	0.18
123-38-6	Propionaldehyde	< 100	ND	0.32	ND	0.14
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.32	ND	0.11
123-72-8	Butyraldehyde	< 100	ND	0.32	ND	0.11
100-52-7	Benzaldehyde	< 100	ND	0.32	ND	0.074
590-86-3	Isovaleraldehyde	< 100	ND	0.32	ND	0.092
110-62-3	Valeraldehyde	< 100	ND	0.32	ND	0.092
529-20-4	o-Tolualdehyde	< 100	ND	0.32	ND	0.066
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.65	ND	0.13
66-25-1	n-Hexaldehyde	< 100	ND	0.32	ND	0.079
5779-94-2	2,5-Dimethylbenzaldehyde	160	<b>0.51</b>	0.32	<b>0.092</b>	0.059

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

BC = Results reported are not blank corrected.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1418

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 304.8

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	980	<b>3.2</b>	0.33	<b>2.6</b>	0.27
75-07-0	Acetaldehyde	350	<b>1.2</b>	0.33	<b>0.64</b>	0.18
123-38-6	Propionaldehyde	< 100	ND	0.33	ND	0.14
4170-30-3	Crotonaldehyde, Total	< 100	ND	0.33	ND	0.11
123-72-8	Butyraldehyde	< 100	ND	0.33	ND	0.11
100-52-7	Benzaldehyde	< 100	ND	0.33	ND	0.076
590-86-3	Isovaleraldehyde	< 100	ND	0.33	ND	0.093
110-62-3	Valeraldehyde	< 100	ND	0.33	ND	0.093
529-20-4	o-Tolualdehyde	< 100	ND	0.33	ND	0.067
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	0.66	ND	0.13
66-25-1	n-Hexaldehyde	< 100	ND	0.33	ND	0.080
5779-94-2	2,5-Dimethylbenzaldehyde	250	<b>0.81</b>	0.33	<b>0.15</b>	0.060

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

BC = Results reported are not blank corrected.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

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

**Client Sample ID:** 1425

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 1.2

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	< 100	ND	83	ND	68
75-07-0	Acetaldehyde	1,400	<b>1,200</b>	83	<b>660</b>	46
123-38-6	Propionaldehyde	790	<b>660</b>	83	<b>280</b>	35
4170-30-3	Crotonaldehyde, Total	< 100	ND	83	ND	29
123-72-8	Butyraldehyde	3,500	<b>3,000</b>	83	<b>1,000</b>	28
100-52-7	Benzaldehyde	2,800	<b>2,300</b>	83	<b>530</b>	19
590-86-3	Isovaleraldehyde	< 100	ND	83	ND	24
110-62-3	Valeraldehyde	< 100	ND	83	ND	24
529-20-4	o-Tolualdehyde	< 100	ND	83	ND	17
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	170	ND	34
66-25-1	n-Hexaldehyde	< 100	ND	83	ND	20
5779-94-2	2,5-Dimethylbenzaldehyde	860	<b>720</b>	83	<b>130</b>	15

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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

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

**Client Sample ID:** 1432

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 1.2

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	< 100	ND	83	ND	68
75-07-0	Acetaldehyde	< 100	ND	83	ND	46
123-38-6	Propionaldehyde	< 100	ND	83	ND	35
4170-30-3	Crotonaldehyde, Total	< 100	ND	83	ND	29
123-72-8	Butyraldehyde	< 100	ND	83	ND	28
100-52-7	Benzaldehyde	160	<b>140</b>	83	<b>31</b>	19
590-86-3	Isovaleraldehyde	140	<b>120</b>	83	<b>33</b>	24
110-62-3	Valeraldehyde	1,400	<b>1,200</b>	83	<b>340</b>	24
529-20-4	o-Tolualdehyde	410	<b>340</b>	83	<b>69</b>	17
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	170	ND	34
66-25-1	n-Hexaldehyde	< 100	ND	83	ND	20
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	83	ND	15

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

BC = Results reported are not blank corrected.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

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

**Client Sample ID:** 1438

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: 1.2

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
50-00-0	Formaldehyde	< 100	ND	83	ND	68
75-07-0	Acetaldehyde	420	<b>350</b>	83	<b>190</b>	46
123-38-6	Propionaldehyde	170	<b>140</b>	83	<b>58</b>	35
4170-30-3	Crotonaldehyde, Total	< 100	ND	83	ND	29
123-72-8	Butyraldehyde	1,900	<b>1,500</b>	83	<b>530</b>	28
100-52-7	Benzaldehyde	1,200	<b>990</b>	83	<b>230</b>	19
590-86-3	Isovaleraldehyde	< 100	ND	83	ND	24
110-62-3	Valeraldehyde	< 100	ND	83	ND	24
529-20-4	o-Tolualdehyde	110	<b>92</b>	83	<b>19</b>	17
620-23-5						
104-87-0	m,p-Tolualdehyde	< 200	ND	170	ND	34
66-25-1	n-Hexaldehyde	< 100	ND	83	ND	20
5779-94-2	2,5-Dimethylbenzaldehyde	1,200	<b>960</b>	83	<b>180</b>	15

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

BC = Results reported are not blank corrected.

BH = Results indicate breakthrough; back section of tube greater than front section.

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

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

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

**Client Sample ID:** 1441

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: NA

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
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

BC = Results reported are not blank corrected.

NA = Not Applicable.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1442

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

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

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Desorption Volume: 1.0  
 Volume Sampled: NA

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
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

BC = Results reported are not blank corrected.

NA = Not Applicable.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

186  
186-020

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ml  
Liter(s)

Data  
Qualifier

\_\_\_\_\_

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method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank (12:29)  
**Client Project ID:** 182608005

CAS Project ID: P12034  
CAS Sample ID: P12082

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

Date Collected: NA  
Date Received: NA  
Date Analyzed: 08/29/1  
Desorption Volume: 1.0  
Volume Sampled: NA

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
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

BC = Results reported are not blank corrected.

NA = Not applicable.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

186  
19-MB

2  
ml  
Liter(s)

Data  
Qualifier

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank (16:24)  
**Client Project ID:** 182608005

CAS Project ID: P12034  
CAS Sample ID: P12082

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

Date Collected: NA  
Date Received: NA  
Date Analyzed: 08/29/1  
Desorption Volume: 1.0  
Volume Sampled: NA

CAS #	Compound	Result ng/Sample	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
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

BC = Results reported are not blank corrected.

NA = Not applicable.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

186  
19-MB

2  
ml  
Liter(s)

Data  
Qualifier

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

method.

## LABORATORY REPORT

September 5, 2012

John Reiter  
Stantec Consulting Services, Inc.  
12075 Corporate Pkwy, Ste. 200  
Mequon, WI 53092

**RE: 182608005**

Dear John:

Enclosed are the results of the samples submitted to our laboratory on August 24, 2012. For your reference, these analyses have been assigned our service request number P1203491.

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.caslab.com](http://www.caslab.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

**ALS | Environmental**

Samantha Henningsen  
Project Manager

Client: Stantec Consulting Services, Inc.  
Project: 182608005

Service Request No: P1203491

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### CASE NARRATIVE

The samples were received intact under chain of custody on August 24, 2012 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.

#### Amine Analysis

The samples were analyzed for amines using a gas chromatograph equipped with a nitrogen phosphorus detector (NPD).

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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 Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of Columbia Analytical Services, Inc. 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 AALS 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.*



DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: 182608005

Service Request: P1203491

Date Received: 8/24/2012  
 Time Received: 09:45

Amines - Amines

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Amines - Amines
1313	P1203491-001	Air	8/21/2012	00:00	X
1319	P1203491-002	Air	8/21/2012	00:00	X
1323	P1203491-003	Air	8/21/2012	00:00	X
1333	P1203491-004	Air	8/21/2012	00:00	X
1338	P1203491-005	Air	8/21/2012	00:00	X
1346	P1203491-006	Air	8/21/2012	00:00	X
1353	P1203491-007	Air	8/21/2012	00:00	X
1361	P1203491-008	Air	8/21/2012	00:00	X
1374	P1203491-009	Air	8/21/2012	00:00	X
1381	P1203491-010	Air	8/21/2012	00:00	X
1391	P1203491-011	Air	8/21/2012	00:00	X
1399	P1203491-012	Air	8/21/2012	00:00	X
1403	P1203491-013	Air	8/21/2012	00:00	X
1413	P1203491-014	Air	8/21/2012	00:00	X
1417	P1203491-015	Air	8/21/2012	00:00	X
1434	P1203491-016	Air	8/21/2012	00:00	X
1429	P1203491-017	Air	8/21/2012	00:00	X
1437	P1203491-018	Air	8/21/2012	00:00	X
1449	P1203491-019	Air	8/21/2012	00:00	X
1450	P1203491-020	Air	8/21/2012	00:00	X



**Stantec Consulting Services, Inc.**  
 12075 Corporate Parkway, Suite 200  
 Mequon, Wisconsin 53092

P1203491

**Date:** Tuesday, August 21, 2012

**Project number: 182608005**  
 (262) 643-9154  
 (262) 241-4901 fax

**Please email sample results to:**  
**John Reiter, CIH**  
 john.reiter@stantec.com

**Laboratory/Sample Transmittal - Analysis Request**

**To:** Columbia Analytical Services  
 2655 Park Center Drive, Suite A  
 Simi Valley, California 93065  
**Attention:** Samantha Henningsen

**Services requested:** Evaluation of the enclosed samples as requested below

**Project No. 182608005**

Sample #	Compound/parameter/contaminant	Duration (minutes)	Volume (liters)	Special instructions
1313	Amines	304	121.0	Columbia Analytical AQL Method 101
1319	Amines	297	122.7	
1323	Amines	291	87.0	
1333	Amines	290	104.1	
1338	Amines	119	47.4	
1346	Amines	186	72.0	
1353	Amines	183	65.5	
1361	Amines	180	53.6	
1374	Amines	212	64.0	
1381	Amines	207	82.0	
1391	Amines	199	69.7	
1399	Amines	174	70.1	
1403	Amines	256	90.4	
1413	Amines	258	79.5	
1417	Amines	254	103.9	
1434	Amines	1	0.4	
1429	Amines	1	0.4	
1437	Amines	1	0.4	
1449	Amines	—	—	Field blank
1450	Amines	—	—	Field blank

Routine handling

Please contact our office with email results by:  
 Wednesday, September 5, 2012

  
 signed: John E. Reiter, CIH, Stantec

Water sample 21°C get it

**Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc. Work order: P1203491

Project: 182608005

Sample(s) received on: 8/24/12 Date opened: 8/24/12 by: MZAMORA

**Note:** This form is used for all samples received by CAS. 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.

- |    |  | <u>Yes</u>                          | <u>No</u>                           | <u>N/A</u>                          |
|----|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1  | Were <b>sample containers</b> properly marked with client sample ID?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2  | Container(s) <b>supplied by CAS</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 type="checkbox"/>            | <input checked="" 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: 21° C Blank Temperature: ° C  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
|    | <b>Gel Packs</b>   |                                     |                                     |                                     |
| 9  | Was a <b>blank</b> received?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 10 | Were <b>custody seals</b> on outside of cooler/Box?<br>Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input 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"/> |
|    | Were custody seals on outside of sample container?<br>Location of seal(s)? _____ Sealing Lid?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input 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"/> |
|    |  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
|    |  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12 | <b>Tubes:</b> Are the tubes capped and intact?<br>Do they contain moisture?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
|    |  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 13 | <b>Badges:</b> Are the badges properly capped and intact?<br>Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
|    |  | <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
P1203491-001.01	Treated Alumina Tube					
P1203491-002.01	Treated Alumina Tube					
P1203491-003.01	Treated Alumina Tube					
P1203491-004.01	Treated Alumina Tube					
P1203491-005.01	Treated Alumina Tube					
P1203491-006.01	Treated Alumina Tube					
P1203491-007.01	Treated Alumina Tube					
P1203491-008.01	Treated Alumina Tube					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 The times of sample collection were not indicated on the COC.  
 Sample -016 has an ID of 1434 on the COC but 1424 on the tube.  
 Per client the COC notes the correct sample ID.



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1313  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-001

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 121.0 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	< 0.53	ND	4.4	ND	2.4	
75-04-7	Ethylamine	< 0.55	ND	4.5	ND	2.5	
75-50-3	Trimethylamine	< 0.52	ND	4.3	ND	1.8	
75-31-0	Isopropylamine	< 0.52	ND	4.3	ND	1.8	
75-64-9	tert-Butylamine	< 1.1	ND	8.7	ND	2.9	
107-10-8	n-Propylamine	< 0.55	ND	4.6	ND	1.9	
109-89-7	Diethylamine	< 0.52	ND	4.3	ND	1.4	
13952-84-6	sec-Butylamine	< 0.53	ND	4.4	ND	1.5	
78-81-9	Isobutylamine	< 0.54	ND	4.4	ND	1.5	
109-73-9	n-Butylamine	< 0.53	ND	4.4	ND	1.5	
108-18-9	Diisopropylamine	< 0.51	ND	4.2	ND	1.0	
121-44-8	Triethylamine	< 0.51	ND	4.2	ND	1.0	
142-84-7	Dipropylamine	< 0.52	ND	4.3	ND	1.0	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1319  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-002

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 122.7 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
124-40-3	Dimethylamine	< 0.53	ND	4.3	ND	2.3	
75-04-7	Ethylamine	< 0.55	ND	4.5	ND	2.4	
75-50-3	Trimethylamine	< 0.52	ND	4.2	ND	1.7	
75-31-0	Isopropylamine	< 0.52	ND	4.3	ND	1.8	
75-64-9	tert-Butylamine	< 1.1	ND	8.6	ND	2.9	
107-10-8	n-Propylamine	< 0.55	ND	4.5	ND	1.9	
109-89-7	Diethylamine	< 0.52	ND	4.2	ND	1.4	
13952-84-6	sec-Butylamine	< 0.53	ND	4.3	ND	1.4	
78-81-9	Isobutylamine	< 0.54	ND	4.4	ND	1.5	
109-73-9	n-Butylamine	< 0.53	ND	4.4	ND	1.5	
108-18-9	Diisopropylamine	< 0.51	ND	4.1	ND	1.0	
121-44-8	Triethylamine	< 0.51	ND	4.2	ND	1.0	
142-84-7	Dipropylamine	< 0.52	ND	4.2	ND	1.0	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1323  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-003

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 87.0 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	< 0.53	ND	6.1	ND	3.3	
75-04-7	Ethylamine	< 0.55	ND	6.3	ND	3.4	
75-50-3	Trimethylamine	< 0.52	ND	5.9	ND	2.5	
75-31-0	Isopropylamine	< 0.52	ND	6.0	ND	2.5	
75-64-9	tert-Butylamine	< 1.1	ND	12	ND	4.0	
107-10-8	n-Propylamine	< 0.55	ND	6.3	ND	2.6	
109-89-7	Diethylamine	< 0.52	ND	5.9	ND	2.0	
13952-84-6	sec-Butylamine	< 0.53	ND	6.1	ND	2.0	
78-81-9	Isobutylamine	< 0.54	ND	6.2	ND	2.1	
109-73-9	n-Butylamine	< 0.53	ND	6.1	ND	2.1	
108-18-9	Diisopropylamine	< 0.51	ND	5.9	ND	1.4	
121-44-8	Triethylamine	< 0.51	ND	5.9	ND	1.4	
142-84-7	Dipropylamine	< 0.52	ND	5.9	ND	1.4	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1333  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-004

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 104.1 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	< 0.53	ND	5.1	ND	2.8	
75-04-7	Ethylamine	< 0.55	ND	5.3	ND	2.9	
75-50-3	Trimethylamine	< 0.52	ND	5.0	ND	2.1	
75-31-0	Isopropylamine	< 0.52	ND	5.0	ND	2.1	
75-64-9	tert-Butylamine	< 1.1	ND	10	ND	3.4	
107-10-8	n-Propylamine	< 0.55	ND	5.3	ND	2.2	
109-89-7	Diethylamine	< 0.52	ND	5.0	ND	1.7	
13952-84-6	sec-Butylamine	< 0.53	ND	5.1	ND	1.7	
78-81-9	Isobutylamine	< 0.54	ND	5.2	ND	1.7	
109-73-9	n-Butylamine	< 0.53	ND	5.1	ND	1.7	
108-18-9	Diisopropylamine	< 0.51	ND	4.9	ND	1.2	
121-44-8	Triethylamine	< 0.51	ND	4.9	ND	1.2	
142-84-7	Dipropylamine	< 0.52	ND	5.0	ND	1.2	

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.



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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1338  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-005

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 47.4 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
124-40-3	Dimethylamine	< 0.53	ND	11	ND	6.0	
75-04-7	Ethylamine	< 0.55	ND	12	ND	6.3	
75-50-3	Trimethylamine	< 0.52	ND	11	ND	4.5	
75-31-0	Isopropylamine	< 0.52	ND	11	ND	4.6	
75-64-9	tert-Butylamine	< 1.1	ND	22	ND	7.4	
107-10-8	n-Propylamine	< 0.55	ND	12	ND	4.8	
109-89-7	Diethylamine	< 0.52	ND	11	ND	3.6	
13952-84-6	sec-Butylamine	< 0.53	ND	11	ND	3.7	
78-81-9	Isobutylamine	< 0.54	ND	11	ND	3.8	
109-73-9	n-Butylamine	< 0.53	ND	11	ND	3.8	
108-18-9	Diisopropylamine	< 0.51	ND	11	ND	2.6	
121-44-8	Triethylamine	< 0.51	ND	11	ND	2.6	
142-84-7	Dipropylamine	< 0.52	ND	11	ND	2.6	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1346  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-006

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 72.0 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	< 0.53	ND	7.3	ND	4.0	
75-04-7	Ethylamine	< 0.55	ND	7.6	ND	4.1	
75-50-3	Trimethylamine	< 0.52	ND	7.2	ND	3.0	
75-31-0	Isopropylamine	< 0.52	ND	7.3	ND	3.0	
75-64-9	tert-Butylamine	< 1.1	ND	15	ND	4.9	
107-10-8	n-Propylamine	< 0.55	ND	7.7	ND	3.2	
109-89-7	Diethylamine	< 0.52	ND	7.2	ND	2.4	
13952-84-6	sec-Butylamine	< 0.53	ND	7.3	ND	2.5	
78-81-9	Isobutylamine	< 0.54	ND	7.5	ND	2.5	
109-73-9	n-Butylamine	< 0.53	ND	7.4	ND	2.5	
108-18-9	Diisopropylamine	< 0.51	ND	7.1	ND	1.7	
121-44-8	Triethylamine	< 0.51	ND	7.1	ND	1.7	
142-84-7	Dipropylamine	< 0.52	ND	7.2	ND	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.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1353  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-007

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 65.5 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	< 0.53	ND	8.1	ND	4.4	
75-04-7	Ethylamine	< 0.55	ND	8.4	ND	4.5	
75-50-3	Trimethylamine	< 0.52	ND	7.9	ND	3.3	
75-31-0	Isopropylamine	< 0.52	ND	8.0	ND	3.3	
75-64-9	tert-Butylamine	< 1.1	ND	16	ND	5.4	
107-10-8	n-Propylamine	< 0.55	ND	8.4	ND	3.5	
109-89-7	Diethylamine	< 0.52	ND	7.9	ND	2.6	
13952-84-6	sec-Butylamine	< 0.53	ND	8.1	ND	2.7	
78-81-9	Isobutylamine	< 0.54	ND	8.2	ND	2.7	
109-73-9	n-Butylamine	< 0.53	ND	8.2	ND	2.7	
108-18-9	Diisopropylamine	< 0.51	ND	7.8	ND	1.9	
121-44-8	Triethylamine	< 0.51	ND	7.8	ND	1.9	
142-84-7	Dipropylamine	< 0.52	ND	7.9	ND	1.9	

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.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1361  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-008

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 53.6 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	< 0.53	ND	9.9	ND	5.3	
75-04-7	Ethylamine	< 0.55	ND	10	ND	5.5	
75-50-3	Trimethylamine	< 0.52	ND	9.6	ND	4.0	
75-31-0	Isopropylamine	< 0.52	ND	9.8	ND	4.1	
75-64-9	tert-Butylamine	< 1.1	ND	20	ND	6.6	
107-10-8	n-Propylamine	< 0.55	ND	10	ND	4.3	
109-89-7	Diethylamine	< 0.52	ND	9.6	ND	3.2	
13952-84-6	sec-Butylamine	< 0.53	ND	9.9	ND	3.3	
78-81-9	Isobutylamine	< 0.54	ND	10	ND	3.4	
109-73-9	n-Butylamine	< 0.53	ND	10	ND	3.3	
108-18-9	Diisopropylamine	< 0.51	ND	9.5	ND	2.3	
121-44-8	Triethylamine	< 0.51	ND	9.6	ND	2.3	
142-84-7	Dipropylamine	< 0.52	ND	9.6	ND	2.3	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1374  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-009

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 64.0 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	< 0.53	ND	8.2	ND	4.5	
75-04-7	Ethylamine	< 0.55	ND	8.6	ND	4.6	
75-50-3	Trimethylamine	< 0.52	ND	8.1	ND	3.3	
75-31-0	Isopropylamine	< 0.52	ND	8.2	ND	3.4	
75-64-9	tert-Butylamine	< 1.1	ND	16	ND	5.5	
107-10-8	n-Propylamine	< 0.55	ND	8.6	ND	3.6	
109-89-7	Diethylamine	< 0.52	ND	8.1	ND	2.7	
13952-84-6	sec-Butylamine	< 0.53	ND	8.3	ND	2.8	
78-81-9	Isobutylamine	< 0.54	ND	8.4	ND	2.8	
109-73-9	n-Butylamine	< 0.53	ND	8.3	ND	2.8	
108-18-9	Diisopropylamine	< 0.51	ND	8.0	ND	1.9	
121-44-8	Triethylamine	< 0.51	ND	8.0	ND	1.9	
142-84-7	Dipropylamine	< 0.52	ND	8.1	ND	1.9	

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.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1381  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-010

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 82.0 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	< 0.53	ND	6.4	ND	3.5	
75-04-7	Ethylamine	< 0.55	ND	6.7	ND	3.6	
75-50-3	Trimethylamine	< 0.52	ND	6.3	ND	2.6	
75-31-0	Isopropylamine	< 0.52	ND	6.4	ND	2.6	
75-64-9	tert-Butylamine	< 1.1	ND	13	ND	4.3	
107-10-8	n-Propylamine	< 0.55	ND	6.7	ND	2.8	
109-89-7	Diethylamine	< 0.52	ND	6.3	ND	2.1	
13952-84-6	sec-Butylamine	< 0.53	ND	6.5	ND	2.2	
78-81-9	Isobutylamine	< 0.54	ND	6.6	ND	2.2	
109-73-9	n-Butylamine	< 0.53	ND	6.5	ND	2.2	
108-18-9	Diisopropylamine	< 0.51	ND	6.2	ND	1.5	
121-44-8	Triethylamine	< 0.51	ND	6.2	ND	1.5	
142-84-7	Dipropylamine	< 0.52	ND	6.3	ND	1.5	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1391  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-011

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 69.7 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
124-40-3	Dimethylamine	< 0.53	ND	7.6	ND	4.1	
75-04-7	Ethylamine	< 0.55	ND	7.9	ND	4.3	
75-50-3	Trimethylamine	< 0.52	ND	7.4	ND	3.1	
75-31-0	Isopropylamine	< 0.52	ND	7.5	ND	3.1	
75-64-9	tert-Butylamine	< 1.1	ND	15	ND	5.0	
107-10-8	n-Propylamine	< 0.55	ND	7.9	ND	3.3	
109-89-7	Diethylamine	< 0.52	ND	7.4	ND	2.5	
13952-84-6	sec-Butylamine	< 0.53	ND	7.6	ND	2.5	
78-81-9	Isobutylamine	< 0.54	ND	7.7	ND	2.6	
109-73-9	n-Butylamine	< 0.53	ND	7.7	ND	2.6	
108-18-9	Diisopropylamine	< 0.51	ND	7.3	ND	1.8	
121-44-8	Triethylamine	< 0.51	ND	7.4	ND	1.8	
142-84-7	Dipropylamine	< 0.52	ND	7.4	ND	1.8	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1399  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-012

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 70.1 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	< 0.53	ND	7.5	ND	4.1	
75-04-7	Ethylamine	< 0.55	ND	7.8	ND	4.2	
75-50-3	Trimethylamine	< 0.52	ND	7.4	ND	3.1	
75-31-0	Isopropylamine	< 0.52	ND	7.5	ND	3.1	
75-64-9	tert-Butylamine	< 1.1	ND	15	ND	5.0	
107-10-8	n-Propylamine	< 0.55	ND	7.9	ND	3.3	
109-89-7	Diethylamine	< 0.52	ND	7.4	ND	2.5	
13952-84-6	sec-Butylamine	< 0.53	ND	7.5	ND	2.5	
78-81-9	Isobutylamine	< 0.54	ND	7.7	ND	2.6	
109-73-9	n-Butylamine	< 0.53	ND	7.6	ND	2.5	
108-18-9	Diisopropylamine	< 0.51	ND	7.3	ND	1.8	
121-44-8	Triethylamine	< 0.51	ND	7.3	ND	1.8	
142-84-7	Dipropylamine	< 0.52	ND	7.4	ND	1.8	

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.



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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1403  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-013

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 90.4 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
124-40-3	Dimethylamine	< 0.53	ND	5.8	ND	3.2	
75-04-7	Ethylamine	< 0.55	ND	6.1	ND	3.3	
75-50-3	Trimethylamine	< 0.52	ND	5.7	ND	2.4	
75-31-0	Isopropylamine	< 0.52	ND	5.8	ND	2.4	
75-64-9	tert-Butylamine	< 1.1	ND	12	ND	3.9	
107-10-8	n-Propylamine	< 0.55	ND	6.1	ND	2.5	
109-89-7	Diethylamine	< 0.52	ND	5.7	ND	1.9	
13952-84-6	sec-Butylamine	< 0.53	ND	5.9	ND	2.0	
78-81-9	Isobutylamine	< 0.54	ND	5.9	ND	2.0	
109-73-9	n-Butylamine	< 0.53	ND	5.9	ND	2.0	
108-18-9	Diisopropylamine	< 0.51	ND	5.6	ND	1.4	
121-44-8	Triethylamine	< 0.51	ND	5.7	ND	1.4	
142-84-7	Dipropylamine	< 0.52	ND	5.7	ND	1.4	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1413  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-014

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 79.5 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	< 0.53	ND	6.6	ND	3.6	
75-04-7	Ethylamine	< 0.55	ND	6.9	ND	3.7	
75-50-3	Trimethylamine	< 0.52	ND	6.5	ND	2.7	
75-31-0	Isopropylamine	< 0.52	ND	6.6	ND	2.7	
75-64-9	tert-Butylamine	< 1.1	ND	13	ND	4.4	
107-10-8	n-Propylamine	< 0.55	ND	6.9	ND	2.9	
109-89-7	Diethylamine	< 0.52	ND	6.5	ND	2.2	
13952-84-6	sec-Butylamine	< 0.53	ND	6.7	ND	2.2	
78-81-9	Isobutylamine	< 0.54	ND	6.8	ND	2.3	
109-73-9	n-Butylamine	< 0.53	ND	6.7	ND	2.2	
108-18-9	Diisopropylamine	< 0.51	ND	6.4	ND	1.5	
121-44-8	Triethylamine	< 0.51	ND	6.4	ND	1.6	
142-84-7	Dipropylamine	< 0.52	ND	6.5	ND	1.6	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1417  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-015

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 103.9 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	< 0.53	ND	5.1	ND	2.8	
75-04-7	Ethylamine	< 0.55	ND	5.3	ND	2.9	
75-50-3	Trimethylamine	< 0.52	ND	5.0	ND	2.1	
75-31-0	Isopropylamine	< 0.52	ND	5.0	ND	2.1	
75-64-9	tert-Butylamine	< 1.1	ND	10	ND	3.4	
107-10-8	n-Propylamine	< 0.55	ND	5.3	ND	2.2	
109-89-7	Diethylamine	< 0.52	ND	5.0	ND	1.7	
13952-84-6	sec-Butylamine	< 0.53	ND	5.1	ND	1.7	
78-81-9	Isobutylamine	< 0.54	ND	5.2	ND	1.7	
109-73-9	n-Butylamine	< 0.53	ND	5.1	ND	1.7	
108-18-9	Diisopropylamine	< 0.51	ND	4.9	ND	1.2	
121-44-8	Triethylamine	< 0.51	ND	4.9	ND	1.2	
142-84-7	Dipropylamine	< 0.52	ND	5.0	ND	1.2	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1434  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-016

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: BC, DE

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 0.4 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
124-40-3	Dimethylamine	< 0.53	ND	1,300	ND	720	
75-04-7	Ethylamine	< 0.55	ND	1,400	ND	740	
75-50-3	Trimethylamine	< 0.52	ND	1,300	ND	530	
75-31-0	Isopropylamine	< 0.52	ND	1,300	ND	540	
75-64-9	tert-Butylamine	< 1.1	ND	2,600	ND	880	
107-10-8	n-Propylamine	< 0.55	ND	1,400	ND	570	
109-89-7	Diethylamine	< 0.52	ND	1,300	ND	430	
13952-84-6	sec-Butylamine	< 0.53	ND	1,300	ND	440	
78-81-9	Isobutylamine	< 0.54	ND	1,300	ND	450	
109-73-9	n-Butylamine	< 0.53	ND	1,300	ND	450	
108-18-9	Diisopropylamine	< 0.51	ND	1,300	ND	310	
121-44-8	Triethylamine	< 0.51	ND	1,300	ND	310	
142-84-7	Dipropylamine	< 0.52	ND	1,300	ND	310	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1429  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-017

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 0.4 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
124-40-3	Dimethylamine	< 0.53	ND	1,300	ND	720	
75-04-7	Ethylamine	< 0.55	ND	1,400	ND	740	
75-50-3	Trimethylamine	< 0.52	ND	1,300	ND	530	
75-31-0	Isopropylamine	< 0.52	ND	1,300	ND	540	
75-64-9	tert-Butylamine	< 1.1	ND	2,600	ND	880	
107-10-8	n-Propylamine	< 0.55	ND	1,400	ND	570	
109-89-7	Diethylamine	< 0.52	ND	1,300	ND	430	
13952-84-6	sec-Butylamine	< 0.53	ND	1,300	ND	440	
78-81-9	Isobutylamine	< 0.54	ND	1,300	ND	450	
109-73-9	n-Butylamine	< 0.53	ND	1,300	ND	450	
108-18-9	Diisopropylamine	< 0.51	ND	1,300	ND	310	
121-44-8	Triethylamine	< 0.51	ND	1,300	ND	310	
142-84-7	Dipropylamine	< 0.52	ND	1,300	ND	310	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1437  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-018

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 2.0 ml  
Volume Sampled: 0.4 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
124-40-3	Dimethylamine	< 0.53	ND	1,300	ND	720	
75-04-7	Ethylamine	< 0.55	ND	1,400	ND	740	
75-50-3	Trimethylamine	< 0.52	ND	1,300	ND	530	
75-31-0	Isopropylamine	< 0.52	ND	1,300	ND	540	
75-64-9	tert-Butylamine	< 1.1	ND	2,600	ND	880	
107-10-8	n-Propylamine	< 0.55	ND	1,400	ND	570	
109-89-7	Diethylamine	< 0.52	ND	1,300	ND	430	
13952-84-6	sec-Butylamine	< 0.53	ND	1,300	ND	440	
78-81-9	Isobutylamine	< 0.54	ND	1,300	ND	450	
109-73-9	n-Butylamine	< 0.53	ND	1,300	ND	450	
108-18-9	Diisopropylamine	< 0.51	ND	1,300	ND	310	
121-44-8	Triethylamine	< 0.51	ND	1,300	ND	310	
142-84-7	Dipropylamine	< 0.52	ND	1,300	ND	310	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1449  
**Client Project ID:** 182608005

**CAS Project ID:** P1203491  
**CAS Sample ID:** P1203491-019

**Test Code:** GC/NPD  
**Instrument ID:** Agilent 6890N/GC15/NPD  
**Analyst:** Zheng Wang  
**Sampling Media:** Treated Alumina Tube  
**Test Notes:** BC, DE

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**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	< 0.53	NA	NA	NA	NA	
75-04-7	Ethylamine	< 0.55	NA	NA	NA	NA	
75-50-3	Trimethylamine	< 0.52	NA	NA	NA	NA	
75-31-0	Isopropylamine	< 0.52	NA	NA	NA	NA	
75-64-9	tert-Butylamine	< 1.1	NA	NA	NA	NA	
107-10-8	n-Propylamine	< 0.55	NA	NA	NA	NA	
109-89-7	Diethylamine	< 0.52	NA	NA	NA	NA	
13952-84-6	sec-Butylamine	< 0.53	NA	NA	NA	NA	
78-81-9	Isobutylamine	< 0.54	NA	NA	NA	NA	
109-73-9	n-Butylamine	< 0.53	NA	NA	NA	NA	
108-18-9	Diisopropylamine	< 0.51	NA	NA	NA	NA	
121-44-8	Triethylamine	< 0.51	NA	NA	NA	NA	
142-84-7	Dipropylamine	< 0.52	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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1450  
**Client Project ID:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P1203491-020

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
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	< 0.53	NA	NA	NA	NA	
75-04-7	Ethylamine	< 0.55	NA	NA	NA	NA	
75-50-3	Trimethylamine	< 0.52	NA	NA	NA	NA	
75-31-0	Isopropylamine	< 0.52	NA	NA	NA	NA	
75-64-9	tert-Butylamine	< 1.1	NA	NA	NA	NA	
107-10-8	n-Propylamine	< 0.55	NA	NA	NA	NA	
109-89-7	Diethylamine	< 0.52	NA	NA	NA	NA	
13952-84-6	sec-Butylamine	< 0.53	NA	NA	NA	NA	
78-81-9	Isobutylamine	< 0.54	NA	NA	NA	NA	
109-73-9	n-Butylamine	< 0.53	NA	NA	NA	NA	
108-18-9	Diisopropylamine	< 0.51	NA	NA	NA	NA	
121-44-8	Triethylamine	< 0.51	NA	NA	NA	NA	
142-84-7	Dipropylamine	< 0.52	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.



## RESULTS OF ANALYSIS

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

**Client Sample ID:** Method Blank

**Client Project ID:** 182608005

CAS Project ID: P1203491

CAS Sample ID: P120828-MB

**Test Code:** GC/NPD  
**Instrument ID:** Agilent 6890N/GC15/NPD  
**Analyst:** Zheng Wang  
**Sampling Media:** Treated Alumina Tube  
**Test Notes:** BC, DE

**Date Collected:** NA  
**Date Received:** NA  
**Date Analyzed:** 8/28/12  
**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	< 0.53	NA	NA	NA	NA	
75-04-7	Ethylamine	< 0.55	NA	NA	NA	NA	
75-50-3	Trimethylamine	< 0.52	NA	NA	NA	NA	
75-31-0	Isopropylamine	< 0.52	NA	NA	NA	NA	
75-64-9	tert-Butylamine	< 1.1	NA	NA	NA	NA	
107-10-8	n-Propylamine	< 0.55	NA	NA	NA	NA	
109-89-7	Diethylamine	< 0.52	NA	NA	NA	NA	
13952-84-6	sec-Butylamine	< 0.53	NA	NA	NA	NA	
78-81-9	Isobutylamine	< 0.54	NA	NA	NA	NA	
109-73-9	n-Butylamine	< 0.53	NA	NA	NA	NA	
108-18-9	Diisopropylamine	< 0.51	NA	NA	NA	NA	
121-44-8	Triethylamine	< 0.51	NA	NA	NA	NA	
142-84-7	Dipropylamine	< 0.52	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.

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:** 182608005

CAS Project ID: P1203491  
CAS Sample ID: P120828-DLCS

Test Code: GC/NPD  
Instrument ID: Agilent 6890N/GC15/NPD  
Analyst: Zheng Wang  
Sampling Media: Treated Alumina Tube  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: NA Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		CAS	RPD	RPD	Data
		LCS / DLCS	LCS	DLCS	LCS	DLCS	Acceptance	RPD			
		µg/ml	µg/ml	µg/ml	LCS	DLCS	Limits	Limit	Qualifier		
124-40-3	Dimethylamine	10.8	10.8	10.5	100	97	57-129	3	19		
75-04-7	Ethylamine	11.7	11.3	10.7	97	91	52-127	6	18		
75-50-3	Trimethylamine	8.29	8.45	8.76	102	106	44-139	4	35		
75-31-0	Isopropylamine	10.4	10.4	9.97	100	96	64-127	4	16		
75-64-9	tert-Butylamine	10.4	10.5	9.93	101	95	65-129	6	20		
107-10-8	n-Propylamine	10.9	10.5	9.87	96	91	57-127	5	14		
109-89-7	Diethylamine	10.7	11.0	10.3	103	96	65-128	7	16		
13952-84-6	sec-Butylamine	10.4	10.5	9.76	101	94	68-125	7	14		
78-81-9	Isobutylamine	10.5	10.2	9.61	97	92	65-125	5	15		
109-73-9	n-Butylamine	10.6	10.1	9.61	95	91	68-123	4	16		
108-18-9	Diisopropylamine	10	10.4	9.68	104	97	63-128	7	17		
121-44-8	Triethylamine	10.2	10.5	9.97	103	98	65-125	5	19		
142-84-7	Dipropylamine	10.2	10.4	9.73	102	95	70-125	7	14		

**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

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

**Client Sample ID:** 1313

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 121.0

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	4.4	ND	2.4
75-04-7	Ethylamine	< 0.55	ND	4.5	ND	2.5
75-50-3	Trimethylamine	< 0.52	ND	4.3	ND	1.8
75-31-0	Isopropylamine	< 0.52	ND	4.3	ND	1.8
75-64-9	tert-Butylamine	< 1.1	ND	8.7	ND	2.9
107-10-8	n-Propylamine	< 0.55	ND	4.6	ND	1.9
109-89-7	Diethylamine	< 0.52	ND	4.3	ND	1.4
13952-84-6	sec-Butylamine	< 0.53	ND	4.4	ND	1.5
78-81-9	Isobutylamine	< 0.54	ND	4.4	ND	1.5
109-73-9	n-Butylamine	< 0.53	ND	4.4	ND	1.5
108-18-9	Diisopropylamine	< 0.51	ND	4.2	ND	1.0
121-44-8	Triethylamine	< 0.51	ND	4.2	ND	1.0
142-84-7	Dipropylamine	< 0.52	ND	4.3	ND	1.0

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-001

ml  
Liter(s)

Data  
Qualifier

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

method.

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

**Client Sample ID:** 1319

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 122.7

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	4.3	ND	2.3
75-04-7	Ethylamine	< 0.55	ND	4.5	ND	2.4
75-50-3	Trimethylamine	< 0.52	ND	4.2	ND	1.7
75-31-0	Isopropylamine	< 0.52	ND	4.3	ND	1.8
75-64-9	tert-Butylamine	< 1.1	ND	8.6	ND	2.9
107-10-8	n-Propylamine	< 0.55	ND	4.5	ND	1.9
109-89-7	Diethylamine	< 0.52	ND	4.2	ND	1.4
13952-84-6	sec-Butylamine	< 0.53	ND	4.3	ND	1.4
78-81-9	Isobutylamine	< 0.54	ND	4.4	ND	1.5
109-73-9	n-Butylamine	< 0.53	ND	4.4	ND	1.5
108-18-9	Diisopropylamine	< 0.51	ND	4.1	ND	1.0
121-44-8	Triethylamine	< 0.51	ND	4.2	ND	1.0
142-84-7	Dipropylamine	< 0.52	ND	4.2	ND	1.0

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-002

ml  
Liter(s)

Data  
Qualifier

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

method.

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

**Client Sample ID:** 1323

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 87.0

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	6.1	ND	3.3
75-04-7	Ethylamine	< 0.55	ND	6.3	ND	3.4
75-50-3	Trimethylamine	< 0.52	ND	5.9	ND	2.5
75-31-0	Isopropylamine	< 0.52	ND	6.0	ND	2.5
75-64-9	tert-Butylamine	< 1.1	ND	12	ND	4.0
107-10-8	n-Propylamine	< 0.55	ND	6.3	ND	2.6
109-89-7	Diethylamine	< 0.52	ND	5.9	ND	2.0
13952-84-6	sec-Butylamine	< 0.53	ND	6.1	ND	2.0
78-81-9	Isobutylamine	< 0.54	ND	6.2	ND	2.1
109-73-9	n-Butylamine	< 0.53	ND	6.1	ND	2.1
108-18-9	Diisopropylamine	< 0.51	ND	5.9	ND	1.4
121-44-8	Triethylamine	< 0.51	ND	5.9	ND	1.4
142-84-7	Dipropylamine	< 0.52	ND	5.9	ND	1.4

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-003

ml  
Liter(s)

Data  
Qualifier

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

method.



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

**Client Sample ID:** 1333

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 104.1

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	5.1	ND	2.8
75-04-7	Ethylamine	< 0.55	ND	5.3	ND	2.9
75-50-3	Trimethylamine	< 0.52	ND	5.0	ND	2.1
75-31-0	Isopropylamine	< 0.52	ND	5.0	ND	2.1
75-64-9	tert-Butylamine	< 1.1	ND	10	ND	3.4
107-10-8	n-Propylamine	< 0.55	ND	5.3	ND	2.2
109-89-7	Diethylamine	< 0.52	ND	5.0	ND	1.7
13952-84-6	sec-Butylamine	< 0.53	ND	5.1	ND	1.7
78-81-9	Isobutylamine	< 0.54	ND	5.2	ND	1.7
109-73-9	n-Butylamine	< 0.53	ND	5.1	ND	1.7
108-18-9	Diisopropylamine	< 0.51	ND	4.9	ND	1.2
121-44-8	Triethylamine	< 0.51	ND	4.9	ND	1.2
142-84-7	Dipropylamine	< 0.52	ND	5.0	ND	1.2

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-004

ml  
Liter(s)

Data  
Qualifier

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

method.

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

**Client Sample ID:** 1338

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 47.4

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	11	ND	6.0
75-04-7	Ethylamine	< 0.55	ND	12	ND	6.3
75-50-3	Trimethylamine	< 0.52	ND	11	ND	4.5
75-31-0	Isopropylamine	< 0.52	ND	11	ND	4.6
75-64-9	tert-Butylamine	< 1.1	ND	22	ND	7.4
107-10-8	n-Propylamine	< 0.55	ND	12	ND	4.8
109-89-7	Diethylamine	< 0.52	ND	11	ND	3.6
13952-84-6	sec-Butylamine	< 0.53	ND	11	ND	3.7
78-81-9	Isobutylamine	< 0.54	ND	11	ND	3.8
109-73-9	n-Butylamine	< 0.53	ND	11	ND	3.8
108-18-9	Diisopropylamine	< 0.51	ND	11	ND	2.6
121-44-8	Triethylamine	< 0.51	ND	11	ND	2.6
142-84-7	Dipropylamine	< 0.52	ND	11	ND	2.6

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-005

ml  
Liter(s)

Data  
Qualifier

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method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1346

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 72.0

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	7.3	ND	4.0
75-04-7	Ethylamine	< 0.55	ND	7.6	ND	4.1
75-50-3	Trimethylamine	< 0.52	ND	7.2	ND	3.0
75-31-0	Isopropylamine	< 0.52	ND	7.3	ND	3.0
75-64-9	tert-Butylamine	< 1.1	ND	15	ND	4.9
107-10-8	n-Propylamine	< 0.55	ND	7.7	ND	3.2
109-89-7	Diethylamine	< 0.52	ND	7.2	ND	2.4
13952-84-6	sec-Butylamine	< 0.53	ND	7.3	ND	2.5
78-81-9	Isobutylamine	< 0.54	ND	7.5	ND	2.5
109-73-9	n-Butylamine	< 0.53	ND	7.4	ND	2.5
108-18-9	Diisopropylamine	< 0.51	ND	7.1	ND	1.7
121-44-8	Triethylamine	< 0.51	ND	7.1	ND	1.7
142-84-7	Dipropylamine	< 0.52	ND	7.2	ND	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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-006

ml  
Liter(s)

Data  
Qualifier

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method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1353

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 65.5

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	8.1	ND	4.4
75-04-7	Ethylamine	< 0.55	ND	8.4	ND	4.5
75-50-3	Trimethylamine	< 0.52	ND	7.9	ND	3.3
75-31-0	Isopropylamine	< 0.52	ND	8.0	ND	3.3
75-64-9	tert-Butylamine	< 1.1	ND	16	ND	5.4
107-10-8	n-Propylamine	< 0.55	ND	8.4	ND	3.5
109-89-7	Diethylamine	< 0.52	ND	7.9	ND	2.6
13952-84-6	sec-Butylamine	< 0.53	ND	8.1	ND	2.7
78-81-9	Isobutylamine	< 0.54	ND	8.2	ND	2.7
109-73-9	n-Butylamine	< 0.53	ND	8.2	ND	2.7
108-18-9	Diisopropylamine	< 0.51	ND	7.8	ND	1.9
121-44-8	Triethylamine	< 0.51	ND	7.8	ND	1.9
142-84-7	Dipropylamine	< 0.52	ND	7.9	ND	1.9

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-007

ml  
Liter(s)

Data  
Qualifier

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method.



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1361

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 53.6

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	9.9	ND	5.3
75-04-7	Ethylamine	< 0.55	ND	10	ND	5.5
75-50-3	Trimethylamine	< 0.52	ND	9.6	ND	4.0
75-31-0	Isopropylamine	< 0.52	ND	9.8	ND	4.1
75-64-9	tert-Butylamine	< 1.1	ND	20	ND	6.6
107-10-8	n-Propylamine	< 0.55	ND	10	ND	4.3
109-89-7	Diethylamine	< 0.52	ND	9.6	ND	3.2
13952-84-6	sec-Butylamine	< 0.53	ND	9.9	ND	3.3
78-81-9	Isobutylamine	< 0.54	ND	10	ND	3.4
109-73-9	n-Butylamine	< 0.53	ND	10	ND	3.3
108-18-9	Diisopropylamine	< 0.51	ND	9.5	ND	2.3
121-44-8	Triethylamine	< 0.51	ND	9.6	ND	2.3
142-84-7	Dipropylamine	< 0.52	ND	9.6	ND	2.3

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-008

ml  
Liter(s)

Data  
Qualifier

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method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

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

**Client Sample ID:** 1374

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 64.0

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	8.2	ND	4.5
75-04-7	Ethylamine	< 0.55	ND	8.6	ND	4.6
75-50-3	Trimethylamine	< 0.52	ND	8.1	ND	3.3
75-31-0	Isopropylamine	< 0.52	ND	8.2	ND	3.4
75-64-9	tert-Butylamine	< 1.1	ND	16	ND	5.5
107-10-8	n-Propylamine	< 0.55	ND	8.6	ND	3.6
109-89-7	Diethylamine	< 0.52	ND	8.1	ND	2.7
13952-84-6	sec-Butylamine	< 0.53	ND	8.3	ND	2.8
78-81-9	Isobutylamine	< 0.54	ND	8.4	ND	2.8
109-73-9	n-Butylamine	< 0.53	ND	8.3	ND	2.8
108-18-9	Diisopropylamine	< 0.51	ND	8.0	ND	1.9
121-44-8	Triethylamine	< 0.51	ND	8.0	ND	1.9
142-84-7	Dipropylamine	< 0.52	ND	8.1	ND	1.9

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-009

ml  
Liter(s)

Data  
Qualifier

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method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1381

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 82.0

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	6.4	ND	3.5
75-04-7	Ethylamine	< 0.55	ND	6.7	ND	3.6
75-50-3	Trimethylamine	< 0.52	ND	6.3	ND	2.6
75-31-0	Isopropylamine	< 0.52	ND	6.4	ND	2.6
75-64-9	tert-Butylamine	< 1.1	ND	13	ND	4.3
107-10-8	n-Propylamine	< 0.55	ND	6.7	ND	2.8
109-89-7	Diethylamine	< 0.52	ND	6.3	ND	2.1
13952-84-6	sec-Butylamine	< 0.53	ND	6.5	ND	2.2
78-81-9	Isobutylamine	< 0.54	ND	6.6	ND	2.2
109-73-9	n-Butylamine	< 0.53	ND	6.5	ND	2.2
108-18-9	Diisopropylamine	< 0.51	ND	6.2	ND	1.5
121-44-8	Triethylamine	< 0.51	ND	6.2	ND	1.5
142-84-7	Dipropylamine	< 0.52	ND	6.3	ND	1.5

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-010

ml  
Liter(s)

Data  
Qualifier

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method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

**RESULTS OF ANALYSIS**

Page 1 of 1

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

**Client Sample ID:** 1391

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 69.7

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	7.6	ND	4.1
75-04-7	Ethylamine	< 0.55	ND	7.9	ND	4.3
75-50-3	Trimethylamine	< 0.52	ND	7.4	ND	3.1
75-31-0	Isopropylamine	< 0.52	ND	7.5	ND	3.1
75-64-9	tert-Butylamine	< 1.1	ND	15	ND	5.0
107-10-8	n-Propylamine	< 0.55	ND	7.9	ND	3.3
109-89-7	Diethylamine	< 0.52	ND	7.4	ND	2.5
13952-84-6	sec-Butylamine	< 0.53	ND	7.6	ND	2.5
78-81-9	Isobutylamine	< 0.54	ND	7.7	ND	2.6
109-73-9	n-Butylamine	< 0.53	ND	7.7	ND	2.6
108-18-9	Diisopropylamine	< 0.51	ND	7.3	ND	1.8
121-44-8	Triethylamine	< 0.51	ND	7.4	ND	1.8
142-84-7	Dipropylamine	< 0.52	ND	7.4	ND	1.8

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-011

ml  
Liter(s)

Data  
Qualifier

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method.



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1399

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 70.1

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	7.5	ND	4.1
75-04-7	Ethylamine	< 0.55	ND	7.8	ND	4.2
75-50-3	Trimethylamine	< 0.52	ND	7.4	ND	3.1
75-31-0	Isopropylamine	< 0.52	ND	7.5	ND	3.1
75-64-9	tert-Butylamine	< 1.1	ND	15	ND	5.0
107-10-8	n-Propylamine	< 0.55	ND	7.9	ND	3.3
109-89-7	Diethylamine	< 0.52	ND	7.4	ND	2.5
13952-84-6	sec-Butylamine	< 0.53	ND	7.5	ND	2.5
78-81-9	Isobutylamine	< 0.54	ND	7.7	ND	2.6
109-73-9	n-Butylamine	< 0.53	ND	7.6	ND	2.5
108-18-9	Diisopropylamine	< 0.51	ND	7.3	ND	1.8
121-44-8	Triethylamine	< 0.51	ND	7.3	ND	1.8
142-84-7	Dipropylamine	< 0.52	ND	7.4	ND	1.8

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-012

ml  
Liter(s)

Data  
Qualifier

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\_\_\_\_\_

method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1403

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 90.4

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	5.8	ND	3.2
75-04-7	Ethylamine	< 0.55	ND	6.1	ND	3.3
75-50-3	Trimethylamine	< 0.52	ND	5.7	ND	2.4
75-31-0	Isopropylamine	< 0.52	ND	5.8	ND	2.4
75-64-9	tert-Butylamine	< 1.1	ND	12	ND	3.9
107-10-8	n-Propylamine	< 0.55	ND	6.1	ND	2.5
109-89-7	Diethylamine	< 0.52	ND	5.7	ND	1.9
13952-84-6	sec-Butylamine	< 0.53	ND	5.9	ND	2.0
78-81-9	Isobutylamine	< 0.54	ND	5.9	ND	2.0
109-73-9	n-Butylamine	< 0.53	ND	5.9	ND	2.0
108-18-9	Diisopropylamine	< 0.51	ND	5.6	ND	1.4
121-44-8	Triethylamine	< 0.51	ND	5.7	ND	1.4
142-84-7	Dipropylamine	< 0.52	ND	5.7	ND	1.4

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-013

ml  
Liter(s)

Data  
Qualifier

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\_\_\_\_\_

method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

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

**Client Sample ID:** 1413

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 79.5

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	6.6	ND	3.6
75-04-7	Ethylamine	< 0.55	ND	6.9	ND	3.7
75-50-3	Trimethylamine	< 0.52	ND	6.5	ND	2.7
75-31-0	Isopropylamine	< 0.52	ND	6.6	ND	2.7
75-64-9	tert-Butylamine	< 1.1	ND	13	ND	4.4
107-10-8	n-Propylamine	< 0.55	ND	6.9	ND	2.9
109-89-7	Diethylamine	< 0.52	ND	6.5	ND	2.2
13952-84-6	sec-Butylamine	< 0.53	ND	6.7	ND	2.2
78-81-9	Isobutylamine	< 0.54	ND	6.8	ND	2.3
109-73-9	n-Butylamine	< 0.53	ND	6.7	ND	2.2
108-18-9	Diisopropylamine	< 0.51	ND	6.4	ND	1.5
121-44-8	Triethylamine	< 0.51	ND	6.4	ND	1.6
142-84-7	Dipropylamine	< 0.52	ND	6.5	ND	1.6

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-014

ml  
Liter(s)

Data  
Qualifier

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method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1417

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 103.9

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	5.1	ND	2.8
75-04-7	Ethylamine	< 0.55	ND	5.3	ND	2.9
75-50-3	Trimethylamine	< 0.52	ND	5.0	ND	2.1
75-31-0	Isopropylamine	< 0.52	ND	5.0	ND	2.1
75-64-9	tert-Butylamine	< 1.1	ND	10	ND	3.4
107-10-8	n-Propylamine	< 0.55	ND	5.3	ND	2.2
109-89-7	Diethylamine	< 0.52	ND	5.0	ND	1.7
13952-84-6	sec-Butylamine	< 0.53	ND	5.1	ND	1.7
78-81-9	Isobutylamine	< 0.54	ND	5.2	ND	1.7
109-73-9	n-Butylamine	< 0.53	ND	5.1	ND	1.7
108-18-9	Diisopropylamine	< 0.51	ND	4.9	ND	1.2
121-44-8	Triethylamine	< 0.51	ND	4.9	ND	1.2
142-84-7	Dipropylamine	< 0.52	ND	5.0	ND	1.2

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-015

ml  
Liter(s)

Data  
Qualifier

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

method.



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1434

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 0.4

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	1,300	ND	720
75-04-7	Ethylamine	< 0.55	ND	1,400	ND	740
75-50-3	Trimethylamine	< 0.52	ND	1,300	ND	530
75-31-0	Isopropylamine	< 0.52	ND	1,300	ND	540
75-64-9	tert-Butylamine	< 1.1	ND	2,600	ND	880
107-10-8	n-Propylamine	< 0.55	ND	1,400	ND	570
109-89-7	Diethylamine	< 0.52	ND	1,300	ND	430
13952-84-6	sec-Butylamine	< 0.53	ND	1,300	ND	440
78-81-9	Isobutylamine	< 0.54	ND	1,300	ND	450
109-73-9	n-Butylamine	< 0.53	ND	1,300	ND	450
108-18-9	Diisopropylamine	< 0.51	ND	1,300	ND	310
121-44-8	Triethylamine	< 0.51	ND	1,300	ND	310
142-84-7	Dipropylamine	< 0.52	ND	1,300	ND	310

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-016

ml  
Liter(s)

Data  
Qualifier

\_\_\_\_\_

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\_\_\_\_\_

method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1429

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 0.4

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	1,300	ND	720
75-04-7	Ethylamine	< 0.55	ND	1,400	ND	740
75-50-3	Trimethylamine	< 0.52	ND	1,300	ND	530
75-31-0	Isopropylamine	< 0.52	ND	1,300	ND	540
75-64-9	tert-Butylamine	< 1.1	ND	2,600	ND	880
107-10-8	n-Propylamine	< 0.55	ND	1,400	ND	570
109-89-7	Diethylamine	< 0.52	ND	1,300	ND	430
13952-84-6	sec-Butylamine	< 0.53	ND	1,300	ND	440
78-81-9	Isobutylamine	< 0.54	ND	1,300	ND	450
109-73-9	n-Butylamine	< 0.53	ND	1,300	ND	450
108-18-9	Diisopropylamine	< 0.51	ND	1,300	ND	310
121-44-8	Triethylamine	< 0.51	ND	1,300	ND	310
142-84-7	Dipropylamine	< 0.52	ND	1,300	ND	310

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-017

ml  
Liter(s)

Data  
Qualifier

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method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1437

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: 0.4

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	ND	1,300	ND	720
75-04-7	Ethylamine	< 0.55	ND	1,400	ND	740
75-50-3	Trimethylamine	< 0.52	ND	1,300	ND	530
75-31-0	Isopropylamine	< 0.52	ND	1,300	ND	540
75-64-9	tert-Butylamine	< 1.1	ND	2,600	ND	880
107-10-8	n-Propylamine	< 0.55	ND	1,400	ND	570
109-89-7	Diethylamine	< 0.52	ND	1,300	ND	430
13952-84-6	sec-Butylamine	< 0.53	ND	1,300	ND	440
78-81-9	Isobutylamine	< 0.54	ND	1,300	ND	450
109-73-9	n-Butylamine	< 0.53	ND	1,300	ND	450
108-18-9	Diisopropylamine	< 0.51	ND	1,300	ND	310
121-44-8	Triethylamine	< 0.51	ND	1,300	ND	310
142-84-7	Dipropylamine	< 0.52	ND	1,300	ND	310

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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-018

ml  
Liter(s)

Data  
Qualifier

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\_\_\_\_\_

method.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1449

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: NA

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	NA	NA	NA	NA
75-04-7	Ethylamine	< 0.55	NA	NA	NA	NA
75-50-3	Trimethylamine	< 0.52	NA	NA	NA	NA
75-31-0	Isopropylamine	< 0.52	NA	NA	NA	NA
75-64-9	tert-Butylamine	< 1.1	NA	NA	NA	NA
107-10-8	n-Propylamine	< 0.55	NA	NA	NA	NA
109-89-7	Diethylamine	< 0.52	NA	NA	NA	NA
13952-84-6	sec-Butylamine	< 0.53	NA	NA	NA	NA
78-81-9	Isobutylamine	< 0.54	NA	NA	NA	NA
109-73-9	n-Butylamine	< 0.53	NA	NA	NA	NA
108-18-9	Diisopropylamine	< 0.51	NA	NA	NA	NA
121-44-8	Triethylamine	< 0.51	NA	NA	NA	NA
142-84-7	Dipropylamine	< 0.52	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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

NA = Not applicable.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-019

ml  
Liter(s)

Data  
Qualifier

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method.



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1450

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12034

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: NA

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	NA	NA	NA	NA
75-04-7	Ethylamine	< 0.55	NA	NA	NA	NA
75-50-3	Trimethylamine	< 0.52	NA	NA	NA	NA
75-31-0	Isopropylamine	< 0.52	NA	NA	NA	NA
75-64-9	tert-Butylamine	< 1.1	NA	NA	NA	NA
107-10-8	n-Propylamine	< 0.55	NA	NA	NA	NA
109-89-7	Diethylamine	< 0.52	NA	NA	NA	NA
13952-84-6	sec-Butylamine	< 0.53	NA	NA	NA	NA
78-81-9	Isobutylamine	< 0.54	NA	NA	NA	NA
109-73-9	n-Butylamine	< 0.53	NA	NA	NA	NA
108-18-9	Diisopropylamine	< 0.51	NA	NA	NA	NA
121-44-8	Triethylamine	< 0.51	NA	NA	NA	NA
142-84-7	Dipropylamine	< 0.52	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

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

NA = Not applicable.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
91-020

ml  
Liter(s)

Data  
Qualifier

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** Method Blank

**Client Project ID:** 182608005

CAS Project ID: P12034

CAS Sample ID: P12082

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes: **BC, DE**

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/28/12  
 Desorption Volume: 2.0  
 Volume Sampled: NA

CAS #	Compound	Result µg/Tube	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
124-40-3	Dimethylamine	< 0.53	NA	NA	NA	NA
75-04-7	Ethylamine	< 0.55	NA	NA	NA	NA
75-50-3	Trimethylamine	< 0.52	NA	NA	NA	NA
75-31-0	Isopropylamine	< 0.52	NA	NA	NA	NA
75-64-9	tert-Butylamine	< 1.1	NA	NA	NA	NA
107-10-8	n-Propylamine	< 0.55	NA	NA	NA	NA
109-89-7	Diethylamine	< 0.52	NA	NA	NA	NA
13952-84-6	sec-Butylamine	< 0.53	NA	NA	NA	NA
78-81-9	Isobutylamine	< 0.54	NA	NA	NA	NA
109-73-9	n-Butylamine	< 0.53	NA	NA	NA	NA
108-18-9	Diisopropylamine	< 0.51	NA	NA	NA	NA
121-44-8	Triethylamine	< 0.51	NA	NA	NA	NA
142-84-7	Dipropylamine	< 0.52	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

NA = Not applicable.

BC = Results reported are not blank corrected.

DE = Results reported are corrected for desorption efficiency.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

91  
8-MB

ml  
Liter(s)

Data  
Qualifier

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

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:** 182608005

CAS Project ID: P1203491  
 CAS Sample ID: P120828-DL

Test Code: GC/NPD  
 Instrument ID: Agilent 6890N/GC15/NPD  
 Analyst: Zheng Wang  
 Sampling Media: Treated Alumina Tube  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: NA Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		CAS	RPD	RPD
		LCS / DLCS	LCS	DLCS	LCS	DLCS	Acceptance	RPD		
		µg/ml	µg/ml	µg/ml	LCS	DLCS	Limits	Limit		
124-40-3	Dimethylamine	10.8	10.8	10.5	<b>100</b>	<b>97</b>	57-129	3	19	
75-04-7	Ethylamine	11.7	11.3	10.7	<b>97</b>	<b>91</b>	52-127	6	18	
75-50-3	Trimethylamine	8.29	8.45	8.76	<b>102</b>	<b>106</b>	44-139	4	35	
75-31-0	Isopropylamine	10.4	10.4	9.97	<b>100</b>	<b>96</b>	64-127	4	16	
75-64-9	tert-Butylamine	10.4	10.5	9.93	<b>101</b>	<b>95</b>	65-129	6	20	
107-10-8	n-Propylamine	10.9	10.5	9.87	<b>96</b>	<b>91</b>	57-127	5	14	
109-89-7	Diethylamine	10.7	11.0	10.3	<b>103</b>	<b>96</b>	65-128	7	16	
13952-84-6	sec-Butylamine	10.4	10.5	9.76	<b>101</b>	<b>94</b>	68-125	7	14	
78-81-9	Isobutylamine	10.5	10.2	9.61	<b>97</b>	<b>92</b>	65-125	5	15	
109-73-9	n-Butylamine	10.6	10.1	9.61	<b>95</b>	<b>91</b>	68-123	4	16	
108-18-9	Diisopropylamine	10	10.4	9.68	<b>104</b>	<b>97</b>	63-128	7	17	
121-44-8	Triethylamine	10.2	10.5	9.97	<b>103</b>	<b>98</b>	65-125	5	19	
142-84-7	Dipropylamine	10.2	10.4	9.73	<b>102</b>	<b>95</b>	70-125	7	14	

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

CS

)

**Data  
Qualifier**

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## LABORATORY REPORT

September 4, 2012

John Reiter  
Stantec Consulting Services, Inc.  
12075 Corporate Pkwy, Ste. 200  
Mequon, WI 53092

**RE: 182608005**

Dear John:

Enclosed are the results of the samples submitted to our laboratory on August 24, 2012. For your reference, these analyses have been assigned our service request number P1203487.

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.caslab.com](http://www.caslab.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

**ALS | Environmental**

Samantha Henningsen  
Project Manager

Client: Stantec Consulting Services, Inc.  
Project: 182608005

Service Request No: P1203487

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### CASE NARRATIVE

The samples were received intact under chain of custody on August 24, 2012 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.

#### Ammonia Analysis

The samples were prepared in accordance with OSHA ID-188 and analyzed for ammonia in air by Ion Selective Electrode per OSHA ID-164.

The upper control criterion was exceeded for the Laboratory Control Sample (LCS) analyzed on August 30, 2012. The analyte in question was not detected in the associated field samples. Since the error associated with the elevated recovery equates to a high bias, the sample data has not been significantly affected. The data has been flagged accordingly. No corrective action was required.

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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 Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of Columbia Analytical Services, Inc. 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 AALS 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.*



DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: 182608005

Service Request: P1203487

Date Received: 8/24/2012  
 Time Received: 09:45

OSHA ID-164 Modified - Ammonia

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
1310	P1203487-001	Air	8/21/2012	00:00	X
1318	P1203487-002	Air	8/21/2012	00:00	X
1326	P1203487-003	Air	8/21/2012	00:00	X
1331	P1203487-004	Air	8/21/2012	00:00	X
1339	P1203487-005	Air	8/21/2012	00:00	X
1348	P1203487-006	Air	8/21/2012	00:00	X
1354	P1203487-007	Air	8/21/2012	00:00	X
1362	P1203487-008	Air	8/21/2012	00:00	X
1376	P1203487-009	Air	8/21/2012	00:00	X
1384	P1203487-010	Air	8/21/2012	00:00	X
1390	P1203487-011	Air	8/21/2012	00:00	X
1397	P1203487-012	Air	8/21/2012	00:00	X
1402	P1203487-013	Air	8/21/2012	00:00	X
1409	P1203487-014	Air	8/21/2012	00:00	X
1419	P1203487-015	Air	8/21/2012	00:00	X
1427	P1203487-016	Air	8/21/2012	00:00	X
1430	P1203487-017	Air	8/21/2012	00:00	X
1439	P1203487-018	Air	8/21/2012	00:00	X
1443	P1203487-019	Air	8/21/2012	00:00	X
1444	P1203487-020	Air	8/21/2012	00:00	X



**Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc. Work order: P1203487

Project: 182608005

Sample(s) received on: 8/24/12 Date opened: 8/24/12 by: MZAMORA

**Note:** This form is used for all samples received by CAS. 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.

- |    |  | <u>Yes</u>                          | <u>No</u>                           | <u>N/A</u>                          |
|----|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 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 CAS</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: 21° C    Blank Temperature: ° C | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
|    | <b>Gel Packs</b>   |                                     |                                     |                                     |
| 9  | Was a <b>blank</b> received?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 10 | Were <b>custody seals</b> on outside of cooler/Box?<br>Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input 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"/> |
|    | Were custody seals on outside of sample container?<br>Location of seal(s)? _____ Sealing Lid?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input 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
P1203487-001.01	Anasorb 747 Tube					
P1203487-002.01	Anasorb 747 Tube					
P1203487-003.01	Anasorb 747 Tube					
P1203487-004.01	Anasorb 747 Tube					
P1203487-005.01	Anasorb 747 Tube					
P1203487-006.01	Anasorb 747 Tube					
P1203487-007.01	Anasorb 747 Tube					
P1203487-008.01	Anasorb 747 Tube					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 The times of sample collection were not indicated on the COC. \_\_\_\_\_



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Project ID:** 182608005

CAS Project ID: P1203487

**Ammonia**

Test Code: OSHA ID-188/ID-164  
 Instrument ID: PH02/Orion 720A/Ammonia ISE  
 Analyst: Sue Anderson  
 Sampling Media: Anasorb 747 Tube(s) (Sulfuric Treated)  
 Test Notes: BC, DE

Date(s) Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28 - 8/30/12  
 Desorption Volume: 0.10 Liter(s)

Client Sample ID	CAS 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						
1310	P1203487-001	147.7	1.0	< 0.011	ND	0.071	ND	0.10	
1318	P1203487-002	144.3	1.0	< 0.011	ND	0.073	ND	0.11	
1326	P1203487-003	145.5	1.0	< 0.011	ND	0.073	ND	0.10	
1331	P1203487-004	142.1	1.0	< 0.011	ND	0.074	ND	0.11	
1339	P1203487-005	47.6	1.0	< 0.011	ND	0.22	ND	0.32	
1348	P1203487-006	89.3	1.0	< 0.011	ND	0.12	ND	0.17	
1354	P1203487-007	87.5	1.0	< 0.011	ND	0.12	ND	0.17	
1362	P1203487-008	86.2	1.0	< 0.011	ND	0.12	ND	0.18	
1376	P1203487-009	106.0	1.0	< 0.011	ND	0.10	ND	0.14	
1384	P1203487-010	102.3	1.0	< 0.011	ND	0.10	ND	0.15	
1390	P1203487-011	96.9	1.0	< 0.011	ND	0.11	ND	0.16	L
1397	P1203487-012	85.1	1.0	< 0.011	ND	0.12	ND	0.18	L
1402	P1203487-013	126.5	1.0	< 0.011	ND	0.083	ND	0.12	L
1409	P1203487-014	121.3	1.0	< 0.011	ND	0.087	ND	0.13	L
1419	P1203487-015	126.7	1.0	< 0.011	ND	0.083	ND	0.12	L
1427	P1203487-016	2.0	1.0	< 0.011	ND	5.3	ND	7.6	L
1430	P1203487-017	2.0	1.0	< 0.011	ND	5.3	ND	7.6	L
1439	P1203487-018	2.0	1.0	< 0.011	ND	5.3	ND	7.6	L
1443	P1203487-019	NA	1.0	< 0.011	NA	NA	NA	NA	L
1444	P1203487-020	NA	1.0	< 0.011	NA	NA	NA	NA	L
Method Blank	P120828-MB	NA	1.0	< 0.011	NA	NA	NA	NA	
Method Blank	P120830-MB	NA	1.0	< 0.011	NA	NA	NA	NA	L

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.  
 L = Laboratory control sample recovery outside the specified limits; results may be biased high.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Duplicate Lab Control Sample  
**Client Project ID:** 182608005

CAS Project ID: P1203487  
 CAS Sample ID: P120828-LCS,  
 P120828-DLCS

**Laboratory Control Sample/Duplicate Laboratory Control Sample Summary**

**Test Code:** OSHA ID-188/ID-164  
**Instrument ID:** PH02/Orion 720A/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:** 8/28/12  
**Volume(s) Analyzed:** N/A

Compound	Spike Amount LCS / DLCS mg/L	Result		% Recovery		CAS Acceptance Limits	Relative Percent Difference	RPD Limit	Data Qualifier
		LCS mg/L	DLCS mg/L	LCS	DLCS				
Ammonia	1.00	1.03	1.00	103	100	80-104	3	5	

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Duplicate Lab Control Sample  
**Client Project ID:** 182608005

CAS Project ID: P1203487  
 CAS Sample ID: P120830-LCS,  
 P120830-DLCS

**Laboratory Control Sample/Duplicate Laboratory Control Sample Summary**

Test Code: OSHA ID-188/ID-164  
 Instrument ID: PH02/Orion 720A/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: 8/30/12  
 Volume(s) Analyzed: N/A

Compound	Spike Amount LCS / DLCS mg/L	Result		% Recovery		CAS Acceptance Limits	Relative Percent Difference	RPD Limit	Data Qualifier
		LCS mg/L	DLCS mg/L	LCS	DLCS				
Ammonia	1.00	1.08	1.06	108	106	80-104	2	5	<b>L</b>

L = Laboratory control sample recovery outside the specified limits; results may be biased high.

## LABORATORY REPORT

September 4, 2012

John Reiter  
Stantec Consulting Services, Inc.  
12075 Corporate Pkwy, Ste. 200  
Mequon, WI 53092

**RE: 182608005**

Dear John:

Enclosed are the results of the samples submitted to our laboratory on August 24, 2012. For your reference, these analyses have been assigned our service request number P1203487.

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.caslab.com](http://www.caslab.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

**ALS | Environmental**

Samantha Henningsen  
Project Manager



Client: Stantec Consulting Services, Inc.  
Project: 182608005

Service Request No: P1203487

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### CASE NARRATIVE

The samples were received intact under chain of custody on August 24, 2012 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.

#### Ammonia Analysis

The samples were prepared in accordance with OSHA ID-188 and analyzed for ammonia in air by Ion Selective Electrode per OSHA ID-164.

The upper control criterion was exceeded for the Laboratory Control Sample (LCS) analyzed on August 30, 2012. The analyte in question was not detected in the associated field samples. Since the error associated with the elevated recovery equates to a high bias, the sample data has not been significantly affected. The data has been flagged accordingly. No corrective action was required.

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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 Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of Columbia Analytical Services, Inc. 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 AALS 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.*

DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: 182608005

Service Request: P1203487

Date Received: 8/24/2012  
 Time Received: 09:45

OSHA ID-164 Modified - Ammonia

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
1310	P1203487-001	Air	8/21/2012	00:00	X
1318	P1203487-002	Air	8/21/2012	00:00	X
1326	P1203487-003	Air	8/21/2012	00:00	X
1331	P1203487-004	Air	8/21/2012	00:00	X
1339	P1203487-005	Air	8/21/2012	00:00	X
1348	P1203487-006	Air	8/21/2012	00:00	X
1354	P1203487-007	Air	8/21/2012	00:00	X
1362	P1203487-008	Air	8/21/2012	00:00	X
1376	P1203487-009	Air	8/21/2012	00:00	X
1384	P1203487-010	Air	8/21/2012	00:00	X
1390	P1203487-011	Air	8/21/2012	00:00	X
1397	P1203487-012	Air	8/21/2012	00:00	X
1402	P1203487-013	Air	8/21/2012	00:00	X
1409	P1203487-014	Air	8/21/2012	00:00	X
1419	P1203487-015	Air	8/21/2012	00:00	X
1427	P1203487-016	Air	8/21/2012	00:00	X
1430	P1203487-017	Air	8/21/2012	00:00	X
1439	P1203487-018	Air	8/21/2012	00:00	X
1443	P1203487-019	Air	8/21/2012	00:00	X
1444	P1203487-020	Air	8/21/2012	00:00	X



Stantec Consulting Services, Inc.  
 12075 Corporate Parkway, Suite 200  
 Mequon, Wisconsin 53092

P1203487

Date: Tuesday, August 21, 2012

Project number: 182608005  
 (262) 643-9154  
 (262) 241-4901 fax

Please email sample results to:  
**John Reiter, CIH**  
 john.reiter@stantec.com

Laboratory/Sample Transmittal - Analysis Request

**To:** Columbia Analytical Services  
 2655 Park Center Drive, Suite A  
 Simi Valley, California 93065  
**Attention:** Samantha Henningsen


**Services requested:** Evaluation of the enclosed samples as requested below

**Project No.** 182608005

Sample #	Compound/parameter/contaminant	Duration (minutes)	Volume (liters)	Special instructions
1310	Ammonia	304	147.7	OSHA ID-188
1318	Ammonia	297	144.3	
1326	Ammonia	291	145.5	
1331	Ammonia	190	142.1	
1339	Ammonia	119	47.6	
1348	Ammonia	186	89.3	
1354	Ammonia	183	87.5	
1362	Ammonia	180	86.2	
1376	Ammonia	212	106.0	
1384	Ammonia	207	102.3	
1390	Ammonia	199	96.9	
1397	Ammonia	174	85.1	
1402	Ammonia	256	126.5	
1409	Ammonia	258	121.3	
1419	Ammonia	254	126.7	
1427	Ammonia	4	2.0	
1430	Ammonia	4	2.0	
1439	Ammonia	4	2.0	
1443	Ammonia	—	—	Field blank
1444	Ammonia	—	—	Field blank

Routine handling

Please contact our office with email results by:  
 Wednesday, September 5, 2012

  
 signed: John E. Reiter, CIH, Stantec

Waltera stuff 0945  
 2102 Oct 12

**Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc. Work order: P1203487

Project: 182608005

Sample(s) received on: 8/24/12 Date opened: 8/24/12 by: MZAMORA

**Note:** This form is used for all samples received by CAS. 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.

- |   | <u>Yes</u>                          | <u>No</u>                           | <u>N/A</u>                          |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 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 CAS</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: 21° C Blank Temperature: ° C | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| <b>Gel Packs</b>  |                                     |                                     |                                     |
| 9 Was a <b>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 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"/> |
| 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
P1203487-001.01	Anasorb 747 Tube					
P1203487-002.01	Anasorb 747 Tube					
P1203487-003.01	Anasorb 747 Tube					
P1203487-004.01	Anasorb 747 Tube					
P1203487-005.01	Anasorb 747 Tube					
P1203487-006.01	Anasorb 747 Tube					
P1203487-007.01	Anasorb 747 Tube					
P1203487-008.01	Anasorb 747 Tube					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 The times of sample collection were not indicated on the COC. \_\_\_\_\_



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Project ID:** 182608005

CAS Project ID: P1203487

**Ammonia**

Test Code: OSHA ID-188/ID-164  
 Instrument ID: PH02/Orion 720A/Ammonia ISE  
 Analyst: Sue Anderson  
 Sampling Media: Anasorb 747 Tube(s) (Sulfuric Treated)  
 Test Notes: **BC, DE**

Date(s) Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28 - 8/30/12  
 Desorption Volume: 0.10 Liter(s)

Client Sample ID	CAS 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						
1310	P1203487-001	147.7	1.0	< 0.011	ND	0.071	ND	0.10	
1318	P1203487-002	144.3	1.0	< 0.011	ND	0.073	ND	0.11	
1326	P1203487-003	145.5	1.0	< 0.011	ND	0.073	ND	0.10	
1331	P1203487-004	142.1	1.0	< 0.011	ND	0.074	ND	0.11	
1339	P1203487-005	47.6	1.0	< 0.011	ND	0.22	ND	0.32	
1348	P1203487-006	89.3	1.0	< 0.011	ND	0.12	ND	0.17	
1354	P1203487-007	87.5	1.0	< 0.011	ND	0.12	ND	0.17	
1362	P1203487-008	86.2	1.0	< 0.011	ND	0.12	ND	0.18	
1376	P1203487-009	106.0	1.0	< 0.011	ND	0.10	ND	0.14	
1384	P1203487-010	102.3	1.0	< 0.011	ND	0.10	ND	0.15	
1390	P1203487-011	96.9	1.0	< 0.011	ND	0.11	ND	0.16	L
1397	P1203487-012	85.1	1.0	< 0.011	ND	0.12	ND	0.18	L
1402	P1203487-013	126.5	1.0	< 0.011	ND	0.083	ND	0.12	L
1409	P1203487-014	121.3	1.0	< 0.011	ND	0.087	ND	0.13	L
1419	P1203487-015	126.7	1.0	< 0.011	ND	0.083	ND	0.12	L
1427	P1203487-016	2.0	1.0	< 0.011	ND	5.3	ND	7.6	L
1430	P1203487-017	2.0	1.0	< 0.011	ND	5.3	ND	7.6	L
1439	P1203487-018	2.0	1.0	< 0.011	ND	5.3	ND	7.6	L
1443	P1203487-019	NA	1.0	< 0.011	NA	NA	NA	NA	L
1444	P1203487-020	NA	1.0	< 0.011	NA	NA	NA	NA	L
Method Blank	P120828-MB	NA	1.0	< 0.011	NA	NA	NA	NA	L
Method Blank	P120830-MB	NA	1.0	< 0.011	NA	NA	NA	NA	L

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.  
 L = Laboratory control sample recovery outside the specified limits; results may be biased high.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Duplicate Lab Control Sample  
**Client Project ID:** 182608005

CAS Project ID: P1203487  
 CAS Sample ID: P120828-LCS,  
 P120828-DLCS

**Laboratory Control Sample/Duplicate Laboratory Control Sample Summary**

Test Code: OSHA ID-188/ID-164  
 Instrument ID: PH02/Orion 720A/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: 8/28/12  
 Volume(s) Analyzed: N/A

Compound	Spike Amount	Result		% Recovery		CAS Acceptance Limits	Relative Percent Difference	RPD Limit	Data Qualifier
	LCS / DLCS mg/L	LCS mg/L	DLCS mg/L	LCS	DLCS				
Ammonia	1.00	1.03	1.00	103	100	80-104	3	5	

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Duplicate Lab Control Sample  
**Client Project ID:** 182608005

CAS Project ID: P1203487  
 CAS Sample ID: P120830-LCS,  
 P120830-DLCS

**Laboratory Control Sample/Duplicate Laboratory Control Sample Summary**

Test Code: OSHA ID-188/ID-164  
 Instrument ID: PH02/Orion 720A/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: 8/30/12  
 Volume(s) Analyzed: N/A

Compound	Spike Amount LCS / DLCS mg/L	Result		% Recovery		CAS Acceptance Limits	Relative Percent Difference	RPD Limit	Data Qualifier
		LCS mg/L	DLCS mg/L	LCS	DLCS				
Ammonia	1.00	1.08	1.06	108	106	80-104	2	5	<b>L</b>

L = Laboratory control sample recovery outside the specified limits; results may be biased high.



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Project ID:** 182608005

CAS Project ID: P1203487

**Ammonia**

Test Code: OSHA ID-188/ID-164  
 Instrument ID: PH02/Orion 720A/Ammonia ISE  
 Analyst: Sue Anderson  
 Sampling Media: Anasorb 747 Tube(s) (Sulfuric Treated)  
 Test Notes: **BC, DE**

Date(s) Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28 - 8/30/12  
 Desorption Volume: 0.10 Liter(s)

Client Sample ID	CAS 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						
1310	P1203487-001	147.7	1.0	< 0.011	ND	0.071	ND	0.10	
1318	P1203487-002	144.3	1.0	< 0.011	ND	0.073	ND	0.11	
1326	P1203487-003	145.5	1.0	< 0.011	ND	0.073	ND	0.10	
1331	P1203487-004	142.1	1.0	< 0.011	ND	0.074	ND	0.11	
1339	P1203487-005	47.6	1.0	< 0.011	ND	0.22	ND	0.32	
1348	P1203487-006	89.3	1.0	< 0.011	ND	0.12	ND	0.17	
1354	P1203487-007	87.5	1.0	< 0.011	ND	0.12	ND	0.17	
1362	P1203487-008	86.2	1.0	< 0.011	ND	0.12	ND	0.18	
1376	P1203487-009	106.0	1.0	< 0.011	ND	0.10	ND	0.14	
1384	P1203487-010	102.3	1.0	< 0.011	ND	0.10	ND	0.15	
1390	P1203487-011	96.9	1.0	< 0.011	ND	0.11	ND	0.16	L
1397	P1203487-012	85.1	1.0	< 0.011	ND	0.12	ND	0.18	L
1402	P1203487-013	126.5	1.0	< 0.011	ND	0.083	ND	0.12	L
1409	P1203487-014	121.3	1.0	< 0.011	ND	0.087	ND	0.13	L
1419	P1203487-015	126.7	1.0	< 0.011	ND	0.083	ND	0.12	L
1427	P1203487-016	2.0	1.0	< 0.011	ND	5.3	ND	7.6	L
1430	P1203487-017	2.0	1.0	< 0.011	ND	5.3	ND	7.6	L
1439	P1203487-018	2.0	1.0	< 0.011	ND	5.3	ND	7.6	L
1443	P1203487-019	NA	1.0	< 0.011	NA	NA	NA	NA	L
1444	P1203487-020	NA	1.0	< 0.011	NA	NA	NA	NA	L
Method Blank	P120828-MB	NA	1.0	< 0.011	NA	NA	NA	NA	
Method Blank	P120830-MB	NA	1.0	< 0.011	NA	NA	NA	NA	L

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.

L = Laboratory control sample recovery outside the specified limits; results may be biased high.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

**RESULTS OF ANALYSIS**

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Duplicate Lab Control Sample  
**Client Project ID:** 182608005

CAS Project ID: P1203487  
CAS Sample ID: P120828-LCS,  
P120828-DLCS

**Laboratory Control Sample/Duplicate Laboratory Control Sample Summary**

Test Code: OSHA ID-188/ID-164  
Instrument ID: PH02/Orion 720A/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: 8/28/12  
Volume(s) Analyzed: N/A

Compound	Spike Amount LCS / DLCS mg/L	Result		% Recovery		CAS Acceptance Limits	Relative Percent Difference	RPD Limit	Data Qualifier
		LCS mg/L	DLCS mg/L	LCS	DLCS				
Ammonia	1.00	1.03	1.00	103	100	80-104	3	5	

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

**RESULTS OF ANALYSIS**

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Duplicate Lab Control Sample  
**Client Project ID:** 182608005

CAS Project ID: P1203487  
CAS Sample ID: P120830-LCS,  
P120830-DLCS

**Laboratory Control Sample/Duplicate Laboratory Control Sample Summary**

Test Code: OSHA ID-188/ID-164  
Instrument ID: PH02/Orion 720A/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: 8/30/12  
Volume(s) Analyzed: N/A

Compound	Spike Amount		Result		% Recovery		CAS Acceptance Limits	Relative Percent Difference	RPD Limit	Data Qualifier
	LCS / DLCS mg/L	LCS mg/L	DLCS mg/L	LCS	DLCS					
Ammonia	1.00	1.08	1.06	108	106	80-104	2	5	<b>L</b>	

L = Laboratory control sample recovery outside the specified limits; results may be biased high.

## LABORATORY REPORT

September 6, 2012

John Reiter  
Stantec Consulting Services, Inc.  
12075 Corporate Pkwy, Ste. 200  
Mequon, WI 53092

**RE: 182608005**

Dear John:

Enclosed are the results of the samples submitted to our laboratory on August 24, 2012. For your reference, these analyses have been assigned our service request number P1203488.

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.caslab.com](http://www.caslab.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

**ALS | Environmental**

Samantha Henningsen  
Project Manager

Client: Stantec Consulting Services, Inc.  
Project: 182608005

Service Request No: P1203488

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### CASE NARRATIVE

The samples were received intact under chain of custody on August 24, 2012 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.

#### Carboxylic Acids Analysis

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

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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 Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of Columbia Analytical Services, Inc. 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 AALS 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.*

DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: 182608005

Service Request: P1203488

Date Received: 8/24/2012  
 Time Received: 09:45

Carbox Acids - Carboxy Acids

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
1311	P1203488-001	Air	8/21/2012	00:00	X
1320	P1203488-002	Air	8/21/2012	00:00	X
1324	P1203488-003	Air	8/21/2012	00:00	X
1332	P1203488-004	Air	8/21/2012	00:00	X
1340	P1203488-005	Air	8/21/2012	00:00	X
1349	P1203488-006	Air	8/21/2012	00:00	X
1351	P1203488-007	Air	8/21/2012	00:00	X
1359	P1203488-008	Air	8/21/2012	00:00	X
1378	P1203488-009	Air	8/21/2012	00:00	X
1385	P1203488-010	Air	8/21/2012	00:00	X
1388	P1203488-011	Air	8/21/2012	00:00	X
1394	P1203488-012	Air	8/21/2012	00:00	X
1406	P1203488-013	Air	8/21/2012	00:00	X
1411	P1203488-014	Air	8/21/2012	00:00	X
1415	P1203488-015	Air	8/21/2012	00:00	X
1422	P1203488-016	Air	8/21/2012	00:00	X
1433	P1203488-017	Air	8/21/2012	00:00	X
1436	P1203488-018	Air	8/21/2012	00:00	X
1447	P1203488-019	Air	8/21/2012	00:00	X
1448	P1203488-020	Air	8/21/2012	00:00	X



**Stantec Consulting Services, Inc.**  
 12075 Corporate Parkway, Suite 200  
 Mequon, Wisconsin 53092

91203488

Date: Tuesday, August 21, 2012

Project number: 182608005  
 (262) 643-9154  
 (262) 241-4901 fax

Please email sample results to:  
**John Reiter, CIH**  
 john.reiter@stantec.com

**Laboratory/Sample Transmittal - Analysis Request**

**To:** Columbia Analytical Services  
 2655 Park Center Drive, Suite A  
 Simi Valley, California 93065  
**Attention:** Samantha Henningsen

**Services requested:** Evaluation of the enclosed samples as requested below

**Project No.** 182608005

Sample #	Compound/parameter/contaminant	Duration (minutes)	Volume (liters)	Special instructions
1311	Carboxylic acids	304	118.9	Columbia Analytical AQL Method 102
1320	Carboxylic acids	297	117.9	
1324	Carboxylic acids	291	112.9	
1332	Carboxylic acids	290	114.6	
1340	Carboxylic acids	119	46.8	
1349	Carboxylic acids	186	69.2	
1351	Carboxylic acids	183	68.8	
1359	Carboxylic acids	180	70.4	
1378	Carboxylic acids	212	82.3	
1385	Carboxylic acids	207	79.5	
1388	Carboxylic acids	199	76.8	
1394	Carboxylic acids	174	69.4	
1406	Carboxylic acids	256	98.6	
1411	Carboxylic acids	258	99.6	
1415	Carboxylic acids	254	99.1	
1422	Carboxylic acids	2	0.8	
1433	Carboxylic acids	1	0.4	
1426	Carboxylic acids	3	1.2	
1447	Carboxylic acids	—	—	Field blank
1448	Carboxylic acids	—	—	Field blank

Routine handling

Please contact our office with email results by:  
 Wednesday, September 5, 2012

  
 signed: John E. Reiter, CIH, Stantec

Waters 8400 0945  
 2100 6010e

**Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc. Work order: P1203488  
 Project: 182608005  
 Sample(s) received on: 8/24/12 Date opened: 8/24/12 by: MZAMORA

*Note:* This form is used for all samples received by CAS. 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 CAS</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 type="checkbox"/>            | <input checked="" 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: 21° C Blank Temperature: ° C | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
|    | <b>Gel Packs</b>  |                                     |                                     |                                     |
| 9  | Was a <b>blank</b> received?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 10 | Were <b>custody seals</b> on outside of cooler/Box?<br>Location of seal(s)? _____ Sealing Lid?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input 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"/> |
|    | Were custody seals on outside of sample container?<br>Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input 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
P1203488-001.01	Silica Gel (C. Acids)					
P1203488-002.01	Silica Gel (C. Acids)					
P1203488-003.01	Silica Gel (C. Acids)					
P1203488-004.01	Silica Gel (C. Acids)					
P1203488-005.01	Silica Gel (C. Acids)					
P1203488-006.01	Silica Gel (C. Acids)					
P1203488-007.01	Silica Gel (C. Acids)					
P1203488-008.01	Silica Gel (C. Acids)					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 The times of sample collection were not indicated on the COC.  
 Sample -018 has an ID of 1426 on the COC but 1436 on the tube.





RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1311  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-001

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 118.9 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
64-19-7	Acetic Acid	< 2.0	ND	17	ND	6.8	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	2.0	ND	0.67	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.1	ND	0.57	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	2.0	ND	0.57	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	2.0	ND	0.49	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.1	ND	0.49	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	2.1	ND	0.50	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	2.0	ND	0.43	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.1	ND	0.44	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	2.0	ND	0.43	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.1	ND	0.44	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	2.0	ND	0.38	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	2.1	ND	0.35	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	2.0	ND	0.39	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	2.0	ND	0.34	
65-85-0	Benzoic Acid	< 0.26	ND	2.1	ND	0.43	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.1	ND	0.32	

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.

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1320  
**Client Project ID:** 182608005

**CAS Project ID:** P1203488  
**CAS Sample ID:** P1203488-002

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Madeleine Dangazyan  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 117.9 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
64-19-7	Acetic Acid	< 2.0	ND	17	ND	6.8	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	2.1	ND	0.68	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.1	ND	0.58	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	2.1	ND	0.57	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	2.1	ND	0.49	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.1	ND	0.50	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	2.1	ND	0.50	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	2.0	ND	0.43	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.1	ND	0.44	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	2.1	ND	0.43	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.1	ND	0.44	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	2.1	ND	0.39	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	2.1	ND	0.35	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	2.1	ND	0.39	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	2.0	ND	0.35	
65-85-0	Benzoic Acid	< 0.26	ND	2.2	ND	0.43	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.1	ND	0.32	

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.

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1324  
**Client Project ID:** 182608005

**CAS Project ID:** P1203488  
**CAS Sample ID:** P1203488-003

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Madeleine Dangazyan  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 112.9 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
64-19-7	Acetic Acid	< 2.0	ND	18	ND	7.1	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	2.1	ND	0.71	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.2	ND	0.60	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	2.1	ND	0.60	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	2.1	ND	0.51	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.2	ND	0.52	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	2.2	ND	0.53	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	2.1	ND	0.45	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.2	ND	0.46	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	2.1	ND	0.45	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.2	ND	0.46	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	2.1	ND	0.40	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	2.2	ND	0.37	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	2.1	ND	0.41	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	2.1	ND	0.36	
65-85-0	Benzoic Acid	< 0.26	ND	2.3	ND	0.45	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.2	ND	0.34	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1332  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-004

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 114.6 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	17	ND	7.0	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	2.1	ND	0.70	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.1	ND	0.59	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	2.1	ND	0.59	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	2.1	ND	0.51	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.1	ND	0.51	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	2.2	ND	0.52	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	2.1	ND	0.44	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.2	ND	0.45	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	2.1	ND	0.45	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.2	ND	0.45	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	2.1	ND	0.40	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	2.1	ND	0.36	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	2.1	ND	0.40	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	2.1	ND	0.36	
65-85-0	Benzoic Acid	< 0.26	ND	2.2	ND	0.45	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.2	ND	0.33	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1340  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-005

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 46.8 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	42	ND	17	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	5.2	ND	1.7	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	5.2	ND	1.5	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	5.2	ND	1.4	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	5.2	ND	1.2	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	5.2	ND	1.3	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	5.3	ND	1.3	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	5.1	ND	1.1	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	5.3	ND	1.1	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	5.2	ND	1.1	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	5.3	ND	1.1	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	5.2	ND	0.97	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	5.2	ND	0.89	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	5.2	ND	0.99	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	5.1	ND	0.87	
65-85-0	Benzoic Acid	< 0.26	ND	5.5	ND	1.1	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	5.3	ND	0.82	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1349  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-006

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 69.2 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	29	ND	12	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	3.5	ND	1.2	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	3.5	ND	0.98	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	3.5	ND	0.97	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	3.5	ND	0.84	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	3.5	ND	0.85	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	3.6	ND	0.86	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	3.5	ND	0.73	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	3.6	ND	0.75	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	3.5	ND	0.74	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	3.6	ND	0.75	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	3.5	ND	0.66	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	3.5	ND	0.60	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	3.5	ND	0.67	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	3.5	ND	0.59	
65-85-0	Benzoic Acid	< 0.26	ND	3.7	ND	0.74	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	3.6	ND	0.55	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1351  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-007

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 68.8 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	29	ND	12	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	3.5	ND	1.2	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	3.6	ND	0.99	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	3.5	ND	0.98	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	3.5	ND	0.84	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	3.6	ND	0.85	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	3.6	ND	0.86	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	3.5	ND	0.74	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	3.6	ND	0.76	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	3.5	ND	0.74	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	3.6	ND	0.76	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	3.5	ND	0.66	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	3.6	ND	0.60	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	3.5	ND	0.67	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	3.5	ND	0.59	
65-85-0	Benzoic Acid	< 0.26	ND	3.7	ND	0.74	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	3.6	ND	0.56	

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.



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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1359  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-008

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 70.4 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	28	ND	11	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	3.4	ND	1.1	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	3.5	ND	0.97	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	3.4	ND	0.96	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	3.4	ND	0.83	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	3.5	ND	0.83	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	3.5	ND	0.84	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	3.4	ND	0.72	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	3.5	ND	0.74	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	3.4	ND	0.73	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	3.5	ND	0.74	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	3.4	ND	0.65	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	3.5	ND	0.59	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	3.4	ND	0.66	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	3.4	ND	0.58	
65-85-0	Benzoic Acid	< 0.26	ND	3.6	ND	0.73	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	3.5	ND	0.54	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1378  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-009

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 82.3 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	24	ND	9.8	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	2.9	ND	0.97	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	3.0	ND	0.83	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	2.9	ND	0.82	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	2.9	ND	0.71	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	3.0	ND	0.71	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	3.0	ND	0.72	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	2.9	ND	0.62	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	3.0	ND	0.63	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	2.9	ND	0.62	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	3.0	ND	0.63	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	2.9	ND	0.55	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	3.0	ND	0.51	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	2.9	ND	0.56	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	2.9	ND	0.50	
65-85-0	Benzoic Acid	< 0.26	ND	3.1	ND	0.62	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	3.0	ND	0.46	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1385  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-010

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 79.5 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	25	ND	10	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	3.1	ND	1.0	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	3.1	ND	0.86	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	3.1	ND	0.85	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	3.1	ND	0.73	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	3.1	ND	0.74	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	3.1	ND	0.75	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	3.0	ND	0.64	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	3.1	ND	0.66	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	3.1	ND	0.64	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	3.1	ND	0.66	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	3.1	ND	0.57	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	3.1	ND	0.52	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	3.1	ND	0.58	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	3.0	ND	0.51	
65-85-0	Benzoic Acid	< 0.26	ND	3.2	ND	0.64	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	3.1	ND	0.48	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1388  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-011

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 76.8 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	26	ND	11	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	3.2	ND	1.0	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	3.2	ND	0.89	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	3.2	ND	0.88	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	3.2	ND	0.76	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	3.2	ND	0.76	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	3.2	ND	0.77	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	3.1	ND	0.66	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	3.2	ND	0.68	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	3.2	ND	0.67	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	3.2	ND	0.68	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	3.2	ND	0.59	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	3.2	ND	0.54	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	3.2	ND	0.60	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	3.1	ND	0.53	
65-85-0	Benzoic Acid	< 0.26	ND	3.3	ND	0.67	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	3.2	ND	0.50	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1394  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-012

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 69.4 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	29	ND	12	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	3.5	ND	1.2	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	3.5	ND	0.98	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	3.5	ND	0.97	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	3.5	ND	0.84	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	3.5	ND	0.85	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	3.6	ND	0.85	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	3.5	ND	0.73	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	3.6	ND	0.75	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	3.5	ND	0.74	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	3.6	ND	0.75	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	3.5	ND	0.66	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	3.5	ND	0.60	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	3.5	ND	0.67	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	3.5	ND	0.59	
65-85-0	Benzoic Acid	< 0.26	ND	3.7	ND	0.74	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	3.6	ND	0.55	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1406  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-013

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 98.6 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	20	ND	8.2	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	2.5	ND	0.81	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.5	ND	0.69	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	2.5	ND	0.68	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	2.5	ND	0.59	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.5	ND	0.60	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	2.5	ND	0.60	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	2.4	ND	0.51	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.5	ND	0.53	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	2.5	ND	0.52	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.5	ND	0.53	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	2.5	ND	0.46	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	2.5	ND	0.42	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	2.5	ND	0.47	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	2.4	ND	0.41	
65-85-0	Benzoic Acid	< 0.26	ND	2.6	ND	0.52	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.5	ND	0.39	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1411  
**Client Project ID:** 182608005

**CAS Project ID:** P1203488  
**CAS Sample ID:** P1203488-014

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Madeleine Dangazyan  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 99.6 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	20	ND	8.1	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	2.4	ND	0.80	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.5	ND	0.68	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	2.4	ND	0.68	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	2.4	ND	0.58	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.5	ND	0.59	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	2.5	ND	0.60	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	2.4	ND	0.51	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.5	ND	0.52	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	2.4	ND	0.51	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.5	ND	0.52	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	2.4	ND	0.46	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	2.5	ND	0.42	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	2.4	ND	0.47	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	2.4	ND	0.41	
65-85-0	Benzoic Acid	< 0.26	ND	2.6	ND	0.51	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.5	ND	0.38	

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.

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1415  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-015

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Desorption Volume: 1.0 ml  
Volume Sampled: 99.1 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
64-19-7	Acetic Acid	< 2.0	ND	20	ND	8.1	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	2.4	ND	0.81	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	2.5	ND	0.69	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	2.4	ND	0.68	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	2.4	ND	0.59	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	2.5	ND	0.59	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	2.5	ND	0.60	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	2.4	ND	0.51	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	2.5	ND	0.53	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	2.4	ND	0.52	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	2.5	ND	0.53	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	2.4	ND	0.46	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	2.5	ND	0.42	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	2.4	ND	0.47	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	2.4	ND	0.41	
65-85-0	Benzoic Acid	< 0.26	ND	2.6	ND	0.52	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	2.5	ND	0.39	

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.



## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1422  
**Client Project ID:** 182608005

**CAS Project ID:** P1203488  
**CAS Sample ID:** P1203488-016

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Madeleine Dangazyan  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 0.8 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	8.8	11,000	2,500	4,500	1,000	BT
79-09-4	Propionic Acid (Propanoic)	11	13,000	300	4,300	100	BT
79-31-2	2-Methylpropanoic Acid (Isobutyric)	9.7	12,000	310	3,400	85	BT
107-92-6	Butanoic Acid (Butyric)	45	56,000	300	16,000	84	BT
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	300	ND	73	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	9.0	11,000	310	2,700	73	BT
109-52-4	Pentanoic Acid (Valeric)	18	23,000	310	5,500	74	BT
97-61-0	2-Methylpentanoic Acid	0.49	610	300	130	63	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	310	ND	65	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	0.86	1,100	300	230	64	BT
142-62-1	Hexanoic Acid (Caproic)	42	53,000	310	11,000	65	BT
111-14-8	Heptanoic Acid (Enanthoic)	2.3	2,900	300	540	57	BT
149-57-5	2-Ethylhexanoic Acid	3.9	4,800	310	820	52	BT
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	300	ND	58	
124-07-2	Octanoic Acid (Caprylic)	0.55	690	300	120	51	
65-85-0	Benzoic Acid	< 0.26	ND	320	ND	64	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	310	ND	48	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1433  
**Client Project ID:** 182608005

**CAS Project ID:** P1203488  
**CAS Sample ID:** P1203488-017

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Madeleine Dangazyan  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28 - 8/29/12  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 0.4 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	5,000	ND	2,000	
79-09-4	Propionic Acid (Propanoic)	< 0.24	ND	610	ND	200	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	ND	610	ND	170	
107-92-6	Butanoic Acid (Butyric)	< 0.24	ND	610	ND	170	
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	610	ND	150	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	ND	610	ND	150	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	ND	620	ND	150	
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	600	ND	130	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	620	ND	130	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	610	ND	130	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	ND	620	ND	130	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	610	ND	110	
149-57-5	2-Ethylhexanoic Acid	< 0.25	ND	610	ND	100	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	610	ND	120	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	600	ND	100	
65-85-0	Benzoic Acid	< 0.26	ND	640	ND	130	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	620	ND	96	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1436  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
 CAS Sample ID: P1203488-018

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Madeleine Dangazyan  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Desorption Volume:** 1.0 ml  
**Volume Sampled:** 1.2 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	1,700	ND	670	
79-09-4	Propionic Acid (Propanoic)	11	<b>9,200</b>	200	<b>3,000</b>	67	<b>BT</b>
79-31-2	2-Methylpropanoic Acid (Isobutyric)	15	<b>13,000</b>	200	<b>3,500</b>	57	<b>BT</b>
107-92-6	Butanoic Acid (Butyric)	49	<b>41,000</b>	200	<b>11,000</b>	56	<b>BT</b>
116-53-0	2-Methylbutanoic Acid	< 0.24	ND	200	ND	48	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	11	<b>9,000</b>	200	<b>2,200</b>	49	<b>BT</b>
109-52-4	Pentanoic Acid (Valeric)	4.5	<b>3,800</b>	210	<b>900</b>	49	<b>BT</b>
97-61-0	2-Methylpentanoic Acid	< 0.24	ND	200	ND	42	
105-43-1	3-Methylpentanoic Acid	< 0.25	ND	210	ND	43	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	ND	200	ND	43	
142-62-1	Hexanoic Acid (Caproic)	1.4	<b>1,200</b>	210	<b>250</b>	43	<b>BT</b>
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	ND	200	ND	38	
149-57-5	2-Ethylhexanoic Acid	2.1	<b>1,800</b>	200	<b>300</b>	35	<b>BT</b>
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	ND	200	ND	39	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	ND	200	ND	34	
65-85-0	Benzoic Acid	< 0.26	ND	210	ND	43	
112-05-0	Nonanoic Acid (Pelargonic)	< 0.25	ND	210	ND	32	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1447  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P1203488-019

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
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)	< 0.24	NA	NA	NA	NA	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	NA	NA	NA	NA	
107-92-6	Butanoic Acid (Butyric)	< 0.24	NA	NA	NA	NA	
116-53-0	2-Methylbutanoic Acid	< 0.24	NA	NA	NA	NA	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	NA	NA	NA	NA	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	NA	NA	NA	NA	
97-61-0	2-Methylpentanoic Acid	< 0.24	NA	NA	NA	NA	
105-43-1	3-Methylpentanoic Acid	< 0.25	NA	NA	NA	NA	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	NA	NA	NA	NA	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	NA	NA	NA	NA	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	NA	NA	NA	NA	
149-57-5	2-Ethylhexanoic Acid	< 0.25	NA	NA	NA	NA	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	NA	NA	NA	NA	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	NA	NA	NA	NA	
65-85-0	Benzoic Acid	< 0.26	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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1448  
**Client Project ID:** 182608005

**CAS Project ID:** P1203488  
**CAS Sample ID:** P1203488-020

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Madeleine Dangazyan  
**Sampling Media:** Silica Gel Tube  
**Test Notes:** BC, DE

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**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)	< 0.24	NA	NA	NA	NA	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	NA	NA	NA	NA	
107-92-6	Butanoic Acid (Butyric)	< 0.24	NA	NA	NA	NA	
116-53-0	2-Methylbutanoic Acid	< 0.24	NA	NA	NA	NA	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	NA	NA	NA	NA	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	NA	NA	NA	NA	
97-61-0	2-Methylpentanoic Acid	< 0.24	NA	NA	NA	NA	
105-43-1	3-Methylpentanoic Acid	< 0.25	NA	NA	NA	NA	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	NA	NA	NA	NA	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	NA	NA	NA	NA	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	NA	NA	NA	NA	
149-57-5	2-Ethylhexanoic Acid	< 0.25	NA	NA	NA	NA	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	NA	NA	NA	NA	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	NA	NA	NA	NA	
65-85-0	Benzoic Acid	< 0.26	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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P120828-MB

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/28/12  
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)	< 0.24	NA	NA	NA	NA	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	NA	NA	NA	NA	
107-92-6	Butanoic Acid (Butyric)	< 0.24	NA	NA	NA	NA	
116-53-0	2-Methylbutanoic Acid	< 0.24	NA	NA	NA	NA	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	NA	NA	NA	NA	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	NA	NA	NA	NA	
97-61-0	2-Methylpentanoic Acid	< 0.24	NA	NA	NA	NA	
105-43-1	3-Methylpentanoic Acid	< 0.25	NA	NA	NA	NA	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	NA	NA	NA	NA	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	NA	NA	NA	NA	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	NA	NA	NA	NA	
149-57-5	2-Ethylhexanoic Acid	< 0.25	NA	NA	NA	NA	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	NA	NA	NA	NA	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	NA	NA	NA	NA	
65-85-0	Benzoic Acid	< 0.26	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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P120829-MB

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes: **BC, DE**

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/29/12  
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)	< 0.24	NA	NA	NA	NA	
79-31-2	2-Methylpropanoic Acid (Isobutyric)	< 0.25	NA	NA	NA	NA	
107-92-6	Butanoic Acid (Butyric)	< 0.24	NA	NA	NA	NA	
116-53-0	2-Methylbutanoic Acid	< 0.24	NA	NA	NA	NA	
503-74-2	3-Methylbutanoic Acid (Isovaleric)	< 0.25	NA	NA	NA	NA	
109-52-4	Pentanoic Acid (Valeric)	< 0.25	NA	NA	NA	NA	
97-61-0	2-Methylpentanoic Acid	< 0.24	NA	NA	NA	NA	
105-43-1	3-Methylpentanoic Acid	< 0.25	NA	NA	NA	NA	
646-07-1	4-Methylpentanoic Acid (Isocaproic)	< 0.24	NA	NA	NA	NA	
142-62-1	Hexanoic Acid (Caproic)	< 0.25	NA	NA	NA	NA	
111-14-8	Heptanoic Acid (Enanthoic)	< 0.24	NA	NA	NA	NA	
149-57-5	2-Ethylhexanoic Acid	< 0.25	NA	NA	NA	NA	
98-89-5	Cyclohexanecarboxylic Acid	< 0.24	NA	NA	NA	NA	
124-07-2	Octanoic Acid (Caprylic)	< 0.24	NA	NA	NA	NA	
65-85-0	Benzoic Acid	< 0.26	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.

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:** 182608005

CAS Project ID: P1203488  
CAS Sample ID: P120828-DLCS

Test Code: GC/MS  
Instrument ID: Agilent 5973/Agilent 6890/MS14  
Analyst: Madeleine Dangazyan  
Sampling Media: Silica Gel Tube  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: NA Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		CAS	RPD	RPD	Data
		LCS / DLCS µg/ml	LCS µg/ml	DLCS µg/ml	LCS	DLCS	Acceptance Limits	Limit	Qualifier		
64-19-7	Acetic Acid	19.0	16.8	17.7	88	93	65-138	6	27		
79-09-4	Propionic Acid (Propanoic)	9.20	8.42	9.07	92	99	73-129	7	19		
79-31-2	2-Methylpropanoic Acid (Isobutyric)	9.22	8.81	9.24	96	100	77-124	4	16		
107-92-6	Butanoic Acid (Butyric)	9.53	9.34	9.62	98	101	77-124	3	18		
116-53-0	2-Methylbutanoic Acid	9.95	9.83	10.3	99	104	79-121	5	15		
503-74-2	3-Methylbutanoic Acid (Isovaleric)	9.89	9.74	10.3	98	104	80-120	6	15		
109-52-4	Pentanoic Acid (Valeric)	10.1	10.0	10.4	99	103	81-119	4	16		
97-61-0	2-Methylpentanoic Acid	10.2	9.97	10.3	98	101	80-118	3	15		
105-43-1	3-Methylpentanoic Acid	10.3	10.2	10.5	99	102	81-119	3	15		
646-07-1	4-Methylpentanoic Acid (Isocaproic)	10.2	10.0	10.5	98	103	81-118	5	16		
142-62-1	Hexanoic Acid (Caproic)	9.99	9.91	10.3	99	103	79-120	4	16		
111-14-8	Heptanoic Acid (Enanthoic)	9.97	9.70	10.3	97	103	78-119	6	15		
149-57-5	2-Ethylhexanoic Acid	9.46	9.03	9.53	95	101	66-120	6	15		
98-89-5	Cyclohexanecarboxylic Acid	8.37	8.67	8.75	104	105	80-117	1	14		
124-07-2	Octanoic Acid (Caprylic)	10.1	9.84	10.3	97	102	78-120	5	15		
65-85-0	Benzoic Acid	10.1	9.36	9.95	93	99	51-122	6	18		
112-05-0	Nonanoic Acid (Pelargonic)	9.95	9.86	10.4	99	105	76-121	6	15		



## 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:** 182608005

CAS Project ID: P1203488  
 CAS Sample ID: P120829-DLCS

**Test Code:** GC/MS  
**Instrument ID:** Agilent 5973/Agilent 6890/MS14  
**Analyst:** Madeleine Dangazyan  
**Sampling Media:** Silica Gel Tube  
**Test Notes:**

**Date Collected:** NA  
**Date Received:** NA  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** NA Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		CAS	RPD	RPD	Data
		LCS / DLCS	LCS	DLCS	LCS	DLCS	Acceptance	RPD			
		µg/ml	µg/ml	µg/ml	LCS	DLCS	Limits	Limit	Qualifier		
64-19-7	Acetic Acid	19.0	13.8	13.1	<b>73</b>	<b>69</b>	65-138	6	27		
79-09-4	Propionic Acid (Propanoic)	9.20	7.27	7.10	<b>79</b>	<b>77</b>	73-129	3	19		
79-31-2	2-Methylpropanoic Acid (Isobutyric)	9.22	8.33	8.66	<b>90</b>	<b>94</b>	77-124	4	16		
107-92-6	Butanoic Acid (Butyric)	9.53	9.06	9.04	<b>95</b>	<b>95</b>	77-124	0	18		
116-53-0	2-Methylbutanoic Acid	9.95	10.1	10.2	<b>102</b>	<b>103</b>	79-121	1	15		
503-74-2	3-Methylbutanoic Acid (Isovaleric)	9.89	9.90	9.84	<b>100</b>	<b>99</b>	80-120	1	15		
109-52-4	Pentanoic Acid (Valeric)	10.1	9.95	9.97	<b>99</b>	<b>99</b>	81-119	0	16		
97-61-0	2-Methylpentanoic Acid	10.2	10.4	10.2	<b>102</b>	<b>100</b>	80-118	2	15		
105-43-1	3-Methylpentanoic Acid	10.3	10.8	10.2	<b>105</b>	<b>99</b>	81-119	6	15		
646-07-1	4-Methylpentanoic Acid (Isocaproic)	10.2	10.6	9.93	<b>104</b>	<b>97</b>	81-118	7	16		
142-62-1	Hexanoic Acid (Caproic)	9.99	10.2	9.69	<b>102</b>	<b>97</b>	79-120	5	16		
111-14-8	Heptanoic Acid (Enanthoic)	9.97	9.86	9.43	<b>99</b>	<b>95</b>	78-119	4	15		
149-57-5	2-Ethylhexanoic Acid	9.46	8.74	8.49	<b>92</b>	<b>90</b>	66-120	2	15		
98-89-5	Cyclohexanecarboxylic Acid	8.37	7.96	7.66	<b>95</b>	<b>92</b>	80-117	3	14		
124-07-2	Octanoic Acid (Caprylic)	10.1	9.98	9.46	<b>99</b>	<b>94</b>	78-120	5	15		
65-85-0	Benzoic Acid	10.1	8.47	8.23	<b>84</b>	<b>81</b>	51-122	4	18		
112-05-0	Nonanoic Acid (Pelargonic)	9.95	9.78	9.60	<b>98</b>	<b>96</b>	76-121	2	15		



## Quality Control Sample Batch Report

### Analysis Information

**Workorder:** 1224134

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** NA  
**Batch:** NA  
**Prepared By:** NA

**Analysis:** NIOSH 6010  
**Batch:** IWC/1773 (HBN: 92965)  
**Analyzed By:** Elijah Gregory

### Blank

<b>LMB:</b> 294210 <b>Analyzed:</b> 09/05/2012 11:15 <b>Units:</b> ug/sample			
Analyte	Result	RL	
Cyanide	ND	0.59	

### Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 294211 <b>Analyzed:</b> 09/05/2012 11:15 <b>Units:</b> ug/sample					<b>LCSD:</b> 294212 <b>Analyzed:</b> 09/05/2012 11:16					
Analyte	Result	Target	% Recovery	QC Limits	Result	RPD	QC Limits			
Cyanide	2.11	2	106	56.2 128.2	1.73	19.9	0 20			

### QC Data Approved and Reviewed by

<u>Elijah Gregory</u> <b>Analyst</b>	<u>Mary N. Karanu</u> <b>Peer Review</b>	<u>9/5/2012</u> <b>Date</b>
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### Symbols and Definitions

- |   |   |
|---|---|
| * - Analyte above reporting limit or outside of control limits        | RPD - Relative % Difference (Spike / Spike Duplicate)                 |
| ▲ - Sample result is greater than 4 times the spike added             | ND - Not Detected   |
| ● - Sample and Matrix Duplicate less than 5 times the reporting limit | QC results are not adjusted for moisture correction, where applicable |



# ANALYTICAL REPORT

Report Date: September 06, 2012

John Reiter  
Stantec Consulting Services, Inc.  
12075 Corporate Pkwy, Ste 200  
Mequon, WI 53092

E-mail: john.reiter@stantec.com

Workorder: **34-1224134**  
Client Project ID: P1203492 082812  
Purchase Order: P1203492  
Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>1314</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012		
Lab ID: 1224134001	Sampling Location: P1203492	Received: 08/28/2012		
Method: NIOSH 6010	Sampling Parameter: Air Volume 11.9 L	Analyzed: 09/05/2012		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.050	<0.045	0.59

Sample ID: <b>1321</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012		
Lab ID: 1224134002	Sampling Location: P1203492	Received: 08/28/2012		
Method: NIOSH 6010	Sampling Parameter: Air Volume 12.7 L	Analyzed: 09/05/2012		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.046	<0.042	0.59

Sample ID: <b>1328</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012		
Lab ID: 1224134003	Sampling Location: P1203492	Received: 08/28/2012		
Method: NIOSH 6010	Sampling Parameter: Air Volume 11.3 L	Analyzed: 09/05/2012		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.052	<0.047	0.59

Sample ID: <b>1335</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012		
Lab ID: 1224134004	Sampling Location: P1203492	Received: 08/28/2012		
Method: NIOSH 6010	Sampling Parameter: Air Volume 11.5 L	Analyzed: 09/05/2012		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.051	<0.046	0.59

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# ANALYTICAL REPORT

Workorder: **34-1224134**  
 Client Project ID: P1203492 082812  
 Purchase Order: P1203492  
 Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>1337</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012
Lab ID: 1224134005	Sampling Location: P1203492	Received: 08/28/2012

Method: NIOSH 6010	Sampling Parameter: Air Volume 5 L	Analyzed: 09/05/2012
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Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.12	<0.11	0.59

Sample ID: <b>1344</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012
Lab ID: 1224134006	Sampling Location: P1203492	Received: 08/28/2012

Method: NIOSH 6010	Sampling Parameter: Air Volume 7.3 L	Analyzed: 09/05/2012
--------------------	--------------------------------------	----------------------

Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.081	<0.073	0.59

Sample ID: <b>1356</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012
Lab ID: 1224134007	Sampling Location: P1203492	Received: 08/28/2012

Method: NIOSH 6010	Sampling Parameter: Air Volume 7.2 L	Analyzed: 09/05/2012
--------------------	--------------------------------------	----------------------

Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.082	<0.074	0.59

Sample ID: <b>1360</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012
Lab ID: 1224134008	Sampling Location: P1203492	Received: 08/28/2012

Method: NIOSH 6010	Sampling Parameter: Air Volume 7.1 L	Analyzed: 09/05/2012
--------------------	--------------------------------------	----------------------

Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.083	<0.075	0.59

Sample ID: <b>1375</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012
Lab ID: 1224134009	Sampling Location: P1203492	Received: 08/28/2012

Method: NIOSH 6010	Sampling Parameter: Air Volume 8.4 L	Analyzed: 09/05/2012
--------------------	--------------------------------------	----------------------

Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.070	<0.064	0.59



# ANALYTICAL REPORT

Workorder: **34-1224134**  
 Client Project ID: P1203492 082812  
 Purchase Order: P1203492  
 Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>1380</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012
Lab ID: 1224134010	Sampling Location: P1203492	Received: 08/28/2012

Method: NIOSH 6010	Sampling Parameter: Air Volume 8.2 L	Analyzed: 09/05/2012
--------------------	--------------------------------------	----------------------

Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.072	<0.065	0.59

Sample ID: <b>1367</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012
Lab ID: 1224134011	Sampling Location: P1203492	Received: 08/28/2012

Method: NIOSH 6010	Sampling Parameter: Air Volume 7.8 L	Analyzed: 09/05/2012
--------------------	--------------------------------------	----------------------

Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.076	<0.068	0.59

Sample ID: <b>1398</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012
Lab ID: 1224134012	Sampling Location: P1203492	Received: 08/28/2012

Method: NIOSH 6010	Sampling Parameter: Air Volume 7.4 L	Analyzed: 09/05/2012
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Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.080	<0.072	0.59

Sample ID: <b>1405</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012
Lab ID: 1224134013	Sampling Location: P1203492	Received: 08/28/2012

Method: NIOSH 6010	Sampling Parameter: Air Volume 10.1 L	Analyzed: 09/05/2012
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Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.058	<0.053	0.59

Sample ID: <b>1408</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012
Lab ID: 1224134014	Sampling Location: P1203492	Received: 08/28/2012

Method: NIOSH 6010	Sampling Parameter: Air Volume 10.2 L	Analyzed: 09/05/2012
--------------------	---------------------------------------	----------------------

Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.058	<0.052	0.59



# ANALYTICAL REPORT

Workorder: **34-1224134**  
Client Project ID: P1203492 082812  
Purchase Order: P1203492  
Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>1420</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012		
Lab ID: 1224134015	Sampling Location: P1203492	Received: 08/28/2012		
<b>Method: NIOSH 6010</b>	<b>Sampling Parameter: Air Volume 9.9 L</b>	<b>Analyzed: 09/05/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<0.060	<0.054	0.59

Sample ID: <b>1423</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012		
Lab ID: 1224134016	Sampling Location: P1203492	Received: 08/28/2012		
<b>Method: NIOSH 6010</b>	<b>Sampling Parameter: Air Volume 0.043 L</b>	<b>Analyzed: 09/05/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<14	<12	0.59

Sample ID: <b>1431</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012		
Lab ID: 1224134017	Sampling Location: P1203492	Received: 08/28/2012		
<b>Method: NIOSH 6010</b>	<b>Sampling Parameter: Air Volume 0.043 L</b>	<b>Analyzed: 09/05/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<14	<12	0.59

Sample ID: <b>1440</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012		
Lab ID: 1224134018	Sampling Location: P1203492	Received: 08/28/2012		
<b>Method: NIOSH 6010</b>	<b>Sampling Parameter: Air Volume 0.043 L</b>	<b>Analyzed: 09/05/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	<14	<12	0.59

Sample ID: <b>1451</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012		
Lab ID: 1224134019	Sampling Location: P1203492	Received: 08/28/2012		
<b>Method: NIOSH 6010</b>	<b>Sampling Parameter: Air Volume Not Provided</b>	<b>Analyzed: 09/05/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	NA	NA	0.59



# ANALYTICAL REPORT

Workorder: **34-1224134**  
 Client Project ID: P1203492 082812  
 Purchase Order: P1203492  
 Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>1452</b>	Media: SKC 226-28, Soda Lime-200/600	Collected: 08/21/2012		
Lab ID: 1224134020	Sampling Location: P1203492	Received: 08/28/2012		
Method: NIOSH 6010	Sampling Parameter: Air Volume Not Provided	Analyzed: 09/05/2012		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Hydrogen Cyanide	<0.59	NA	NA	0.59

## Comments

**Workorder: 1224134**

N6010, HCN: Reporting limit has been raised due to instrument instability. All field samples were analyzed as 'not detected' for hydrogen cyanide.

## Report Authorization

Method	Analyst	Peer Review
NIOSH 6010	Elijah Gregory	Mary N. Karanu

## Laboratory Contact Information

ALS Environmental  
 960 W Levoy Drive  
 Salt Lake City, Utah 84123

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# ANALYTICAL REPORT

Workorder: **34-1224134**  
 Client Project ID: P1203492 082812  
 Purchase Order: P1203492  
 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	ACCLASS (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/bsdwlabservice.htm">http://ndep.nv.gov/bsdwlabservice.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	ACCLASS (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	ACCLASS (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.  
 \*\* 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.





Dioxon concentration calculation  
Sample 1416

<i>Name</i>	<i>Mass (pg)</i>	<i>Air volume (L)</i>	<i>Concentration (µg/m3)</i>
2,3,7,8-TCDD	0.00	3.6478E+05	0.00E+00
1,2,3,7,8-PeCDD	2.74	3.6478E+05	7.51E-09
1,2,3,4,7,8-HxCDD	1.77	3.6478E+05	4.85E-09
1,2,3,6,7,8-HxCDD	1.58	3.6478E+05	4.33E-09
1,2,3,7,8,9-HxCDD	3.94	3.6478E+05	1.08E-08
1,2,3,4,6,7,8-HpCDD	15.10	3.6478E+05	4.14E-08
OCDD	50.70	3.6478E+05	1.39E-07
2,3,7,8-TCDF	9.67	3.6478E+05	2.65E-08
1,2,3,7,8-PeCDF	3.11	3.6478E+05	8.53E-09
2,3,4,7,8-PeCDF	3.61	3.6478E+05	9.90E-09
1,2,3,4,7,8-HxCDF	5.99	3.6478E+05	1.64E-08
1,2,3,6,7,8-HxCDF	3.35	3.6478E+05	9.18E-09
1,2,3,7,8,9-HxCDF	0.00	3.6478E+05	0.00E+00
2,3,4,6,7,8-HxCDF	2.38	3.6478E+05	6.52E-09
1,2,3,4,6,7,8-HpCDF	11.00	3.6478E+05	3.02E-08
1,2,3,4,7,8,9-HpCDF	0.00	3.6478E+05	0.00E+00
OCDF	42.30	3.6478E+05	1.16E-07
Total Tetra-dioxins	0.00	3.6478E+05	0.00E+00
Total Penta-dioxins	11.30	3.6478E+05	3.10E-08
Total Hexa-dioxins	21.40	3.6478E+05	5.87E-08
Total Hepta-dioxins	32.50	3.6478E+05	8.91E-08
Total Tetra-furans	24.50	3.6478E+05	6.72E-08
Total Penta-furans	53.70	3.6478E+05	1.47E-07
Total Hexa-furans	34.30	3.6478E+05	9.40E-08
Total Hepta-furans	17.00	3.6478E+05	4.66E-08

Dioxon concentration calculation  
Sample 1417

<i>Name</i>	<i>Mass (µg)</i>	<i>Air volume (L)</i>	<i>Concentration (µg/m<sup>3</sup>)</i>
2,3,7,8-TCDD	1.59	4.4419E+05	3.58E-09
1,2,3,7,8-PeCDD	2.31	4.4419E+05	5.20E-09
1,2,3,4,7,8-HxCDD	0.00	4.4419E+05	0.00E+00
1,2,3,6,7,8-HxCDD	1.77	4.4419E+05	3.98E-09
1,2,3,7,8,9-HxCDD	2.82	4.4419E+05	6.35E-09
1,2,3,4,6,7,8-HpCDD	17.20	4.4419E+05	3.87E-08
OCDD	87.10	4.4419E+05	1.96E-07
2,3,7,8-TCDF	7.99	4.4419E+05	1.80E-08
1,2,3,7,8-PeCDF	1.86	4.4419E+05	4.19E-09
2,3,4,7,8-PeCDF	1.84	4.4419E+05	4.14E-09
1,2,3,4,7,8-HxCDF	2.93	4.4419E+05	6.60E-09
1,2,3,6,7,8-HxCDF	2.17	4.4419E+05	4.89E-09
1,2,3,7,8,9-HxCDF	0.00	4.4419E+05	0.00E+00
2,3,4,6,7,8-HxCDF	0.00	4.4419E+05	0.00E+00
1,2,3,4,6,7,8-HpCDF	12.00	4.4419E+05	2.70E-08
1,2,3,4,7,8,9-HpCDF	0.00	4.4419E+05	0.00E+00
OCDF	48.40	4.4419E+05	1.09E-07
Total Tetra-dioxins	7.61	4.4419E+05	1.71E-08
Total Penta-dioxins	4.86	4.4419E+05	1.09E-08
Total Hexa-dioxins	11.40	4.4419E+05	2.57E-08
Total Hepta-dioxins	17.20	4.4419E+05	3.87E-08
Total Tetra-furans	27.00	4.4419E+05	6.08E-08
Total Penta-furans	20.80	4.4419E+05	4.68E-08
Total Hexa-furans	19.50	4.4419E+05	4.39E-08
Total Hepta-furans	12.00	4.4419E+05	2.70E-08

Dioxon concentration calculation  
Sample 1420

<i>Name</i>	<i>Mass (µg)</i>	<i>Air volume (L)</i>	<i>Concentration (µg/m<sup>3</sup>)</i>
2,3,7,8-TCDD	0.00	3.3109E+05	0.00E+00
1,2,3,7,8-PeCDD	1.20	3.3109E+05	3.62E-09
1,2,3,4,7,8-HxCDD	0.88	3.3109E+05	2.66E-09
1,2,3,6,7,8-HxCDD	2.01	3.3109E+05	6.07E-09
1,2,3,7,8,9-HxCDD	2.78	3.3109E+05	8.40E-09
1,2,3,4,6,7,8-HpCDD	12.70	3.3109E+05	3.84E-08
OCDD	52.00	3.3109E+05	1.57E-07
2,3,7,8-TCDF	2.20	3.3109E+05	6.64E-09
1,2,3,7,8-PeCDF	0.00	3.3109E+05	0.00E+00
2,3,4,7,8-PeCDF	0.00	3.3109E+05	0.00E+00
1,2,3,4,7,8-HxCDF	2.86	3.3109E+05	8.64E-09
1,2,3,6,7,8-HxCDF	0.95	3.3109E+05	2.88E-09
1,2,3,7,8,9-HxCDF	0.00	3.3109E+05	0.00E+00
2,3,4,6,7,8-HxCDF	0.00	3.3109E+05	0.00E+00
1,2,3,4,6,7,8-HpCDF	8.97	3.3109E+05	2.71E-08
1,2,3,4,7,8,9-HpCDF	0.00	3.3109E+05	0.00E+00
OCDF	28.80	3.3109E+05	8.70E-08
Total Tetra-dioxins	0.00	3.3109E+05	0.00E+00
Total Penta-dioxins	7.83	3.3109E+05	2.36E-08
Total Hexa-dioxins	5.67	3.3109E+05	1.71E-08
Total Hepta-dioxins	29.40	3.3109E+05	8.88E-08
Total Tetra-furans	6.28	3.3109E+05	1.90E-08
Total Penta-furans	8.03	3.3109E+05	2.43E-08
Total Hexa-furans	5.14	3.3109E+05	1.55E-08
Total Hepta-furans	8.97	3.3109E+05	2.71E-08

Dioxon concentration calculation  
Sample 1422

<i>Name</i>	<i>Mass (µg)</i>	<i>Air volume (L)</i>	<i>Concentration (µg/m<sup>3</sup>)</i>
2,3,7,8-TCDD	0.00	5.9568E+04	0.00E+00
1,2,3,7,8-PeCDD	0.00	5.9568E+04	0.00E+00
1,2,3,4,7,8-HxCDD	0.00	5.9568E+04	0.00E+00
1,2,3,6,7,8-HxCDD	0.00	5.9568E+04	0.00E+00
1,2,3,7,8,9-HxCDD	0.00	5.9568E+04	0.00E+00
1,2,3,4,6,7,8-HpCDD	2.73	5.9568E+04	4.58E-08
OCDD	9.61	5.9568E+04	1.61E-07
2,3,7,8-TCDF	0.00	5.9568E+04	0.00E+00
1,2,3,7,8-PeCDF	0.92	5.9568E+04	1.54E-08
2,3,4,7,8-PeCDF	0.73	5.9568E+04	1.22E-08
1,2,3,4,7,8-HxCDF	2.03	5.9568E+04	3.41E-08
1,2,3,6,7,8-HxCDF	0.71	5.9568E+04	1.19E-08
1,2,3,7,8,9-HxCDF	0.00	5.9568E+04	0.00E+00
2,3,4,6,7,8-HxCDF	0.00	5.9568E+04	0.00E+00
1,2,3,4,6,7,8-HpCDF	5.90	5.9568E+04	9.90E-08
1,2,3,4,7,8,9-HpCDF	0.00	5.9568E+04	0.00E+00
OCDF	25.20	5.9568E+04	4.23E-07
Total Tetra-dioxins	0.00	5.9568E+04	0.00E+00
Total Penta-dioxins	0.00	5.9568E+04	0.00E+00
Total Hexa-dioxins	0.00	5.9568E+04	0.00E+00
Total Hepta-dioxins	7.99	5.9568E+04	1.34E-07
Total Tetra-furans	0.00	5.9568E+04	0.00E+00
Total Penta-furans	1.75	5.9568E+04	2.94E-08
Total Hexa-furans	3.67	5.9568E+04	6.16E-08
Total Hepta-furans	8.78	5.9568E+04	1.47E-07

Dioxon concentration calculation  
Sample 1423

<i>Name</i>	<i>Mass (µg)</i>	<i>Air volume (L)</i>	<i>Concentration (µg/m<sup>3</sup>)</i>
2,3,7,8-TCDD	0.97	5.5002E+04	1.76E-08
1,2,3,7,8-PeCDD	0.00	5.5002E+04	0.00E+00
1,2,3,4,7,8-HxCDD	0.00	5.5002E+04	0.00E+00
1,2,3,6,7,8-HxCDD	0.00	5.5002E+04	0.00E+00
1,2,3,7,8,9-HxCDD	1.92	5.5002E+04	3.49E-08
1,2,3,4,6,7,8-HpCDD	3.36	5.5002E+04	6.11E-08
OCDD	0.00	5.5002E+04	0.00E+00
2,3,7,8-TCDF	0.84	5.5002E+04	1.53E-08
1,2,3,7,8-PeCDF	0.71	5.5002E+04	1.29E-08
2,3,4,7,8-PeCDF	0.00	5.5002E+04	0.00E+00
1,2,3,4,7,8-HxCDF	1.64	5.5002E+04	2.98E-08
1,2,3,6,7,8-HxCDF	0.86	5.5002E+04	1.57E-08
1,2,3,7,8,9-HxCDF	0.00	5.5002E+04	0.00E+00
2,3,4,6,7,8-HxCDF	0.00	5.5002E+04	0.00E+00
1,2,3,4,6,7,8-HpCDF	7.94	5.5002E+04	1.44E-07
1,2,3,4,7,8,9-HpCDF	0.00	5.5002E+04	0.00E+00
OCDF	68.90	5.5002E+04	1.25E-06
Total Tetra-dioxins	0.00	5.5002E+04	0.00E+00
Total Penta-dioxins	0.00	5.5002E+04	0.00E+00
Total Hexa-dioxins	1.92	5.5002E+04	3.49E-08
Total Hepta-dioxins	6.69	5.5002E+04	1.22E-07
Total Tetra-furans	1.61	5.5002E+04	2.93E-08
Total Penta-furans	1.75	5.5002E+04	3.18E-08
Total Hexa-furans	3.23	5.5002E+04	5.87E-08
Total Hepta-furans	0.00	5.5002E+04	0.00E+00

Dioxon concentration calculation  
Sample 1425

<i>Name</i>	<i>Mass (µg)</i>	<i>Air volume (L)</i>	<i>Concentration (µg/m<sup>3</sup>)</i>
2,3,7,8-TCDD	0.00	8.0320E+04	0.00E+00
1,2,3,7,8-PeCDD	0.00	8.0320E+04	0.00E+00
1,2,3,4,7,8-HxCDD	0.00	8.0320E+04	0.00E+00
1,2,3,6,7,8-HxCDD	0.00	8.0320E+04	0.00E+00
1,2,3,7,8,9-HxCDD	0.70	8.0320E+04	8.74E-09
1,2,3,4,6,7,8-HpCDD	6.54	8.0320E+04	8.14E-08
OCDD	40.70	8.0320E+04	5.07E-07
2,3,7,8-TCDF	1.88	8.0320E+04	2.34E-08
1,2,3,7,8-PeCDF	1.15	8.0320E+04	1.43E-08
2,3,4,7,8-PeCDF	1.13	8.0320E+04	1.41E-08
1,2,3,4,7,8-HxCDF	2.86	8.0320E+04	3.56E-08
1,2,3,6,7,8-HxCDF	1.23	8.0320E+04	1.53E-08
1,2,3,7,8,9-HxCDF	0.00	8.0320E+04	0.00E+00
2,3,4,6,7,8-HxCDF	0.00	8.0320E+04	0.00E+00
1,2,3,4,6,7,8-HpCDF	9.71	8.0320E+04	1.21E-07
1,2,3,4,7,8,9-HpCDF	0.00	8.0320E+04	0.00E+00
OCDF	29.30	8.0320E+04	3.65E-07
Total Tetra-dioxins	0.00	8.0320E+04	0.00E+00
Total Penta-dioxins	0.69	8.0320E+04	8.57E-09
Total Hexa-dioxins	1.55	8.0320E+04	1.93E-08
Total Hepta-dioxins	6.54	8.0320E+04	8.14E-08
Total Tetra-furans	0.00	8.0320E+04	0.00E+00
Total Penta-furans	3.02	8.0320E+04	3.76E-08
Total Hexa-furans	4.55	8.0320E+04	5.66E-08
Total Hepta-furans	9.71	8.0320E+04	1.21E-07



September 21, 2012

Service Request No: P1203422

Samantha Henningsen  
ALS  
2655 Park Center Drive, Suite A  
Simi Valley, CA 93065

**Laboratory Results for: 182608005**

Dear Samantha,

Enclosed are the results of the sample(s) submitted to our laboratory on August 18, 2012. For your reference, these analyses have been assigned our service request number **P1203422**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. dba 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 NELAC 2003 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 281-994-2970 and my email address is nicole.brown@alsglobal.com.

Respectfully submitted,

**Columbia Analytical Services, Inc. dba ALS Environmental**

Nicole Brown

Page 1 of \_\_\_\_\_



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**COLUMBIA ANALYTICAL SERVICES, INC**  
**dba ALS Environmental**

<b>Client:</b>	ALS – Simi Valley, CA	<b>Service Request No.:</b>	P1203422
<b>Project:</b>	182608005 – Stantec Consulting Group, Inc.	<b>Date Received:</b>	08/22/12
<b>Sample Matrix:</b>	Air		

**CASE NARRATIVE**

All analyses were performed in adherence to the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

**Sample Receipt**

Six air samples were received for analysis at Columbia Analytical Services on 08/22/12.

Please note the reporting forms are currently referencing the date ALS-Rochester received the samples (08/18/12) and not the date ALS-Houston received the samples (08/22/12).

The samples were received at 2°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**

**B flags – Method Blanks**

The Method Blank EQ1200481-01 contained low levels of various compounds below the Method Reporting Limit (MRL). The associated compounds in the samples are flagged with ‘B’ flags.

**MS/MSD**

EQ1200481: 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 batch quality control criteria were met.

The matrix spike recovery of 1,2,3,4,7,8,9-HpCDF in both the LCS and DLCS was slightly above control criteria. In addition the matrix spike recovery of OCDF in the DLCS was slightly above control criteria. The relative percent difference between the LCS and DLCS was in control. The matrix spike outliers suggests a potential high bias in this matrix. No further corrective action was appropriate.

**C flags – 2378-TCDF Confirmation**

Confirmation of the TCDF compound: When 2378-TCDF is detected on the DB-5 column, confirmation analyses are performed on a second column (DB-225.) The results from both the DB-5 column and the DB-225 column are included in this data package.

The valid result for the 2378-TCDF compound is reported from the confirmation column.

The confirmation results have been included on the Total TEQ summary pages.

### **Y flags – Labeled Standards**

Samples that had recoveries of labeled standards outside the acceptance limits are flagged with ‘Y’ flags on the Labeled Compound summary pages. In all cases, the signal-to-noise ratios are greater than 10:1, making these data acceptable.

### **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. A ‘K’ flag indicates an estimated maximum possible concentration for the associated compound.

### **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 TEQ Summary results for each sample have been calculated by CAS/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)
- 2378-TCDF from the DB-225 column, when confirmation required
- 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 Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of Columbia Analytical Services, Inc. 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 Services, Inc.  
**Project:** 182608005

**Service Request:** P1203422

**SAMPLE CROSS-REFERENCE**

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
P1203422-001	1416	8/17/12	00:00
P1203422-002	1417	8/17/12	00:00
P1203422-003	1420	8/17/12	00:00
P1203422-004	1422	8/17/12	00:00
P1203422-005	1423	8/17/12	00:00
P1203422-006	1425	8/17/12	00:00

## Laboratory Certifications 2012-2013

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<b>STATE/PROGRAM</b>	<b>AGENCY</b>	<b>CERT#</b>	<b>EXP DATE</b>	<b>CERTIFIED?</b>
<b>DoD ELAP</b>	A2LA	2897.01	11/30/12	Yes
<b>ISO 17025</b>	A2LA	2897.01	11/30/12	Yes
<b>ARIZONA</b>	AZ-DHS	AZ0725	05/27/13	Yes
<b>ARKANSAS</b>	ADEQ	10-035-0	06/16/13	Yes
<b>CALIFORNIA</b>	CA-ELAP	2452	02/28/13	Yes
<b>FLORIDA/NELAP</b>	FL-DOHS	E87611	06/30/13	Yes
<b>HAWAII</b>	HI-DOH	N/A	06/30/13	Yes
<b>ILLINOIS/NELAP</b>	IL-EPA	002611	10/26/12	Yes
<b>LOUISIANA/NELAP</b>	LELAP	03048	06/30/13	Yes
<b>LOUISIANA/NELAP</b>	LDHH	LA100032	12/31/12	Yes
<b>MAINE</b>	ME-DOHS	2010041	06/05/13	Yes
<b>MICHIGAN</b>	MIDEQ	9971	06/30/13	Yes
<b>MINNESOTA</b>	MDH	048-999-427	12/31/12	Yes
<b>NEVADA</b>	NDEP	TX014112010A	09/30/12	Yes (Extension)
<b>NEW JERSEY</b>	NJDEP	TX008	06/30/13	Yes
<b>NEW MEXICO</b>	NMED-DWB	N/A	06/30/13	Yes
<b>NEW YORK/NELAP</b>	NY-DOH	11707	04/1/13	Yes
<b>OKLAHOMA</b>	OKDEQ	2010-022	08/31/13	Yes
<b>OREGON/NELAP</b>	ORELAP	TX200002-006	03/24/13	Yes
<b>PENNSYLVANIA/NELAP</b>	PLAP	002	06/30/13	Yes
<b>TENNESSEE</b>	TNDEC	04016	06/30/13	Yes
<b>TEXAS/NELAP</b>	TCEQ	T104704216-10-1	06/30/13	Yes
<b>UTAH/NELAP</b>	UTELCP	COLU2	06/30/13	Yes
<b>SOIL IMPORT PERMIT</b>	USDA	P330-12-00002	01/13/15	Yes
<b>WASHINGTON/NELAP</b>	WA-Ecology	C819-10	11/14/12	Yes
<b>WEST VIRGINIA</b>	WVDEP	347	06/30/12	Yes

# Abbreviations, Acronyms & Definitions

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<b>Cal</b>	Calibration
<b>Conc</b>	CONCentration
<b>Dioxin(s)</b>	Polychlorinated dibenzo-p-dioxin(s)
<b>EDL</b>	Estimated Detection Limit
<b>EMPC</b>	Estimated Maximum Possible Concentration
<b>Flags</b>	Data qualifiers
<b>Furan(s)</b>	Polychlorinated dibenzofuran(s)
<b>g</b>	Grams
<b>ICAL</b>	Initial CALibration
<b>ID</b>	IDentifier
<b>Ions</b>	Masses monitored for the analyte during data acquisition
<b>L</b>	Liter (s)
<b>LCS</b>	Laboratory Control Sample
<b>DLCS</b>	Duplicate Laboratory Control Sample
<b>MB</b>	Method Blank
<b>MCL</b>	Method Calibration Limit
<b>MDL</b>	Method Detection Limit
<b>MRL</b>	Method Reporting Limit
<b>mL</b>	Milliliters
<b>MS</b>	Matrix Spiked sample
<b>DMS</b>	Duplicate Matrix Spiked sample
<b>NO</b>	Number of peaks meeting all identification criteria
<b>PCDD(s)</b>	Polychlorinated dibenzo-p-dioxin(s)
<b>PCDF(s)</b>	Polychlorinated dibenzofuran(s)
<b>ppb</b>	Parts per billion
<b>ppm</b>	Parts per million
<b>ppq</b>	Parts per quadrillion
<b>ppt</b>	Parts per trillion
<b>QA</b>	Quality Assurance
<b>QC</b>	Quality Control
<b>Ratio</b>	Ratio of areas from monitored ions for an analyte
<b>% Rec.</b>	Percent Recovery
<b>RPD</b>	Relative Percent Difference
<b>RRF</b>	Relative Response Factor
<b>RT</b>	Retention Time
<b>RRT</b>	Relative Retention Time
<b>SDG</b>	Sample Delivery Group
<b>S/N</b>	Signal-to-Noise ratio
<b>TEF</b>	Toxicity Equivalence Factor
<b>TEQ</b>	Toxicity Equivalence Quotient

# Data Qualifier Flags – Dioxin/Furans

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- **B** Indicates the associated analyte is found in the method blank, as well as in the sample.
- **C** Confirmation of the TCDF compound: When 2378-TCDF is detected on the DB-5 column, confirmation analyses are performed on a second column (DB-225). The results from both the DB-5 column and the DB-225 column are included in this data package. The results from the DB-225 analyses should be used to evaluate the 2378-TCDF in the samples. The confirmed result should be used in determining the TEQ value for TCDF.
- **E** Indicates an estimated value – used when the analyte concentration exceeds the upper end of the linear calibration range.
- **J** Indicates an estimated value – used when the analyte concentration is below the method reporting limit (MRL) and above the estimated detection limit (EDL).
- **K** EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.
- **U** Indicates the compound was analyzed and not detected.
- **Y** Samples that had recoveries of labeled standards outside the acceptance limits are flagged with 'Y'. In all cases, the signal-to-noise ratios are greater than 10:1, making these data acceptable.
- **ND** Indicates concentration is reported as 'Not Detected.'
- **S** Peak is saturated; data not reportable.
- **P** Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
- **Q** Lock-mass interference by chlorodiphenyl ether compounds.

COLUMBIA ANALYTICAL SERVICES, INC. – Houston  
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

P1203422

DB-5

DB-225

SPB-Octyl

**First Level - Data Processing - to be filled by person generating the forms**

Date:

09/14/12

Analyst:

JC

Samples:

001-004

**Second Level - Data Review – to be filled by person doing peer review**

Date:

09/18/12

Analyst:

LKC

Samples:

001-004



COLUMBIA ANALYTICAL SERVICES, INC. – Houston  
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

P1203422

DB-5

DB-225

SPB-Octyl

**First Level - Data Processing - to be filled by person generating the forms**

Date:

09/18/12

Analyst:

gc

Samples:

005,006

**Second Level - Data Review – to be filled by person doing peer review**

Date:

09/19/12

Analyst:

GA

Samples:

005,006

COLUMBIA ANALYTICAL SERVICES, INC. – Houston  
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID P1203422

DB- 5

DB- 225

SPB- Oct yl

**First Level - Data Processing - to be filled by person generating the forms**

Date:	Anal yst:	Sampl es:
09/17/12	JL	-001, -002

**Second Level - Data Review - to be filled by person doing peer review**

Date:	Anal yst	Sampl es:
09/17/12	UK	-001, 002

COLUMBIA ANALYTICAL SERVICES, INC. – Houston  
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID P1203422

DB- 5

DB- 225

SPB- Oct y!

**First Level - Data Processing - to be filled by person generating the forms**

Date:	Anal yst :	Sampl es:
09/21/12	JC	-003, -005, -006

**Second Level - Data Review - to be filled by person doing peer review**

Date:	Anal yst	Sampl es:
09/21/12	LKL	003, 005, 006



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## *Analytical Results*

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1416  
**Lab Code:** P1203422-001

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159838  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 2212  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.982	20.0			1
1,2,3,7,8-PeCDD	2.74	J	0.708	100	1.42	1.000	1
1,2,3,4,7,8-HxCDD	1.77	J	1.04	100	1.15	0.998	1
1,2,3,6,7,8-HxCDD	1.58	JK	0.990	100	2.03	1.000	1
1,2,3,7,8,9-HxCDD	3.94	BJK	0.944	100	0.92	1.008	1
1,2,3,4,6,7,8-HpCDD	15.1	BJ	1.43	100	1.14	1.000	1
OCDD	50.7	BJ	3.57	200	0.98	1.000	1
2,3,7,8-TCDF	9.67	CJ	0.926	20.0	0.80	1.002	1
1,2,3,7,8-PeCDF	3.11	BJK	0.649	100	1.24	1.000	1
2,3,4,7,8-PeCDF	3.61	J	0.680	100	1.50	1.024	1
1,2,3,4,7,8-HxCDF	5.99	BJ	1.34	100	1.21	0.997	1
1,2,3,6,7,8-HxCDF	3.35	BJ	1.20	100	1.27	1.000	1
1,2,3,7,8,9-HxCDF	ND	U	1.51	100			1
2,3,4,6,7,8-HxCDF	2.38	J	1.33	100	1.39	1.013	1
1,2,3,4,6,7,8-HpCDF	11.0	BJ	1.61	100	0.97	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	2.06	100			1
OCDF	42.3	BJ	5.95	200	0.85	1.004	1
Total Tetra-Dioxins	ND	U	0.982	20.0			1
Total Penta-Dioxins	11.3	J	0.708	100	1.56		1
Total Hexa-Dioxins	21.4	J	1.04	100	1.16		1
Total Hepta-Dioxins	32.5	J	1.43	100	1.02		1
Total Tetra-Furans	24.5		0.926	20.0	0.75		1
Total Penta-Furans	53.7	J	0.680	100	1.51		1
Total Hexa-Furans	34.3	J	1.34	100	1.25		1
Total Hepta-Furans	17.0	J	1.61	100	0.97		1

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1416  
**Lab Code:** P1203422-001

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159838  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 2212  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	4000	2604.729	65		50-120	0.79	1.008
13C-1,2,3,7,8-PeCDD	4000	2800.542	70		50-120	1.54	1.177
13C-1,2,3,6,7,8-HxCDD	4000	2484.877	62		50-120	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	4000	2356.833	59		40-120	1.06	1.069
13C-OCDD	8000	3681.725	46		40-120	0.89	1.149
13C-2,3,7,8-TCDF	4000	2520.020	63		50-120	0.76	0.977
13C-1,2,3,7,8-PeCDF	4000	2995.475	75		50-120	1.55	1.137
13C-1,2,3,6,7,8-HxCDF	4000	2942.350	74		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	4000	2255.221	56		40-120	0.44	1.045
37Cl-2,3,7,8-TCDD	4000	4571.027	114		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	4000	4582.347	115		50-120	1.23	0.998
13C-2,3,4,7,8-PeCDF	4000	3806.760	95		50-120	1.54	1.024
13C-1,2,3,4,7,8-HxCDF	4000	4052.310	101		50-120	0.52	0.997
13C-1,2,3,4,7,8,9-HpCDF	4000	5107.282	128	Y	40-120	0.44	1.033
13C-1,2,3,7,8,9-HxCDF	4000	2939.559	73		50-120	0.52	1.006

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1416  
**Lab Code:** P1203422-001

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.982	20.0	1	1	
1,2,3,7,8-PeCDD	<b>2.74</b>	0.708	100	1	1	2.74
1,2,3,4,7,8-HxCDD	<b>1.77</b>	1.04	100	1	0.1	0.177
1,2,3,6,7,8-HxCDD	<b>1.58</b>	0.990	100	1	0.1	0.158
1,2,3,7,8,9-HxCDD	<b>3.94</b>	0.944	100	1	0.1	0.394
1,2,3,4,6,7,8-HpCDD	<b>15.1</b>	1.43	100	1	0.01	0.151
OCDD	<b>50.7</b>	3.57	200	1	0.0003	0.0152
2,3,7,8-TCDF	ND	3.74	20.0	1	0.1	
1,2,3,7,8-PeCDF	<b>3.11</b>	0.649	100	1	0.03	0.0933
2,3,4,7,8-PeCDF	<b>3.61</b>	0.680	100	1	0.3	1.08
1,2,3,4,7,8-HxCDF	<b>5.99</b>	1.34	100	1	0.1	0.599
1,2,3,6,7,8-HxCDF	<b>3.35</b>	1.20	100	1	0.1	0.335
1,2,3,7,8,9-HxCDF	ND	1.51	100	1	0.1	
2,3,4,6,7,8-HxCDF	<b>2.38</b>	1.33	100	1	0.1	0.238
1,2,3,4,6,7,8-HpCDF	<b>11.0</b>	1.61	100	1	0.01	0.110
1,2,3,4,7,8,9-HpCDF	ND	2.06	100	1	0.01	
OCDF	<b>42.3</b>	5.95	200	1	0.0003	0.0127
Total TEQ						6.10

2005 WHO TEFs, ND = 0

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1416  
**Lab Code:** P1203422-001

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P219413  
**ICAL Date:** 09/14/12

**Date Analyzed:** 9/14/12 1350  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-04  
**GC Column:** DB-225  
**Blank File Name:** P219410  
**Cal Ver. File Name:** P219405

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	ND	U	3.74	20.0			1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	4000	2182.324	55		50-120	0.79	1.062
37Cl-2,3,7,8-TCDD	4000	2780.370	70		50-120	NA	0.990



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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1417  
**Lab Code:** P1203422-002

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159839  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 2259  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	1.59	JK	1.08	20.0	0.13	1.001	1
1,2,3,7,8-PeCDD	2.31	J	0.545	100	1.66	1.000	1
1,2,3,4,7,8-HxCDD	ND	U	0.985	100			1
1,2,3,6,7,8-HxCDD	1.77	JK	0.943	100	2.08	1.000	1
1,2,3,7,8,9-HxCDD	2.82	BJ	0.898	100	1.43	1.008	1
1,2,3,4,6,7,8-HpCDD	17.2	BJ	0.927	100	1.03	1.000	1
OCDD	87.1	BJ	2.34	200	0.85	1.000	1
2,3,7,8-TCDF	7.99	CJK	1.27	20.0	0.64	1.002	1
1,2,3,7,8-PeCDF	1.86	BJK	0.459	100	1.31	1.001	1
2,3,4,7,8-PeCDF	1.84	JK	0.481	100	2.02	1.024	1
1,2,3,4,7,8-HxCDF	2.93	BJK	1.01	100	1.70	0.997	1
1,2,3,6,7,8-HxCDF	2.17	BJ	0.901	100	1.11	1.000	1
1,2,3,7,8,9-HxCDF	ND	U	1.14	100			1
2,3,4,6,7,8-HxCDF	ND	U	0.996	100			1
1,2,3,4,6,7,8-HpCDF	12.0	BJ	1.93	100	1.08	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	2.47	100			1
OCDF	48.4	BJ	9.44	200	0.86	1.004	1
Total Tetra-Dioxins	7.61	J	1.08	20.0	0.72		1
Total Penta-Dioxins	4.86	J	0.545	100	1.73		1
Total Hexa-Dioxins	11.4	J	0.985	100	1.18		1
Total Hepta-Dioxins	17.2	J	0.927	100	1.03		1
Total Tetra-Furans	27.0		1.27	20.0	0.68		1
Total Penta-Furans	20.8	J	0.481	100	1.70		1
Total Hexa-Furans	19.5	J	1.01	100	1.35		1
Total Hepta-Furans	12.0	J	1.93	100	1.08		1

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1417  
**Lab Code:** P1203422-002

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
  
**Data File Name:** P159839  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 2259  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	4000	2523.083	63		50-120	0.79	1.008
13C-1,2,3,7,8-PeCDD	4000	2716.575	68		50-120	1.55	1.177
13C-1,2,3,6,7,8-HxCDD	4000	2514.111	63		50-120	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	4000	2376.263	59		40-120	1.05	1.069
13C-OCDD	8000	3986.648	50		40-120	0.89	1.149
13C-2,3,7,8-TCDF	4000	2388.706	60		50-120	0.77	0.977
13C-1,2,3,7,8-PeCDF	4000	2879.719	72		50-120	1.53	1.138
13C-1,2,3,6,7,8-HxCDF	4000	2884.721	72		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	4000	2328.814	58		40-120	0.44	1.045
37Cl-2,3,7,8-TCDD	4000	4473.184	112		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	4000	4285.936	107		50-120	1.22	0.998
13C-2,3,4,7,8-PeCDF	4000	3673.445	92		50-120	1.54	1.023
13C-1,2,3,4,7,8-HxCDF	4000	4096.608	102		50-120	0.51	0.997
13C-1,2,3,4,7,8,9-HpCDF	4000	4651.981	116		40-120	0.44	1.033
13C-1,2,3,7,8,9-HxCDF	4000	3166.273	79		50-120	0.52	1.006

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now part of the ALS Group

Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1417  
**Lab Code:** P1203422-002

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	<b>1.59</b>	1.08	20.0	1	1	1.59
1,2,3,7,8-PeCDD	<b>2.31</b>	0.545	100	1	1	2.31
1,2,3,4,7,8-HxCDD	ND	0.985	100	1	0.1	
1,2,3,6,7,8-HxCDD	<b>1.77</b>	0.943	100	1	0.1	0.177
1,2,3,7,8,9-HxCDD	<b>2.82</b>	0.898	100	1	0.1	0.282
1,2,3,4,6,7,8-HpCDD	<b>17.2</b>	0.927	100	1	0.01	0.172
OCDD	<b>87.1</b>	2.34	200	1	0.0003	0.0261
2,3,7,8-TCDF	ND	2.20	20.0	1	0.1	
1,2,3,7,8-PeCDF	<b>1.86</b>	0.459	100	1	0.03	0.0558
2,3,4,7,8-PeCDF	<b>1.84</b>	0.481	100	1	0.3	0.552
1,2,3,4,7,8-HxCDF	<b>2.93</b>	1.01	100	1	0.1	0.293
1,2,3,6,7,8-HxCDF	<b>2.17</b>	0.901	100	1	0.1	0.217
1,2,3,7,8,9-HxCDF	ND	1.14	100	1	0.1	
2,3,4,6,7,8-HxCDF	ND	0.996	100	1	0.1	
1,2,3,4,6,7,8-HpCDF	<b>12.0</b>	1.93	100	1	0.01	0.120
1,2,3,4,7,8,9-HpCDF	ND	2.47	100	1	0.01	
OCDF	<b>48.4</b>	9.44	200	1	0.0003	0.0145
Total TEQ						5.81

2005 WHO TEFs, ND = 0

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1417  
**Lab Code:** P1203422-002

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P219414  
**ICAL Date:** 09/14/12

**Date Analyzed:** 9/14/12 1416  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-04  
**GC Column:** DB-225  
**Blank File Name:** P219410  
**Cal Ver. File Name:** P219405

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	ND	U	2.20	20.0			1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	4000	2120.397	53		50-120	0.79	1.061
37Cl-2,3,7,8-TCDD	4000	2651.791	66		50-120	NA	0.990

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1420  
**Lab Code:** P1203422-003

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159840  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 2347  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.939	20.0			1
1,2,3,7,8-PeCDD	<b>1.20</b>	J	0.451	100	1.50	1.001	1
1,2,3,4,7,8-HxCDD	<b>0.882</b>	J	0.686	100	1.10	0.999	1
1,2,3,6,7,8-HxCDD	<b>2.01</b>	J	0.656	100	1.18	1.000	1
1,2,3,7,8,9-HxCDD	<b>2.78</b>	BJ	0.625	100	1.29	1.008	1
1,2,3,4,6,7,8-HpCDD	<b>12.7</b>	BJ	0.804	100	1.14	1.000	1
OCDD	<b>52.0</b>	BJ	1.74	200	0.90	1.000	1
2,3,7,8-TCDF	<b>2.20</b>	CJ	0.649	20.0	0.72	1.002	1
1,2,3,7,8-PeCDF	ND	U	0.536	100			1
2,3,4,7,8-PeCDF	ND	U	0.562	100			1
1,2,3,4,7,8-HxCDF	<b>2.86</b>	BJ	0.677	100	1.17	0.997	1
1,2,3,6,7,8-HxCDF	<b>0.952</b>	BJK	0.608	100	0.86	1.000	1
1,2,3,7,8,9-HxCDF	ND	U	0.763	100			1
2,3,4,6,7,8-HxCDF	ND	U	0.672	100			1
1,2,3,4,6,7,8-HpCDF	<b>8.97</b>	BJ	1.93	100	0.95	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	2.47	100			1
OCDF	<b>28.8</b>	BJ	2.44	200	0.96	1.004	1
Total Tetra-Dioxins	ND	U	0.939	20.0			1
Total Penta-Dioxins	<b>7.83</b>	J	0.451	100	1.35		1
Total Hexa-Dioxins	<b>5.67</b>	J	0.686	100	1.10		1
Total Hepta-Dioxins	<b>29.4</b>	J	0.804	100	1.06		1
Total Tetra-Furans	<b>6.28</b>	J	0.649	20.0	0.77		1
Total Penta-Furans	<b>8.03</b>	J	0.562	100	1.66		1
Total Hexa-Furans	<b>5.14</b>	J	0.677	100	1.28		1
Total Hepta-Furans	<b>8.97</b>	J	1.93	100	0.95		1

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1420  
**Lab Code:** P1203422-003

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159840  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 2347  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	4000	2810.877	70		50-120	0.78	1.008
13C-1,2,3,7,8-PeCDD	4000	3038.926	76		50-120	1.55	1.177
13C-1,2,3,6,7,8-HxCDD	4000	2764.445	69		50-120	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	4000	2650.596	66		40-120	1.04	1.069
13C-OCDD	8000	4621.091	58		40-120	0.89	1.148
13C-2,3,7,8-TCDF	4000	2763.282	69		50-120	0.76	0.977
13C-1,2,3,7,8-PeCDF	4000	3258.333	81		50-120	1.55	1.137
13C-1,2,3,6,7,8-HxCDF	4000	3102.250	78		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	4000	2557.988	64		40-120	0.44	1.045
37Cl-2,3,7,8-TCDD	4000	4641.864	116		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	4000	4419.807	110		50-120	1.24	0.998
13C-2,3,4,7,8-PeCDF	4000	3851.400	96		50-120	1.53	1.024
13C-1,2,3,4,7,8-HxCDF	4000	4309.424	108		50-120	0.51	0.997
13C-1,2,3,4,7,8,9-HpCDF	4000	5135.438	128	Y	40-120	0.44	1.033
13C-1,2,3,7,8,9-HxCDF	4000	3640.909	91		50-120	0.52	1.006

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1420  
**Lab Code:** P1203422-003

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.939	20.0	1	1	
1,2,3,7,8-PeCDD	<b>1.20</b>	0.451	100	1	1	1.20
1,2,3,4,7,8-HxCDD	<b>0.882</b>	0.686	100	1	0.1	0.0882
1,2,3,6,7,8-HxCDD	<b>2.01</b>	0.656	100	1	0.1	0.201
1,2,3,7,8,9-HxCDD	<b>2.78</b>	0.625	100	1	0.1	0.278
1,2,3,4,6,7,8-HpCDD	<b>12.7</b>	0.804	100	1	0.01	0.127
OCDD	<b>52.0</b>	1.74	200	1	0.0003	0.0156
2,3,7,8-TCDF	ND	4.32	20.0	1	0.1	
1,2,3,7,8-PeCDF	ND	0.536	100	1	0.03	
2,3,4,7,8-PeCDF	ND	0.562	100	1	0.3	
1,2,3,4,7,8-HxCDF	<b>2.86</b>	0.677	100	1	0.1	0.286
1,2,3,6,7,8-HxCDF	<b>0.952</b>	0.608	100	1	0.1	0.0952
1,2,3,7,8,9-HxCDF	ND	0.763	100	1	0.1	
2,3,4,6,7,8-HxCDF	ND	0.672	100	1	0.1	
1,2,3,4,6,7,8-HpCDF	<b>8.97</b>	1.93	100	1	0.01	0.0897
1,2,3,4,7,8,9-HpCDF	ND	2.47	100	1	0.01	
OCDF	<b>28.8</b>	2.44	200	1	0.0003	0.00864

Total TEQ 2.39

2005 WHO TEFs, ND = 0

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1420  
**Lab Code:** P1203422-003

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P219509  
**ICAL Date:** 09/14/12

**Date Analyzed:** 9/20/12 2125  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-04  
**GC Column:** DB-225  
**Blank File Name:** P219507  
**Cal Ver. File Name:** P219504

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	ND	U	4.32	20.0			1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	4000	2303.013	58		50-120	0.76	1.062
37Cl-2,3,7,8-TCDD	4000	2824.744	71		50-120	NA	0.990



**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1422  
**Lab Code:** P1203422-004

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159841  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/14/12 0035  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.768	20.0			1
1,2,3,7,8-PeCDD	ND	U	0.472	100			1
1,2,3,4,7,8-HxCDD	ND	U	0.834	100			1
1,2,3,6,7,8-HxCDD	ND	U	0.796	100			1
1,2,3,7,8,9-HxCDD	ND	U	0.759	100			1
1,2,3,4,6,7,8-HpCDD	<b>2.73</b>	BJ	0.592	100	1.10	1.000	1
OCDD	<b>9.61</b>	BJK	2.23	200	1.06	1.000	1
2,3,7,8-TCDF	ND	U	0.603	20.0			1
1,2,3,7,8-PeCDF	<b>0.919</b>	BJK	0.340	100	1.04	1.000	1
2,3,4,7,8-PeCDF	<b>0.726</b>	J	0.356	100	1.36	1.024	1
1,2,3,4,7,8-HxCDF	<b>2.03</b>	BJ	0.554	100	1.14	0.997	1
1,2,3,6,7,8-HxCDF	<b>0.711</b>	BJK	0.498	100	1.68	1.000	1
1,2,3,7,8,9-HxCDF	ND	U	0.625	100			1
2,3,4,6,7,8-HxCDF	ND	U	0.551	100			1
1,2,3,4,6,7,8-HpCDF	<b>5.90</b>	BJ	1.68	100	1.06	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	2.15	100			1
OCDF	<b>25.2</b>	BJ	4.41	200	0.90	1.004	1
Total Tetra-Dioxins	ND	U	0.768	20.0			1
Total Penta-Dioxins	ND	U	0.472	100			1
Total Hexa-Dioxins	ND	U	0.834	100			1
Total Hepta-Dioxins	<b>7.99</b>	J	0.592	100	0.98		1
Total Tetra-Furans	ND	U	0.603	20.0			1
Total Penta-Furans	<b>1.75</b>	J	0.356	100	1.43		1
Total Hexa-Furans	<b>3.67</b>	J	0.554	100	1.27		1
Total Hepta-Furans	<b>8.78</b>	J	1.68	100	1.06		1

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1422  
**Lab Code:** P1203422-004

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159841  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/14/12 0035  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	4000	3221.954	81		50-120	0.79	1.008
13C-1,2,3,7,8-PeCDD	4000	3460.814	87		50-120	1.54	1.177
13C-1,2,3,6,7,8-HxCDD	4000	3097.643	77		50-120	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	4000	2904.812	73		40-120	1.05	1.069
13C-OCDD	8000	4463.146	56		40-120	0.90	1.149
13C-2,3,7,8-TCDF	4000	3175.431	79		50-120	0.76	0.977
13C-1,2,3,7,8-PeCDF	4000	3725.285	93		50-120	1.54	1.137
13C-1,2,3,6,7,8-HxCDF	4000	3763.859	94		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	4000	2784.334	70		40-120	0.45	1.045
37Cl-2,3,7,8-TCDD	4000	4579.729	114		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	4000	4714.394	118		50-120	1.24	0.998
13C-2,3,4,7,8-PeCDF	4000	3863.708	97		50-120	1.54	1.024
13C-1,2,3,4,7,8-HxCDF	4000	4030.883	101		50-120	0.51	0.997
13C-1,2,3,4,7,8,9-HpCDF	4000	4643.594	116		40-120	0.45	1.033
13C-1,2,3,7,8,9-HxCDF	4000	3753.836	94		50-120	0.52	1.006

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1422  
**Lab Code:** P1203422-004

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.768	20.0	1	1	
1,2,3,7,8-PeCDD	ND	0.472	100	1	1	
1,2,3,4,7,8-HxCDD	ND	0.834	100	1	0.1	
1,2,3,6,7,8-HxCDD	ND	0.796	100	1	0.1	
1,2,3,7,8,9-HxCDD	ND	0.759	100	1	0.1	
1,2,3,4,6,7,8-HpCDD	<b>2.73</b>	0.592	100	1	0.01	0.0273
OCDD	<b>9.61</b>	2.23	200	1	0.0003	0.00288
2,3,7,8-TCDF	ND	0.603	20.0	1	0.1	
1,2,3,7,8-PeCDF	<b>0.919</b>	0.340	100	1	0.03	0.0276
2,3,4,7,8-PeCDF	<b>0.726</b>	0.356	100	1	0.3	0.218
1,2,3,4,7,8-HxCDF	<b>2.03</b>	0.554	100	1	0.1	0.203
1,2,3,6,7,8-HxCDF	<b>0.711</b>	0.498	100	1	0.1	0.0711
1,2,3,7,8,9-HxCDF	ND	0.625	100	1	0.1	
2,3,4,6,7,8-HxCDF	ND	0.551	100	1	0.1	
1,2,3,4,6,7,8-HpCDF	<b>5.90</b>	1.68	100	1	0.01	0.0590
1,2,3,4,7,8,9-HpCDF	ND	2.15	100	1	0.01	
OCDF	<b>25.2</b>	4.41	200	1	0.0003	0.00756
Total TEQ						0.616

2005 WHO TEFs, ND = 0

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1423  
**Lab Code:** P1203422-005

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P219424  
**ICAL Date:** 05/03/12

**Date Analyzed:** 9/15/12 1330  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-04  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P219420

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	<b>0.966</b>	JK	0.466	20.0	0.08	1.001	1
1,2,3,7,8-PeCDD	ND	U	0.482	100			1
1,2,3,4,7,8-HxCDD	ND	U	0.654	100			1
1,2,3,6,7,8-HxCDD	ND	U	0.633	100			1
1,2,3,7,8,9-HxCDD	<b>1.92</b>	BJ	0.631	100	1.20	1.009	1
1,2,3,4,6,7,8-HpCDD	<b>3.36</b>	BJK	1.64	100	0.85	1.001	1
OCDD	ND	U	6.59	200			1
2,3,7,8-TCDF	<b>0.840</b>	CJK	0.521	20.0	0.39	1.001	1
1,2,3,7,8-PeCDF	<b>0.712</b>	BJK	0.394	100	1.30	1.001	1
2,3,4,7,8-PeCDF	ND	U	0.405	100			1
1,2,3,4,7,8-HxCDF	<b>1.64</b>	BJ	0.716	100	1.32	0.997	1
1,2,3,6,7,8-HxCDF	<b>0.862</b>	BJ	0.656	100	1.05	1.000	1
1,2,3,7,8,9-HxCDF	ND	U	0.850	100			1
2,3,4,6,7,8-HxCDF	ND	U	0.745	100			1
1,2,3,4,6,7,8-HpCDF	<b>7.94</b>	BJ	2.65	100	1.01	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	3.40	100			1
OCDF	<b>68.9</b>	BJ	7.55	200	0.96	1.001	1
Total Tetra-Dioxins	ND	U	0.466	20.0			1
Total Penta-Dioxins	ND	U	0.482	100			1
Total Hexa-Dioxins	<b>1.92</b>	J	0.654	100	1.20		1
Total Hepta-Dioxins	<b>6.69</b>	J	1.64	100	0.99		1
Total Tetra-Furans	<b>1.61</b>	J	0.521	20.0	0.77		1
Total Penta-Furans	<b>1.75</b>	J	0.405	100	1.45		1
Total Hexa-Furans	<b>3.23</b>	J	0.716	100	1.32		1
Total Hepta-Furans	ND	U	2.65	100			1

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1423  
**Lab Code:** P1203422-005

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P219424  
**ICAL Date:** 05/03/12

**Date Analyzed:** 9/15/12 1330  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-04  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P219420

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	4000	3086.908	77		50-120	0.78	1.008
13C-1,2,3,7,8-PeCDD	4000	2802.839	70		50-120	1.56	1.178
13C-1,2,3,6,7,8-HxCDD	4000	2550.557	64		50-120	1.26	0.991
13C-1,2,3,4,6,7,8-HpCDD	4000	2433.229	61		40-120	1.06	1.084
13C-OCDD	8000	4453.286	56		40-120	0.90	1.197
13C-2,3,7,8-TCDF	4000	2877.763	72		50-120	0.78	0.977
13C-1,2,3,7,8-PeCDF	4000	2841.316	71		50-120	1.57	1.137
13C-1,2,3,6,7,8-HxCDF	4000	2834.442	71		50-120	0.52	0.970
13C-1,2,3,4,6,7,8-HpCDF	4000	2056.270	51		40-120	0.44	1.052
37Cl-2,3,7,8-TCDD	4000	4352.494	109		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	4000	4753.023	119		50-120	1.25	0.998
13C-2,3,4,7,8-PeCDF	4000	3772.363	94		50-120	1.57	1.024
13C-1,2,3,4,7,8-HxCDF	4000	3997.347	100		50-120	0.52	0.997
13C-1,2,3,4,7,8,9-HpCDF	4000	4319.628	108		40-120	0.44	1.040
13C-1,2,3,7,8,9-HxCDF	4000	3144.940	79		50-120	0.52	1.006

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1423  
**Lab Code:** P1203422-005

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	<b>0.966</b>	0.466	20.0	1	1	0.966
1,2,3,7,8-PeCDD	ND	0.482	100	1	1	
1,2,3,4,7,8-HxCDD	ND	0.654	100	1	0.1	
1,2,3,6,7,8-HxCDD	ND	0.633	100	1	0.1	
1,2,3,7,8,9-HxCDD	<b>1.92</b>	0.631	100	1	0.1	0.192
1,2,3,4,6,7,8-HpCDD	<b>3.36</b>	1.64	100	1	0.01	0.0336
OCDD	ND	6.59	200	1	0.0003	
2,3,7,8-TCDF	ND	3.85	20.0	1	0.1	
1,2,3,7,8-PeCDF	<b>0.712</b>	0.394	100	1	0.03	0.0214
2,3,4,7,8-PeCDF	ND	0.405	100	1	0.3	
1,2,3,4,7,8-HxCDF	<b>1.64</b>	0.716	100	1	0.1	0.164
1,2,3,6,7,8-HxCDF	<b>0.862</b>	0.656	100	1	0.1	0.0862
1,2,3,7,8,9-HxCDF	ND	0.850	100	1	0.1	
2,3,4,6,7,8-HxCDF	ND	0.745	100	1	0.1	
1,2,3,4,6,7,8-HpCDF	<b>7.94</b>	2.65	100	1	0.01	0.0794
1,2,3,4,7,8,9-HpCDF	ND	3.40	100	1	0.01	
OCDF	<b>68.9</b>	7.55	200	1	0.0003	0.0207
Total TEQ						1.56

2005 WHO TEFs, ND = 0

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1423  
**Lab Code:** P1203422-005

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P219510  
**ICAL Date:** 09/14/12

**Date Analyzed:** 9/20/12 2203  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-04  
**GC Column:** DB-225  
**Blank File Name:** P219507  
**Cal Ver. File Name:** P219504

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	ND	U	3.85	20.0			1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	4000	2417.553	60		50-120	0.77	1.061
37Cl-2,3,7,8-TCDD	4000	2929.867	73		50-120	NA	0.989

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1425  
**Lab Code:** P1203422-006

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P219425  
**ICAL Date:** 05/03/12

**Date Analyzed:** 9/15/12 1421  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-04  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P219420

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.458	20.0			1
1,2,3,7,8-PeCDD	ND	U	0.353	100			1
1,2,3,4,7,8-HxCDD	ND	U	0.709	100			1
1,2,3,6,7,8-HxCDD	ND	U	0.687	100			1
1,2,3,7,8,9-HxCDD	<b>0.702</b>	BJK	0.685	100	0.95	1.008	1
1,2,3,4,6,7,8-HpCDD	<b>6.54</b>	BJ	0.929	100	1.12	1.000	1
OCDD	<b>40.7</b>	BJ	5.62	200	0.89	1.000	1
2,3,7,8-TCDF	<b>1.88</b>	CJK	0.481	20.0	0.93	1.001	1
1,2,3,7,8-PeCDF	<b>1.15</b>	BJK	0.555	100	2.01	1.001	1
2,3,4,7,8-PeCDF	<b>1.13</b>	J	0.570	100	1.43	1.025	1
1,2,3,4,7,8-HxCDF	<b>2.86</b>	BJ	0.706	100	1.31	0.997	1
1,2,3,6,7,8-HxCDF	<b>1.23</b>	BJK	0.647	100	1.73	1.000	1
1,2,3,7,8,9-HxCDF	ND	U	0.838	100			1
2,3,4,6,7,8-HxCDF	ND	U	0.735	100			1
1,2,3,4,6,7,8-HpCDF	<b>9.71</b>	BJ	3.46	100	1.19	1.001	1
1,2,3,4,7,8,9-HpCDF	ND	U	4.44	100			1
OCDF	<b>29.3</b>	BJ	6.73	200	0.84	1.003	1
Total Tetra-Dioxins	ND	U	0.458	20.0			1
Total Penta-Dioxins	<b>0.688</b>	J	0.353	100	1.47		1
Total Hexa-Dioxins	<b>1.55</b>	J	0.709	100	1.27		1
Total Hepta-Dioxins	<b>6.54</b>	J	0.929	100	1.12		1
Total Tetra-Furans	ND	U	0.481	20.0			1
Total Penta-Furans	<b>3.02</b>	J	0.570	100	1.46		1
Total Hexa-Furans	<b>4.55</b>	J	0.706	100	1.22		1
Total Hepta-Furans	<b>9.71</b>	J	3.46	100	1.19		1



**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1425  
**Lab Code:** P1203422-006

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P219425  
**ICAL Date:** 05/03/12

**Date Analyzed:** 9/15/12 1421  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-04  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P219420

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	4000	3115.616	78		50-120	0.78	1.008
13C-1,2,3,7,8-PeCDD	4000	2848.957	71		50-120	1.57	1.177
13C-1,2,3,6,7,8-HxCDD	4000	2451.332	61		50-120	1.27	0.992
13C-1,2,3,4,6,7,8-HpCDD	4000	2265.657	57		40-120	1.06	1.085
13C-OCDD	8000	4190.525	52		40-120	0.90	1.194
13C-2,3,7,8-TCDF	4000	3013.621	75		50-120	0.79	0.977
13C-1,2,3,7,8-PeCDF	4000	2905.588	73		50-120	1.57	1.136
13C-1,2,3,6,7,8-HxCDF	4000	2746.249	69		50-120	0.52	0.970
13C-1,2,3,4,6,7,8-HpCDF	4000	1923.717	48		40-120	0.44	1.053
37Cl-2,3,7,8-TCDD	4000	4405.912	110		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	4000	4688.709	117		50-120	1.26	0.997
13C-2,3,4,7,8-PeCDF	4000	3637.881	91		50-120	1.58	1.024
13C-1,2,3,4,7,8-HxCDF	4000	4007.081	100		50-120	0.52	0.997
13C-1,2,3,4,7,8,9-HpCDF	4000	3916.279	98		40-120	0.44	1.041
13C-1,2,3,7,8,9-HxCDF	4000	3046.131	76		50-120	0.52	1.006

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1425  
**Lab Code:** P1203422-006

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.458	20.0	1	1	
1,2,3,7,8-PeCDD	ND	0.353	100	1	1	
1,2,3,4,7,8-HxCDD	ND	0.709	100	1	0.1	
1,2,3,6,7,8-HxCDD	ND	0.687	100	1	0.1	
1,2,3,7,8,9-HxCDD	<b>0.702</b>	0.685	100	1	0.1	0.0702
1,2,3,4,6,7,8-HpCDD	<b>6.54</b>	0.929	100	1	0.01	0.0654
OCDD	<b>40.7</b>	5.62	200	1	0.0003	0.0122
2,3,7,8-TCDF	ND	2.34	20.0	1	0.1	
1,2,3,7,8-PeCDF	<b>1.15</b>	0.555	100	1	0.03	0.0345
2,3,4,7,8-PeCDF	<b>1.13</b>	0.570	100	1	0.3	0.339
1,2,3,4,7,8-HxCDF	<b>2.86</b>	0.706	100	1	0.1	0.286
1,2,3,6,7,8-HxCDF	<b>1.23</b>	0.647	100	1	0.1	0.123
1,2,3,7,8,9-HxCDF	ND	0.838	100	1	0.1	
2,3,4,6,7,8-HxCDF	ND	0.735	100	1	0.1	
1,2,3,4,6,7,8-HpCDF	<b>9.71</b>	3.46	100	1	0.01	0.0971
1,2,3,4,7,8,9-HpCDF	ND	4.44	100	1	0.01	
OCDF	<b>29.3</b>	6.73	200	1	0.0003	0.00879
Total TEQ						1.04

2005 WHO TEFs, ND = 0

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** 1425  
**Lab Code:** P1203422-006

**Service Request:** P1203422  
**Date Collected:** 8/17/12 0000  
**Date Received:** 8/18/12  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P219511  
**ICAL Date:** 09/14/12

**Date Analyzed:** 9/20/12 2240  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-04  
**GC Column:** DB-225  
**Blank File Name:** P219507  
**Cal Ver. File Name:** P219504

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	ND	U	2.34	20.0			1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	4000	2459.296	61		50-120	0.77	1.061
37Cl-2,3,7,8-TCDD	4000	2921.429	73		50-120	NA	0.989

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** Method Blank  
**Lab Code:** EQ1200481-01

**Service Request:** P1203422  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159835  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 1949  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	1.07	20.0			1
1,2,3,7,8-PeCDD	ND	U	0.614	100			1
1,2,3,4,7,8-HxCDD	ND	U	0.617	100			1
1,2,3,6,7,8-HxCDD	ND	U	0.591	100			1
1,2,3,7,8,9-HxCDD	<b>0.894</b>	JK	0.562	100	0.75	1.008	1
1,2,3,4,6,7,8-HpCDD	<b>2.39</b>	J	0.494	100	1.11	1.000	1
OCDD	<b>5.02</b>	J	1.45	200	0.96	1.000	1
2,3,7,8-TCDF	ND	U	0.723	20.0			1
1,2,3,7,8-PeCDF	<b>0.924</b>	JK	0.509	100	0.79	1.001	1
2,3,4,7,8-PeCDF	ND	U	0.533	100			1
1,2,3,4,7,8-HxCDF	<b>1.01</b>	JK	0.822	100	1.81	0.997	1
1,2,3,6,7,8-HxCDF	<b>0.767</b>	JK	0.739	100	1.76	1.000	1
1,2,3,7,8,9-HxCDF	ND	U	0.927	100			1
2,3,4,6,7,8-HxCDF	ND	U	0.816	100			1
1,2,3,4,6,7,8-HpCDF	<b>3.66</b>	J	1.81	100	1.10	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	2.31	100			1
OCDF	<b>37.1</b>	J	4.21	200	0.92	1.004	1
Total Tetra-Dioxins	ND	U	1.07	20.0			1
Total Penta-Dioxins	ND	U	0.614	100			1
Total Hexa-Dioxins	ND	U	0.617	100			1
Total Hepta-Dioxins	<b>5.28</b>	J	0.494	100	0.94		1
Total Tetra-Furans	ND	U	0.723	20.0			1
Total Penta-Furans	ND	U	0.533	100			1
Total Hexa-Furans	ND	U	0.822	100			1
Total Hepta-Furans	<b>3.66</b>	J	1.81	100	1.10		1

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** Method Blank  
**Lab Code:** EQ1200481-01

**Service Request:** P1203422  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159835  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 1949  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	4000	2313.383	58		50-120	0.78	1.008
13C-1,2,3,7,8-PeCDD	4000	2429.546	61		50-120	1.55	1.177
13C-1,2,3,6,7,8-HxCDD	4000	2339.973	58		50-120	1.24	0.992
13C-1,2,3,4,6,7,8-HpCDD	4000	2248.345	56		40-120	1.05	1.069
13C-OCDD	8000	3922.205	49		40-120	0.90	1.148
13C-2,3,7,8-TCDF	4000	2241.700	56		50-120	0.77	0.977
13C-1,2,3,7,8-PeCDF	4000	2581.661	65		50-120	1.55	1.137
13C-1,2,3,6,7,8-HxCDF	4000	2610.724	65		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	4000	2244.385	56		40-120	0.45	1.045
37Cl-2,3,7,8-TCDD	4000	4572.088	114		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	4000	4359.522	109		50-120	1.24	0.998
13C-2,3,4,7,8-PeCDF	4000	4073.538	102		50-120	1.54	1.024
13C-1,2,3,4,7,8-HxCDF	4000	4086.576	102		50-120	0.52	0.997
13C-1,2,3,4,7,8,9-HpCDF	4000	4995.110	125	Y	40-120	0.44	1.033
13C-1,2,3,7,8,9-HxCDF	4000	7504.984	188	Y	50-120	0.52	1.006



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**COLUMBIA ANALYTICAL SERVICES, INC.**

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QA/QC Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air

**Service Request:** P1203422  
**Date Analyzed:** 9/13/12

**Lab Control Sample Summary**  
**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method

**Units:** pg  
**Basis:** NA

**Extraction Lot:** 165569

Analyte Name	Lab Control Sample EQ1200481-02			Duplicate Lab Control Sample EQ1200481-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
2,3,7,8-TCDD	219	200	109	238	200	119	70 - 130	9	30
1,2,3,7,8-PeCDD	1100	1000	110	1200	1000	120	70 - 130	9	30
1,2,3,4,7,8-HxCDD	995	1000	100	1120	1000	112	70 - 130	11	30
1,2,3,6,7,8-HxCDD	1090	1000	109	1210	1000	121	70 - 130	10	30
1,2,3,7,8,9-HxCDD	1000	1000	100	1090	1000	109	70 - 130	9	30
1,2,3,4,6,7,8-HpCDD	1030	1000	103	1130	1000	113	70 - 130	9	30
OCDD	2050	2000	103	2270	2000	114	70 - 130	10	30
2,3,7,8-TCDF	216	200	108	236	200	118	70 - 130	9	30
1,2,3,7,8-PeCDF	1100	1000	110	1190	1000	119	70 - 130	8	30
2,3,4,7,8-PeCDF	1060	1000	106	1130	1000	113	70 - 130	6	30
1,2,3,4,7,8-HxCDF	1050	1000	105	1140	1000	114	70 - 130	8	30
1,2,3,6,7,8-HxCDF	1040	1000	104	1130	1000	113	70 - 130	8	30
1,2,3,7,8,9-HxCDF	1100	1000	110	1160	1000	116	70 - 130	5	30
2,3,4,6,7,8-HxCDF	990	1000	99	1080	1000	108	70 - 130	9	30
1,2,3,4,6,7,8-HpCDF	1010	1000	101	1110	1000	111	70 - 130	9	30
1,2,3,4,7,8,9-HpCDF	1330	1000	133 *	1380	1000	138 *	70 - 130	4	30
OCDF	2520	2000	126	2730	2000	137 *	70 - 130	8	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** Lab Control Sample  
**Lab Code:** EQ1200481-02

**Service Request:** P1203422  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159832  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 1719  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	219		0.423	20.0	0.77	1.001	1
1,2,3,7,8-PeCDD	1100		0.358	100	1.55	1.000	1
1,2,3,4,7,8-HxCDD	995		0.468	100	1.26	0.998	1
1,2,3,6,7,8-HxCDD	1090		0.447	100	1.27	1.000	1
1,2,3,7,8,9-HxCDD	1000		0.426	100	1.27	1.008	1
1,2,3,4,6,7,8-HpCDD	1030		0.308	100	1.06	1.000	1
OCDD	2050		9.57	200	0.91	1.000	1
2,3,7,8-TCDF	216		0.485	20.0	0.75	1.000	1
1,2,3,7,8-PeCDF	1100		0.389	100	1.57	1.001	1
2,3,4,7,8-PeCDF	1060		0.408	100	1.53	1.024	1
1,2,3,4,7,8-HxCDF	1050		0.250	100	1.22	0.997	1
1,2,3,6,7,8-HxCDF	1040		0.224	100	1.22	1.000	1
1,2,3,7,8,9-HxCDF	1100		0.282	100	1.23	1.033	1
2,3,4,6,7,8-HxCDF	990		0.248	100	1.22	1.014	1
1,2,3,4,6,7,8-HpCDF	1010		1.94	100	1.03	1.000	1
1,2,3,4,7,8,9-HpCDF	1330		2.47	100	1.03	1.033	1
OCDF	2520		1.67	200	0.91	1.004	1
Total Tetra-Dioxins	220		0.423	20.0	0.77		1
Total Penta-Dioxins	1100		0.358	100	1.55		1
Total Hexa-Dioxins	3090		0.468	100	1.26		1
Total Hepta-Dioxins	1040		0.308	100	0.89		1
Total Tetra-Furans	222		0.485	20.0	0.75		1
Total Penta-Furans	2170		0.408	100	1.48		1
Total Hexa-Furans	4170		0.250	100	1.34		1
Total Hepta-Furans	2350		1.94	100	1.03		1



**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** Lab Control Sample  
**Lab Code:** EQ1200481-02

**Service Request:** P1203422  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159832  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 1719  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	4000	2887.100	72		50-120	0.79	1.009
13C-1,2,3,7,8-PeCDD	4000	3135.582	78		50-120	1.55	1.177
13C-1,2,3,6,7,8-HxCDD	4000	3004.794	75		50-120	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	4000	2725.864	68		40-120	1.07	1.069
13C-OCDD	8000	4592.149	57		40-120	0.88	1.148
13C-2,3,7,8-TCDF	4000	2790.083	70		50-120	0.76	0.978
13C-1,2,3,7,8-PeCDF	4000	3364.554	84		50-120	1.56	1.138
13C-1,2,3,6,7,8-HxCDF	4000	3153.879	79		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	4000	2628.189	66		40-120	0.44	1.045
37Cl-2,3,7,8-TCDD	4000	4542.144	114		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	4000	3975.725	99		50-120	1.24	0.998
13C-2,3,4,7,8-PeCDF	4000	3914.919	98		50-120	1.54	1.024
13C-1,2,3,4,7,8-HxCDF	4000	4177.094	104		50-120	0.52	0.997
13C-1,2,3,4,7,8,9-HpCDF	4000	5269.581	132	Y	40-120	0.44	1.033
13C-1,2,3,7,8,9-HxCDF	4000	8690.790	217	Y	50-120	0.53	1.006

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** EQ1200481-03

**Service Request:** P1203422  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** pg  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159833  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 1805  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	238		0.412	20.0	0.74	1.001	1
1,2,3,7,8-PeCDD	1200		0.301	100	1.54	1.000	1
1,2,3,4,7,8-HxCDD	1120		0.398	100	1.25	0.998	1
1,2,3,6,7,8-HxCDD	1210		0.380	100	1.24	1.000	1
1,2,3,7,8,9-HxCDD	1090		0.363	100	1.21	1.008	1
1,2,3,4,6,7,8-HpCDD	1130		0.239	100	1.06	1.000	1
OCDD	2270		0.746	200	0.88	1.000	1
2,3,7,8-TCDF	236		0.474	20.0	0.73	1.001	1
1,2,3,7,8-PeCDF	1190		0.275	100	1.54	1.001	1
2,3,4,7,8-PeCDF	1130		0.289	100	1.55	1.024	1
1,2,3,4,7,8-HxCDF	1140		0.437	100	1.22	0.997	1
1,2,3,6,7,8-HxCDF	1130		0.392	100	1.23	1.000	1
1,2,3,7,8,9-HxCDF	1160		0.493	100	1.23	1.033	1
2,3,4,6,7,8-HxCDF	1080		0.433	100	1.23	1.014	1
1,2,3,4,6,7,8-HpCDF	1110		2.13	100	1.02	1.000	1
1,2,3,4,7,8,9-HpCDF	1380		2.72	100	1.04	1.033	1
OCDF	2730		1.74	200	0.91	1.004	1
Total Tetra-Dioxins	238		0.412	20.0	0.74		1
Total Penta-Dioxins	1200		0.301	100	1.54		1
Total Hexa-Dioxins	3430		0.398	100	1.21		1
Total Hepta-Dioxins	1170		0.239	100	0.98		1
Total Tetra-Furans	237		0.474	20.0	0.87		1
Total Penta-Furans	2330		0.289	100	1.51		1
Total Hexa-Furans	4510		0.437	100	1.22		1
Total Hepta-Furans	2490		2.13	100	1.02		1

**COLUMBIA ANALYTICAL SERVICES, INC.**

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Analytical Report

**Client:** Stantec Consulting Group, Inc.  
**Project:** 182608005  
**Sample Matrix:** Air  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** EQ1200481-03

**Service Request:** P1203422  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** Percent  
**Basis:** NA

**Polychlorinated, Polybrominated, Brominated/Chlorinated Dibenzo-p-Dioxins, Dibenzofurans in Amb. Air**

**Analytical Method:** TO-9A  
**Prep Method:** Method  
**Sample Amount:** 1.0000  
**Data File Name:** P159833  
**ICAL Date:** 09/06/12

**Date Analyzed:** 9/13/12 1805  
**Date Extracted:** 8/24/12  
**Instrument Name:** E-HRMS-03  
**GC Column:** DB-5  
**Blank File Name:** P159835  
**Cal Ver. File Name:** P159830

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	4000	2824.940	71		50-120	0.79	1.009
13C-1,2,3,7,8-PeCDD	4000	3109.776	78		50-120	1.55	1.177
13C-1,2,3,6,7,8-HxCDD	4000	3028.358	76		50-120	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	4000	2779.216	69		40-120	1.05	1.069
13C-OCDD	8000	4823.610	60		40-120	0.89	1.148
13C-2,3,7,8-TCDF	4000	2742.499	69		50-120	0.76	0.977
13C-1,2,3,7,8-PeCDF	4000	3359.836	84		50-120	1.54	1.138
13C-1,2,3,6,7,8-HxCDF	4000	3217.929	80		50-120	0.52	0.974
13C-1,2,3,4,6,7,8-HpCDF	4000	2752.990	69		40-120	0.45	1.045
37Cl-2,3,7,8-TCDD	4000	4439.699	111		50-120	NA	1.001
13C-1,2,3,4,7,8-HxCDD	4000	3983.982	100		50-120	1.24	0.998
13C-2,3,4,7,8-PeCDF	4000	3792.937	95		50-120	1.53	1.024
13C-1,2,3,4,7,8-HxCDF	4000	4146.635	104		50-120	0.52	0.997
13C-1,2,3,4,7,8,9-HpCDF	4000	4852.808	121	Y	40-120	0.45	1.033
13C-1,2,3,7,8,9-HxCDF	4000	8590.547	215	Y	50-120	0.52	1.006



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## *Chain of Custody*

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# Intra-Network Chain of Custody

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ALS Contact: Samantha Henningsen

**Project Name:**  
**Project Number:** 182608005  
**Project Manager:** John Reiter  
**Company:** Stantec Consulting Group, Inc.

Dioxins and Furans  
TO-9A

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample		Date Received	Send To	
				Date	Time			
P1203422-001	1416	1	Air	8/17/12	0000	8/18/12	HOUSTON	II
P1203422-002	1417	1	Air	8/17/12	0000	8/18/12	HOUSTON	II
P1203422-003	1420	1	Air	8/17/12	0000	8/18/12	HOUSTON	II
P1203422-004	1422	1	Air	8/17/12	0000	8/18/12	HOUSTON	II
P1203422-005	1423	1	Air	8/17/12	0000	8/18/12	HOUSTON	II
P1203422-006	1425	1	Air	8/17/12	0000	8/18/12	HOUSTON	II

**Test Comments**  
 Dioxins and Furans - TO-9A    P1203422-001,2,3,4,5,6    17 Dioxin/Furans

**Folder Comments:**

<b>Special Instructions/Comments</b> 1024 1/2 S/N: 101915976	<b>Turnaround Requirements</b> <input type="checkbox"/> RUSH (Surcharges Apply) <b>PLEASE CIRCLE WORK DAYS</b> 1   2   3   4   5 <input type="checkbox"/> STANDARD Requested FAX Date: _____ Requested Report Date: <u>09/01/12</u>	<b>Report Requirements</b> <input type="checkbox"/> I. Results Only <input type="checkbox"/> II. Results + QC Summaries <input type="checkbox"/> III. Results + QC and Calibration Summaries <input type="checkbox"/> IV. Data Validation Report with Raw Data PQL/MDL/J <u>N</u> EDD <u>N</u>	<b>Invoice Information</b> PO# P1203422 Bill to
---	---	--	--

Relinquished By: ngin Villameal 8/21/12 14:30    Received By: Coh 1023 8/22/12    Airbill Number: 1278905X0141503481

# Cooler Receipt Form

Project Chemist

Client/Project

Service Request

Date/Time Received:

Date/Time Logged in:

Technician

Technician

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  N/A If yes, how many and where?  
 Were they intact?  Yes  No  N/A  
 Were they signed and dated?  Yes  No  N/A

4. Method of delivery:  Inserts  Baggies  Bubble Wrap  Gel Packs  Wet Ice  Sleeves  Other

5. Foreign or Regulated Soil?  Yes  No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?	Filed
1Z78905X0141503481		Aug 24, 2012	1024	AL	1/2	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>
						<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  N/A
7. Did all bottles arrive in good condition (not broken, no signs of leakage)?  Yes  No  N/A
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)?  Yes  No  N/A
9. Were appropriate bottles/containers and volumes received for the requested tests?  Yes  No  N/A
10. Did sample labels and tags agree with custody documents?  Yes  No  N/A

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Broken	Date	Technician
			<input type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>		

Notes, Discrepancies, & Resolutions:

Received 2 unused puffs AL 8/24/12



## Sample Acceptance Policy

This policy outlines the criteria samples must meet to be accepted by CAS/ Houston.

### **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, CAS/Houston will complete a COC, which must be approved by the client, in writing, prior to proceeding with the analysis.

### **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 can be shipped and stored at ambient temperature, ~23°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.

## Service Request Summary

**Folder #:** P1203422  
**Client Name:** Stantec Consulting Group, Inc.  
**Project Name:**  
**Project Number:** 182608005  
**Report To:** John Reiter  
 Stantec Consulting Services, Inc.  
 12075 Corporate Pkwy, Ste. 200  
 Mequon, WI 53092  
**Phone Number:** 262-643-9154  
**Cell Number:**  
**Fax Number:**  
**E-mail:** john.reiter@stantec.com

**Project Chemist:** Nicole Brown  
**Originating Lab:** SIMIVALLEY  
**Logged By:** KHORIUCHI  
**Date Received:** 8/18/12  
**Internal Due Date:** 9/1/12  
**QAP:** LAB QAP  
**Qualifier Set:** CAS Standard  
**Formset:** CAS Standard  
**Merged?:** N  
**Report to MDL?:** Y  
**P.O. Number:**  
**EDD:** No EDD Specified

6 - 1 each-Cartridge PUF/Filter (High Volume)

**Location:** E-WIC01

CAS Samp No	Client Samp No.	Matrix	Collected	TO-9A/ Dioxins and Furans	SVM
P1203422-001	1416	Air	8/17/12 0000	II	
P1203422-002	1417	Air	8/17/12 0000	II	
P1203422-003	1420	Air	8/17/12 0000	II	
P1203422-004	1422	Air	8/17/12 0000	II	
P1203422-005	1423	Air	8/17/12 0000	II	
P1203422-006	1425	Air	8/17/12 0000	II	

**Folder Comments:**

PUFs sent to Houston. Note 1421,1422,1423,1424,1425 & 1426 became saturated with moisture.  
 Results due 9/5/12  
 sample dates taken from the outter jar for -004 & -005.  
 1422 jar is marked with pump #1066  
 1423 jar is marked with pump #1077  
 1425 jar is marked with pump #1068  
 2 unused PUFs returned and included in sample shipment to Houston. Total of 8 PUFs shipped.

**Test Comments:**

Group	Test/Method	Samples	Comments
Semivoa GCMS	Dioxins and Furans/TO-9A	1-6, 0	17 Dioxin/Furans



# Preparation Information Benchsheet

**Prep Run#:** 165569  
**Team:** Semivoa GCMS/SMORE

**Prep WorkFlow:** OrgExtDioxA(60)  
**Prep Method:** Method

**Status:** Prepped  
**Prep Date/Time:** 8/24/12 1 :00 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	E1201197-001	IR5-AIR-170	.01	TO-9A/Dioxins and Furans		Air	1.0000	PUF WITH FILTER
2	E1201197-002	IR5-AIR-176	.01	TO-9A/Dioxins and Furans		Air	1.0000	PUF with filter
3	EQ1200481-01	MB		TO-9A/Dioxins and Furans		Air	1.0000	
4	EQ1200481-02	LCS		TO-9A/Dioxins and Furans		Air	1.0000	
5	EQ1200481-03	DLCS		TO-9A/Dioxins and Furans		Air	1.0000	
6	P1203422-001	1416	.01	TO-9A/Dioxins and Furans		Air	1.0000	PUF
7	P1203422-002	1417	.01	TO-9A/Dioxins and Furans		Air	1.0000	PUF
8	P1203422-003	1420	.01	TO-9A/Dioxins and Furans		Air	1.0000	PUF/WET (FEUL LIKE SMELL)
9	P1203422-004	1422	.01	TO-9A/Dioxins and Furans		Air	1.0000	PUF/WET (FEUL LIKE SMELL)
10	P1203422-005	1423	.01	TO-9A/Dioxins and Furans		Air	1.0000	PUF/WET (FEUL LIKE SMELL)
11	P1203422-006	1425	.01	TO-9A/Dioxins and Furans		Air	1.0000	PUF/WET (FEUL LIKE SMELL)

## Spiking Solutions

<b>Name:</b> 1613B Matrix Working Standard	<b>Inventory ID</b> 47785	<b>Logbook Ref:</b> D13-46-5 (47785)	<b>Expires On:</b> 08/04/2013
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EQ1200481-02 100.00µL      EQ1200481-03 100.00µL

<b>Name:</b> 23/TO-9A Internal Working Solution	<b>Inventory ID</b> 47984	<b>Logbook Ref:</b> D12-96-4(47984)	<b>Expires On:</b> 08/09/2013
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E1201197-001 40.00µL      E1201197-002 40.00µL      EQ1200481-01 40.00µL      EQ1200481-02 40.00µL      EQ1200481-03 40.00µL      P1203422-001 40.00µL  
P1203422-002 40.00µL      P1203422-003 40.00µL      P1203422-004 40.00µL      P1203422-005 40.00µL      P1203422-006 40.00µL

<b>Name:</b> 23/TO-9A Alternate Working Solution	<b>Inventory ID</b> 47985	<b>Logbook Ref:</b> D12-97-1(47985)	<b>Expires On:</b> 08/09/2013
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E1201197-001 100.00µL      E1201197-002 40.00µL      EQ1200481-01 100.00µL      EQ1200481-02 100.00µL      EQ1200481-03 100.00µL      P1203422-001 40.00µL  
P1203422-002 40.00µL      P1203422-003 40.00µL      P1203422-004 40.00µL      P1203422-005 40.00µL      P1203422-006 40.00µL

<b>Name:</b> 23/TO-9A Surrogate Working Solution	<b>Inventory ID</b> 48472	<b>Logbook Ref:</b> D12-97-2 (48472)	<b>Expires On:</b> 08/24/2013
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EQ1200481-01 40.00µL      EQ1200481-02 40.00µL      EQ1200481-03 40.00µL

## Preparation Materials

Ethyl Acetate 99.9% Minimum EtOAc	C2-79-2 (52060) (48043)	Glass Wool	C2-79-6 (K93168686) (48047)	Sulfuric Acid Reagent Grade H2SO4	C2-77-3 (51299) (46170)
Dichloromethane (Methylene Chloride) 99.9% MeCl2	C2-81-4 (48626)	Sodium Chloride Reagent Grade NaCl	C2-65-5 (38670)	Sodium Hydroxide Reagent Grade NaOH	C2-63-6 (37033)
Sodium Sulfate Anhydrous Reagent Grade Na2SO4	C2-78-1 (06010505) (46897)	Tridecane (n-Tridecane)	C2-77-1 (MKBJ3173V) (46168)	Hexane (n-Hexane) 98.5% Minimum	C2-79-5 (48044)
Silica Gel Reagent Grade	C2-80-6 (48144)	Toluene 99.9% Minimum	C2-78-6 (52012) (48045)		

# Preparation Information Benchsheet

**Prep Run#:** 165569  
**Team:** Semivoa GCMS/SMORE

**Prep Workflow:** OrgExtDioxA(60)  
**Prep Method:** Method

**Status:** Prepped  
**Prep Date/Time:** 8/24/12 1 :00 PM

## Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	8/24/12 13:00	Started:	8/27/12 12:00	Started:	8/29/12 11:25	Started:	8/30/12 06:15
Finished:	8/24/12 13:30	Finished:	8/27/12 13:20	Finished:	8/29/12 13:40	Finished:	8/30/12 09:00
By:	SMORE	By:	SMORE	By:	SMORE	By:	SMORE
Comments		Comments		Comments		Comments	

Comments: \_\_\_\_\_

Reviewed By: rp Date: 9/5/2012

## Chain of Custody

Relinquished By: _____	Date: _____	<u>Extracts Examined</u>
Received By: _____	Date: _____	Yes No

## LABORATORY REPORT

August 31, 2012

John Reiter  
Stantec Consulting Group, Inc.  
12075 Corporate Pkwy, Ste. 200  
Mequon, WI 53092

**RE: Bridgeton Landfill / 182608005 Task 300**

Dear John:

Enclosed are the results of the samples submitted to our laboratory on August 17, 2012. For your reference, these analyses have been assigned our service request number P1203374.

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.caslab.com](http://www.caslab.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

**ALS | Environmental**

Samantha Henningsen  
Project Manager

Client: Stantec Consulting Group, Inc. Service Request No: P1203374  
Project: Bridgeton Landfill / 182608005 Task 300

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 17, 2012 and were stored in accordance with the analytical method requirements. The bag for sample 1305 (Tedlar Bag) (P1203374-006) was received flat and could not be analyzed. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample(s) at the time of sample receipt.

The samples labeled "1301 (Tedlar Bag)", "1302 (Tedlar Bag)", and "1305 (Tedlar Bag)" were received with obvious stress marks on the seams of the Tedlar bags, which rendered them flat and unusable. In addition, the samples labeled "1300 (Tedlar Bag)" and "1304 (Tedlar Bag)" were received with low volume and stress marks on the seams. All of these samples were most likely either overfilled or expanded during flight.

### 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). Laboratory air was analyzed as a second source laboratory control sample containing oxygen and nitrogen. A second source for the other analytes was not performed and no positive results were detected of those other compounds.

### Sulfur Analysis

The samples were also analyzed for twenty sulfur compounds per ASTM D 5504-08 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.

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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 Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of Columbia Analytical Services, Inc. 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.*

DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: Bridgeton Landfill / 182608005 Task 300

Service Request: P1203374

Date Received: 8/17/2012  
 Time Received: 09:45

3C Modified - Fxd Gases Bag	ASTM D5504-08 - Sulfur Bag
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Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	3C Modified - Fxd Gases Bag	ASTM D5504-08 - Sulfur Bag
1300 (Tedlar Bag)	P1203374-001	Air	8/16/2012	00:00	X	X
1303 (Tedlar Bag)	P1203374-004	Air	8/16/2012	00:00	X	X
1304 (Tedlar Bag)	P1203374-005	Air	8/16/2012	00:00	X	X
1306 (Tedlar Bag)	P1203374-007	Air	8/16/2012	00:00	X	X
1307 (Tedlar Bag)	P1203374-008	Air	8/16/2012	00:00	X	X

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

Company Name & Address (Reporting Information)  
 Stantec Consulting Services Inc.  
 12075 Corporate Parkway, Suite 201  
 Meridian, Wisc 53092

Project Name  
 Bridgerton Landfill 182608005 Task 300

CAS Contact: \_\_\_\_\_ CAS Project No. 1123374

Project Manager Deborah Gray  
 Phone (262) 643-9154 Fax (262) 241-4999

P.O. # / Billing Information  
 Same as reporting address

Analysis Method  
 Reduced Sulfur Compounds (ASTM D5504)  
 Fixed gases (hydrogen, methane, carbon monoxide) EPA Method 3C

Email Address for Result Reporting  
 john.reiter@stantec.com

Sampler (Print & Sign)  
 John Reiter

Comments  
 e.g. Actual Preservative or specific instructions  
 \* Questions? Call John Reiter at phone listed on cell (262) 930-7307.

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
1300 (Tedlar bag)	(1)	8/16/12	N/A						X
1301 ( )	(2)								X
1302 ( )	(3)								X
1303 ( )	(4)								X
1304 ( )	(5)								X
1305 ( )	(6)								X
1306 ( )	(7)								X
1307 ( )	(8)	8/16/12							X

**Report Tier Levels - please select**

Tier I - Results (Default if not specified) \_\_\_\_\_  
 Tier II (Results + QC Summaries) \_\_\_\_\_  
 Tier III (Results + QC & Calibration Summaries) \_\_\_\_\_  
 Tier IV (Data Validation Package) 10% Surcharge \_\_\_\_\_

EDD required Yes / No  
 Type: \_\_\_\_\_

Relinquished by: (Signature) [Signature] Date: 8-16-12 Time: 8:00 PM

Relinquished by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Received by: (Signature) [Signature] Date: 8/16/12 Time: 8:00 PM

Received by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Project Requirements (MRLs, QAPP) \_\_\_\_\_

Cooler / Blank Temperature \_\_\_\_\_ °C

**Sample Acceptance Check Form**

Client: Stantec Consulting Group, Inc. Work order: P1203374

Project: Bridgeton Landfill / 182608005 Task 300

Sample(s) received on: 8/17/12 Date opened: 8/17/12 by: MZAMORA

**Note:** This form is used for all samples received by CAS. 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.

- |  | <u>Yes</u>                          | <u>No</u>                           | <u>N/A</u>                          |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 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 CAS</b> ?  | <input type="checkbox"/>            | <input checked="" 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 type="checkbox"/>            | <input checked="" 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 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"/> |
| 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
P1203374-001.01	10 L Tedlar Bag					
P1203374-002.01	10 L Tedlar Bag					
P1203374-003.01	10 L Tedlar Bag					
P1203374-004.01	10 L Tedlar Bag					
P1203374-005.01	10 L Tedlar Bag					
P1203374-006.01	10 L Tedlar Bag					
P1203374-007.01	10 L Tedlar Bag					
P1203374-008.01	10 L Tedlar Bag					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 Chain of Custody is missing time collected \_\_\_\_\_

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1300 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-001

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.4</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.



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1303 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-004

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.5</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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1304 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P1203374-005

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: 8/16/12  
 Date Received: 8/17/12  
 Date Analyzed: 8/17/12  
 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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.4</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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1306 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-007

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.5</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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1307 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-008

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.4</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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P120817-MB

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/17/12  
 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.

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P120817-LCS

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/17/12  
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppmV	Result ppmV	% Recovery	CAS Acceptance Limits	Data Qualifier
7782-44-7	Oxygen +					
7440-37-1	Argon	219,000	<b>217,000</b>	<b>99</b>	74-132	
7727-37-9	Nitrogen	781,000	<b>800,000</b>	<b>102</b>	76-126	

LABORATORY DUPLICATE SUMMARY RESULTS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1307 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P1203374-008DUP

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: 8/16/12  
 Date Received: 8/17/12  
 Date Analyzed: 8/17/12  
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Sample Result %, v/v	Duplicate Sample Result %, v/v	Average	% RPD	RPD Limit	Data Qualifier
1333-74-0	Hydrogen	ND	ND	-	-	17	
7782-44-7	Oxygen +						
7440-37-1	Argon	21.5	21.5	21.5	0	19	
7727-37-9	Nitrogen	78.4	78.4	78.4	0	19	
630-08-0	Carbon Monoxide	ND	ND	-	-	18	
74-82-8	Methane	ND	ND	-	-	18	
124-38-9	Carbon Dioxide	ND	ND	-	-	19	

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

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1300 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P1203374-001

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: 8/16/12  
 Time Collected: NA  
 Date Received: 8/17/12  
 Date Analyzed: 8/17/12  
 Time Analyzed: 16:29  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1303 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P1203374-004

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: 8/16/12  
 Time Collected: NA  
 Date Received: 8/17/12  
 Date Analyzed: 8/17/12  
 Time Analyzed: 15:22  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1304 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-005

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
Time Analyzed: 15:58  
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1306 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-007

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 7890A/GC22/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
Time Analyzed: 15:39  
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1307 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P1203374-008

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: 8/16/12  
 Time Collected: NA  
 Date Received: 8/17/12  
 Date Analyzed: 8/17/12  
 Time Analyzed: 15:38  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P120817-MB

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/17/12  
 Time Analyzed: 07:55  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P120817-MB

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 7890A/GC22/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: NA  
Time Collected: NA  
Date Received: NA  
Date Analyzed: 8/17/12  
Time Analyzed: 07:33  
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P120817-LCS

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/17/12  
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	CAS Acceptance Limits	Data Qualifier
7783-06-4	Hydrogen Sulfide	2,380	<b>2,440</b>	<b>103</b>	51-141	
463-58-1	Carbonyl Sulfide	2,470	<b>2,080</b>	<b>84</b>	63-147	
74-93-1	Methyl Mercaptan	2,360	<b>2,990</b>	<b>127</b>	54-156	

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P120817-LCS

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/17/12  
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	CAS Acceptance Limits	Data Qualifier
7783-06-4	Hydrogen Sulfide	2,380	<b>2,180</b>	<b>92</b>	51-141	
463-58-1	Carbonyl Sulfide	2,470	<b>1,800</b>	<b>73</b>	63-147	
74-93-1	Methyl Mercaptan	2,360	<b>2,720</b>	<b>115</b>	54-156	



## LABORATORY REPORT

August 31, 2012

John Reiter  
Stantec Consulting Group, Inc.  
12075 Corporate Pkwy, Ste. 200  
Mequon, WI 53092

**RE: Bridgeton Landfill / 182608005 Task 300**

Dear John:

Enclosed are the results of the samples submitted to our laboratory on August 18, 2012. For your reference, these analyses have been assigned our service request number P1203396.

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.caslab.com](http://www.caslab.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

**ALS | Environmental**

Samantha Henningsen  
Project Manager

Client: Stantec Consulting Group, Inc. Service Request No: P1203396  
Project: Bridgeton Landfill / 182608005 Task 300

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 18, 2012 and were stored in accordance with the analytical method requirements. The bag for sample 1371 (Tedlar bag) (P1203396-008) was received flat and could not be analyzed. The samples were received past the recommended holding time for the sulfur analysis. The analysis was performed as soon as possible after receipt by the laboratory. The data is flagged to indicate the holding time exceedance. 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).

### Sulfur Analysis

The samples were also analyzed for twenty sulfur compounds per ASTM D 5504-08 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.

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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 Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of Columbia Analytical Services, Inc. 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 AALS 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.*

DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: Bridgeton Landfill / 182608005 Task 300

Service Request: P1203396

Date Received: 8/18/2012  
 Time Received: 10:45

3C Modified - Fxd Gases Bag	ASTM D5504-08 - Sulfur Bag
-----------------------------	----------------------------

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	3C Modified - Fxd Gases Bag	ASTM D5504-08 - Sulfur Bag
1364 (Tedlar bag)	P1203396-001	Air	8/16/2012	00:00	X	X
1365 (Tedlar bag)	P1203396-002	Air	8/16/2012	00:00	X	X
1366 (Tedlar bag)	P1203396-003	Air	8/16/2012	00:00	X	X
1367 (Tedlar bag)	P1203396-004	Air	8/16/2012	00:00	X	X
1368 (Tedlar bag)	P1203396-005	Air	8/16/2012	00:00	X	X
1369 (Tedlar bag)	P1203396-006	Air	8/16/2012	00:00	X	X
1370 (Tedlar bag)	P1203396-007	Air	8/16/2012	00:00	X	X
1428 1 Liter	P1203396-009	Air	8/16/2012	00:00	X	X
1421 1 Liter	P1203396-010	Air	8/16/2012	00:00	X	X
1435 1 Liter	P1203396-011	Air	8/16/2012	00:00	X	X

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

CAS Project No. **P1203396**

**Company Name & Address (Reporting Information)**  
 Started Consulting Services, Inc  
 12075 Corporate Parkway Suite 201  
 Meriden, CT 03092

**Project Name**  
 Bridgeton landfill #882 Task 300  
 1836 08005

**Analysis Method**  
 Reduced Sulfur Compounds (ASTM D5504)  
 Fixed Gases (hydrogen, methane, carbon monoxide) EPA method 3C

**Project Manager** Deborah Gray  
**Phone** 262-643-8154 **Fax** 262-241-4901

**P.O. # / Billing Information**  
 Same as reporting address

**Comments**  
 e.g. Actual Preservative or specific instructions

**Email Address for Result Reporting**  
 John.Reiter@starter.com

**Sampler (Print & Sign)**  
 John Reiter

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	Received by: (Signature)	Date:	Time:	Project Requirements (MRLs, CAPP)
1364 (Tealark bag)	①	8/16/12	N/A									
1365	②											
1366	③											
1367	④											
1368	⑤											
1369	⑥											
1370	⑦											
1371	⑧											
1428	⑨											
1492	⑩											
14385	⑪											

\*Reference quoted # 25404

\*Questions, call John Reiter at 262-930-7307

**Report Tier Levels - please select**  
 Tier I - Results (Default if not specified) \_\_\_\_\_  
 Tier II (Results + QC Summaries) \_\_\_\_\_  
 Tier III (Results + QC & Calibration Summaries) \_\_\_\_\_  
 Tier IV (Data Validation Package) 10% Surcharge \_\_\_\_\_  
 EDD required Yes / No  
 Type: \_\_\_\_\_

**Relinquished by: (Signature)** *Richard Sage* **Date:** 8/17/12 **Time:** 4:00 PM  
**Received by: (Signature)** *[Signature]* **Date:** 8/17/12 **Time:** 10:45  
**Project Requirements (MRLs, CAPP)**  
 Cooler / Blank \_\_\_\_\_ °C  
 Temperature \_\_\_\_\_ °C

**Sample Acceptance Check Form**

 Client: Stantec Consulting Group, Inc. Work order: P1203396

 Project: Bridgeton Landfill / 182608005 Task 300

 Sample(s) received on: 8/18/12 Date opened: 8/18/12 by: MZAMORA

**Note:** This form is used for all samples received by CAS. 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.

- |  | <u>Yes</u>                          | <u>No</u>                           | <u>N/A</u>                          |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 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 CAS</b> ?  | <input type="checkbox"/>            | <input checked="" 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 type="checkbox"/>            | <input checked="" 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 type="checkbox"/>            | <input checked="" 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 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"/> |
| Were custody seals on outside of sample container?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input 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
P1203396-001.01	10 L Tedlar Bag					
P1203396-002.01	10 L Tedlar Bag					
P1203396-003.01	10 L Tedlar Bag					
P1203396-004.01	10 L Tedlar Bag					
P1203396-005.01	10 L Tedlar Bag					
P1203396-006.01	10 L Tedlar Bag					
P1203396-007.01	10 L Tedlar Bag					
P1203396-008.01	10 L Tedlar Bag					Very little volume in tedlar bag

 Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 Chain of Custody is missing time collected



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1364 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-001

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.5</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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1365 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-002

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.4</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.



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1366 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-003

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.4</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.

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RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1367 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-004

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.5</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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1368 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-005

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.5</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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1369 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-006

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.4</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.4</b>	0.10	
630-08-0	Carbon Monoxide	ND	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	<b>Carbon Dioxide</b>	<b>0.105</b>	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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1370 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-007

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.5</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.

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RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1428 1 Liter  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-009

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 1.0 L Zefon Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>7.68</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>35.7</b>	0.10	
630-08-0	Carbon Monoxide	ND	0.10	
74-82-8	<b>Methane</b>	<b>9.94</b>	0.10	
124-38-9	<b>Carbon Dioxide</b>	<b>46.7</b>	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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1421 1 Liter  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-010

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 1.0 L Zefon Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	<b>Hydrogen</b>	<b>1.29</b>	0.10	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>7.92</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>47.0</b>	0.10	
630-08-0	Carbon Monoxide	ND	0.10	
74-82-8	<b>Methane</b>	<b>8.70</b>	0.10	
124-38-9	<b>Carbon Dioxide</b>	<b>35.0</b>	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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1435 1 Liter  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-011

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 1.0 L Zefon Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	<b>Hydrogen</b>	<b>2.03</b>	0.10	
7782-44-7	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>8.04</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>47.7</b>	0.10	
630-08-0	Carbon Monoxide	ND	0.10	
74-82-8	<b>Methane</b>	<b>10.7</b>	0.10	
124-38-9	<b>Carbon Dioxide</b>	<b>31.4</b>	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.



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P120818-MB

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/18/12  
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.

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P120818-LCS

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/18/12  
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppmV	Result ppmV	% Recovery	CAS Acceptance Limits	Data Qualifier
1333-74-0	Hydrogen	40,000	35,500	89	83-122	
7782-44-7	Oxygen +					
7440-37-1	Argon	50,000	47,400	95	74-132	
7727-37-9	Nitrogen	50,000	48,900	98	76-126	
630-08-0	Carbon Monoxide	50,000	48,000	96	84-113	
74-82-8	Methane	40,000	39,500	99	84-113	
124-38-9	Carbon Dioxide	50,000	47,500	95	87-117	

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1364 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
 CAS Sample ID: P1203396-001

**Test Code:** ASTM D 5504-08  
**Instrument ID:** Agilent 7890A/GC22/SCD  
**Analyst:** Wade Henton  
**Sampling Media:** 10 L Tedlar Bag  
**Test Notes:** H3

**Date Collected:** 8/16/12  
**Time Collected:** NA  
**Date Received:** 8/18/12  
**Date Analyzed:** 8/18/12  
**Time Analyzed:** 11:06  
**Volume(s) Analyzed:** 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	<b>19</b>	13	<b>7.3</b>	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

H3 = Sample was received and analyzed past holding time.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1365 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
 CAS Sample ID: P1203396-002

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes: **H3**

Date Collected: 8/16/12  
 Time Collected: NA  
 Date Received: 8/18/12  
 Date Analyzed: 8/18/12  
 Time Analyzed: 11:23  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

H3 = Sample was received and analyzed past holding time.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1366 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
 CAS Sample ID: P1203396-003

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes: **H3**

Date Collected: 8/16/12  
 Time Collected: NA  
 Date Received: 8/18/12  
 Date Analyzed: 8/18/12  
 Time Analyzed: 11:39  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

H3 = Sample was received and analyzed past holding time.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1367 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-004

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 7890A/GC22/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes: **H3**

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
Time Analyzed: 11:57  
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	<b>33</b>	13	<b>13</b>	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

H3 = Sample was received and analyzed past holding time.

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1368 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
 CAS Sample ID: P1203396-005

**Test Code:** ASTM D 5504-08  
**Instrument ID:** Agilent 7890A/GC22/SCD  
**Analyst:** Wade Henton  
**Sampling Media:** 10 L Tedlar Bag  
**Test Notes:** H3

**Date Collected:** 8/16/12  
**Time Collected:** NA  
**Date Received:** 8/18/12  
**Date Analyzed:** 8/18/12  
**Time Analyzed:** 12:19  
**Volume(s) Analyzed:** 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

H3 = Sample was received and analyzed past holding time.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1369 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-006

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 7890A/GC22/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes: **H3**

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
Time Analyzed: 12:36  
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

H3 = Sample was received and analyzed past holding time.



RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1370 (Tedlar bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
 CAS Sample ID: P1203396-007

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes: **H3**

Date Collected: 8/16/12  
 Time Collected: NA  
 Date Received: 8/18/12  
 Date Analyzed: 8/18/12  
 Time Analyzed: 12:50  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

H3 = Sample was received and analyzed past holding time.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1428 1 Liter  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-009

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 1 L Zefon Bag  
Test Notes: **H3**

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
Time Analyzed: 12:30  
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	70	ND	50	
463-58-1	Carbonyl Sulfide	ND	120	ND	50	
74-93-1	Methyl Mercaptan	490	98	250	50	
75-08-1	Ethyl Mercaptan	460	130	180	50	
75-18-3	Dimethyl Sulfide	240,000	130	93,000	50	
75-15-0	Carbon Disulfide	190	78	62	25	
75-33-2	Isopropyl Mercaptan	210	160	69	50	
75-66-1	tert-Butyl Mercaptan	380	180	100	50	
107-03-9	n-Propyl Mercaptan	ND	160	ND	50	
624-89-5	Ethyl Methyl Sulfide	12,000	160	3,900	50	
110-02-1	Thiophene	11,000	170	3,300	50	
513-44-0	Isobutyl Mercaptan	ND	180	ND	50	
352-93-2	Diethyl Sulfide	ND	180	ND	50	
109-79-5	n-Butyl Mercaptan	2,100	180	560	50	
624-92-0	Dimethyl Disulfide	4,100	96	1,100	25	
616-44-4	3-Methylthiophene	840	200	210	50	
110-01-0	Tetrahydrothiophene	ND	180	ND	50	
638-02-8	2,5-Dimethylthiophene	ND	230	ND	50	
872-55-9	2-Ethylthiophene	ND	230	ND	50	
110-81-6	Diethyl Disulfide	ND	120	ND	25	

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.

H3 = Sample was received and analyzed past holding time.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1421 1 Liter  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-010

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 1 L Zefon Bag  
Test Notes: **H3**

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
Time Analyzed: 11:27, 12:07  
Volume(s) Analyzed: 1.0 ml(s)  
0.010 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	27	7.0	20	5.0	
463-58-1	Carbonyl Sulfide	150	12	61	5.0	
74-93-1	Methyl Mercaptan	4,000	9.8	2,000	5.0	
75-08-1	Ethyl Mercaptan	130	13	50	5.0	
75-18-3	Dimethyl Sulfide	600,000	1,300	240,000	500	<b>D</b>
75-15-0	Carbon Disulfide	180	7.8	59	2.5	
75-33-2	Isopropyl Mercaptan	170	16	54	5.0	
75-66-1	tert-Butyl Mercaptan	29	18	7.8	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	4,000	16	1,300	5.0	
110-02-1	Thiophene	5,000	17	1,400	5.0	
513-44-0	Isobutyl Mercaptan	420	18	110	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	710	18	190	5.0	
624-92-0	Dimethyl Disulfide	20,000	9.6	5,200	2.5	
616-44-4	3-Methylthiophene	330	20	83	5.0	
110-01-0	Tetrahydrothiophene	210	18	58	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

H3 = Sample was received and analyzed past holding time.

D = The reported result is from a dilution.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1435 1 Liter  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
CAS Sample ID: P1203396-011

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 1 L Zefon Bag  
Test Notes: **H3**

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/18/12  
Date Analyzed: 8/18/12  
Time Analyzed: 11:06, 11:47  
Volume(s) Analyzed: 1.0 ml(s)  
0.10 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	150	12	60	5.0	
74-93-1	Methyl Mercaptan	260	9.8	130	5.0	
75-08-1	Ethyl Mercaptan	17	13	6.7	5.0	
75-18-3	Dimethyl Sulfide	570,000	130	220,000	50	<b>D</b>
75-15-0	Carbon Disulfide	2,300	7.8	750	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	5,100	16	1,600	5.0	
110-02-1	Thiophene	19,000	17	5,400	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	1,400	18	370	5.0	
624-92-0	Dimethyl Disulfide	54,000	9.6	14,000	2.5	
616-44-4	3-Methylthiophene	900	20	220	5.0	
110-01-0	Tetrahydrothiophene	380	18	100	5.0	
638-02-8	2,5-Dimethylthiophene	800	23	170	5.0	
872-55-9	2-Ethylthiophene	840	23	180	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

H3 = Sample was received and analyzed past holding time.

D = The reported result is from a dilution.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
 CAS Sample ID: P120818-MB

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/18/12  
 Time Analyzed: 09:18  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
 CAS Sample ID: P120818-MB

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/18/12  
 Time Analyzed: 09:18  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
 CAS Sample ID: P120818-LCS

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/18/12  
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	CAS Acceptance Limits	Data Qualifier
7783-06-4	Hydrogen Sulfide	2,380	<b>1,860</b>	<b>78</b>	51-141	
463-58-1	Carbonyl Sulfide	2,470	<b>1,560</b>	<b>63</b>	63-147	
74-93-1	Methyl Mercaptan	2,360	<b>2,240</b>	<b>95</b>	54-156	

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203396  
 CAS Sample ID: P120818-LCS

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/18/12  
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	CAS Acceptance Limits	Data Qualifier
7783-06-4	Hydrogen Sulfide	2,380	<b>2,040</b>	<b>86</b>	51-141	
463-58-1	Carbonyl Sulfide	2,470	<b>1,740</b>	<b>70</b>	63-147	
74-93-1	Methyl Mercaptan	2,360	<b>2,650</b>	<b>112</b>	54-156	



**COLUMBIA ANALYTICAL SERVICES, INC.**

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**RESULTS OF ANALYSIS**

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1300 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-001

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: #####  
Date Received: #####  
Date Analyzed: #####  
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	21.5	0.10	
7727-37-9	Nitrogen	78.4	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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

**RESULTS OF ANALYSIS**

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1303 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-004

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: #####  
Date Received: #####  
Date Analyzed: #####  
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	21.5	0.10	
7727-37-9	Nitrogen	78.5	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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

**RESULTS OF ANALYSIS**

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1304 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-005

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: #####  
Date Received: #####  
Date Analyzed: #####  
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	21.5	0.10	
7727-37-9	Nitrogen	78.4	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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

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**RESULTS OF ANALYSIS**

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1306 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-007

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: #####  
Date Received: #####  
Date Analyzed: #####  
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	21.5	0.10	
7727-37-9	Nitrogen	78.5	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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1307 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-008

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: #####  
Date Received: #####  
Date Analyzed: #####  
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	21.5	0.10	
7727-37-9	Nitrogen	78.4	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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

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**RESULTS OF ANALYSIS**

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P120817-MB

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/17/12  
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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P120817-LCS

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/17/12  
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppmV	Result ppmV	% Recovery	CAS Acceptance Limits
7782-44-7	Oxygen +				
7440-37-1	Argon	219,000	<b>217,000</b>	<b>99</b>	74-132
7727-37-9	Nitrogen	781,000	<b>800,000</b>	<b>102</b>	76-126

Data  
Qualifier

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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LABORATORY DUPLICATE SUMMARY RESULTS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1307 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P1203374-008DUP

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: #####  
 Date Received: #####  
 Date Analyzed: #####  
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Sample Result	Duplicate	Average	% RPD	RPD Limit
		%, v/v	Sample Result %, v/v			
1333-74-0	Hydrogen	ND	ND	-	-	17
7782-44-7	Oxygen +					
7440-37-1	Argon	21.5	21.5	21.5	0	19
7727-37-9	Nitrogen	78.4	78.4	78.4	0	19
630-08-0	Carbon Monoxide	ND	ND	-	-	18
74-82-8	Methane	ND	ND	-	-	18
124-38-9	Carbon Dioxide	ND	ND	-	-	19

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

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

Data  
Qualifier

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## LABORATORY REPORT

August 31, 2012

John Reiter  
Stantec Consulting Group, Inc.  
12075 Corporate Pkwy, Ste. 200  
Mequon, WI 53092

**RE: Bridgeton Landfill / 182608005 Task 300**

Dear John:

Enclosed are the results of the samples submitted to our laboratory on August 17, 2012. For your reference, these analyses have been assigned our service request number P1203374.

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.caslab.com](http://www.caslab.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

**ALS | Environmental**

Samantha Henningsen  
Project Manager

Client: Stantec Consulting Group, Inc. Service Request No: P1203374  
Project: Bridgeton Landfill / 182608005 Task 300

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 17, 2012 and were stored in accordance with the analytical method requirements. The bag for sample 1305 (Tedlar Bag) (P1203374-006) was received flat and could not be analyzed. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample(s) at the time of sample receipt.

The samples labeled "1301 (Tedlar Bag)", "1302 (Tedlar Bag)", and "1305 (Tedlar Bag)" were received with obvious stress marks on the seams of the Tedlar bags, which rendered them flat and unusable. In addition, the samples labeled "1300 (Tedlar Bag)" and "1304 (Tedlar Bag)" were received with low volume and stress marks on the seams. All of these samples were most likely either overfilled or expanded during flight.

### 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). Laboratory air was analyzed as a second source laboratory control sample containing oxygen and nitrogen. A second source for the other analytes was not performed and no positive results were detected of those other compounds.

### Sulfur Analysis

The samples were also analyzed for twenty sulfur compounds per ASTM D 5504-08 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.

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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 Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of Columbia Analytical Services, Inc. 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.*

DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: Bridgeton Landfill / 182608005 Task 300

Service Request: P1203374

Date Received: 8/17/2012  
 Time Received: 09:45

3C Modified - Fxd Gases Bag	ASTM D5504-08 - Sulfur Bag
-----------------------------	----------------------------

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	3C Modified - Fxd Gases Bag	ASTM D5504-08 - Sulfur Bag
1300 (Tedlar Bag)	P1203374-001	Air	8/16/2012	00:00	X	X
1303 (Tedlar Bag)	P1203374-004	Air	8/16/2012	00:00	X	X
1304 (Tedlar Bag)	P1203374-005	Air	8/16/2012	00:00	X	X
1306 (Tedlar Bag)	P1203374-007	Air	8/16/2012	00:00	X	X
1307 (Tedlar Bag)	P1203374-008	Air	8/16/2012	00:00	X	X

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

Company Name & Address (Reporting Information)  
 Stantec Consulting Services Inc.  
 12075 Corporate Parkway, Suite 201  
 Meridian, Wisc 53092

Project Name  
 Bridgerton Landfill 182608005 Task 300

CAS Contact: \_\_\_\_\_ CAS Project No. 11203374

Project Manager Deborah Gray  
 Phone (262) 643-9154 Fax (262) 241-4999

P.O. # / Billing Information  
 Same as reporting address

Analysis Method  
 Reduced Sulfur Compounds (ASTM D5504)  
 Fixed gases (hydrogen, methane, carbon monoxide) EPA Method 3C

Email Address for Result Reporting  
 john.reiter@stantec.com

Sampler (Print & Sign)  
 John Reiter

Comments  
 e.g. Actual Preservative or specific instructions  
 \* Questions? Call John Reiter at phone listed on cell (262) 930-7307.

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
1300 (Tedlar bag)	(1)	8/16/12	N/A						X
1301 ( )	(2)								X
1302 ( )	(3)								X
1303 ( )	(4)								X
1304 ( )	(5)								X
1305 ( )	(6)								X
1306 ( )	(7)								X
1307 ( )	(8)	8/16/12							X

**Report Tier Levels - please select**  
 Tier I - Results (Default if not specified) \_\_\_\_\_  
 Tier II (Results + QC Summaries) \_\_\_\_\_  
 Tier III (Results + QC & Calibration Summaries) \_\_\_\_\_  
 Tier IV (Data Validation Package) 10% Surcharge \_\_\_\_\_  
 EDD required Yes / No  
 Type: \_\_\_\_\_

Relinquished by: (Signature) [Signature] Date: 8-16-12 Time: 8:00 PM  
 Relinquished by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Received by: (Signature) [Signature] Date: 8/16/12 Time: 8:00 PM  
 Received by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Project Requirements (MRLs, QAPP)  
 Cooler / Blank \_\_\_\_\_ °C  
 Temperature \_\_\_\_\_ °C

**Sample Acceptance Check Form**

Client: Stantec Consulting Group, Inc. Work order: P1203374

Project: Bridgeton Landfill / 182608005 Task 300

Sample(s) received on: 8/17/12 Date opened: 8/17/12 by: MZAMORA

**Note:** This form is used for all samples received by CAS. 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.

- |  | <u>Yes</u>                          | <u>No</u>                           | <u>N/A</u>                          |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 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 CAS</b> ?  | <input type="checkbox"/>            | <input checked="" 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 type="checkbox"/>            | <input checked="" 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 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"/> |
| 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
P1203374-001.01	10 L Tedlar Bag					
P1203374-002.01	10 L Tedlar Bag					
P1203374-003.01	10 L Tedlar Bag					
P1203374-004.01	10 L Tedlar Bag					
P1203374-005.01	10 L Tedlar Bag					
P1203374-006.01	10 L Tedlar Bag					
P1203374-007.01	10 L Tedlar Bag					
P1203374-008.01	10 L Tedlar Bag					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 Chain of Custody is missing time collected \_\_\_\_\_

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1300 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-001

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.4</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.



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1303 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-004

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.5</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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1304 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-005

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.4</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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1306 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-007

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.5</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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1307 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-008

Test Code: EPA Method 3C Modified  
Instrument ID: HP5890 II/GC1/TCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
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	<b>Oxygen +</b>			
7440-37-1	<b>Argon</b>	<b>21.5</b>	0.10	
7727-37-9	<b>Nitrogen</b>	<b>78.4</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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P120817-MB

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/17/12  
 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.

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P120817-LCS

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/17/12  
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppmV	Result ppmV	% Recovery	CAS Acceptance Limits	Data Qualifier
7782-44-7	Oxygen +					
7440-37-1	Argon	219,000	<b>217,000</b>	<b>99</b>	74-132	
7727-37-9	Nitrogen	781,000	<b>800,000</b>	<b>102</b>	76-126	

LABORATORY DUPLICATE SUMMARY RESULTS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1307 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P1203374-008DUP

Test Code: EPA Method 3C Modified  
 Instrument ID: HP5890 II/GC1/TCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: 8/16/12  
 Date Received: 8/17/12  
 Date Analyzed: 8/17/12  
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Sample Result %, v/v	Duplicate Sample Result %, v/v	Average	% RPD	RPD Limit	Data Qualifier
1333-74-0	Hydrogen	ND	ND	-	-	17	
7782-44-7	Oxygen +						
7440-37-1	Argon	21.5	21.5	21.5	0	19	
7727-37-9	Nitrogen	78.4	78.4	78.4	0	19	
630-08-0	Carbon Monoxide	ND	ND	-	-	18	
74-82-8	Methane	ND	ND	-	-	18	
124-38-9	Carbon Dioxide	ND	ND	-	-	19	

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

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1300 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-001

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
Time Analyzed: 16:29  
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1303 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P1203374-004

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: 8/16/12  
 Time Collected: NA  
 Date Received: 8/17/12  
 Date Analyzed: 8/17/12  
 Time Analyzed: 15:22  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1304 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-005

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
Time Analyzed: 15:58  
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1306 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P1203374-007

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: 8/16/12  
 Time Collected: NA  
 Date Received: 8/17/12  
 Date Analyzed: 8/17/12  
 Time Analyzed: 15:39  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1307 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374-008

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
Time Analyzed: 15:38  
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P120817-MB

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/17/12  
 Time Analyzed: 07:55  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P120817-MB

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/17/12  
 Time Analyzed: 07:33  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

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.

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P120817-LCS

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/17/12  
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	CAS Acceptance Limits	Data Qualifier
7783-06-4	Hydrogen Sulfide	2,380	<b>2,440</b>	<b>103</b>	51-141	
463-58-1	Carbonyl Sulfide	2,470	<b>2,080</b>	<b>84</b>	63-147	
74-93-1	Methyl Mercaptan	2,360	<b>2,990</b>	<b>127</b>	54-156	

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P120817-LCS

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/17/12  
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	CAS Acceptance Limits	Data Qualifier
7783-06-4	Hydrogen Sulfide	2,380	<b>2,180</b>	<b>92</b>	51-141	
463-58-1	Carbonyl Sulfide	2,470	<b>1,800</b>	<b>73</b>	63-147	
74-93-1	Methyl Mercaptan	2,360	<b>2,720</b>	<b>115</b>	54-156	





## Quality Control Sample Batch Report

### Analysis Information

**Workorder:** 1224137

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** NA  
**Batch:** NA  
**Prepared By:** NA

**Analysis:** NIOSH 6009  
**Batch:** IHG/2093 (HBN: 92826)  
**Analyzed By:** Kevin Tucker

### Blank

<b>Blank:</b> 293827 <b>Analyzed:</b> 09/04/2012 14:51 <b>Units:</b> ug/sample		
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Analyte	Result	RL
Mercury	ND	0.01

<b>LMB:</b> 293828 <b>Analyzed:</b> 09/04/2012 14:52 <b>Units:</b> ug/sample		
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Analyte	Result	RL
Mercury	ND	0.01

<b>Blank:</b> 293833 <b>Analyzed:</b> 09/04/2012 14:59 <b>Units:</b> ug/sample		
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Analyte	Result	RL
Mercury	ND	0.01

<b>LMB:</b> 293834 <b>Analyzed:</b> 09/04/2012 15:00 <b>Units:</b> ug/sample		
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Analyte	Result	RL
Mercury	ND	0.01

### Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 293829 <b>Analyzed:</b> 09/04/2012 14:53 <b>Units:</b> ug/sample					<b>LCSD:</b> 293830 <b>Analyzed:</b> 09/04/2012 14:54				
--	--	--	--	--	--	--	--	--	--

Analyte	Result	Target	% Recovery	QC Limits	Result	RPD	QC Limits
Mercury	0.533	0.5	107	80.3 128.9	0.531	0.357	0 15

<b>LCS:</b> 293835 <b>Analyzed:</b> 09/04/2012 15:01 <b>Units:</b> ug/sample					<b>LCSD:</b> 293836 <b>Analyzed:</b> 09/04/2012 15:05				
--	--	--	--	--	--	--	--	--	--

Analyte	Result	Target	% Recovery	QC Limits	Result	RPD	QC Limits
Mercury	0.539	0.5	108	80.3 128.9	0.539	0	0 15

### QC Data Approved and Reviewed by

<u>Kevin Tucker</u> <b>Analyst</b>	<u>Christopher R. Hansen</u> <b>Peer Review</b>	<u>9/4/2012</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
- QC results are not adjusted for moisture correction, where applicable



# ANALYTICAL REPORT

Report Date: September 06, 2012

John Reiter  
Stantec Consulting Services, Inc.  
12075 Corporate Pkwy, Ste 200  
Mequon, WI 53092

E-mail: john.reiter@stantec.com

Workorder: **34-1224137**  
Client Project ID: P1203490 082812  
Purchase Order: P1203490  
Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>1312</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137001	Sampling Location: P1203490	Received: 08/28/2012		
Method: NIOSH 6009	Sampling Parameter: Air Volume 60.5 L	Analyzed: 09/04/2012		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00017	<0.000020	0.010

Sample ID: <b>1316</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137002	Sampling Location: P1203490	Received: 08/28/2012		
Method: NIOSH 6009	Sampling Parameter: Air Volume 58.5 L	Analyzed: 09/04/2012		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00017	<0.000021	0.010

Sample ID: <b>1327</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137003	Sampling Location: P1203490	Received: 08/28/2012		
Method: NIOSH 6009	Sampling Parameter: Air Volume 58.2 L	Analyzed: 09/04/2012		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00017	<0.000021	0.010

Sample ID: <b>1334</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137004	Sampling Location: P1203490	Received: 08/28/2012		
Method: NIOSH 6009	Sampling Parameter: Air Volume 57.4 L	Analyzed: 09/04/2012		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00017	<0.000021	0.010

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# ANALYTICAL REPORT

Workorder: **34-1224137**  
 Client Project ID: P1203490 082812  
 Purchase Order: P1203490  
 Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>1341</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137005	Sampling Location: P1203490	Received: 08/28/2012		
<b>Method: NIOSH 6009</b>	<b>Sampling Parameter: Air Volume 23.1 L</b>	<b>Analyzed: 09/04/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00043	<0.000053	0.010

Sample ID: <b>1347</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137006	Sampling Location: P1203490	Received: 08/28/2012		
<b>Method: NIOSH 6009</b>	<b>Sampling Parameter: Air Volume 36.1 L</b>	<b>Analyzed: 09/04/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00028	<0.000034	0.010

Sample ID: <b>1352</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137007	Sampling Location: P1203490	Received: 08/28/2012		
<b>Method: NIOSH 6009</b>	<b>Sampling Parameter: Air Volume 35 L</b>	<b>Analyzed: 09/04/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00029	<0.000035	0.010

Sample ID: <b>1363</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137008	Sampling Location: P1203490	Received: 08/28/2012		
<b>Method: NIOSH 6009</b>	<b>Sampling Parameter: Air Volume 35.1 L</b>	<b>Analyzed: 09/04/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00028	<0.000035	0.010

Sample ID: <b>1377</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137009	Sampling Location: P1203490	Received: 08/28/2012		
<b>Method: NIOSH 6009</b>	<b>Sampling Parameter: Air Volume 41.3 L</b>	<b>Analyzed: 09/04/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00024	<0.000030	0.010



# ANALYTICAL REPORT

Workorder: **34-1224137**  
 Client Project ID: P1203490 082812  
 Purchase Order: P1203490  
 Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>1382</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012
Lab ID: 1224137010	Sampling Location: P1203490	Received: 08/28/2012

Method: NIOSH 6009	Sampling Parameter: Air Volume 40.4 L	Analyzed: 09/04/2012
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Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00025	<0.000030	0.010

Sample ID: <b>1389</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012
Lab ID: 1224137011	Sampling Location: P1203490	Received: 08/28/2012

Method: NIOSH 6009	Sampling Parameter: Air Volume 39 L	Analyzed: 09/04/2012
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Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00026	<0.000031	0.010

Sample ID: <b>1395</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012
Lab ID: 1224137012	Sampling Location: P1203490	Received: 08/28/2012

Method: NIOSH 6009	Sampling Parameter: Air Volume 34.6 L	Analyzed: 09/04/2012
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Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00029	<0.000035	0.010

Sample ID: <b>1404</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012
Lab ID: 1224137013	Sampling Location: P1203490	Received: 08/28/2012

Method: NIOSH 6009	Sampling Parameter: Air Volume 50.2 L	Analyzed: 09/04/2012
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Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00020	<0.000024	0.010

Sample ID: <b>1412</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012
Lab ID: 1224137014	Sampling Location: P1203490	Received: 08/28/2012

Method: NIOSH 6009	Sampling Parameter: Air Volume 51.1 L	Analyzed: 09/04/2012
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Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00020	<0.000024	0.010



# ANALYTICAL REPORT

Workorder: **34-1224137**  
 Client Project ID: P1203490 082812  
 Purchase Order: P1203490  
 Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>1416</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137015	Sampling Location: P1203490	Received: 08/28/2012		
<b>Method: NIOSH 6009</b>	<b>Sampling Parameter: Air Volume 50.3 L</b>	<b>Analyzed: 09/04/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.00020	<0.000024	0.010

Sample ID: <b>1426</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137016	Sampling Location: P1203490	Received: 08/28/2012		
<b>Method: NIOSH 6009</b>	<b>Sampling Parameter: Air Volume 0.8 L</b>	<b>Analyzed: 09/04/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.013	<0.0015	0.010

Sample ID: <b>1434</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137017	Sampling Location: P1203490	Received: 08/28/2012		
<b>Method: NIOSH 6009</b>	<b>Sampling Parameter: Air Volume 0.8 L</b>	<b>Analyzed: 09/04/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.013	<0.0015	0.010

Sample ID: <b>1441</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137018	Sampling Location: P1203490	Received: 08/28/2012		
<b>Method: NIOSH 6009</b>	<b>Sampling Parameter: Air Volume 0.8 L</b>	<b>Analyzed: 09/04/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	<0.013	<0.0015	0.010

Sample ID: <b>1445</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137019	Sampling Location: P1203490	Received: 08/28/2012		
<b>Method: NIOSH 6009</b>	<b>Sampling Parameter: Air Volume Not Provided</b>	<b>Analyzed: 09/04/2012</b>		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	NA	NA	0.010



# ANALYTICAL REPORT

Workorder: **34-1224137**  
 Client Project ID: P1203490 082812  
 Purchase Order: P1203490  
 Project Manager: Paul Pope

## Analytical Results

Sample ID: <b>1446</b>	Media: SKC 226-17-1A, Hopcalite Tube	Collected: 08/21/2012		
Lab ID: 1224137020	Sampling Location: P1203490	Received: 08/28/2012		
Method: NIOSH 6009	Sampling Parameter: Air Volume Not Provided	Analyzed: 09/04/2012		
Analyte	ug/sample	mg/m <sup>3</sup>	ppm	RL (ug/sample)
Mercury	<0.010	NA	NA	0.010

## Report Authorization

Method	Analyst	Peer Review
NIOSH 6009	Kevin Tucker	Christopher R. Hansen

## Laboratory Contact Information

ALS Environmental  
 960 W Levoy Drive  
 Salt Lake City, Utah 84123

Phone: (801) 266-7700  
 Email: [alst.lab@ALSGlobal.com](mailto:alst.lab@ALSGlobal.com)  
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# ANALYTICAL REPORT

Workorder: **34-1224137**  
 Client Project ID: P1203490 082812  
 Purchase Order: P1203490  
 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	ACCLASS (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/bsdwlabservice.htm">http://ndep.nv.gov/bsdwlabservice.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	ACCLASS (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	ACCLASS (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.  
 \*\* 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.

## LABORATORY REPORT

September 10, 2012

John Reiter  
Stantec Consulting Services, Inc.  
12075 Corporate Pkwy, Ste. 200  
Mequon, WI 53092

**RE: 182608005**

Dear John:

Enclosed are the results of the samples submitted to our laboratory on August 18, 2012. For your reference, these analyses have been assigned our service request number P1203426.

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.caslab.com](http://www.caslab.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

**ALS | Environmental**

Samantha Henningsen  
Project Manager



Client: Stantec Consulting Services, Inc.  
Project: 182608005

Service Request No: P1203426

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 18, 2012 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 Relative Percent Difference (RPD) for indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene was outside the control criteria in the Laboratory Control Sample (LCS) and Duplicate Laboratory Control Sample (LCSD) analyzed on August 27, 2012. The data has been flagged accordingly. A laboratory corrective action has been generated.

The upper control criterion was exceeded for benzo(b)fluoranthene in the Laboratory Control Sample (LCS) and Duplicate Laboratory Control Sample (LCSD) analyzed on August 27, 2012. The analyte(s) in question were not detected in the associated field samples. Since the error associated with the elevated recovery equates to a high bias, the sample data has not been significantly affected. The data has been flagged accordingly. No corrective action was required.

The upper surrogate control criterion was exceeded for pyrene-d10 in sample(s) identified as "1421" due to severe matrix interference. The upper surrogate control criterion was exceeded for fluorine-d10 in sample identified as "1426" due to severe matrix interference. The data has been flagged accordingly. No further corrective action was required.

NELAC requirements for compliance with EPA TO-13A state a duplicate sample must be analyzed. However, this is dependent upon the client submitting a secondary sample for extraction and analysis. 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 Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of Columbia Analytical Services, Inc. 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 AALS 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.*

DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: 182608005

Service Request: P1203426

Date Received: 8/18/2012  
 Time Received: 13:54

TO-13A Modified - PAH SIM Hi Vol

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
1418	P1203426-001	Air	8/17/2012	00:00	X
1419	P1203426-002	Air	8/17/2012	00:00	X
1421	P1203426-003	Air	8/17/2012	00:00	X
1084	P1203426-004	Air	8/17/2012	00:00	X
1426	P1203426-005	Air	8/17/2012	00:00	X

P1203422  
P1203426



Stantec

Stantec Consulting Services, Inc.  
12075 Corporate Parkway, Suite 200  
Mequon, Wisconsin 53092

Date: Tuesday, August 21, 2012

Project number: 182608005  
(262) 643-9154  
(262) 241-4901 fax

Please email sample results to:  
John Reiter, CIH  
john.reiter@stantec.com

Laboratory/Sample Transmittal - Analysis Request

To: Columbia Analytical Services  
2655 Park Center Drive, Suite A  
Simi Valley, California 93065  
Attention: Samantha Henningsen

Services requested: Evaluation of the enclosed PUF samples for  
dioxins/furans and PAHs, per Columbia Analytical  
Quote No. 25404

Project No. 182608005

Sample #	Compound/parameter/contaminant	Duration (minutes)	Volume (liters)	Special instructions
1416	Dioxins/furans	1287.6	3.6478E+05	
1417	Dioxins/furans	1485.6	4.4419E+05	
1420	Dioxins/furans	1042.8	3.3109E+05	
1422	Dioxins/furans	204	5.9568E+04	
1423	Dioxins/furans	206	5.5002E+04	
1425	Dioxins/furans	320	8.0320E+04	
1418	PAHs	1482.6	4.4626E+05	
1419	PAHs	1042.8	3.4412E+05	
1421	PAHs	204	4.8348E+04	
1084	PAHs	207	5.3199E+04	
1426	PAHs	316	7.0784E+04	
				NOTE: Samples 1421, 1422, 1423, 1424, 1425, and 1426 became saturated with moisture after relatively short sample durations. Actual sample volumes are likely much shorter than expressed in this table. Please let me know what, if anything, can be done with these samples - perhaps a simple determination of the presence or absence of the requested analytes.

Routine handling

Please contact our office with email results by:  
Wednesday, September 5, 2012

  
signed: John E. Reiter, CIH, Stantec



**Sample Acceptance Check Form**

Client: Stantec Consulting Group, Inc. Work order: P1203426

Project: 182608005

Sample(s) received on: 8/18/12 Date opened: 8/18/12 by: KHORIUCHI

**Note:** This form is used for all samples received by CAS. 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.

- |  | <u>Yes</u>                          | <u>No</u>                           | <u>N/A</u>                          |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were <b>sample containers</b> properly marked with client sample ID?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2 Container(s) <b>supplied by CAS</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 type="checkbox"/>            | <input checked="" 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: 4° C Blank Temperature: ° C | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
|  |                                     |                                     | <b>Wet Ice</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?   | <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"/> |
| 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
P1203426-001.01	PUF/XAD-2/Filter (High Vol)					
P1203426-002.01	PUF/XAD-2/Filter (High Vol)					
P1203426-003.01	PUF/XAD-2/Filter (High Vol)					
P1203426-004.01	PUF/XAD-2/Filter (High Vol)					
P1203426-005.01	PUF/XAD-2/Filter (High Vol)					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 1421, 1422, 1423, 1424, 1425, & 1426 became saturated with moisture. 1421 jar is marked with pump #1067. 1426 jar is marked with pump #1071

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1418  
**Client Project ID:** 182608005

CAS Project ID: P1203426  
CAS Sample ID: P1203426-001

Test Code: EPA TO-13A Modified  
Instrument ID: HP 5890II+/HP5972A/MS15  
Analyst: Madeleine Dangazyan  
Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
Test Notes:

Date Collected: 8/17/12  
Date Received: 8/18/12  
Date Extracted: 8/23/12  
Date Analyzed: 8/27/12  
Final Volume: 1.0 ml  
Volume Sampled: 446260 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	40	<b>0.089</b>	0.011	<b>0.017</b>	0.0021	
208-96-8	Acenaphthylene	< 0.50	ND	0.0011	ND	0.00018	
83-32-9	Acenaphthene	3.4	<b>0.0076</b>	0.0011	<b>0.0012</b>	0.00018	
86-73-7	Fluorene	4.0	<b>0.0089</b>	0.0011	<b>0.0013</b>	0.00016	
85-01-8	Phenanthrene	10	<b>0.023</b>	0.0011	<b>0.0032</b>	0.00015	
120-12-7	Anthracene	< 0.50	ND	0.0011	ND	0.00015	
206-44-0	Fluoranthene	1.8	<b>0.0040</b>	0.0011	<b>0.00049</b>	0.00014	
129-00-0	Pyrene	0.91	<b>0.0020</b>	0.0011	<b>0.00025</b>	0.00014	
56-55-3	Benz(a)anthracene	< 0.50	ND	0.0011	ND	0.00012	
218-01-9	Chrysene	< 0.50	ND	0.0011	ND	0.00012	
205-99-2	Benzo(b)fluoranthene	< 0.50	ND	0.0011	ND	0.00011	<b>L</b>
207-08-9	Benzo(k)fluoranthene	< 0.50	ND	0.0011	ND	0.00011	
50-32-8	Benzo(a)pyrene	< 0.50	ND	0.0011	ND	0.00011	
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	ND	0.0011	ND	0.000099	
53-70-3	Dibenz(a,h)anthracene	< 0.50	ND	0.0011	ND	0.000098	
191-24-2	Benzo(g,h,i)perylene	< 0.50	ND	0.0011	ND	0.000099	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1419  
**Client Project ID:** 182608005

CAS Project ID: P1203426  
CAS Sample ID: P1203426-002

Test Code: EPA TO-13A Modified  
Instrument ID: HP 5890II+/HP5972A/MS15  
Analyst: Madeleine Dangazyan  
Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
Test Notes:

Date Collected: 8/17/12  
Date Received: 8/18/12  
Date Extracted: 8/23/12  
Date Analyzed: 8/27/12  
Final Volume: 1.0 ml  
Volume Sampled: 344120 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	10	<b>0.029</b>	0.015	<b>0.0056</b>	0.0028	
208-96-8	Acenaphthylene	< 0.50	ND	0.0015	ND	0.00023	
83-32-9	Acenaphthene	1.4	<b>0.0040</b>	0.0015	<b>0.00063</b>	0.00023	
86-73-7	Fluorene	1.3	<b>0.0038</b>	0.0015	<b>0.00056</b>	0.00021	
85-01-8	Phenanthrene	3.8	<b>0.011</b>	0.0015	<b>0.0015</b>	0.00020	
120-12-7	Anthracene	< 0.50	ND	0.0015	ND	0.00020	
206-44-0	Fluoranthene	0.71	<b>0.0021</b>	0.0015	<b>0.00025</b>	0.00018	
129-00-0	Pyrene	< 0.50	ND	0.0015	ND	0.00018	
56-55-3	Benzo(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	<b>L</b>
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.



RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1421  
**Client Project ID:** 182608005

CAS Project ID: P1203426  
CAS Sample ID: P1203426-003

Test Code: EPA TO-13A Modified  
Instrument ID: HP 5890II+/HP5972A/MS15  
Analyst: Madeleine Dangazyan  
Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
Test Notes:

Date Collected: 8/17/12  
Date Received: 8/18/12  
Date Extracted: 8/23/12  
Date Analyzed: 8/27 - 8/29/12  
Final Volume: 1.0 ml  
Volume Sampled: 48348 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	380	<b>7.9</b>	1.0	<b>1.5</b>	0.20	<b>D</b>
208-96-8	Acenaphthylene	< 0.50	ND	0.010	ND	0.0017	
83-32-9	Acenaphthene	11	<b>0.23</b>	0.10	<b>0.036</b>	0.016	<b>D</b>
86-73-7	Fluorene	9.9	<b>0.20</b>	0.10	<b>0.030</b>	0.015	<b>D</b>
85-01-8	Phenanthrene	21	<b>0.44</b>	0.10	<b>0.061</b>	0.014	<b>D</b>
120-12-7	Anthracene	1.0	<b>0.022</b>	0.010	<b>0.0030</b>	0.0014	
206-44-0	Fluoranthene	0.94	<b>0.019</b>	0.010	<b>0.0024</b>	0.0013	
129-00-0	Pyrene	1.0	<b>0.021</b>	0.010	<b>0.0025</b>	0.0013	
56-55-3	Benz(a)anthracene	< 0.50	ND	0.010	ND	0.0011	
218-01-9	Chrysene	< 0.50	ND	0.010	ND	0.0011	
205-99-2	Benzo(b)fluoranthene	< 0.50	ND	0.010	ND	0.0010	<b>L</b>
207-08-9	Benzo(k)fluoranthene	< 0.50	ND	0.010	ND	0.0010	
50-32-8	Benzo(a)pyrene	< 0.50	ND	0.010	ND	0.0010	
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	ND	0.010	ND	0.00092	
53-70-3	Dibenz(a,h)anthracene	< 0.50	ND	0.010	ND	0.00091	
191-24-2	Benzo(g,h,i)perylene	< 0.50	ND	0.010	ND	0.00092	

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.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1084  
**Client Project ID:** 182608005

CAS Project ID: P1203426  
CAS Sample ID: P1203426-004

Test Code: EPA TO-13A Modified  
Instrument ID: HP 5890II+/HP5972A/MS15  
Analyst: Madeleine Dangazyan  
Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
Test Notes:

Date Collected: 8/17/12  
Date Received: 8/18/12  
Date Extracted: 8/23/12  
Date Analyzed: 8/27 - 8/29/12  
Final Volume: 1.0 ml  
Volume Sampled: 53199 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	680	<b>13</b>	0.94	<b>2.5</b>	0.18	<b>D, M, E</b>
208-96-8	Acenaphthylene	< 0.50	ND	0.0094	ND	0.0015	
83-32-9	Acenaphthene	12	<b>0.22</b>	0.094	<b>0.035</b>	0.015	<b>D</b>
86-73-7	Fluorene	9.6	<b>0.18</b>	0.094	<b>0.027</b>	0.014	<b>D</b>
85-01-8	Phenanthrene	11	<b>0.21</b>	0.094	<b>0.029</b>	0.013	<b>D</b>
120-12-7	Anthracene	2.2	<b>0.041</b>	0.0094	<b>0.0056</b>	0.0013	
206-44-0	Fluoranthene	1.4	<b>0.026</b>	0.0094	<b>0.0032</b>	0.0011	
129-00-0	Pyrene	0.83	<b>0.016</b>	0.0094	<b>0.0019</b>	0.0011	
56-55-3	Benz(a)anthracene	< 0.50	ND	0.0094	ND	0.0010	
218-01-9	Chrysene	< 0.50	ND	0.0094	ND	0.0010	
205-99-2	Benzo(b)fluoranthene	< 0.50	ND	0.0094	ND	0.00091	<b>L</b>
207-08-9	Benzo(k)fluoranthene	< 0.50	ND	0.0094	ND	0.00091	
50-32-8	Benzo(a)pyrene	< 0.50	ND	0.0094	ND	0.00091	
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	ND	0.0094	ND	0.00083	
53-70-3	Dibenz(a,h)anthracene	< 0.50	ND	0.0094	ND	0.00083	
191-24-2	Benzo(g,h,i)perylene	< 0.50	ND	0.0094	ND	0.00083	

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.

M = Matrix interference; results may be biased high.

E = Estimated; concentration exceeded calibration range.

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1426  
**Client Project ID:** 182608005

**CAS Project ID:** P1203426  
**CAS Sample ID:** P1203426-005

**Test Code:** EPA TO-13A Modified  
**Instrument ID:** HP 5890II+/HP5972A/MS15  
**Analyst:** Madeleine Dangazyan  
**Sampling Media:** PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
**Test Notes:**

**Date Collected:** 8/17/12  
**Date Received:** 8/18/12  
**Date Extracted:** 8/23/12  
**Date Analyzed:** 8/29/12  
**Final Volume:** 3.0 ml  
**Volume Sampled:** 70784 Liter(s)

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	2,500	<b>35</b>	2.1	<b>6.7</b>	0.40	<b>M, E</b>
208-96-8	Acenaphthylene	< 15	ND	0.21	ND	0.034	
83-32-9	Acenaphthene	320	<b>4.5</b>	0.21	<b>0.71</b>	0.034	<b>M, E</b>
86-73-7	Fluorene	240	<b>3.4</b>	0.21	<b>0.50</b>	0.031	
85-01-8	Phenanthrene	15	<b>0.21</b>	0.21	<b>0.029</b>	0.029	<b>J</b>
120-12-7	Anthracene	14	<b>0.19</b>	0.21	<b>0.026</b>	0.029	<b>J</b>
206-44-0	Fluoranthene	< 15	ND	0.21	ND	0.026	
129-00-0	Pyrene	< 15	ND	0.21	ND	0.026	
56-55-3	Benz(a)anthracene	< 15	ND	0.21	ND	0.023	
218-01-9	Chrysene	< 15	ND	0.21	ND	0.023	
205-99-2	Benzo(b)fluoranthene	< 15	ND	0.21	ND	0.021	<b>L</b>
207-08-9	Benzo(k)fluoranthene	< 15	ND	0.21	ND	0.021	
50-32-8	Benzo(a)pyrene	< 15	ND	0.21	ND	0.021	
193-39-5	Indeno(1,2,3-cd)pyrene	< 15	ND	0.21	ND	0.019	
53-70-3	Dibenz(a,h)anthracene	< 15	ND	0.21	ND	0.019	
191-24-2	Benzo(g,h,i)perylene	< 15	ND	0.21	ND	0.019	

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.

M = Matrix interference; results may be biased high.

E = Estimated; concentration exceeded calibration range.

J = The result is an estimated concentration that is less than the MRL.

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** 182608005

CAS Project ID: P1203426  
CAS Sample ID: P120823-MB

Test Code: EPA TO-13A Modified  
Instrument ID: HP 5890II+/HP5972A/MS15  
Analyst: Madeleine Dangazyan  
Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Extracted: 8/23/12  
Date Analyzed: 8/27/12  
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	< 0.50	NA	NA	NA	NA	
208-96-8	Acenaphthylene	< 0.50	NA	NA	NA	NA	
83-32-9	Acenaphthene	< 0.50	NA	NA	NA	NA	
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	Benzo(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	<b>L</b>
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.

NA = Not applicable.

L = Laboratory control sample recovery outside the specified limits.

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Project ID:** 182608005

CAS Project ID: P1203426

Test Code: EPA TO-13A Modified  
 Instrument ID: HP 5890II+/HP5972A/MS15  
 Analyst: Madeleine Dangazyan  
 Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge(s)  
 Test Notes:

Date(s) Collected: 8/17/12  
 Date(s) Received: 8/18/12  
 Date(s) Extracted: 8/23/12  
 Date(s) Analyzed: 8/27 - 8/29/12

Client Sample ID	CAS Sample ID	Fluorene-d10		Pyrene-d10		Data Qualifier
		% Recovered	Acceptance Limits	% Recovered	Acceptance Limits	
Method Blank	P120823-MB	90	60-120	89	60-120	
Lab Control Sample	P120823-LCS	81	60-120	88	60-120	
Duplicate Lab Control Sample	P120823-DLCS	86	60-120	90	60-120	
1418	P1203426-001	67	60-120	85	60-120	
1419	P1203426-002	72	60-120	86	60-120	
1421 (Dilution)	P1203426-003	100	60-120	152	60-120	S
1084 (Dilution)	P1203426-004	100	60-120	90	60-120	
1426 (Dilution)	P1203426-005	228	60-120	114	60-120	S

S = Surrogate recovery not within specified limits.

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:** 182608005

CAS Project ID: P1203426  
CAS Sample ID: P120823-DLCS

Test Code: EPA TO-13A Modified  
Instrument ID: HP 5890II+/HP5972A/MS15  
Analyst: Madeleine Dangazyan  
Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Extracted: 8/23/12  
Date Analyzed: 8/27/12  
Volume(s) Analyzed: NA Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		CAS	RPD	RPD	Data
		LCS / DLCS µg/ml	LCS µg/ml	DLCS µg/ml	LCS	DLCS	Acceptance Limits	Limit	Limit	Qualifier	
91-20-3	Naphthalene	5.00	3.55	3.68	71	74	60-120	4	20		
208-96-8	Acenaphthylene	5.00	3.56	3.65	71	73	60-120	3	23		
83-32-9	Acenaphthene	5.00	3.96	4.22	79	84	60-120	6	30		
86-73-7	Fluorene	5.00	4.03	4.26	81	85	60-120	5	21		
85-01-8	Phenanthrene	5.00	4.46	4.37	89	87	60-120	2	18		
120-12-7	Anthracene	5.00	3.95	4.05	79	81	60-120	3	17		
206-44-0	Fluoranthene	5.00	4.51	4.50	90	90	60-120	0	13		
129-00-0	Pyrene	5.00	4.44	4.40	89	88	60-120	1	13		
56-55-3	Benz(a)anthracene	5.00	4.44	4.34	89	87	60-120	2	9		
218-01-9	Chrysene	5.00	4.65	4.65	93	93	60-120	0	10		
205-99-2	Benzo(b)fluoranthene	5.00	6.27	6.47	125	129	60-120	3	24	L	
207-08-9	Benzo(k)fluoranthene	5.00	5.53	5.15	111	103	60-120	7	18		
50-32-8	Benzo(a)pyrene	5.00	4.39	4.32	88	86	60-120	2	12		
193-39-5	Indeno(1,2,3-cd)pyrene	5.00	5.56	3.61	111	72	60-120	43	28	R	
53-70-3	Dibenz(a,h)anthracene	5.00	5.26	3.39	105	68	60-120	43	17	R	
191-24-2	Benzo(g,h,i)perylene	5.00	5.31	3.41	106	68	60-120	44	16	R	

L = Laboratory control sample recovery outside the specified limits.  
R = Duplicate precision not met.

**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 1 of 1

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

**Client Sample ID:** 1418

**Client Project ID:** 182608005

CAS Project ID: P1203426

CAS Sample ID: P1203426-001

Test Code: EPA TO-13A Modified  
 Instrument ID: HP 5890II+/HP5972A/MS15  
 Analyst: Madeleine Dangazyan  
 Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
 Test Notes:

Date Collected: #####  
 Date Received: #####  
 Date Extracted: #####  
 Date Analyzed: #####  
 Final Volume: 1.0 ml  
 Volume Sampled: 446260 Liter

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
91-20-3	Naphthalene	40	<b>0.089</b>	0.011	<b>0.017</b>	0.0021
208-96-8	Acenaphthylene	< 0.50	ND	0.0011	ND	0.00018
83-32-9	Acenaphthene	3.4	<b>0.0076</b>	0.0011	<b>0.0012</b>	0.00018
86-73-7	Fluorene	4.0	<b>0.0089</b>	0.0011	<b>0.0013</b>	0.00016
85-01-8	Phenanthrene	10	<b>0.023</b>	0.0011	<b>0.0032</b>	0.00015
120-12-7	Anthracene	< 0.50	ND	0.0011	ND	0.00015
206-44-0	Fluoranthene	1.8	<b>0.0040</b>	0.0011	<b>0.00049</b>	0.00014
129-00-0	Pyrene	0.91	<b>0.0020</b>	0.0011	<b>0.00025</b>	0.00014
56-55-3	Benz(a)anthracene	< 0.50	ND	0.0011	ND	0.00012
218-01-9	Chrysene	< 0.50	ND	0.0011	ND	0.00012
205-99-2	Benzo(b)fluoranthene	< 0.50	ND	0.0011	ND	0.00011
207-08-9	Benzo(k)fluoranthene	< 0.50	ND	0.0011	ND	0.00011
50-32-8	Benzo(a)pyrene	< 0.50	ND	0.0011	ND	0.00011
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	ND	0.0011	ND	0.000099
53-70-3	Dibenz(a,h)anthracene	< 0.50	ND	0.0011	ND	0.000098
191-24-2	Benzo(g,h,i)perylene	< 0.50	ND	0.0011	ND	0.000099

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

L = Laboratory control sample recovery outside the specified limits.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1419  
**Client Project ID:** 182608005

CAS Project ID: P1203426  
CAS Sample ID: P1203426-002

Test Code: EPA TO-13A Modified  
Instrument ID: HP 5890II+/HP5972A/MS15  
Analyst: Madeleine Dangazyan  
Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
Test Notes:

Date Collected: #####  
Date Received: #####  
Date Extracted: #####  
Date Analyzed: #####  
Final Volume: 1.0 ml  
Volume Sampled: 344120 Liter

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
91-20-3	Naphthalene	10	<b>0.029</b>	0.015	<b>0.0056</b>	0.0028
208-96-8	Acenaphthylene	< 0.50	ND	0.0015	ND	0.00023
83-32-9	Acenaphthene	1.4	<b>0.0040</b>	0.0015	<b>0.00063</b>	0.00023
86-73-7	Fluorene	1.3	<b>0.0038</b>	0.0015	<b>0.00056</b>	0.00021
85-01-8	Phenanthrene	3.8	<b>0.011</b>	0.0015	<b>0.0015</b>	0.00020
120-12-7	Anthracene	< 0.50	ND	0.0015	ND	0.00020
206-44-0	Fluoranthene	0.71	<b>0.0021</b>	0.0015	<b>0.00025</b>	0.00018
129-00-0	Pyrene	< 0.50	ND	0.0015	ND	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

L = Laboratory control sample recovery outside the specified limits.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

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

**Client Sample ID:** 1421

**Client Project ID:** 182608005

CAS Project ID: P1203426

CAS Sample ID: P1203426-003

Test Code: EPA TO-13A Modified  
 Instrument ID: HP 5890II+/HP5972A/MS15  
 Analyst: Madeleine Dangazyan  
 Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
 Test Notes:

Date Collected: #####  
 Date Received: #####  
 Date Extracted: #####  
 Date Analyzed: 8/27 - 8/29/12  
 Final Volume: 1.0 ml  
 Volume Sampled: 48348 Liter

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	Dilution Factor:
						MRL ppbV
91-20-3	Naphthalene	380	<b>7.9</b>	1.0	<b>1.5</b>	
208-96-8	Acenaphthylene	< 0.50	ND	0.010	ND	0.0017
83-32-9	Acenaphthene	11	<b>0.23</b>	0.10	<b>0.036</b>	0.016
86-73-7	Fluorene	9.9	<b>0.20</b>	0.10	<b>0.030</b>	0.015
85-01-8	Phenanthrene	21	<b>0.44</b>	0.10	<b>0.061</b>	0.014
120-12-7	Anthracene	1.0	<b>0.022</b>	0.010	<b>0.0030</b>	0.0014
206-44-0	Fluoranthene	0.94	<b>0.019</b>	0.010	<b>0.0024</b>	0.0013
129-00-0	Pyrene	1.0	<b>0.021</b>	0.010	<b>0.0025</b>	0.0013
56-55-3	Benz(a)anthracene	< 0.50	ND	0.010	ND	0.0011
218-01-9	Chrysene	< 0.50	ND	0.010	ND	0.0011
205-99-2	Benzo(b)fluoranthene	< 0.50	ND	0.010	ND	0.0010
207-08-9	Benzo(k)fluoranthene	< 0.50	ND	0.010	ND	0.0010
50-32-8	Benzo(a)pyrene	< 0.50	ND	0.010	ND	0.0010
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	ND	0.010	ND	0.00092
53-70-3	Dibenz(a,h)anthracene	< 0.50	ND	0.010	ND	0.00091
191-24-2	Benzo(g,h,i)perylene	< 0.50	ND	0.010	ND	0.00092

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

L = Laboratory control sample recovery outside the specified limits.

D = The reported result is from a dilution.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

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

**Client Sample ID:** 1084

**Client Project ID:** 182608005

CAS Project ID: P1203426

CAS Sample ID: P1203426-004

Test Code: EPA TO-13A Modified  
 Instrument ID: HP 5890II+/HP5972A/MS15  
 Analyst: Madeleine Dangazyan  
 Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
 Test Notes:

Date Collected: #####  
 Date Received: #####  
 Date Extracted: #####  
 Date Analyzed: 8/27 - 8/29/12  
 Final Volume: 1.0 ml  
 Volume Sampled: 53199 Liter

CAS #	Compound	Result		MRL	Result	
		µg/Cartridge	µg/m <sup>3</sup>		µg/m <sup>3</sup>	ppbV
91-20-3	Naphthalene	680	<b>13</b>	0.94	<b>2.5</b>	0.18
208-96-8	Acenaphthylene	< 0.50	ND	0.0094	ND	0.0015
83-32-9	Acenaphthene	12	<b>0.22</b>	0.094	<b>0.035</b>	0.015
86-73-7	Fluorene	9.6	<b>0.18</b>	0.094	<b>0.027</b>	0.014
85-01-8	Phenanthrene	11	<b>0.21</b>	0.094	<b>0.029</b>	0.013
120-12-7	Anthracene	2.2	<b>0.041</b>	0.0094	<b>0.0056</b>	0.0013
206-44-0	Fluoranthene	1.4	<b>0.026</b>	0.0094	<b>0.0032</b>	0.0011
129-00-0	Pyrene	0.83	<b>0.016</b>	0.0094	<b>0.0019</b>	0.0011
56-55-3	Benz(a)anthracene	< 0.50	ND	0.0094	ND	0.0010
218-01-9	Chrysene	< 0.50	ND	0.0094	ND	0.0010
205-99-2	Benzo(b)fluoranthene	< 0.50	ND	0.0094	ND	0.00091
207-08-9	Benzo(k)fluoranthene	< 0.50	ND	0.0094	ND	0.00091
50-32-8	Benzo(a)pyrene	< 0.50	ND	0.0094	ND	0.00091
193-39-5	Indeno(1,2,3-cd)pyrene	< 0.50	ND	0.0094	ND	0.00083
53-70-3	Dibenz(a,h)anthracene	< 0.50	ND	0.0094	ND	0.00083
191-24-2	Benzo(g,h,i)perylene	< 0.50	ND	0.0094	ND	0.00083

Dilution Factor:  
 Dilution Factor:

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

L = Laboratory control sample recovery outside the specified limits.

D = The reported result is from a dilution.

M = Matrix interference; results may be biased high.

E = Estimated; concentration exceeded calibration range.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

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

**Client Sample ID:** 1426

**Client Project ID:** 182608005

CAS Project ID: P1203426

CAS Sample ID: P1203426-005

Test Code: EPA TO-13A Modified  
 Instrument ID: HP 5890II+/HP5972A/MS15  
 Analyst: Madeleine Dangazyan  
 Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
 Test Notes:

Date Collected: #####  
 Date Received: #####  
 Date Extracted: #####  
 Date Analyzed: #####  
 Final Volume: 3.0 ml  
 Volume Sampled: 70784 Liter

Dilution Factor:

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
91-20-3	Naphthalene	2,500	<b>35</b>	2.1	<b>6.7</b>	0.40
208-96-8	Acenaphthylene	< 15	ND	0.21	ND	0.034
83-32-9	Acenaphthene	320	<b>4.5</b>	0.21	<b>0.71</b>	0.034
86-73-7	Fluorene	240	<b>3.4</b>	0.21	<b>0.50</b>	0.031
85-01-8	Phenanthrene	15	<b>0.21</b>	0.21	<b>0.029</b>	0.029
120-12-7	Anthracene	14	<b>0.19</b>	0.21	<b>0.026</b>	0.029
206-44-0	Fluoranthene	< 15	ND	0.21	ND	0.026
129-00-0	Pyrene	< 15	ND	0.21	ND	0.026
56-55-3	Benz(a)anthracene	< 15	ND	0.21	ND	0.023
218-01-9	Chrysene	< 15	ND	0.21	ND	0.023
205-99-2	Benzo(b)fluoranthene	< 15	ND	0.21	ND	0.021
207-08-9	Benzo(k)fluoranthene	< 15	ND	0.21	ND	0.021
50-32-8	Benzo(a)pyrene	< 15	ND	0.21	ND	0.021
193-39-5	Indeno(1,2,3-cd)pyrene	< 15	ND	0.21	ND	0.019
53-70-3	Dibenz(a,h)anthracene	< 15	ND	0.21	ND	0.019
191-24-2	Benzo(g,h,i)perylene	< 15	ND	0.21	ND	0.019

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

L = Laboratory control sample recovery outside the specified limits.

D = The reported result is from a dilution.

M = Matrix interference; results may be biased high.

E = Estimated; concentration exceeded calibration range.

J = The result is an estimated concentration that is less than the MRL.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** 182608005

CAS Project ID: P1203426  
CAS Sample ID: P120823-MB

Test Code: EPA TO-13A Modified  
Instrument ID: HP 5890II+/HP5972A/MS15  
Analyst: Madeleine Dangazyan  
Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Extracted: 8/23/12  
Date Analyzed: 8/27/12  
Final Volume: 1.0 ml  
Volume Sampled: NA Liter

CAS #	Compound	Result µg/Cartridge	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
91-20-3	Naphthalene	< 5.0	NA	NA	NA	NA
208-96-8	Acenaphthylene	< 0.50	NA	NA	NA	NA
83-32-9	Acenaphthene	< 0.50	NA	NA	NA	NA
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  
NA = Not applicable.

L = Laboratory control sample recovery outside the specified limits.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

**SURROGATE SPIKE RECOVERY RESULTS**

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Project ID:** 182608005

CAS Project ID: P1203426

Test Code: EPA TO-13A Modified  
 Instrument ID: HP 5890II+/HP5972A/MS15  
 Analyst: Madeleine Dangazyan  
 Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge(s)  
 Test Notes:

Date(s) Collected: 8/17/12  
 Date(s) Received: 8/18/12  
 Date(s) Extracted: 8/23/12  
 Date(s) Analyzed: 8/27 - 8/29/12

Client Sample ID	CAS Sample ID	Fluorene-d10		Pyrene-d10	
		% Recovered	Acceptance Limits	% Recovered	Acceptance Limits
Method Blank	P120823-MB	<b>90</b>	60-120	<b>89</b>	60-120
Lab Control Sample	P120823-LCS	<b>81</b>	60-120	<b>88</b>	60-120
Duplicate Lab Control Sample	P120823-DLCS	<b>86</b>	60-120	<b>90</b>	60-120
1418	P1203426-001	<b>67</b>	60-120	<b>85</b>	60-120
1419	P1203426-002	<b>72</b>	60-120	<b>86</b>	60-120
1421 (Dilution)	P1203426-003	<b>100</b>	60-120	<b>152</b>	60-120
1084 (Dilution)	P1203426-004	<b>100</b>	60-120	<b>90</b>	60-120
1426 (Dilution)	P1203426-005	<b>228</b>	60-120	<b>114</b>	60-120

S = Surrogate recovery not within specified limits.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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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:** 182608005

CAS Project ID: P1203426  
CAS Sample ID: P120823-DL

Test Code: EPA TO-13A Modified  
Instrument ID: HP 5890II+/HP5972A/MS15  
Analyst: Madeleine Dangazyan  
Sampling Media: PUF/XAD-2/Filter (Hi\_Vol) Cartridge  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Extracted: 8/23/12  
Date Analyzed: 8/27/12  
Volume(s) Analyzed: NA Liter(s)

CAS #	Compound	Spike Amount		Result		% Recovery		CAS	RPD	RPD
		LCS / DLCS		LCS	DLCS	LCS	DLCS	Acceptance		
		µg/ml	µg/ml	µg/ml	µg/ml	Limits	Limit			
91-20-3	Naphthalene	5.00	3.55	3.68	<b>71</b>	<b>74</b>	60-120	4	20	
208-96-8	Acenaphthylene	5.00	3.56	3.65	<b>71</b>	<b>73</b>	60-120	3	23	
83-32-9	Acenaphthene	5.00	3.96	4.22	<b>79</b>	<b>84</b>	60-120	6	30	
86-73-7	Fluorene	5.00	4.03	4.26	<b>81</b>	<b>85</b>	60-120	5	21	
85-01-8	Phenanthrene	5.00	4.46	4.37	<b>89</b>	<b>87</b>	60-120	2	18	
120-12-7	Anthracene	5.00	3.95	4.05	<b>79</b>	<b>81</b>	60-120	3	17	
206-44-0	Fluoranthene	5.00	4.51	4.50	<b>90</b>	<b>90</b>	60-120	0	13	
129-00-0	Pyrene	5.00	4.44	4.40	<b>89</b>	<b>88</b>	60-120	1	13	
56-55-3	Benz(a)anthracene	5.00	4.44	4.34	<b>89</b>	<b>87</b>	60-120	2	9	
218-01-9	Chrysene	5.00	4.65	4.65	<b>93</b>	<b>93</b>	60-120	0	10	
205-99-2	Benzo(b)fluoranthene	5.00	6.27	6.47	<b>125</b>	<b>129</b>	60-120	3	24	
207-08-9	Benzo(k)fluoranthene	5.00	5.53	5.15	<b>111</b>	<b>103</b>	60-120	7	18	
50-32-8	Benzo(a)pyrene	5.00	4.39	4.32	<b>88</b>	<b>86</b>	60-120	2	12	
193-39-5	Indeno(1,2,3-cd)pyrene	5.00	5.56	3.61	<b>111</b>	<b>72</b>	60-120	43	28	
53-70-3	Dibenz(a,h)anthracene	5.00	5.26	3.39	<b>105</b>	<b>68</b>	60-120	43	17	
191-24-2	Benzo(g,h,i)perylene	5.00	5.31	3.41	<b>106</b>	<b>68</b>	60-120	44	16	

L = Laboratory control sample recovery outside the specified limits.

R = Duplicate precision not met.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1300 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
Time Analyzed: 16:29  
Volume(s) Analyzed: 1.0

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0
110-02-1	Thiophene	ND	17	ND	5.0
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0
352-93-2	Diethyl Sulfide	ND	18	ND	5.0
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5
616-44-4	3-Methylthiophene	ND	20	ND	5.0
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0
872-55-9	2-Ethylthiophene	ND	23	ND	5.0
110-81-6	Diethyl Disulfide	ND	12	ND	2.5

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 n

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1303 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
Time Analyzed: 15:22  
Volume(s) Analyzed: 1.0

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0
110-02-1	Thiophene	ND	17	ND	5.0
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0
352-93-2	Diethyl Sulfide	ND	18	ND	5.0
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5
616-44-4	3-Methylthiophene	ND	20	ND	5.0
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0
872-55-9	2-Ethylthiophene	ND	23	ND	5.0
110-81-6	Diethyl Disulfide	ND	12	ND	2.5

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 n

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1304 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
Time Analyzed: 15:58  
Volume(s) Analyzed: 1.0

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0
110-02-1	Thiophene	ND	17	ND	5.0
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0
352-93-2	Diethyl Sulfide	ND	18	ND	5.0
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5
616-44-4	3-Methylthiophene	ND	20	ND	5.0
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0
872-55-9	2-Ethylthiophene	ND	23	ND	5.0
110-81-6	Diethyl Disulfide	ND	12	ND	2.5

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 n

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1306 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 7890A/GC22/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
Time Analyzed: 15:39  
Volume(s) Analyzed: 1.0

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0
110-02-1	Thiophene	ND	17	ND	5.0
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0
352-93-2	Diethyl Sulfide	ND	18	ND	5.0
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5
616-44-4	3-Methylthiophene	ND	20	ND	5.0
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0
872-55-9	2-Ethylthiophene	ND	23	ND	5.0
110-81-6	Diethyl Disulfide	ND	12	ND	2.5

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 n

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** 1307 (Tedlar Bag)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P1203374

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: 8/16/12  
Time Collected: NA  
Date Received: 8/17/12  
Date Analyzed: 8/17/12  
Time Analyzed: 15:38  
Volume(s) Analyzed: 1.0

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0
110-02-1	Thiophene	ND	17	ND	5.0
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0
352-93-2	Diethyl Sulfide	ND	18	ND	5.0
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5
616-44-4	3-Methylthiophene	ND	20	ND	5.0
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0
872-55-9	2-Ethylthiophene	ND	23	ND	5.0
110-81-6	Diethyl Disulfide	ND	12	ND	2.5

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 n

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
 CAS Sample ID: P120817-1

Test Code: ASTM D 5504-08  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Wade Henton  
 Sampling Media: 10 L Tedlar Bag  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/17/12  
 Time Analyzed: 07:55  
 Volume(s) Analyzed: 1.0

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0
110-02-1	Thiophene	ND	17	ND	5.0
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0
352-93-2	Diethyl Sulfide	ND	18	ND	5.0
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5
616-44-4	3-Methylthiophene	ND	20	ND	5.0
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0
872-55-9	2-Ethylthiophene	ND	23	ND	5.0
110-81-6	Diethyl Disulfide	ND	12	ND	2.5

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 n

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

√B

ml(s)

Data  
Qualifier

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

nethod.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P120817-1

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 7890A/GC22/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: NA  
Time Collected: NA  
Date Received: NA  
Date Analyzed: 8/17/12  
Time Analyzed: 07:33  
Volume(s) Analyzed: 1.0

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0
110-02-1	Thiophene	ND	17	ND	5.0
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0
352-93-2	Diethyl Sulfide	ND	18	ND	5.0
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5
616-44-4	3-Methylthiophene	ND	20	ND	5.0
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0
872-55-9	2-Ethylthiophene	ND	23	ND	5.0
110-81-6	Diethyl Disulfide	ND	12	ND	2.5

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 n

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

√B

ml(s)

Data  
Qualifier

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

nethod.

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P120817-LCS

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 6890A/GC13/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/17/12  
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount	Result	% Recovery	CAS	Data
		ppbV	ppbV		Acceptance	
7783-06-4	Hydrogen Sulfide	2,380	<b>2,440</b>	<b>103</b>	51-141	
463-58-1	Carbonyl Sulfide	2,470	<b>2,080</b>	<b>84</b>	63-147	
74-93-1	Methyl Mercaptan	2,360	<b>2,990</b>	<b>127</b>	54-156	

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** Stantec Consulting Group, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203374  
CAS Sample ID: P120817-LCS

Test Code: ASTM D 5504-08  
Instrument ID: Agilent 7890A/GC22/SCD  
Analyst: Wade Henton  
Sampling Media: 10 L Tedlar Bag  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/17/12  
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	CAS	Data
					Acceptance Limits	Qualifier
7783-06-4	Hydrogen Sulfide	2,380	<b>2,180</b>	<b>92</b>	51-141	
463-58-1	Carbonyl Sulfide	2,470	<b>1,800</b>	<b>73</b>	63-147	
74-93-1	Methyl Mercaptan	2,360	<b>2,720</b>	<b>115</b>	54-156	

## LABORATORY REPORT

September 6, 2012

John Reiter  
Stantec Consulting Services, Inc.  
12075 Corporate Pkwy, Ste. 200  
Mequon, WI 53092

**RE: Bridgeton Landfill / 182608005 Task 300**

Dear John:

Enclosed are the results of the samples submitted to our laboratory on August 24, 2012. For your reference, these analyses have been assigned our service request number P1203506.

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.caslab.com](http://www.caslab.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

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

Respectfully submitted,

**ALS | Environmental**

Samantha Henningsen  
Project Manager

Client: Stantec Consulting Services, Inc. Service Request No: P1203506  
Project: Bridgeton Landfill / 182608005 Task 300

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### CASE NARRATIVE

The samples were received intact under chain of custody on August 24, 2012 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.

#### 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. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator.

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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 Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of Columbia Analytical Services, Inc. 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 AALS 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.*



DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.  
 Project ID: Bridgeton Landfill / 182608005 Task 300

Service Request: P1203506

Date Received: 8/24/2012  
 Time Received: 09:10

TO-15 Modified - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
1 Amphitheater, Grab	P1203506-001	Air	8/21/2012	00:00	1SC00027	-0.79	5.07	X
2 Level 2, Grab	P1203506-002	Air	8/21/2012	00:00	1SC00355	-0.97	5.18	X
3 East Side, Grab	P1203506-003	Air	8/21/2012	00:00	1SC00562	-0.87	5.38	X
4 Field Blank	P1203506-004	Air	8/21/2012	00:00	1SC00919	-14.51	5.37	X
A Pond Center	P1203506-005	Air	8/21/2012	00:00	SC00121	-0.98	3.56	X
B Pond East	P1203506-006	Air	8/21/2012	00:00	SC01025	-1.43	3.60	X
C Pond West	P1203506-007	Air	8/21/2012	00:00	SC00862	-1.36	3.65	X
D Summit	P1203506-008	Air	8/21/2012	00:00	SC00104	-0.99	3.67	X
E Amphitheater	P1203506-009	Air	8/21/2012	00:00	SC00884	-2.55	3.62	X
F Grassy Knoll Center	P1203506-010	Air	8/21/2012	00:00	SC00790	-3.07	3.64	X
G Grassy Knoll West	P1203506-011	Air	8/21/2012	00:00	SC00925	-2.68	3.72	X
H Grassy Knoll North	P1203506-012	Air	8/21/2012	00:00	SC00078	-2.65	3.70	X
I East Fenceline #1	P1203506-013	Air	8/21/2012	00:00	SC00091	-1.85	3.69	X
J East Fenceline #2	P1203506-014	Air	8/21/2012	00:00	SC00905	-2.55	3.59	X
K South Fenceline	P1203506-015	Air	8/21/2012	00:00	SC00689	-3.59	3.55	X
K South Fenceline (i)	P1203506-016	Air	8/21/2012	00:00	SC01647	-8.17	3.78	X
L Summitt Valley	P1203506-017	Air	8/21/2012	00:00	SC01066	-3.07	3.66	X
M Grassy Knoll Center (2)	P1203506-018	Air	8/21/2012	00:00	SC01626	-1.60	3.56	X
N Grassy Knoll West (2)	P1203506-019	Air	8/21/2012	00:00	SC00889	-2.50	3.64	X
O Grassy Knoll North (2)	P1203506-020	Air	8/21/2012	00:00	SC01649	-2.07	3.52	X
Field Blank 1	P1203506-021	Air	8/21/2012	00:00	SC00994	-14.60	3.75	X
Field Blank 2	P1203506-022	Air	8/21/2012	00:00	SC00098	-14.55	3.52	X

P120 3506



**Stantec Consulting Services, Inc.**  
 12075 Corporate Parkway, Suite 200  
 Mequon, Wisconsin 53092

Date: Tuesday, August 21, 2012

Project number: 182608005  
 (262) 643-9154  
 (262) 241-4901 fax

Please email sample results to:  
**John Reiter, CIH**  
 john.reiter@stantec.com

**Laboratory/Sample Transmittal - Analysis Request**

**To:** Columbia Analytical Services  
 2655 Park Center Drive, Suite A  
 Simi Valley, California 93065  
 Attention: Samantha Henningsen

**Services requested:** Evaluation of the previously shipped SUMMA canisters for VOCs by EPA TO-15, per Columbia Quote No. 25404

Project No. 182608005

Sample #	Compound/parameter/contaminant	Duration (minutes)	Volume (liters)	Special instructions	
1	VOCs and TICs, by EPA TO-15	10 sec	(1 L)	1SC00027, under FML, amphitheater, grab	-0.71
2	VOCs and TICs, by EPA TO-15	10 sec	(1 L)	1SC00355, under FML, level 2, grab	-0.52
3	VOCs and TICs, by EPA TO-15	10 sec	(1 L)	1SC00562, under FML, east side, grab	-0.61
4	VOCs and TICs, by EPA TO-15	—	—	1SC00919 (field blank)	-14.16
A	VOCs and TICs, by EPA TO-15	244	(6 L)	Pond Center, downwind	-0.75
B	VOCs and TICs, by EPA TO-15	145	(6 L)	Pond East, downwind	-1.22
C	VOCs and TICs, by EPA TO-15	290	(6 L)	Pond West, downwind	-1.11
D	VOCs and TICs, by EPA TO-15	290	(6 L)	Summit, ambient	-0.83
E	VOCs and TICs, by EPA TO-15	120	(6 L)	Amphitheater, ambient	-2.35
F	VOCs and TICs, by EPA TO-15	181	(6 L)	Grassy Knoll center, ambient	-2.87
G	VOCs and TICs, by EPA TO-15	181	(6 L)	Grassy Knoll West, ambient	-2.54
H	VOCs and TICs, by EPA TO-15	179	(6 L)	Grassy Knoll North, ambient	-2.48
I	VOCs and TICs, by EPA TO-15	213	(6 L)	East Fenceline #1, ambient, near receptors	-1.66
J	VOCs and TICs, by EPA TO-15	207	(6 L)	East Fenceline #2, ambient, N of Fenceline #1	-2.11
K	VOCs and TICs, by EPA TO-15	167	(6 L)	South Fenceline, ambient, near receptors	-3.26 -7.62
L	VOCs and TICs, by EPA TO-15	174	(6 L)	Summit Valley, ambient	-2.81
M	VOCs and TICs, by EPA TO-15	257	(6 L)	Grassy Knoll Center (2), ambient	-1.34
N	VOCs and TICs, by EPA TO-15	258	(6 L)	Grassy Knoll West (2), ambient	-2.25
O	VOCs and TICs, by EPA TO-15	253	(6 L)	Grassy Knoll North (2), ambient	-1.83
	VOCs and TICs, by EPA TO-15	—	—	Field blank	-14.22
	VOCs and TICs, by EPA TO-15	—	—	Field blank	-14.16
					-13.59
					-8.82

Routine handling

Please contact our office with email results by:  
 Wednesday, September 5, 2012

*John E. Reiter*  
 signed: John E. Reiter, CIH, Stantec

*Walter Stults*

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

CAS Project No. **91203506**

Company Name & Address (Reporting Information)  
**STANTEC CONSULTING SERVICES, INC**  
**12075 CORPORATE PARKWAY SUITE 201**  
**MEQUON, WI 53092**

Project Name  
**REDBETON LANDFILL TASK 300**  
 Project Number  
**182608005**

CAS Contract:  
 Analysis Method

Comments  
 e.g. Actual Preservative or specific instructions

Project Manager  
**DEBORAH GRAY**  
 Phone  
**262-643-8154** Fax  
**262-241-4901**

P.O. # / Billing Information  
**SAME AS REPORTING ADDRESS**

Email Address for Result Reporting  
**JOHN.REITER@STANTEC.COM**

Sampler (Print & Sign)  
**JOHN REITER**

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	VOC BY TO #15
L - SUMMIT Valley	0-284			02008					
J - EAST FENCELINE #2	0-211			01839					
K - SOUTH FENCELINE	0-336			01832					
L - SOUTH FENCELINE #1	0-784			003180					
I - EAST FENCELINE #1	0-466			00596					
G - GRASSY KNOW WEST	0-284			003375					
F - GK CENTER	0-287			01592					
E - ANODIUM HEAVY	0-235			002679					
H - GRASSY KNOW NORTH	0-248			01124					
B - POND EAST	0-122			003762					
C - POND WEST	0-111			01328					
A - POND CENTRAL	0-075			00080					
D - SUMMIT	0-083			00157					

Report Tier Levels - please select  
 T I - Results (Default if not specified) \_\_\_\_\_  
 T II (Results + QC Summaries) \_\_\_\_\_  
 T III (Results + QC & Calibration Summaries) \_\_\_\_\_  
 T IV (Data Validation Package) 10% Surcharge \_\_\_\_\_  
 EDD required Yes / No  
 Type: \_\_\_\_\_

Inquished by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Received by: (Signature) \_\_\_\_\_ Date: **5/24/10** Time: **0910**  
 Project Requirements (MRLs, OAPP) \_\_\_\_\_  
 Cooler / Blank \_\_\_\_\_ °C  
 Temperature \_\_\_\_\_ °C

\*QUESTIONS, CALL JOHN REITER AT 262-930-7307\*

**Sample Acceptance Check Form**

Client: Stantec Consulting Services, Inc. Work order: P1203506

Project: Bridgeton Landfill / 182608005 Task 300

Sample(s) received on: 8/24/12 Date opened: 8/24/12 by: MZAMORA

**Note:** This form is used for all samples received by CAS. 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.

- |  | <u>Yes</u>                          | <u>No</u>                           | <u>N/A</u>                          |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 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 CAS</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 type="checkbox"/>            | <input checked="" 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 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"/> |
| 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
P1203506-001.01	1.0 L Source Can					
P1203506-002.01	1.0 L Source Can					
P1203506-003.01	1.0 L Source Can					
P1203506-004.01	1.0 L Source Can					
P1203506-005.01	6.0 L Source Can					
P1203506-006.01	6.0 L Source Can					
P1203506-007.01	6.0 L Source Can					
P1203506-008.01	6.0 L Source Can					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 Chain of Custody is missing time collected \_\_\_\_\_



RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1 Amphitheater, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-001

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:  
Container ID: 1SC00027

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 0.0020 Liter(s)  
0.00020 Liter(s)

Initial Pressure (psig): -0.79 Final Pressure (psig): 5.07

Canister Dilution Factor: 1.42

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	27,000	360	15,000	210	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	360	ND	72	
74-87-3	Chloromethane	ND	360	ND	170	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	360	ND	51	
75-01-4	Vinyl Chloride	ND	360	ND	140	
106-99-0	1,3-Butadiene	590	360	270	160	
74-83-9	Bromomethane	ND	360	ND	91	
75-00-3	Chloroethane	ND	360	ND	130	
64-17-5	Ethanol	99,000	3,600	52,000	1,900	
75-05-8	Acetonitrile	ND	360	ND	210	
107-02-8	Acrolein	ND	1,400	ND	620	
67-64-1	Acetone	500,000	36,000	210,000	15,000	D
75-69-4	Trichlorofluoromethane	ND	360	ND	63	
67-63-0	2-Propanol (Isopropyl Alcohol)	60,000	3,600	24,000	1,400	
107-13-1	Acrylonitrile	ND	360	ND	160	
75-35-4	1,1-Dichloroethene	ND	360	ND	90	
75-09-2	Methylene Chloride	ND	360	ND	100	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	360	ND	110	
76-13-1	Trichlorotrifluoroethane	ND	360	ND	46	
75-15-0	Carbon Disulfide	ND	3,600	ND	1,100	
156-60-5	trans-1,2-Dichloroethene	ND	360	ND	90	
75-34-3	1,1-Dichloroethane	ND	360	ND	88	
1634-04-4	Methyl tert-Butyl Ether	ND	360	ND	99	
108-05-4	Vinyl Acetate	ND	3,600	ND	1,000	
78-93-3	2-Butanone (MEK)	340,000	36,000	120,000	12,000	D

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.

D = The reported result is from a dilution.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1 Amphitheater, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-001

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:  
Container ID: 1SC00027

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 0.0020 Liter(s)  
0.00020 Liter(s)

Initial Pressure (psig): -0.79 Final Pressure (psig): 5.07

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	360	ND	90	
141-78-6	Ethyl Acetate	4,800	710	1,300	200	
110-54-3	n-Hexane	2,100	360	580	100	
67-66-3	Chloroform	ND	360	ND	73	
109-99-9	Tetrahydrofuran (THF)	170,000	3,600	56,000	1,200	D
107-06-2	1,2-Dichloroethane	ND	360	ND	88	
71-55-6	1,1,1-Trichloroethane	ND	360	ND	65	
71-43-2	Benzene	120,000	3,600	37,000	1,100	D
56-23-5	Carbon Tetrachloride	ND	360	ND	56	
110-82-7	Cyclohexane	1,100	710	320	210	
78-87-5	1,2-Dichloropropane	ND	360	ND	77	
75-27-4	Bromodichloromethane	ND	360	ND	53	
79-01-6	Trichloroethene	ND	360	ND	66	
123-91-1	1,4-Dioxane	4,100	360	1,100	99	
80-62-6	Methyl Methacrylate	ND	710	ND	170	
142-82-5	n-Heptane	3,200	360	790	87	
10061-01-5	cis-1,3-Dichloropropene	ND	360	ND	78	
108-10-1	4-Methyl-2-pentanone	30,000	360	7,200	87	
10061-02-6	trans-1,3-Dichloropropene	ND	360	ND	78	
79-00-5	1,1,2-Trichloroethane	ND	360	ND	65	
108-88-3	Toluene	43,000	360	11,000	94	
591-78-6	2-Hexanone	11,000	360	2,800	87	
124-48-1	Dibromochloromethane	ND	360	ND	42	
106-93-4	1,2-Dibromoethane	ND	360	ND	46	
123-86-4	n-Butyl Acetate	12,000	360	2,500	75	

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.

D = The reported result is from a dilution.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1 Amphitheater, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-001

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00027

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.0020 Liter(s)  
 0.00020 Liter(s)

Initial Pressure (psig): -0.79 Final Pressure (psig): 5.07

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	9,500	360	2,000	76	
127-18-4	Tetrachloroethene	ND	360	ND	52	
108-90-7	Chlorobenzene	3,000	360	650	77	
100-41-4	Ethylbenzene	27,000	360	6,200	82	
179601-23-1	m,p-Xylenes	57,000	710	13,000	160	
75-25-2	Bromoform	ND	360	ND	34	
100-42-5	Styrene	1,200	360	280	83	
95-47-6	o-Xylene	20,000	360	4,600	82	
111-84-2	n-Nonane	16,000	360	3,100	68	
79-34-5	1,1,2,2-Tetrachloroethane	ND	360	ND	52	
98-82-8	Cumene	6,000	360	1,200	72	
80-56-8	alpha-Pinene	12,000	360	2,100	64	
103-65-1	n-Propylbenzene	3,800	360	780	72	
622-96-8	4-Ethyltoluene	4,900	360	990	72	
108-67-8	1,3,5-Trimethylbenzene	6,700	360	1,400	72	
95-63-6	1,2,4-Trimethylbenzene	19,000	360	3,900	72	
100-44-7	Benzyl Chloride	ND	360	ND	69	
541-73-1	1,3-Dichlorobenzene	ND	360	ND	59	
106-46-7	1,4-Dichlorobenzene	10,000	360	1,700	59	
95-50-1	1,2-Dichlorobenzene	ND	360	ND	59	
5989-27-5	d-Limonene	22,000	360	3,900	64	
96-12-8	1,2-Dibromo-3-chloropropane	ND	360	ND	37	
120-82-1	1,2,4-Trichlorobenzene	ND	360	ND	48	
91-20-3	Naphthalene	510	360	97	68	
87-68-3	Hexachlorobutadiene	ND	360	ND	33	

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.



RESULTS OF ANALYSIS

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

**Client Sample ID:** 1 Amphitheater, Grab

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-001

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Date Collected: 8/21/12

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Date Received: 8/24/12

Analyst: Lusine Hakobyan

Date Analyzed: 8/29/12

Sampling Media: 1.0 L Summa Canister

Volume(s) Analyzed: 0.0020 Liter(s)

Test Notes: **T**

0.00020 Liter(s)

Container ID: 1SC00027

Initial Pressure (psig): -0.79      Final Pressure (psig): 5.07

Canister Dilution Factor: 1.42

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
7.57	Furan	46,000	
8.16	Dimethyl Sulfide	68,000	
8.45	Methyl Acetate	44,000	
11.21	2-Methylfuran	68,000	
11.98	Methyl Propionate	45,000	
13.09	1-Butanol	73,000	
13.60	2-Pentanone	59,000	
14.74	Methyl Butyrate	110,000	
15.35	Dimethyl disulfide	70,000	
17.17	2-Methylcyclopentanone	51,000	
18.48	Methyl Hexanoate	43,000	
18.73	2-Ethylcyclopentanone	41,000	
19.66	n-Decane	40,000	
19.95	p-Isopropyltoluene	120,000	
20.68	n-Undecane	46,000	

T = Analyte is a tentatively identified compound, result is estimated.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 2 Level 2, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-002

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 1.0 L Summa Canister  
**Test Notes:**  
**Container ID:** 1SC00355

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 0.00015 Liter(s)

Initial Pressure (psig): -0.97      Final Pressure (psig): 5.18

Canister Dilution Factor: 1.45

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	95,000	4,800	55,000	2,800	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	4,800	ND	980	
74-87-3	Chloromethane	ND	4,800	ND	2,300	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	4,800	ND	690	
75-01-4	Vinyl Chloride	ND	4,800	ND	1,900	
106-99-0	1,3-Butadiene	ND	4,800	ND	2,200	
74-83-9	Bromomethane	ND	4,800	ND	1,200	
75-00-3	Chloroethane	5,600	4,800	2,100	1,800	
64-17-5	Ethanol	ND	48,000	ND	26,000	
75-05-8	Acetonitrile	ND	4,800	ND	2,900	
107-02-8	Acrolein	ND	19,000	ND	8,400	
67-64-1	Acetone	ND	48,000	ND	20,000	
75-69-4	Trichlorofluoromethane	ND	4,800	ND	860	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	48,000	ND	20,000	
107-13-1	Acrylonitrile	ND	4,800	ND	2,200	
75-35-4	1,1-Dichloroethene	ND	4,800	ND	1,200	
75-09-2	Methylene Chloride	ND	4,800	ND	1,400	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	4,800	ND	1,500	
76-13-1	Trichlorotrifluoroethane	ND	4,800	ND	630	
75-15-0	Carbon Disulfide	ND	48,000	ND	16,000	
156-60-5	trans-1,2-Dichloroethene	ND	4,800	ND	1,200	
75-34-3	1,1-Dichloroethane	ND	4,800	ND	1,200	
1634-04-4	Methyl tert-Butyl Ether	ND	4,800	ND	1,300	
108-05-4	Vinyl Acetate	ND	48,000	ND	14,000	
78-93-3	2-Butanone (MEK)	ND	48,000	ND	16,000	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 2 Level 2, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-002

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 1.0 L Summa Canister  
**Test Notes:**  
**Container ID:** 1SC00355

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 0.00015 Liter(s)

Initial Pressure (psig): -0.97 Final Pressure (psig): 5.18

Canister Dilution Factor: 1.45

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	4,800	ND	1,200	
141-78-6	Ethyl Acetate	ND	9,700	ND	2,700	
110-54-3	n-Hexane	ND	4,800	ND	1,400	
67-66-3	Chloroform	ND	4,800	ND	990	
109-99-9	Tetrahydrofuran (THF)	<b>39,000</b>	4,800	<b>13,000</b>	1,600	
107-06-2	1,2-Dichloroethane	ND	4,800	ND	1,200	
71-55-6	1,1,1-Trichloroethane	ND	4,800	ND	890	
71-43-2	Benzene	<b>620,000</b>	4,800	<b>200,000</b>	1,500	
56-23-5	Carbon Tetrachloride	ND	4,800	ND	770	
110-82-7	Cyclohexane	ND	9,700	ND	2,800	
78-87-5	1,2-Dichloropropane	ND	4,800	ND	1,000	
75-27-4	Bromodichloromethane	ND	4,800	ND	720	
79-01-6	Trichloroethene	ND	4,800	ND	900	
123-91-1	1,4-Dioxane	ND	4,800	ND	1,300	
80-62-6	Methyl Methacrylate	ND	9,700	ND	2,400	
142-82-5	n-Heptane	<b>8,000</b>	4,800	<b>2,000</b>	1,200	
10061-01-5	cis-1,3-Dichloropropene	ND	4,800	ND	1,100	
108-10-1	4-Methyl-2-pentanone	ND	4,800	ND	1,200	
10061-02-6	trans-1,3-Dichloropropene	ND	4,800	ND	1,100	
79-00-5	1,1,2-Trichloroethane	ND	4,800	ND	890	
108-88-3	Toluene	<b>100,000</b>	4,800	<b>27,000</b>	1,300	
591-78-6	2-Hexanone	ND	4,800	ND	1,200	
124-48-1	Dibromochloromethane	ND	4,800	ND	570	
106-93-4	1,2-Dibromoethane	ND	4,800	ND	630	
123-86-4	n-Butyl Acetate	ND	4,800	ND	1,000	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 2 Level 2, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-002

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 1.0 L Summa Canister  
**Test Notes:**  
**Container ID:** 1SC00355

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 0.00015 Liter(s)

Initial Pressure (psig): -0.97      Final Pressure (psig): 5.18

Canister Dilution Factor: 1.45

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	17,000	4,800	3,700	1,000	
127-18-4	Tetrachloroethene	ND	4,800	ND	710	
108-90-7	Chlorobenzene	ND	4,800	ND	1,000	
100-41-4	Ethylbenzene	32,000	4,800	7,400	1,100	
179601-23-1	m,p-Xylenes	37,000	9,700	8,600	2,200	
75-25-2	Bromoform	ND	4,800	ND	470	
100-42-5	Styrene	ND	4,800	ND	1,100	
95-47-6	o-Xylene	12,000	4,800	2,800	1,100	
111-84-2	n-Nonane	17,000	4,800	3,200	920	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4,800	ND	700	
98-82-8	Cumene	5,200	4,800	1,100	980	
80-56-8	alpha-Pinene	53,000	4,800	9,400	870	
103-65-1	n-Propylbenzene	ND	4,800	ND	980	
622-96-8	4-Ethyltoluene	ND	4,800	ND	980	
108-67-8	1,3,5-Trimethylbenzene	ND	4,800	ND	980	
95-63-6	1,2,4-Trimethylbenzene	ND	4,800	ND	980	
100-44-7	Benzyl Chloride	ND	4,800	ND	930	
541-73-1	1,3-Dichlorobenzene	ND	4,800	ND	800	
106-46-7	1,4-Dichlorobenzene	ND	4,800	ND	800	
95-50-1	1,2-Dichlorobenzene	ND	4,800	ND	800	
5989-27-5	d-Limonene	22,000	4,800	3,900	870	
96-12-8	1,2-Dibromo-3-chloropropane	ND	4,800	ND	500	
120-82-1	1,2,4-Trichlorobenzene	ND	4,800	ND	650	
91-20-3	Naphthalene	ND	4,800	ND	920	
87-68-3	Hexachlorobutadiene	ND	4,800	ND	450	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 2 Level 2, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-002

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes: T  
 Container ID: 1SC00355

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.00015 Liter(s)

Initial Pressure (psig): -0.97      Final Pressure (psig): 5.18

Canister Dilution Factor: 1.45

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
4.45	Dimethyl Ether	120,000	
5.13	Isobutene	140,000	
5.31	n-Butane	41,000	
5.51	C4H8 Alkene	83,000	
5.80	C4H8 Alkene	90,000	
7.54	Furan	120,000	
8.14	Dimethyl Sulfide	83,000	
8.52	Isopentene	42,000	
9.71	Cyclopentene	41,000	
11.19	2-Methylfuran	380,000	
13.07	C6H10 Alkene	110,000	
14.58	C7H12 Alkene	92,000	
14.63	C7H12 Alkene	110,000	
16.76	3-Methyl-3-heptene	27,000	
16.96	C8H14 Alkene	22,000	

T = Analyte is a tentatively identified compound, result is estimated.

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 3 East Side, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-003

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 1.0 L Summa Canister  
**Test Notes:**  
**Container ID:** 1SC00562

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 0.00040 Liter(s)

Initial Pressure (psig): -0.87      Final Pressure (psig): 5.38

Canister Dilution Factor: 1.45

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	37,000	1,800	22,000	1,100	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	1,800	ND	370	
74-87-3	Chloromethane	2,700	1,800	1,300	880	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	1,800	ND	260	
75-01-4	Vinyl Chloride	ND	1,800	ND	710	
106-99-0	1,3-Butadiene	ND	1,800	ND	820	
74-83-9	Bromomethane	ND	1,800	ND	470	
75-00-3	Chloroethane	ND	1,800	ND	690	
64-17-5	Ethanol	ND	18,000	ND	9,600	
75-05-8	Acetonitrile	ND	1,800	ND	1,100	
107-02-8	Acrolein	ND	7,300	ND	3,200	
67-64-1	Acetone	72,000	18,000	31,000	7,600	
75-69-4	Trichlorofluoromethane	ND	1,800	ND	320	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	18,000	ND	7,400	
107-13-1	Acrylonitrile	ND	1,800	ND	840	
75-35-4	1,1-Dichloroethene	ND	1,800	ND	460	
75-09-2	Methylene Chloride	ND	1,800	ND	520	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	1,800	ND	580	
76-13-1	Trichlorotrifluoroethane	ND	1,800	ND	240	
75-15-0	Carbon Disulfide	ND	18,000	ND	5,800	
156-60-5	trans-1,2-Dichloroethene	ND	1,800	ND	460	
75-34-3	1,1-Dichloroethane	ND	1,800	ND	450	
1634-04-4	Methyl tert-Butyl Ether	ND	1,800	ND	500	
108-05-4	Vinyl Acetate	ND	18,000	ND	5,100	
78-93-3	2-Butanone (MEK)	89,000	18,000	30,000	6,100	

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.

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 3 East Side, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-003

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:  
Container ID: 1SC00562

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 0.00040 Liter(s)

Initial Pressure (psig): -0.87 Final Pressure (psig): 5.38

Canister Dilution Factor: 1.45

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	1,800	ND	460	
141-78-6	Ethyl Acetate	ND	3,600	ND	1,000	
110-54-3	n-Hexane	<b>2,900</b>	1,800	<b>830</b>	510	
67-66-3	Chloroform	ND	1,800	ND	370	
109-99-9	Tetrahydrofuran (THF)	<b>70,000</b>	1,800	<b>24,000</b>	610	
107-06-2	1,2-Dichloroethane	ND	1,800	ND	450	
71-55-6	1,1,1-Trichloroethane	ND	1,800	ND	330	
71-43-2	Benzene	<b>390,000</b>	1,800	<b>120,000</b>	570	
56-23-5	Carbon Tetrachloride	ND	1,800	ND	290	
110-82-7	Cyclohexane	ND	3,600	ND	1,100	
78-87-5	1,2-Dichloropropane	ND	1,800	ND	390	
75-27-4	Bromodichloromethane	ND	1,800	ND	270	
79-01-6	Trichloroethene	ND	1,800	ND	340	
123-91-1	1,4-Dioxane	ND	1,800	ND	500	
80-62-6	Methyl Methacrylate	ND	3,600	ND	890	
142-82-5	n-Heptane	<b>3,300</b>	1,800	<b>820</b>	440	
10061-01-5	cis-1,3-Dichloropropene	ND	1,800	ND	400	
108-10-1	4-Methyl-2-pentanone	<b>16,000</b>	1,800	<b>3,800</b>	440	
10061-02-6	trans-1,3-Dichloropropene	ND	1,800	ND	400	
79-00-5	1,1,2-Trichloroethane	ND	1,800	ND	330	
108-88-3	Toluene	<b>48,000</b>	1,800	<b>13,000</b>	480	
591-78-6	2-Hexanone	<b>3,100</b>	1,800	<b>770</b>	440	
124-48-1	Dibromochloromethane	ND	1,800	ND	210	
106-93-4	1,2-Dibromoethane	ND	1,800	ND	240	
123-86-4	n-Butyl Acetate	ND	1,800	ND	380	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 3 East Side, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-003

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:  
Container ID: 1SC00562

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 0.00040 Liter(s)

Initial Pressure (psig): -0.87 Final Pressure (psig): 5.38

Canister Dilution Factor: 1.45

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	13,000	1,800	2,800	390	
127-18-4	Tetrachloroethene	ND	1,800	ND	270	
108-90-7	Chlorobenzene	ND	1,800	ND	390	
100-41-4	Ethylbenzene	22,000	1,800	5,200	420	
179601-23-1	m,p-Xylenes	40,000	3,600	9,300	830	
75-25-2	Bromoform	ND	1,800	ND	180	
100-42-5	Styrene	ND	1,800	ND	430	
95-47-6	o-Xylene	16,000	1,800	3,700	420	
111-84-2	n-Nonane	9,000	1,800	1,700	350	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1,800	ND	260	
98-82-8	Cumene	4,300	1,800	870	370	
80-56-8	alpha-Pinene	16,000	1,800	2,900	330	
103-65-1	n-Propylbenzene	2,200	1,800	450	370	
622-96-8	4-Ethyltoluene	2,900	1,800	580	370	
108-67-8	1,3,5-Trimethylbenzene	3,500	1,800	720	370	
95-63-6	1,2,4-Trimethylbenzene	8,300	1,800	1,700	370	
100-44-7	Benzyl Chloride	ND	1,800	ND	350	
541-73-1	1,3-Dichlorobenzene	ND	1,800	ND	300	
106-46-7	1,4-Dichlorobenzene	3,200	1,800	530	300	
95-50-1	1,2-Dichlorobenzene	ND	1,800	ND	300	
5989-27-5	d-Limonene	21,000	1,800	3,700	330	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1,800	ND	190	
120-82-1	1,2,4-Trichlorobenzene	ND	1,800	ND	240	
91-20-3	Naphthalene	ND	1,800	ND	350	
87-68-3	Hexachlorobutadiene	ND	1,800	ND	170	

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.



RESULTS OF ANALYSIS

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

**Client Sample ID:** 3 East Side, Grab

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-003

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 1.0 L Summa Canister

Test Notes: **T**

Container ID: 1SC00562

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 0.00040 Liter(s)

Initial Pressure (psig): -0.87      Final Pressure (psig): 5.38

Canister Dilution Factor: 1.45

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
5.13	Isobutene	85,000	
5.31	n-Butane	35,000	
5.50	C4H8 Alkene	33,000	
5.80	C4H8 Alkene	34,000	
7.55	Furan	300,000	
8.15	Dimethyl Sulfide	280,000	
9.71	Cyclopentene	33,000	
11.20	2-Methylfuran	240,000	
13.07	C6H10 Alkene	74,000	
14.58	C7H12 Alkene	71,000	
14.63	C7H12 Alkene	93,000	
15.33	Dimethyl disulfide	42,000	
16.76	3-Methyl-3-heptene	29,000	
16.89	C8H14 Alkene	31,000	
19.94	p-Isopropyltoluene	42,000	

T = Analyte is a tentatively identified compound, result is estimated.

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 4 Field Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-004

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:  
Container ID: 1SC00919

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
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>	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	1.3	ND	0.73	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	1.3	ND	0.25	
74-87-3	Chloromethane	ND	1.3	ND	0.61	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	1.3	ND	0.18	
75-01-4	Vinyl Chloride	ND	1.3	ND	0.49	
106-99-0	1,3-Butadiene	ND	1.3	ND	0.57	
74-83-9	Bromomethane	ND	1.3	ND	0.32	
75-00-3	Chloroethane	ND	1.3	ND	0.47	
64-17-5	Ethanol	ND	13	ND	6.6	
75-05-8	Acetonitrile	ND	1.3	ND	0.74	
107-02-8	Acrolein	ND	5.0	ND	2.2	
67-64-1	Acetone	ND	13	ND	5.3	
75-69-4	Trichlorofluoromethane	ND	1.3	ND	0.22	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	13	ND	5.1	
107-13-1	Acrylonitrile	ND	1.3	ND	0.58	
75-35-4	1,1-Dichloroethene	ND	1.3	ND	0.32	
75-09-2	Methylene Chloride	ND	1.3	ND	0.36	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	1.3	ND	0.40	
76-13-1	Trichlorotrifluoroethane	ND	1.3	ND	0.16	
75-15-0	Carbon Disulfide	ND	13	ND	4.0	
156-60-5	trans-1,2-Dichloroethene	ND	1.3	ND	0.32	
75-34-3	1,1-Dichloroethane	ND	1.3	ND	0.31	
1634-04-4	Methyl tert-Butyl Ether	ND	1.3	ND	0.35	
108-05-4	Vinyl Acetate	ND	13	ND	3.6	
78-93-3	2-Butanone (MEK)	ND	13	ND	4.2	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 4 Field Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-004

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:  
Container ID: 1SC00919

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
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>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	1.3	ND	0.32	
141-78-6	Ethyl Acetate	ND	2.5	ND	0.69	
110-54-3	n-Hexane	ND	1.3	ND	0.35	
67-66-3	Chloroform	ND	1.3	ND	0.26	
109-99-9	Tetrahydrofuran (THF)	ND	1.3	ND	0.42	
107-06-2	1,2-Dichloroethane	ND	1.3	ND	0.31	
71-55-6	1,1,1-Trichloroethane	ND	1.3	ND	0.23	
71-43-2	Benzene	ND	1.3	ND	0.39	
56-23-5	Carbon Tetrachloride	ND	1.3	ND	0.20	
110-82-7	Cyclohexane	ND	2.5	ND	0.73	
78-87-5	1,2-Dichloropropane	ND	1.3	ND	0.27	
75-27-4	Bromodichloromethane	ND	1.3	ND	0.19	
79-01-6	Trichloroethene	ND	1.3	ND	0.23	
123-91-1	1,4-Dioxane	ND	1.3	ND	0.35	
80-62-6	Methyl Methacrylate	ND	2.5	ND	0.61	
142-82-5	n-Heptane	ND	1.3	ND	0.31	
10061-01-5	cis-1,3-Dichloropropene	ND	1.3	ND	0.28	
108-10-1	4-Methyl-2-pentanone	ND	1.3	ND	0.31	
10061-02-6	trans-1,3-Dichloropropene	ND	1.3	ND	0.28	
79-00-5	1,1,2-Trichloroethane	ND	1.3	ND	0.23	
108-88-3	Toluene	ND	1.3	ND	0.33	
591-78-6	2-Hexanone	ND	1.3	ND	0.31	
124-48-1	Dibromochloromethane	ND	1.3	ND	0.15	
106-93-4	1,2-Dibromoethane	ND	1.3	ND	0.16	
123-86-4	n-Butyl Acetate	ND	1.3	ND	0.26	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 4 Field Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-004

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:  
Container ID: 1SC00919

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
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>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	1.3	ND	0.27	
127-18-4	Tetrachloroethene	ND	1.3	ND	0.18	
108-90-7	Chlorobenzene	ND	1.3	ND	0.27	
100-41-4	Ethylbenzene	ND	1.3	ND	0.29	
179601-23-1	m,p-Xylenes	ND	2.5	ND	0.58	
75-25-2	Bromoform	ND	1.3	ND	0.12	
100-42-5	Styrene	ND	1.3	ND	0.29	
95-47-6	o-Xylene	ND	1.3	ND	0.29	
111-84-2	n-Nonane	ND	1.3	ND	0.24	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.3	ND	0.18	
98-82-8	Cumene	ND	1.3	ND	0.25	
80-56-8	alpha-Pinene	ND	1.3	ND	0.22	
103-65-1	n-Propylbenzene	ND	1.3	ND	0.25	
622-96-8	4-Ethyltoluene	ND	1.3	ND	0.25	
108-67-8	1,3,5-Trimethylbenzene	ND	1.3	ND	0.25	
95-63-6	1,2,4-Trimethylbenzene	ND	1.3	ND	0.25	
100-44-7	Benzyl Chloride	ND	1.3	ND	0.24	
541-73-1	1,3-Dichlorobenzene	ND	1.3	ND	0.21	
106-46-7	1,4-Dichlorobenzene	ND	1.3	ND	0.21	
95-50-1	1,2-Dichlorobenzene	ND	1.3	ND	0.21	
5989-27-5	d-Limonene	ND	1.3	ND	0.22	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.3	ND	0.13	
120-82-1	1,2,4-Trichlorobenzene	ND	1.3	ND	0.17	
91-20-3	Naphthalene	ND	1.3	ND	0.24	
87-68-3	Hexachlorobutadiene	ND	1.3	ND	0.12	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 4 Field Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-004

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00919

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 0.40 Liter(s)

Canister Dilution Factor: 1.00

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
No Compounds Detected			

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** A Pond Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-005

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00121

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.98 Final Pressure (psig): 3.56

Canister Dilution Factor: 1.33

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	1.6	0.67	0.93	0.39	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.2	0.67	0.44	0.13	
74-87-3	Chloromethane	ND	0.67	ND	0.32	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.67	ND	0.095	
75-01-4	Vinyl Chloride	ND	0.67	ND	0.26	
106-99-0	1,3-Butadiene	ND	0.67	ND	0.30	
74-83-9	Bromomethane	ND	0.67	ND	0.17	
75-00-3	Chloroethane	ND	0.67	ND	0.25	
64-17-5	Ethanol	ND	6.7	ND	3.5	
75-05-8	Acetonitrile	0.82	0.67	0.49	0.40	
107-02-8	Acrolein	ND	2.7	ND	1.2	
67-64-1	Acetone	17	6.7	7.1	2.8	
75-69-4	Trichlorofluoromethane	1.2	0.67	0.21	0.12	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.7	ND	2.7	
107-13-1	Acrylonitrile	ND	0.67	ND	0.31	
75-35-4	1,1-Dichloroethene	ND	0.67	ND	0.17	
75-09-2	Methylene Chloride	ND	0.67	ND	0.19	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.67	ND	0.21	
76-13-1	Trichlorotrifluoroethane	ND	0.67	ND	0.087	
75-15-0	Carbon Disulfide	ND	6.7	ND	2.1	
156-60-5	trans-1,2-Dichloroethene	ND	0.67	ND	0.17	
75-34-3	1,1-Dichloroethane	ND	0.67	ND	0.16	
1634-04-4	Methyl tert-Butyl Ether	ND	0.67	ND	0.18	
108-05-4	Vinyl Acetate	ND	6.7	ND	1.9	
78-93-3	2-Butanone (MEK)	ND	6.7	ND	2.3	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** A Pond Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-005

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00121

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -0.98 Final Pressure (psig): 3.56

Canister Dilution Factor: 1.33

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.67	ND	0.17	
141-78-6	Ethyl Acetate	17	1.3	4.8	0.37	
110-54-3	n-Hexane	ND	0.67	ND	0.19	
67-66-3	Chloroform	ND	0.67	ND	0.14	
109-99-9	Tetrahydrofuran (THF)	2.7	0.67	0.91	0.23	
107-06-2	1,2-Dichloroethane	ND	0.67	ND	0.16	
71-55-6	1,1,1-Trichloroethane	ND	0.67	ND	0.12	
71-43-2	Benzene	10	0.67	3.1	0.21	
56-23-5	Carbon Tetrachloride	ND	0.67	ND	0.11	
110-82-7	Cyclohexane	ND	1.3	ND	0.39	
78-87-5	1,2-Dichloropropane	ND	0.67	ND	0.14	
75-27-4	Bromodichloromethane	ND	0.67	ND	0.099	
79-01-6	Trichloroethene	ND	0.67	ND	0.12	
123-91-1	1,4-Dioxane	ND	0.67	ND	0.18	
80-62-6	Methyl Methacrylate	ND	1.3	ND	0.32	
142-82-5	n-Heptane	ND	0.67	ND	0.16	
10061-01-5	cis-1,3-Dichloropropene	ND	0.67	ND	0.15	
108-10-1	4-Methyl-2-pentanone	ND	0.67	ND	0.16	
10061-02-6	trans-1,3-Dichloropropene	ND	0.67	ND	0.15	
79-00-5	1,1,2-Trichloroethane	ND	0.67	ND	0.12	
108-88-3	Toluene	3.7	0.67	0.97	0.18	
591-78-6	2-Hexanone	ND	0.67	ND	0.16	
124-48-1	Dibromochloromethane	ND	0.67	ND	0.078	
106-93-4	1,2-Dibromoethane	ND	0.67	ND	0.087	
123-86-4	n-Butyl Acetate	ND	0.67	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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** A Pond Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-005

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00121

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -0.98      Final Pressure (psig): 3.56

Canister Dilution Factor: 1.33

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.67	ND	0.14	
127-18-4	Tetrachloroethene	ND	0.67	ND	0.098	
108-90-7	Chlorobenzene	ND	0.67	ND	0.14	
100-41-4	Ethylbenzene	<b>0.72</b>	0.67	<b>0.17</b>	0.15	
179601-23-1	m,p-Xylenes	<b>1.5</b>	1.3	<b>0.34</b>	0.31	
75-25-2	Bromoform	ND	0.67	ND	0.064	
100-42-5	Styrene	ND	0.67	ND	0.16	
95-47-6	o-Xylene	ND	0.67	ND	0.15	
111-84-2	n-Nonane	ND	0.67	ND	0.13	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.67	ND	0.097	
98-82-8	Cumene	ND	0.67	ND	0.14	
80-56-8	alpha-Pinene	ND	0.67	ND	0.12	
103-65-1	n-Propylbenzene	ND	0.67	ND	0.14	
622-96-8	4-Ethyltoluene	ND	0.67	ND	0.14	
108-67-8	1,3,5-Trimethylbenzene	ND	0.67	ND	0.14	
95-63-6	1,2,4-Trimethylbenzene	ND	0.67	ND	0.14	
100-44-7	Benzyl Chloride	ND	0.67	ND	0.13	
541-73-1	1,3-Dichlorobenzene	ND	0.67	ND	0.11	
106-46-7	1,4-Dichlorobenzene	ND	0.67	ND	0.11	
95-50-1	1,2-Dichlorobenzene	ND	0.67	ND	0.11	
5989-27-5	d-Limonene	<b>0.99</b>	0.67	<b>0.18</b>	0.12	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.67	ND	0.069	
120-82-1	1,2,4-Trichlorobenzene	ND	0.67	ND	0.090	
91-20-3	Naphthalene	ND	0.67	ND	0.13	
87-68-3	Hexachlorobutadiene	ND	0.67	ND	0.062	

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.



RESULTS OF ANALYSIS

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

**Client Sample ID:** A Pond Center

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-005

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC00121

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/28/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.98      Final Pressure (psig): 3.56

Canister Dilution Factor: 1.33

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
7.54	Furan	3.4	
8.14	Dimethyl Sulfide	4.5	
9.41	Unidentified Compound	4.1	
11.19	2-Methylfuran	3.7	
14.42	Ethyl Propionate	14	
16.47	Ethyl Butyrate	14	
17.12	Hexamethylcyclotrisiloxane	12	
19.81	2-Ethyl-1-hexanol	3.2	

T = Analyte is a tentatively identified compound, result is estimated.

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** B Pond East  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-006

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC01025

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -1.43      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.38

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	1.8	0.69	1.1	0.40	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.7	0.69	0.55	0.14	
74-87-3	Chloromethane	ND	0.69	ND	0.33	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.69	ND	0.099	
75-01-4	Vinyl Chloride	ND	0.69	ND	0.27	
106-99-0	1,3-Butadiene	ND	0.69	ND	0.31	
74-83-9	Bromomethane	ND	0.69	ND	0.18	
75-00-3	Chloroethane	ND	0.69	ND	0.26	
64-17-5	Ethanol	ND	6.9	ND	3.7	
75-05-8	Acetonitrile	ND	0.69	ND	0.41	
107-02-8	Acrolein	ND	2.8	ND	1.2	
67-64-1	Acetone	18	6.9	7.8	2.9	
75-69-4	Trichlorofluoromethane	1.4	0.69	0.25	0.12	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.9	ND	2.8	
107-13-1	Acrylonitrile	ND	0.69	ND	0.32	
75-35-4	1,1-Dichloroethene	ND	0.69	ND	0.17	
75-09-2	Methylene Chloride	ND	0.69	ND	0.20	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.69	ND	0.22	
76-13-1	Trichlorotrifluoroethane	ND	0.69	ND	0.090	
75-15-0	Carbon Disulfide	ND	6.9	ND	2.2	
156-60-5	trans-1,2-Dichloroethene	ND	0.69	ND	0.17	
75-34-3	1,1-Dichloroethane	ND	0.69	ND	0.17	
1634-04-4	Methyl tert-Butyl Ether	ND	0.69	ND	0.19	
108-05-4	Vinyl Acetate	ND	6.9	ND	2.0	
78-93-3	2-Butanone (MEK)	ND	6.9	ND	2.3	

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.

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** B Pond East  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-006

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC01025

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -1.43      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.38

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.69	ND	0.17	
141-78-6	Ethyl Acetate	5.0	1.4	1.4	0.38	
110-54-3	n-Hexane	ND	0.69	ND	0.20	
67-66-3	Chloroform	ND	0.69	ND	0.14	
109-99-9	Tetrahydrofuran (THF)	2.6	0.69	0.89	0.23	
107-06-2	1,2-Dichloroethane	ND	0.69	ND	0.17	
71-55-6	1,1,1-Trichloroethane	ND	0.69	ND	0.13	
71-43-2	Benzene	10	0.69	3.1	0.22	
56-23-5	Carbon Tetrachloride	ND	0.69	ND	0.11	
110-82-7	Cyclohexane	ND	1.4	ND	0.40	
78-87-5	1,2-Dichloropropane	ND	0.69	ND	0.15	
75-27-4	Bromodichloromethane	ND	0.69	ND	0.10	
79-01-6	Trichloroethene	ND	0.69	ND	0.13	
123-91-1	1,4-Dioxane	ND	0.69	ND	0.19	
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.34	
142-82-5	n-Heptane	ND	0.69	ND	0.17	
10061-01-5	cis-1,3-Dichloropropene	ND	0.69	ND	0.15	
108-10-1	4-Methyl-2-pentanone	ND	0.69	ND	0.17	
10061-02-6	trans-1,3-Dichloropropene	ND	0.69	ND	0.15	
79-00-5	1,1,2-Trichloroethane	ND	0.69	ND	0.13	
108-88-3	Toluene	3.3	0.69	0.89	0.18	
591-78-6	2-Hexanone	ND	0.69	ND	0.17	
124-48-1	Dibromochloromethane	ND	0.69	ND	0.081	
106-93-4	1,2-Dibromoethane	ND	0.69	ND	0.090	
123-86-4	n-Butyl Acetate	ND	0.69	ND	0.15	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** B Pond East  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-006

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01025

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.43 Final Pressure (psig): 3.60

Canister Dilution Factor: 1.38

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.69	ND	0.15	
127-18-4	Tetrachloroethene	ND	0.69	ND	0.10	
108-90-7	Chlorobenzene	ND	0.69	ND	0.15	
100-41-4	Ethylbenzene	<b>0.83</b>	0.69	<b>0.19</b>	0.16	
179601-23-1	m,p-Xylenes	<b>1.7</b>	1.4	<b>0.38</b>	0.32	
75-25-2	Bromoform	ND	0.69	ND	0.067	
100-42-5	Styrene	ND	0.69	ND	0.16	
95-47-6	o-Xylene	ND	0.69	ND	0.16	
111-84-2	n-Nonane	ND	0.69	ND	0.13	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.69	ND	0.10	
98-82-8	Cumene	ND	0.69	ND	0.14	
80-56-8	alpha-Pinene	ND	0.69	ND	0.12	
103-65-1	n-Propylbenzene	ND	0.69	ND	0.14	
622-96-8	4-Ethyltoluene	ND	0.69	ND	0.14	
108-67-8	1,3,5-Trimethylbenzene	ND	0.69	ND	0.14	
95-63-6	1,2,4-Trimethylbenzene	ND	0.69	ND	0.14	
100-44-7	Benzyl Chloride	ND	0.69	ND	0.13	
541-73-1	1,3-Dichlorobenzene	ND	0.69	ND	0.11	
106-46-7	1,4-Dichlorobenzene	ND	0.69	ND	0.11	
95-50-1	1,2-Dichlorobenzene	ND	0.69	ND	0.11	
5989-27-5	d-Limonene	ND	0.69	ND	0.12	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.69	ND	0.071	
120-82-1	1,2,4-Trichlorobenzene	ND	0.69	ND	0.093	
91-20-3	Naphthalene	ND	0.69	ND	0.13	
87-68-3	Hexachlorobutadiene	ND	0.69	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.

RESULTS OF ANALYSIS

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

**Client Sample ID:** B Pond East

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-006

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC01025

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/28/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.43      Final Pressure (psig): 3.60

Canister Dilution Factor: 1.38

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
7.54	Furan	4.7	
8.15	Dimethyl Sulfide	4.4	
9.41	Unidentified Compound	4.0	
11.14	Acetic Acid	4.7	
11.19	2-Methylfuran	5.4	
14.42	Ethyl Propionate	7.1	
16.47	Ethyl Butyrate	8.4	
17.12	Hexamethylcyclotrisiloxane	3.5	

T = Analyte is a tentatively identified compound, result is estimated.

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** C Pond West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-007

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00862

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.36 Final Pressure (psig): 3.65

Canister Dilution Factor: 1.38

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	2.0	0.69	1.2	0.40	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.3	0.69	0.46	0.14	
74-87-3	Chloromethane	ND	0.69	ND	0.33	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.69	ND	0.099	
75-01-4	Vinyl Chloride	ND	0.69	ND	0.27	
106-99-0	1,3-Butadiene	ND	0.69	ND	0.31	
74-83-9	Bromomethane	ND	0.69	ND	0.18	
75-00-3	Chloroethane	ND	0.69	ND	0.26	
64-17-5	Ethanol	ND	6.9	ND	3.7	
75-05-8	Acetonitrile	ND	0.69	ND	0.41	
107-02-8	Acrolein	ND	2.8	ND	1.2	
67-64-1	Acetone	13	6.9	5.5	2.9	
75-69-4	Trichlorofluoromethane	1.3	0.69	0.23	0.12	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.9	ND	2.8	
107-13-1	Acrylonitrile	ND	0.69	ND	0.32	
75-35-4	1,1-Dichloroethene	ND	0.69	ND	0.17	
75-09-2	Methylene Chloride	ND	0.69	ND	0.20	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.69	ND	0.22	
76-13-1	Trichlorotrifluoroethane	ND	0.69	ND	0.090	
75-15-0	Carbon Disulfide	ND	6.9	ND	2.2	
156-60-5	trans-1,2-Dichloroethene	ND	0.69	ND	0.17	
75-34-3	1,1-Dichloroethane	ND	0.69	ND	0.17	
1634-04-4	Methyl tert-Butyl Ether	ND	0.69	ND	0.19	
108-05-4	Vinyl Acetate	ND	6.9	ND	2.0	
78-93-3	2-Butanone (MEK)	ND	6.9	ND	2.3	

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.

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** C Pond West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-007

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00862

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.36 Final Pressure (psig): 3.65

Canister Dilution Factor: 1.38

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.69	ND	0.17	
141-78-6	Ethyl Acetate	8.7	1.4	2.4	0.38	
110-54-3	n-Hexane	ND	0.69	ND	0.20	
67-66-3	Chloroform	ND	0.69	ND	0.14	
109-99-9	Tetrahydrofuran (THF)	3.0	0.69	1.0	0.23	
107-06-2	1,2-Dichloroethane	ND	0.69	ND	0.17	
71-55-6	1,1,1-Trichloroethane	ND	0.69	ND	0.13	
71-43-2	Benzene	16	0.69	5.1	0.22	
56-23-5	Carbon Tetrachloride	ND	0.69	ND	0.11	
110-82-7	Cyclohexane	ND	1.4	ND	0.40	
78-87-5	1,2-Dichloropropane	ND	0.69	ND	0.15	
75-27-4	Bromodichloromethane	ND	0.69	ND	0.10	
79-01-6	Trichloroethene	ND	0.69	ND	0.13	
123-91-1	1,4-Dioxane	ND	0.69	ND	0.19	
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.34	
142-82-5	n-Heptane	ND	0.69	ND	0.17	
10061-01-5	cis-1,3-Dichloropropene	ND	0.69	ND	0.15	
108-10-1	4-Methyl-2-pentanone	ND	0.69	ND	0.17	
10061-02-6	trans-1,3-Dichloropropene	ND	0.69	ND	0.15	
79-00-5	1,1,2-Trichloroethane	ND	0.69	ND	0.13	
108-88-3	Toluene	3.4	0.69	0.90	0.18	
591-78-6	2-Hexanone	ND	0.69	ND	0.17	
124-48-1	Dibromochloromethane	ND	0.69	ND	0.081	
106-93-4	1,2-Dibromoethane	ND	0.69	ND	0.090	
123-86-4	n-Butyl Acetate	ND	0.69	ND	0.15	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** C Pond West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-007

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00862

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -1.36      Final Pressure (psig): 3.65

Canister Dilution Factor: 1.38

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	0.98	0.69	0.21	0.15	
127-18-4	Tetrachloroethene	ND	0.69	ND	0.10	
108-90-7	Chlorobenzene	ND	0.69	ND	0.15	
100-41-4	Ethylbenzene	0.91	0.69	0.21	0.16	
179601-23-1	m,p-Xylenes	3.2	1.4	0.74	0.32	
75-25-2	Bromoform	ND	0.69	ND	0.067	
100-42-5	Styrene	ND	0.69	ND	0.16	
95-47-6	o-Xylene	1.1	0.69	0.26	0.16	
111-84-2	n-Nonane	0.87	0.69	0.17	0.13	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.69	ND	0.10	
98-82-8	Cumene	ND	0.69	ND	0.14	
80-56-8	alpha-Pinene	ND	0.69	ND	0.12	
103-65-1	n-Propylbenzene	ND	0.69	ND	0.14	
622-96-8	4-Ethyltoluene	ND	0.69	ND	0.14	
108-67-8	1,3,5-Trimethylbenzene	ND	0.69	ND	0.14	
95-63-6	1,2,4-Trimethylbenzene	ND	0.69	ND	0.14	
100-44-7	Benzyl Chloride	ND	0.69	ND	0.13	
541-73-1	1,3-Dichlorobenzene	ND	0.69	ND	0.11	
106-46-7	1,4-Dichlorobenzene	ND	0.69	ND	0.11	
95-50-1	1,2-Dichlorobenzene	ND	0.69	ND	0.11	
5989-27-5	d-Limonene	ND	0.69	ND	0.12	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.69	ND	0.071	
120-82-1	1,2,4-Trichlorobenzene	ND	0.69	ND	0.093	
91-20-3	Naphthalene	ND	0.69	ND	0.13	
87-68-3	Hexachlorobutadiene	ND	0.69	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.



RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** C Pond West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-007

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes: **T**  
 Container ID: SC00862

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.36      Final Pressure (psig): 3.65

Canister Dilution Factor: 1.38

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
5.13	Isobutene	2.9	
8.14	Dimethyl Sulfide	2.8	
9.41	Unidentified Compound	3.3	
14.42	Ethyl Propionate	11	
16.47	Ethyl Butyrate	11	
17.12	Hexamethylcyclotrisiloxane	3.4	

T = Analyte is a tentatively identified compound, result is estimated.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** D Summit  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-008

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00104

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.99 Final Pressure (psig): 3.67

Canister Dilution Factor: 1.34

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	ND	0.67	ND	0.39	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.2</b>	0.67	<b>0.45</b>	0.14	
74-87-3	Chloromethane	ND	0.67	ND	0.32	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.67	ND	0.096	
75-01-4	Vinyl Chloride	ND	0.67	ND	0.26	
106-99-0	1,3-Butadiene	ND	0.67	ND	0.30	
74-83-9	Bromomethane	ND	0.67	ND	0.17	
75-00-3	Chloroethane	ND	0.67	ND	0.25	
64-17-5	Ethanol	ND	6.7	ND	3.6	
75-05-8	Acetonitrile	ND	0.67	ND	0.40	
107-02-8	Acrolein	ND	2.7	ND	1.2	
67-64-1	Acetone	<b>13</b>	6.7	<b>5.4</b>	2.8	
75-69-4	Trichlorofluoromethane	<b>1.3</b>	0.67	<b>0.24</b>	0.12	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.7	ND	2.7	
107-13-1	Acrylonitrile	ND	0.67	ND	0.31	
75-35-4	1,1-Dichloroethene	ND	0.67	ND	0.17	
75-09-2	Methylene Chloride	ND	0.67	ND	0.19	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.67	ND	0.21	
76-13-1	Trichlorotrifluoroethane	ND	0.67	ND	0.087	
75-15-0	Carbon Disulfide	ND	6.7	ND	2.2	
156-60-5	trans-1,2-Dichloroethene	ND	0.67	ND	0.17	
75-34-3	1,1-Dichloroethane	ND	0.67	ND	0.17	
1634-04-4	Methyl tert-Butyl Ether	ND	0.67	ND	0.19	
108-05-4	Vinyl Acetate	ND	6.7	ND	1.9	
78-93-3	2-Butanone (MEK)	ND	6.7	ND	2.3	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** D Summit  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-008

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00104

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -0.99 Final Pressure (psig): 3.67

Canister Dilution Factor: 1.34

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.67	ND	0.17	
141-78-6	Ethyl Acetate	8.0	1.3	2.2	0.37	
110-54-3	n-Hexane	ND	0.67	ND	0.19	
67-66-3	Chloroform	ND	0.67	ND	0.14	
109-99-9	Tetrahydrofuran (THF)	ND	0.67	ND	0.23	
107-06-2	1,2-Dichloroethane	ND	0.67	ND	0.17	
71-55-6	1,1,1-Trichloroethane	ND	0.67	ND	0.12	
71-43-2	Benzene	ND	0.67	ND	0.21	
56-23-5	Carbon Tetrachloride	ND	0.67	ND	0.11	
110-82-7	Cyclohexane	ND	1.3	ND	0.39	
78-87-5	1,2-Dichloropropane	ND	0.67	ND	0.15	
75-27-4	Bromodichloromethane	ND	0.67	ND	0.10	
79-01-6	Trichloroethene	ND	0.67	ND	0.12	
123-91-1	1,4-Dioxane	ND	0.67	ND	0.19	
80-62-6	Methyl Methacrylate	ND	1.3	ND	0.33	
142-82-5	n-Heptane	ND	0.67	ND	0.16	
10061-01-5	cis-1,3-Dichloropropene	ND	0.67	ND	0.15	
108-10-1	4-Methyl-2-pentanone	ND	0.67	ND	0.16	
10061-02-6	trans-1,3-Dichloropropene	ND	0.67	ND	0.15	
79-00-5	1,1,2-Trichloroethane	ND	0.67	ND	0.12	
108-88-3	Toluene	1.7	0.67	0.46	0.18	
591-78-6	2-Hexanone	ND	0.67	ND	0.16	
124-48-1	Dibromochloromethane	ND	0.67	ND	0.079	
106-93-4	1,2-Dibromoethane	ND	0.67	ND	0.087	
123-86-4	n-Butyl Acetate	ND	0.67	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.

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** D Summit  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-008

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00104

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.99 Final Pressure (psig): 3.67

Canister Dilution Factor: 1.34

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.67	ND	0.14	
127-18-4	Tetrachloroethene	ND	0.67	ND	0.099	
108-90-7	Chlorobenzene	ND	0.67	ND	0.15	
100-41-4	Ethylbenzene	ND	0.67	ND	0.15	
179601-23-1	m,p-Xylenes	ND	1.3	ND	0.31	
75-25-2	Bromoform	ND	0.67	ND	0.065	
100-42-5	Styrene	ND	0.67	ND	0.16	
95-47-6	o-Xylene	ND	0.67	ND	0.15	
111-84-2	n-Nonane	ND	0.67	ND	0.13	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.67	ND	0.098	
98-82-8	Cumene	ND	0.67	ND	0.14	
80-56-8	alpha-Pinene	ND	0.67	ND	0.12	
103-65-1	n-Propylbenzene	ND	0.67	ND	0.14	
622-96-8	4-Ethyltoluene	ND	0.67	ND	0.14	
108-67-8	1,3,5-Trimethylbenzene	ND	0.67	ND	0.14	
95-63-6	1,2,4-Trimethylbenzene	ND	0.67	ND	0.14	
100-44-7	Benzyl Chloride	ND	0.67	ND	0.13	
541-73-1	1,3-Dichlorobenzene	ND	0.67	ND	0.11	
106-46-7	1,4-Dichlorobenzene	ND	0.67	ND	0.11	
95-50-1	1,2-Dichlorobenzene	ND	0.67	ND	0.11	
5989-27-5	d-Limonene	ND	0.67	ND	0.12	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.67	ND	0.069	
120-82-1	1,2,4-Trichlorobenzene	ND	0.67	ND	0.090	
91-20-3	Naphthalene	ND	0.67	ND	0.13	
87-68-3	Hexachlorobutadiene	ND	0.67	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.

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** D Summit

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-008

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC00104

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/28/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.99      Final Pressure (psig): 3.67

Canister Dilution Factor: 1.34

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
14.42	Ethyl Propionate	9.9	
16.47	Ethyl Butyrate	9.7	
18.27	2-Butoxyethanol	2.8	

T = Analyte is a tentatively identified compound, result is estimated.

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** E Amphitheater  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-009

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00884

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55 Final Pressure (psig): 3.62

Canister Dilution Factor: 1.51

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	ND	0.76	ND	0.44	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.1</b>	0.76	<b>0.42</b>	0.15	
74-87-3	Chloromethane	ND	0.76	ND	0.37	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.76	ND	0.11	
75-01-4	Vinyl Chloride	ND	0.76	ND	0.30	
106-99-0	1,3-Butadiene	ND	0.76	ND	0.34	
74-83-9	Bromomethane	ND	0.76	ND	0.19	
75-00-3	Chloroethane	ND	0.76	ND	0.29	
64-17-5	Ethanol	<b>16</b>	7.6	<b>8.4</b>	4.0	
75-05-8	Acetonitrile	<b>0.76</b>	0.76	<b>0.45</b>	0.45	
107-02-8	Acrolein	ND	3.0	ND	1.3	
67-64-1	Acetone	<b>14</b>	7.6	<b>6.0</b>	3.2	
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.76	<b>0.19</b>	0.13	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.6	ND	3.1	
107-13-1	Acrylonitrile	ND	0.76	ND	0.35	
75-35-4	1,1-Dichloroethene	ND	0.76	ND	0.19	
75-09-2	Methylene Chloride	ND	0.76	ND	0.22	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.76	ND	0.24	
76-13-1	Trichlorotrifluoroethane	ND	0.76	ND	0.099	
75-15-0	Carbon Disulfide	ND	7.6	ND	2.4	
156-60-5	trans-1,2-Dichloroethene	ND	0.76	ND	0.19	
75-34-3	1,1-Dichloroethane	ND	0.76	ND	0.19	
1634-04-4	Methyl tert-Butyl Ether	ND	0.76	ND	0.21	
108-05-4	Vinyl Acetate	ND	7.6	ND	2.1	
78-93-3	2-Butanone (MEK)	ND	7.6	ND	2.6	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** E Amphitheater  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-009

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00884

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55 Final Pressure (psig): 3.62

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.76	ND	0.19	
141-78-6	Ethyl Acetate	3.1	1.5	0.85	0.42	
110-54-3	n-Hexane	ND	0.76	ND	0.21	
67-66-3	Chloroform	ND	0.76	ND	0.15	
109-99-9	Tetrahydrofuran (THF)	ND	0.76	ND	0.26	
107-06-2	1,2-Dichloroethane	ND	0.76	ND	0.19	
71-55-6	1,1,1-Trichloroethane	ND	0.76	ND	0.14	
71-43-2	Benzene	1.1	0.76	0.34	0.24	
56-23-5	Carbon Tetrachloride	ND	0.76	ND	0.12	
110-82-7	Cyclohexane	ND	1.5	ND	0.44	
78-87-5	1,2-Dichloropropane	ND	0.76	ND	0.16	
75-27-4	Bromodichloromethane	ND	0.76	ND	0.11	
79-01-6	Trichloroethene	ND	0.76	ND	0.14	
123-91-1	1,4-Dioxane	ND	0.76	ND	0.21	
80-62-6	Methyl Methacrylate	ND	1.5	ND	0.37	
142-82-5	n-Heptane	ND	0.76	ND	0.18	
10061-01-5	cis-1,3-Dichloropropene	ND	0.76	ND	0.17	
108-10-1	4-Methyl-2-pentanone	ND	0.76	ND	0.18	
10061-02-6	trans-1,3-Dichloropropene	ND	0.76	ND	0.17	
79-00-5	1,1,2-Trichloroethane	ND	0.76	ND	0.14	
108-88-3	Toluene	1.6	0.76	0.43	0.20	
591-78-6	2-Hexanone	ND	0.76	ND	0.18	
124-48-1	Dibromochloromethane	ND	0.76	ND	0.089	
106-93-4	1,2-Dibromoethane	ND	0.76	ND	0.098	
123-86-4	n-Butyl Acetate	ND	0.76	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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** E Amphitheater  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-009

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00884

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.62

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.76	ND	0.16	
127-18-4	Tetrachloroethene	ND	0.76	ND	0.11	
108-90-7	Chlorobenzene	ND	0.76	ND	0.16	
100-41-4	Ethylbenzene	ND	0.76	ND	0.17	
179601-23-1	m,p-Xylenes	ND	1.5	ND	0.35	
75-25-2	Bromoform	ND	0.76	ND	0.073	
100-42-5	Styrene	ND	0.76	ND	0.18	
95-47-6	o-Xylene	ND	0.76	ND	0.17	
111-84-2	n-Nonane	ND	0.76	ND	0.14	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.76	ND	0.11	
98-82-8	Cumene	ND	0.76	ND	0.15	
80-56-8	alpha-Pinene	ND	0.76	ND	0.14	
103-65-1	n-Propylbenzene	ND	0.76	ND	0.15	
622-96-8	4-Ethyltoluene	ND	0.76	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.76	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	ND	0.76	ND	0.15	
100-44-7	Benzyl Chloride	ND	0.76	ND	0.15	
541-73-1	1,3-Dichlorobenzene	ND	0.76	ND	0.13	
106-46-7	1,4-Dichlorobenzene	ND	0.76	ND	0.13	
95-50-1	1,2-Dichlorobenzene	ND	0.76	ND	0.13	
5989-27-5	d-Limonene	ND	0.76	ND	0.14	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.76	ND	0.078	
120-82-1	1,2,4-Trichlorobenzene	ND	0.76	ND	0.10	
91-20-3	Naphthalene	ND	0.76	ND	0.14	
87-68-3	Hexachlorobutadiene	ND	0.76	ND	0.071	

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.



RESULTS OF ANALYSIS

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

**Client Sample ID:** E Amphitheater

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-009

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC00884

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/28/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.62

Canister Dilution Factor: 1.51

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
7.06	Isopentane	4.9	
14.42	Ethyl Propionate	4.1	
16.47	Ethyl Butyrate	5.9	

T = Analyte is a tentatively identified compound, result is estimated.

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** F Grassy Knoll Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-010

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00790

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07 Final Pressure (psig): 3.64

Canister Dilution Factor: 1.58

CAS #	Compound	Result		MRL		Data Qualifier
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	ppbV	ppbV	
115-07-1	Propene	ND	0.79	ND	0.46	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.1</b>	0.79	<b>0.43</b>	0.16	
74-87-3	Chloromethane	ND	0.79	ND	0.38	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.79	ND	0.11	
75-01-4	Vinyl Chloride	ND	0.79	ND	0.31	
106-99-0	1,3-Butadiene	ND	0.79	ND	0.36	
74-83-9	Bromomethane	ND	0.79	ND	0.20	
75-00-3	Chloroethane	ND	0.79	ND	0.30	
64-17-5	Ethanol	ND	7.9	ND	4.2	
75-05-8	Acetonitrile	ND	0.79	ND	0.47	
107-02-8	Acrolein	ND	3.2	ND	1.4	
67-64-1	Acetone	<b>12</b>	7.9	<b>4.9</b>	3.3	
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.79	<b>0.20</b>	0.14	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.9	ND	3.2	
107-13-1	Acrylonitrile	ND	0.79	ND	0.36	
75-35-4	1,1-Dichloroethene	ND	0.79	ND	0.20	
75-09-2	Methylene Chloride	ND	0.79	ND	0.23	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.79	ND	0.25	
76-13-1	Trichlorotrifluoroethane	ND	0.79	ND	0.10	
75-15-0	Carbon Disulfide	ND	7.9	ND	2.5	
156-60-5	trans-1,2-Dichloroethene	ND	0.79	ND	0.20	
75-34-3	1,1-Dichloroethane	ND	0.79	ND	0.20	
1634-04-4	Methyl tert-Butyl Ether	ND	0.79	ND	0.22	
108-05-4	Vinyl Acetate	ND	7.9	ND	2.2	
78-93-3	2-Butanone (MEK)	ND	7.9	ND	2.7	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** F Grassy Knoll Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-010

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00790

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -3.07 Final Pressure (psig): 3.64

Canister Dilution Factor: 1.58

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.79	ND	0.20	
141-78-6	Ethyl Acetate	<b>2.6</b>	1.6	<b>0.71</b>	0.44	
110-54-3	n-Hexane	ND	0.79	ND	0.22	
67-66-3	Chloroform	ND	0.79	ND	0.16	
109-99-9	Tetrahydrofuran (THF)	ND	0.79	ND	0.27	
107-06-2	1,2-Dichloroethane	ND	0.79	ND	0.20	
71-55-6	1,1,1-Trichloroethane	ND	0.79	ND	0.14	
71-43-2	Benzene	ND	0.79	ND	0.25	
56-23-5	Carbon Tetrachloride	ND	0.79	ND	0.13	
110-82-7	Cyclohexane	ND	1.6	ND	0.46	
78-87-5	1,2-Dichloropropane	ND	0.79	ND	0.17	
75-27-4	Bromodichloromethane	ND	0.79	ND	0.12	
79-01-6	Trichloroethene	ND	0.79	ND	0.15	
123-91-1	1,4-Dioxane	ND	0.79	ND	0.22	
80-62-6	Methyl Methacrylate	ND	1.6	ND	0.39	
142-82-5	n-Heptane	ND	0.79	ND	0.19	
10061-01-5	cis-1,3-Dichloropropene	ND	0.79	ND	0.17	
108-10-1	4-Methyl-2-pentanone	ND	0.79	ND	0.19	
10061-02-6	trans-1,3-Dichloropropene	ND	0.79	ND	0.17	
79-00-5	1,1,2-Trichloroethane	ND	0.79	ND	0.14	
108-88-3	Toluene	<b>1.0</b>	0.79	<b>0.28</b>	0.21	
591-78-6	2-Hexanone	ND	0.79	ND	0.19	
124-48-1	Dibromochloromethane	ND	0.79	ND	0.093	
106-93-4	1,2-Dibromoethane	ND	0.79	ND	0.10	
123-86-4	n-Butyl Acetate	ND	0.79	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.

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** F Grassy Knoll Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-010

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00790

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07 Final Pressure (psig): 3.64

Canister Dilution Factor: 1.58

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.79	ND	0.17	
127-18-4	Tetrachloroethene	1.4	0.79	0.20	0.12	
108-90-7	Chlorobenzene	ND	0.79	ND	0.17	
100-41-4	Ethylbenzene	ND	0.79	ND	0.18	
179601-23-1	m,p-Xylenes	ND	1.6	ND	0.36	
75-25-2	Bromoform	ND	0.79	ND	0.076	
100-42-5	Styrene	ND	0.79	ND	0.19	
95-47-6	o-Xylene	ND	0.79	ND	0.18	
111-84-2	n-Nonane	ND	0.79	ND	0.15	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.79	ND	0.12	
98-82-8	Cumene	ND	0.79	ND	0.16	
80-56-8	alpha-Pinene	ND	0.79	ND	0.14	
103-65-1	n-Propylbenzene	ND	0.79	ND	0.16	
622-96-8	4-Ethyltoluene	ND	0.79	ND	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.79	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	ND	0.79	ND	0.16	
100-44-7	Benzyl Chloride	ND	0.79	ND	0.15	
541-73-1	1,3-Dichlorobenzene	ND	0.79	ND	0.13	
106-46-7	1,4-Dichlorobenzene	ND	0.79	ND	0.13	
95-50-1	1,2-Dichlorobenzene	ND	0.79	ND	0.13	
5989-27-5	d-Limonene	ND	0.79	ND	0.14	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.79	ND	0.082	
120-82-1	1,2,4-Trichlorobenzene	ND	0.79	ND	0.11	
91-20-3	Naphthalene	ND	0.79	ND	0.15	
87-68-3	Hexachlorobutadiene	ND	0.79	ND	0.074	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** F Grassy Knoll Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-010

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes: **T**  
 Container ID: SC00790

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07      Final Pressure (psig): 3.64

Canister Dilution Factor: 1.58

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
9.41	Unidentified Compound	3.3	
14.42	Ethyl Propionate	5.0	
16.47	Ethyl Butyrate	7.6	
17.12	Hexamethylcyclotrisiloxane	3.3	

T = Analyte is a tentatively identified compound, result is estimated.

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** G Grassy Knoll West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-011

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00925

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -2.68      Final Pressure (psig): 3.72

Canister Dilution Factor: 1.53

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	ND	0.77	ND	0.44	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.2	0.77	0.45	0.15	
74-87-3	Chloromethane	ND	0.77	ND	0.37	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.77	ND	0.11	
75-01-4	Vinyl Chloride	ND	0.77	ND	0.30	
106-99-0	1,3-Butadiene	ND	0.77	ND	0.35	
74-83-9	Bromomethane	ND	0.77	ND	0.20	
75-00-3	Chloroethane	ND	0.77	ND	0.29	
64-17-5	Ethanol	ND	7.7	ND	4.1	
75-05-8	Acetonitrile	ND	0.77	ND	0.46	
107-02-8	Acrolein	ND	3.1	ND	1.3	
67-64-1	Acetone	13	7.7	5.5	3.2	
75-69-4	Trichlorofluoromethane	1.2	0.77	0.21	0.14	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.7	ND	3.1	
107-13-1	Acrylonitrile	ND	0.77	ND	0.35	
75-35-4	1,1-Dichloroethene	ND	0.77	ND	0.19	
75-09-2	Methylene Chloride	ND	0.77	ND	0.22	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.77	ND	0.24	
76-13-1	Trichlorotrifluoroethane	ND	0.77	ND	0.10	
75-15-0	Carbon Disulfide	ND	7.7	ND	2.5	
156-60-5	trans-1,2-Dichloroethene	ND	0.77	ND	0.19	
75-34-3	1,1-Dichloroethane	ND	0.77	ND	0.19	
1634-04-4	Methyl tert-Butyl Ether	ND	0.77	ND	0.21	
108-05-4	Vinyl Acetate	ND	7.7	ND	2.2	
78-93-3	2-Butanone (MEK)	ND	7.7	ND	2.6	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** G Grassy Knoll West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-011

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00925

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.68 Final Pressure (psig): 3.72

Canister Dilution Factor: 1.53

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.77	ND	0.19	
141-78-6	Ethyl Acetate	<b>3.0</b>	1.5	<b>0.83</b>	0.42	
110-54-3	n-Hexane	ND	0.77	ND	0.22	
67-66-3	Chloroform	ND	0.77	ND	0.16	
109-99-9	Tetrahydrofuran (THF)	ND	0.77	ND	0.26	
107-06-2	1,2-Dichloroethane	ND	0.77	ND	0.19	
71-55-6	1,1,1-Trichloroethane	ND	0.77	ND	0.14	
71-43-2	Benzene	ND	0.77	ND	0.24	
56-23-5	Carbon Tetrachloride	ND	0.77	ND	0.12	
110-82-7	Cyclohexane	ND	1.5	ND	0.44	
78-87-5	1,2-Dichloropropane	ND	0.77	ND	0.17	
75-27-4	Bromodichloromethane	ND	0.77	ND	0.11	
79-01-6	Trichloroethene	ND	0.77	ND	0.14	
123-91-1	1,4-Dioxane	ND	0.77	ND	0.21	
80-62-6	Methyl Methacrylate	ND	1.5	ND	0.37	
142-82-5	n-Heptane	ND	0.77	ND	0.19	
10061-01-5	cis-1,3-Dichloropropene	ND	0.77	ND	0.17	
108-10-1	4-Methyl-2-pentanone	ND	0.77	ND	0.19	
10061-02-6	trans-1,3-Dichloropropene	ND	0.77	ND	0.17	
79-00-5	1,1,2-Trichloroethane	ND	0.77	ND	0.14	
108-88-3	Toluene	<b>1.4</b>	0.77	<b>0.38</b>	0.20	
591-78-6	2-Hexanone	ND	0.77	ND	0.19	
124-48-1	Dibromochloromethane	ND	0.77	ND	0.090	
106-93-4	1,2-Dibromoethane	ND	0.77	ND	0.10	
123-86-4	n-Butyl Acetate	ND	0.77	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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** G Grassy Knoll West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-011

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00925

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.68 Final Pressure (psig): 3.72

Canister Dilution Factor: 1.53

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.77	ND	0.16	
127-18-4	Tetrachloroethene	ND	0.77	ND	0.11	
108-90-7	Chlorobenzene	ND	0.77	ND	0.17	
100-41-4	Ethylbenzene	ND	0.77	ND	0.18	
179601-23-1	m,p-Xylenes	ND	1.5	ND	0.35	
75-25-2	Bromoform	ND	0.77	ND	0.074	
100-42-5	Styrene	ND	0.77	ND	0.18	
95-47-6	o-Xylene	ND	0.77	ND	0.18	
111-84-2	n-Nonane	ND	0.77	ND	0.15	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.77	ND	0.11	
98-82-8	Cumene	ND	0.77	ND	0.16	
80-56-8	alpha-Pinene	ND	0.77	ND	0.14	
103-65-1	n-Propylbenzene	ND	0.77	ND	0.16	
622-96-8	4-Ethyltoluene	ND	0.77	ND	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.77	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	ND	0.77	ND	0.16	
100-44-7	Benzyl Chloride	ND	0.77	ND	0.15	
541-73-1	1,3-Dichlorobenzene	ND	0.77	ND	0.13	
106-46-7	1,4-Dichlorobenzene	ND	0.77	ND	0.13	
95-50-1	1,2-Dichlorobenzene	ND	0.77	ND	0.13	
5989-27-5	d-Limonene	ND	0.77	ND	0.14	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.77	ND	0.079	
120-82-1	1,2,4-Trichlorobenzene	ND	0.77	ND	0.10	
91-20-3	Naphthalene	ND	0.77	ND	0.15	
87-68-3	Hexachlorobutadiene	ND	0.77	ND	0.072	

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.



RESULTS OF ANALYSIS

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

**Client Sample ID:** G Grassy Knoll West

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-011

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC00925

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.68      Final Pressure (psig): 3.72

Canister Dilution Factor: 1.53

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
11.10	Acetic Acid	3.7	
14.42	Ethyl Propionate	4.7	
16.47	Ethyl Butyrate	6.5	

T = Analyte is a tentatively identified compound, result is estimated.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-012

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00078

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65      Final Pressure (psig): 3.70

Canister Dilution Factor: 1.53

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	ND	0.77	ND	0.44	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.2</b>	0.77	<b>0.44</b>	0.15	
74-87-3	Chloromethane	ND	0.77	ND	0.37	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.77	ND	0.11	
75-01-4	Vinyl Chloride	ND	0.77	ND	0.30	
106-99-0	1,3-Butadiene	ND	0.77	ND	0.35	
74-83-9	Bromomethane	ND	0.77	ND	0.20	
75-00-3	Chloroethane	ND	0.77	ND	0.29	
64-17-5	Ethanol	ND	7.7	ND	4.1	
75-05-8	Acetonitrile	ND	0.77	ND	0.46	
107-02-8	Acrolein	ND	3.1	ND	1.3	
67-64-1	Acetone	<b>21</b>	7.7	<b>8.9</b>	3.2	
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.77	<b>0.20</b>	0.14	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.7	ND	3.1	
107-13-1	Acrylonitrile	ND	0.77	ND	0.35	
75-35-4	1,1-Dichloroethene	ND	0.77	ND	0.19	
75-09-2	Methylene Chloride	ND	0.77	ND	0.22	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.77	ND	0.24	
76-13-1	Trichlorotrifluoroethane	ND	0.77	ND	0.10	
75-15-0	Carbon Disulfide	ND	7.7	ND	2.5	
156-60-5	trans-1,2-Dichloroethene	ND	0.77	ND	0.19	
75-34-3	1,1-Dichloroethane	ND	0.77	ND	0.19	
1634-04-4	Methyl tert-Butyl Ether	ND	0.77	ND	0.21	
108-05-4	Vinyl Acetate	ND	7.7	ND	2.2	
78-93-3	2-Butanone (MEK)	ND	7.7	ND	2.6	

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.

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-012

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00078

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -2.65      Final Pressure (psig): 3.70

Canister Dilution Factor: 1.53

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.77	ND	0.19	
141-78-6	Ethyl Acetate	2.7	1.5	0.74	0.42	
110-54-3	n-Hexane	ND	0.77	ND	0.22	
67-66-3	Chloroform	ND	0.77	ND	0.16	
109-99-9	Tetrahydrofuran (THF)	ND	0.77	ND	0.26	
107-06-2	1,2-Dichloroethane	ND	0.77	ND	0.19	
71-55-6	1,1,1-Trichloroethane	ND	0.77	ND	0.14	
71-43-2	Benzene	ND	0.77	ND	0.24	
56-23-5	Carbon Tetrachloride	ND	0.77	ND	0.12	
110-82-7	Cyclohexane	ND	1.5	ND	0.44	
78-87-5	1,2-Dichloropropane	ND	0.77	ND	0.17	
75-27-4	Bromodichloromethane	ND	0.77	ND	0.11	
79-01-6	Trichloroethene	ND	0.77	ND	0.14	
123-91-1	1,4-Dioxane	ND	0.77	ND	0.21	
80-62-6	Methyl Methacrylate	ND	1.5	ND	0.37	
142-82-5	n-Heptane	ND	0.77	ND	0.19	
10061-01-5	cis-1,3-Dichloropropene	ND	0.77	ND	0.17	
108-10-1	4-Methyl-2-pentanone	ND	0.77	ND	0.19	
10061-02-6	trans-1,3-Dichloropropene	ND	0.77	ND	0.17	
79-00-5	1,1,2-Trichloroethane	ND	0.77	ND	0.14	
108-88-3	Toluene	1.1	0.77	0.29	0.20	
591-78-6	2-Hexanone	ND	0.77	ND	0.19	
124-48-1	Dibromochloromethane	ND	0.77	ND	0.090	
106-93-4	1,2-Dibromoethane	ND	0.77	ND	0.10	
123-86-4	n-Butyl Acetate	ND	0.77	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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-012

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00078

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -2.65 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.53

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.77	ND	0.16	
127-18-4	Tetrachloroethene	ND	0.77	ND	0.11	
108-90-7	Chlorobenzene	ND	0.77	ND	0.17	
100-41-4	Ethylbenzene	ND	0.77	ND	0.18	
179601-23-1	m,p-Xylenes	ND	1.5	ND	0.35	
75-25-2	Bromoform	ND	0.77	ND	0.074	
100-42-5	Styrene	ND	0.77	ND	0.18	
95-47-6	o-Xylene	ND	0.77	ND	0.18	
111-84-2	n-Nonane	ND	0.77	ND	0.15	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.77	ND	0.11	
98-82-8	Cumene	ND	0.77	ND	0.16	
80-56-8	alpha-Pinene	ND	0.77	ND	0.14	
103-65-1	n-Propylbenzene	ND	0.77	ND	0.16	
622-96-8	4-Ethyltoluene	ND	0.77	ND	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.77	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	ND	0.77	ND	0.16	
100-44-7	Benzyl Chloride	ND	0.77	ND	0.15	
541-73-1	1,3-Dichlorobenzene	ND	0.77	ND	0.13	
106-46-7	1,4-Dichlorobenzene	ND	0.77	ND	0.13	
95-50-1	1,2-Dichlorobenzene	ND	0.77	ND	0.13	
5989-27-5	d-Limonene	ND	0.77	ND	0.14	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.77	ND	0.079	
120-82-1	1,2,4-Trichlorobenzene	ND	0.77	ND	0.10	
91-20-3	Naphthalene	ND	0.77	ND	0.15	
87-68-3	Hexachlorobutadiene	ND	0.77	ND	0.072	

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.

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-012

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes: **T**  
 Container ID: SC00078

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65      Final Pressure (psig): 3.70

Canister Dilution Factor: 1.53

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
9.41	Unidentified Compound	4.6	
14.42	Ethyl Propionate	5.2	
16.47	Ethyl Butyrate	7.9	
17.12	Hexamethylcyclotrisiloxane	12	
19.00	Benzaldehyde	3.4	

T = Analyte is a tentatively identified compound, result is estimated.

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** I East Fenceline #1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-013

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00091

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.85 Final Pressure (psig): 3.69

Canister Dilution Factor: 1.43

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	1.8	0.72	1.0	0.42	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.2	0.72	0.45	0.14	
74-87-3	Chloromethane	ND	0.72	ND	0.35	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.72	ND	0.10	
75-01-4	Vinyl Chloride	ND	0.72	ND	0.28	
106-99-0	1,3-Butadiene	ND	0.72	ND	0.32	
74-83-9	Bromomethane	ND	0.72	ND	0.18	
75-00-3	Chloroethane	ND	0.72	ND	0.27	
64-17-5	Ethanol	ND	7.2	ND	3.8	
75-05-8	Acetonitrile	0.88	0.72	0.52	0.43	
107-02-8	Acrolein	ND	2.9	ND	1.2	
67-64-1	Acetone	11	7.2	4.5	3.0	
75-69-4	Trichlorofluoromethane	1.1	0.72	0.20	0.13	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.2	ND	2.9	
107-13-1	Acrylonitrile	ND	0.72	ND	0.33	
75-35-4	1,1-Dichloroethene	ND	0.72	ND	0.18	
75-09-2	Methylene Chloride	0.94	0.72	0.27	0.21	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.72	ND	0.23	
76-13-1	Trichlorotrifluoroethane	ND	0.72	ND	0.093	
75-15-0	Carbon Disulfide	ND	7.2	ND	2.3	
156-60-5	trans-1,2-Dichloroethene	ND	0.72	ND	0.18	
75-34-3	1,1-Dichloroethane	ND	0.72	ND	0.18	
1634-04-4	Methyl tert-Butyl Ether	ND	0.72	ND	0.20	
108-05-4	Vinyl Acetate	ND	7.2	ND	2.0	
78-93-3	2-Butanone (MEK)	ND	7.2	ND	2.4	

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.

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** I East Fenceline #1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-013

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00091

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -1.85 Final Pressure (psig): 3.69

Canister Dilution Factor: 1.43

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.72	ND	0.18	
141-78-6	Ethyl Acetate	ND	1.4	ND	0.40	
110-54-3	n-Hexane	ND	0.72	ND	0.20	
67-66-3	Chloroform	ND	0.72	ND	0.15	
109-99-9	Tetrahydrofuran (THF)	2.5	0.72	0.85	0.24	
107-06-2	1,2-Dichloroethane	ND	0.72	ND	0.18	
71-55-6	1,1,1-Trichloroethane	ND	0.72	ND	0.13	
71-43-2	Benzene	11	0.72	3.4	0.22	
56-23-5	Carbon Tetrachloride	ND	0.72	ND	0.11	
110-82-7	Cyclohexane	ND	1.4	ND	0.42	
78-87-5	1,2-Dichloropropane	ND	0.72	ND	0.15	
75-27-4	Bromodichloromethane	ND	0.72	ND	0.11	
79-01-6	Trichloroethene	ND	0.72	ND	0.13	
123-91-1	1,4-Dioxane	ND	0.72	ND	0.20	
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.35	
142-82-5	n-Heptane	ND	0.72	ND	0.17	
10061-01-5	cis-1,3-Dichloropropene	ND	0.72	ND	0.16	
108-10-1	4-Methyl-2-pentanone	ND	0.72	ND	0.17	
10061-02-6	trans-1,3-Dichloropropene	ND	0.72	ND	0.16	
79-00-5	1,1,2-Trichloroethane	ND	0.72	ND	0.13	
108-88-3	Toluene	2.0	0.72	0.52	0.19	
591-78-6	2-Hexanone	ND	0.72	ND	0.17	
124-48-1	Dibromochloromethane	ND	0.72	ND	0.084	
106-93-4	1,2-Dibromoethane	ND	0.72	ND	0.093	
123-86-4	n-Butyl Acetate	ND	0.72	ND	0.15	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** I East Fenceline #1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-013

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00091

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.85 Final Pressure (psig): 3.69

Canister Dilution Factor: 1.43

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.72	ND	0.15	
127-18-4	Tetrachloroethene	ND	0.72	ND	0.11	
108-90-7	Chlorobenzene	ND	0.72	ND	0.16	
100-41-4	Ethylbenzene	ND	0.72	ND	0.16	
179601-23-1	m,p-Xylenes	ND	1.4	ND	0.33	
75-25-2	Bromoform	ND	0.72	ND	0.069	
100-42-5	Styrene	ND	0.72	ND	0.17	
95-47-6	o-Xylene	ND	0.72	ND	0.16	
111-84-2	n-Nonane	ND	0.72	ND	0.14	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.72	ND	0.10	
98-82-8	Cumene	ND	0.72	ND	0.15	
80-56-8	alpha-Pinene	<b>1.1</b>	0.72	<b>0.19</b>	0.13	
103-65-1	n-Propylbenzene	ND	0.72	ND	0.15	
622-96-8	4-Ethyltoluene	ND	0.72	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.72	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	ND	0.72	ND	0.15	
100-44-7	Benzyl Chloride	ND	0.72	ND	0.14	
541-73-1	1,3-Dichlorobenzene	ND	0.72	ND	0.12	
106-46-7	1,4-Dichlorobenzene	ND	0.72	ND	0.12	
95-50-1	1,2-Dichlorobenzene	ND	0.72	ND	0.12	
5989-27-5	d-Limonene	ND	0.72	ND	0.13	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.72	ND	0.074	
120-82-1	1,2,4-Trichlorobenzene	ND	0.72	ND	0.096	
91-20-3	Naphthalene	ND	0.72	ND	0.14	
87-68-3	Hexachlorobutadiene	ND	0.72	ND	0.067	

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.



RESULTS OF ANALYSIS

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

**Client Sample ID:** I East Fenceline #1

CAS Project ID: P1203506

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Sample ID: P1203506-013

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Date Collected: 8/21/12

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Date Received: 8/24/12

Analyst: Lusine Hakobyan

Date Analyzed: 8/29/12

Sampling Media: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes: **T**

Container ID: SC00091

Initial Pressure (psig): -1.85      Final Pressure (psig): 3.69

Canister Dilution Factor: 1.43

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
7.54	Furan	3.5	
8.14	Dimethyl Sulfide	5.2	
9.40	Unidentified Compound	3.1	
11.19	2-Methylfuran	3.9	
16.47	Ethyl Butyrate	3.9	
17.12	Hexamethylcyclotrisiloxane	15	

T = Analyte is a tentatively identified compound, result is estimated.

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** J East Fenceline #2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-014

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00905

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55 Final Pressure (psig): 3.59

Canister Dilution Factor: 1.51

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	1.1	0.76	0.64	0.44	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.2	0.76	0.44	0.15	
74-87-3	Chloromethane	ND	0.76	ND	0.37	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.76	ND	0.11	
75-01-4	Vinyl Chloride	ND	0.76	ND	0.30	
106-99-0	1,3-Butadiene	ND	0.76	ND	0.34	
74-83-9	Bromomethane	ND	0.76	ND	0.19	
75-00-3	Chloroethane	ND	0.76	ND	0.29	
64-17-5	Ethanol	12	7.6	6.2	4.0	
75-05-8	Acetonitrile	14	0.76	8.1	0.45	
107-02-8	Acrolein	ND	3.0	ND	1.3	
67-64-1	Acetone	ND	7.6	ND	3.2	
75-69-4	Trichlorofluoromethane	1.1	0.76	0.20	0.13	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.6	ND	3.1	
107-13-1	Acrylonitrile	ND	0.76	ND	0.35	
75-35-4	1,1-Dichloroethene	ND	0.76	ND	0.19	
75-09-2	Methylene Chloride	0.79	0.76	0.23	0.22	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.76	ND	0.24	
76-13-1	Trichlorotrifluoroethane	ND	0.76	ND	0.099	
75-15-0	Carbon Disulfide	ND	7.6	ND	2.4	
156-60-5	trans-1,2-Dichloroethene	ND	0.76	ND	0.19	
75-34-3	1,1-Dichloroethane	ND	0.76	ND	0.19	
1634-04-4	Methyl tert-Butyl Ether	ND	0.76	ND	0.21	
108-05-4	Vinyl Acetate	ND	7.6	ND	2.1	
78-93-3	2-Butanone (MEK)	ND	7.6	ND	2.6	

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.

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** J East Fenceline #2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-014

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00905

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.59

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.76	ND	0.19	
141-78-6	Ethyl Acetate	ND	1.5	ND	0.42	
110-54-3	n-Hexane	ND	0.76	ND	0.21	
67-66-3	Chloroform	ND	0.76	ND	0.15	
109-99-9	Tetrahydrofuran (THF)	<b>1.2</b>	0.76	<b>0.42</b>	0.26	
107-06-2	1,2-Dichloroethane	ND	0.76	ND	0.19	
71-55-6	1,1,1-Trichloroethane	ND	0.76	ND	0.14	
71-43-2	Benzene	ND	0.76	ND	0.24	
56-23-5	Carbon Tetrachloride	ND	0.76	ND	0.12	
110-82-7	Cyclohexane	ND	1.5	ND	0.44	
78-87-5	1,2-Dichloropropane	ND	0.76	ND	0.16	
75-27-4	Bromodichloromethane	ND	0.76	ND	0.11	
79-01-6	Trichloroethene	ND	0.76	ND	0.14	
123-91-1	1,4-Dioxane	ND	0.76	ND	0.21	
80-62-6	Methyl Methacrylate	ND	1.5	ND	0.37	
142-82-5	n-Heptane	ND	0.76	ND	0.18	
10061-01-5	cis-1,3-Dichloropropene	ND	0.76	ND	0.17	
108-10-1	4-Methyl-2-pentanone	ND	0.76	ND	0.18	
10061-02-6	trans-1,3-Dichloropropene	ND	0.76	ND	0.17	
79-00-5	1,1,2-Trichloroethane	ND	0.76	ND	0.14	
108-88-3	Toluene	ND	0.76	ND	0.20	
591-78-6	2-Hexanone	ND	0.76	ND	0.18	
124-48-1	Dibromochloromethane	ND	0.76	ND	0.089	
106-93-4	1,2-Dibromoethane	ND	0.76	ND	0.098	
123-86-4	n-Butyl Acetate	ND	0.76	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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** J East Fenceline #2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-014

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00905

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.59

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.76	ND	0.16	
127-18-4	Tetrachloroethene	2.1	0.76	0.31	0.11	
108-90-7	Chlorobenzene	ND	0.76	ND	0.16	
100-41-4	Ethylbenzene	ND	0.76	ND	0.17	
179601-23-1	m,p-Xylenes	ND	1.5	ND	0.35	
75-25-2	Bromoform	ND	0.76	ND	0.073	
100-42-5	Styrene	ND	0.76	ND	0.18	
95-47-6	o-Xylene	ND	0.76	ND	0.17	
111-84-2	n-Nonane	ND	0.76	ND	0.14	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.76	ND	0.11	
98-82-8	Cumene	ND	0.76	ND	0.15	
80-56-8	alpha-Pinene	ND	0.76	ND	0.14	
103-65-1	n-Propylbenzene	ND	0.76	ND	0.15	
622-96-8	4-Ethyltoluene	ND	0.76	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.76	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	ND	0.76	ND	0.15	
100-44-7	Benzyl Chloride	ND	0.76	ND	0.15	
541-73-1	1,3-Dichlorobenzene	ND	0.76	ND	0.13	
106-46-7	1,4-Dichlorobenzene	ND	0.76	ND	0.13	
95-50-1	1,2-Dichlorobenzene	ND	0.76	ND	0.13	
5989-27-5	d-Limonene	ND	0.76	ND	0.14	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.76	ND	0.078	
120-82-1	1,2,4-Trichlorobenzene	ND	0.76	ND	0.10	
91-20-3	Naphthalene	ND	0.76	ND	0.14	
87-68-3	Hexachlorobutadiene	ND	0.76	ND	0.071	

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.

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** J East Fenceline #2

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-014

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00905

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.59

Canister Dilution Factor: 1.51

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
No Compounds Detected			

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-015

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00689

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -3.59      Final Pressure (psig): 3.55

Canister Dilution Factor: 1.64

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	ppbV	ppbV	
115-07-1	Propene	<b>0.86</b>	0.82	<b>0.50</b>	0.48	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.3</b>	0.82	<b>0.46</b>	0.17	
74-87-3	Chloromethane	ND	0.82	ND	0.40	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.82	ND	0.12	
75-01-4	Vinyl Chloride	ND	0.82	ND	0.32	
106-99-0	1,3-Butadiene	ND	0.82	ND	0.37	
74-83-9	Bromomethane	ND	0.82	ND	0.21	
75-00-3	Chloroethane	ND	0.82	ND	0.31	
64-17-5	Ethanol	ND	8.2	ND	4.4	
75-05-8	Acetonitrile	ND	0.82	ND	0.49	
107-02-8	Acrolein	ND	3.3	ND	1.4	
67-64-1	Acetone	<b>8.9</b>	8.2	<b>3.7</b>	3.5	
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.82	<b>0.20</b>	0.15	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	8.2	ND	3.3	
107-13-1	Acrylonitrile	ND	0.82	ND	0.38	
75-35-4	1,1-Dichloroethene	ND	0.82	ND	0.21	
75-09-2	Methylene Chloride	ND	0.82	ND	0.24	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.82	ND	0.26	
76-13-1	Trichlorotrifluoroethane	ND	0.82	ND	0.11	
75-15-0	Carbon Disulfide	ND	8.2	ND	2.6	
156-60-5	trans-1,2-Dichloroethene	ND	0.82	ND	0.21	
75-34-3	1,1-Dichloroethane	ND	0.82	ND	0.20	
1634-04-4	Methyl tert-Butyl Ether	ND	0.82	ND	0.23	
108-05-4	Vinyl Acetate	ND	8.2	ND	2.3	
78-93-3	2-Butanone (MEK)	ND	8.2	ND	2.8	

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.

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-015

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00689

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -3.59 Final Pressure (psig): 3.55

Canister Dilution Factor: 1.64

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.82	ND	0.21	
141-78-6	Ethyl Acetate	ND	1.6	ND	0.46	
110-54-3	n-Hexane	ND	0.82	ND	0.23	
67-66-3	Chloroform	ND	0.82	ND	0.17	
109-99-9	Tetrahydrofuran (THF)	ND	0.82	ND	0.28	
107-06-2	1,2-Dichloroethane	ND	0.82	ND	0.20	
71-55-6	1,1,1-Trichloroethane	ND	0.82	ND	0.15	
71-43-2	Benzene	1.5	0.82	0.47	0.26	
56-23-5	Carbon Tetrachloride	ND	0.82	ND	0.13	
110-82-7	Cyclohexane	ND	1.6	ND	0.48	
78-87-5	1,2-Dichloropropane	ND	0.82	ND	0.18	
75-27-4	Bromodichloromethane	ND	0.82	ND	0.12	
79-01-6	Trichloroethene	ND	0.82	ND	0.15	
123-91-1	1,4-Dioxane	ND	0.82	ND	0.23	
80-62-6	Methyl Methacrylate	ND	1.6	ND	0.40	
142-82-5	n-Heptane	ND	0.82	ND	0.20	
10061-01-5	cis-1,3-Dichloropropene	ND	0.82	ND	0.18	
108-10-1	4-Methyl-2-pentanone	ND	0.82	ND	0.20	
10061-02-6	trans-1,3-Dichloropropene	ND	0.82	ND	0.18	
79-00-5	1,1,2-Trichloroethane	ND	0.82	ND	0.15	
108-88-3	Toluene	1.1	0.82	0.29	0.22	
591-78-6	2-Hexanone	ND	0.82	ND	0.20	
124-48-1	Dibromochloromethane	ND	0.82	ND	0.096	
106-93-4	1,2-Dibromoethane	ND	0.82	ND	0.11	
123-86-4	n-Butyl Acetate	ND	0.82	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.

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-015

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00689

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -3.59 Final Pressure (psig): 3.55

Canister Dilution Factor: 1.64

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.82	ND	0.18	
127-18-4	Tetrachloroethene	ND	0.82	ND	0.12	
108-90-7	Chlorobenzene	ND	0.82	ND	0.18	
100-41-4	Ethylbenzene	ND	0.82	ND	0.19	
179601-23-1	m,p-Xylenes	ND	1.6	ND	0.38	
75-25-2	Bromoform	ND	0.82	ND	0.079	
100-42-5	Styrene	ND	0.82	ND	0.19	
95-47-6	o-Xylene	ND	0.82	ND	0.19	
111-84-2	n-Nonane	ND	0.82	ND	0.16	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.82	ND	0.12	
98-82-8	Cumene	ND	0.82	ND	0.17	
80-56-8	alpha-Pinene	ND	0.82	ND	0.15	
103-65-1	n-Propylbenzene	ND	0.82	ND	0.17	
622-96-8	4-Ethyltoluene	ND	0.82	ND	0.17	
108-67-8	1,3,5-Trimethylbenzene	ND	0.82	ND	0.17	
95-63-6	1,2,4-Trimethylbenzene	ND	0.82	ND	0.17	
100-44-7	Benzyl Chloride	ND	0.82	ND	0.16	
541-73-1	1,3-Dichlorobenzene	ND	0.82	ND	0.14	
106-46-7	1,4-Dichlorobenzene	ND	0.82	ND	0.14	
95-50-1	1,2-Dichlorobenzene	ND	0.82	ND	0.14	
5989-27-5	d-Limonene	ND	0.82	ND	0.15	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.82	ND	0.085	
120-82-1	1,2,4-Trichlorobenzene	ND	0.82	ND	0.11	
91-20-3	Naphthalene	ND	0.82	ND	0.16	
87-68-3	Hexachlorobutadiene	ND	0.82	ND	0.077	

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.



RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** K South Fenceline

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-015

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC00689

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.59      Final Pressure (psig): 3.55

Canister Dilution Factor: 1.64

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
16.47	Ethyl Butyrate	4.9	

T = Analyte is a tentatively identified compound, result is estimated.

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline (i)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-016

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC01647

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -8.17      Final Pressure (psig): 3.78

Canister Dilution Factor: 2.83

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	2.2	1.4	1.3	0.82	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.3	1.4	0.47	0.29	
74-87-3	Chloromethane	ND	1.4	ND	0.69	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	1.4	ND	0.20	
75-01-4	Vinyl Chloride	ND	1.4	ND	0.55	
106-99-0	1,3-Butadiene	ND	1.4	ND	0.64	
74-83-9	Bromomethane	ND	1.4	ND	0.36	
75-00-3	Chloroethane	ND	1.4	ND	0.54	
64-17-5	Ethanol	ND	14	ND	7.5	
75-05-8	Acetonitrile	1.9	1.4	1.1	0.84	
107-02-8	Acrolein	ND	5.7	ND	2.5	
67-64-1	Acetone	21	14	8.7	6.0	
75-69-4	Trichlorofluoromethane	ND	1.4	ND	0.25	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	14	ND	5.8	
107-13-1	Acrylonitrile	ND	1.4	ND	0.65	
75-35-4	1,1-Dichloroethene	ND	1.4	ND	0.36	
75-09-2	Methylene Chloride	2.1	1.4	0.60	0.41	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	1.4	ND	0.45	
76-13-1	Trichlorotrifluoroethane	ND	1.4	ND	0.18	
75-15-0	Carbon Disulfide	ND	14	ND	4.5	
156-60-5	trans-1,2-Dichloroethene	ND	1.4	ND	0.36	
75-34-3	1,1-Dichloroethane	ND	1.4	ND	0.35	
1634-04-4	Methyl tert-Butyl Ether	ND	1.4	ND	0.39	
108-05-4	Vinyl Acetate	ND	14	ND	4.0	
78-93-3	2-Butanone (MEK)	ND	14	ND	4.8	

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.

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline (i)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-016

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC01647

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -8.17 Final Pressure (psig): 3.78

Canister Dilution Factor: 2.83

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	1.4	ND	0.36	
141-78-6	Ethyl Acetate	ND	2.8	ND	0.79	
110-54-3	n-Hexane	ND	1.4	ND	0.40	
67-66-3	Chloroform	ND	1.4	ND	0.29	
109-99-9	Tetrahydrofuran (THF)	<b>2.0</b>	1.4	<b>0.67</b>	0.48	
107-06-2	1,2-Dichloroethane	ND	1.4	ND	0.35	
71-55-6	1,1,1-Trichloroethane	ND	1.4	ND	0.26	
71-43-2	Benzene	<b>6.1</b>	1.4	<b>1.9</b>	0.44	
56-23-5	Carbon Tetrachloride	ND	1.4	ND	0.23	
110-82-7	Cyclohexane	ND	2.8	ND	0.82	
78-87-5	1,2-Dichloropropane	ND	1.4	ND	0.31	
75-27-4	Bromodichloromethane	ND	1.4	ND	0.21	
79-01-6	Trichloroethene	ND	1.4	ND	0.26	
123-91-1	1,4-Dioxane	ND	1.4	ND	0.39	
80-62-6	Methyl Methacrylate	ND	2.8	ND	0.69	
142-82-5	n-Heptane	ND	1.4	ND	0.35	
10061-01-5	cis-1,3-Dichloropropene	ND	1.4	ND	0.31	
108-10-1	4-Methyl-2-pentanone	ND	1.4	ND	0.35	
10061-02-6	trans-1,3-Dichloropropene	ND	1.4	ND	0.31	
79-00-5	1,1,2-Trichloroethane	ND	1.4	ND	0.26	
108-88-3	Toluene	<b>2.6</b>	1.4	<b>0.70</b>	0.38	
591-78-6	2-Hexanone	ND	1.4	ND	0.35	
124-48-1	Dibromochloromethane	ND	1.4	ND	0.17	
106-93-4	1,2-Dibromoethane	ND	1.4	ND	0.18	
123-86-4	n-Butyl Acetate	ND	1.4	ND	0.30	

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.

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline (i)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-016

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01647

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -8.17 Final Pressure (psig): 3.78

Canister Dilution Factor: 2.83

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	1.4	ND	0.30	
127-18-4	Tetrachloroethene	ND	1.4	ND	0.21	
108-90-7	Chlorobenzene	ND	1.4	ND	0.31	
100-41-4	Ethylbenzene	ND	1.4	ND	0.33	
179601-23-1	m,p-Xylenes	ND	2.8	ND	0.65	
75-25-2	Bromoform	ND	1.4	ND	0.14	
100-42-5	Styrene	ND	1.4	ND	0.33	
95-47-6	o-Xylene	ND	1.4	ND	0.33	
111-84-2	n-Nonane	ND	1.4	ND	0.27	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.4	ND	0.21	
98-82-8	Cumene	ND	1.4	ND	0.29	
80-56-8	alpha-Pinene	ND	1.4	ND	0.25	
103-65-1	n-Propylbenzene	ND	1.4	ND	0.29	
622-96-8	4-Ethyltoluene	ND	1.4	ND	0.29	
108-67-8	1,3,5-Trimethylbenzene	ND	1.4	ND	0.29	
95-63-6	1,2,4-Trimethylbenzene	ND	1.4	ND	0.29	
100-44-7	Benzyl Chloride	ND	1.4	ND	0.27	
541-73-1	1,3-Dichlorobenzene	ND	1.4	ND	0.24	
106-46-7	1,4-Dichlorobenzene	ND	1.4	ND	0.24	
95-50-1	1,2-Dichlorobenzene	ND	1.4	ND	0.24	
5989-27-5	d-Limonene	ND	1.4	ND	0.25	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.4	ND	0.15	
120-82-1	1,2,4-Trichlorobenzene	ND	1.4	ND	0.19	
91-20-3	Naphthalene	ND	1.4	ND	0.27	
87-68-3	Hexachlorobutadiene	ND	1.4	ND	0.13	

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.

RESULTS OF ANALYSIS

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

**Client Sample ID:** K South Fenceline (i)

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-016

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC01647

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -8.17      Final Pressure (psig): 3.78

Canister Dilution Factor: 2.83

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>	Data Qualifier
8.14	Dimethyl Sulfide	7.5	

T = Analyte is a tentatively identified compound, result is estimated.

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** L Summitt Valley  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-017

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01066

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.58

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	1.8	0.79	1.1	0.46	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.2	0.79	0.44	0.16	
74-87-3	Chloromethane	ND	0.79	ND	0.38	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.79	ND	0.11	
75-01-4	Vinyl Chloride	ND	0.79	ND	0.31	
106-99-0	1,3-Butadiene	ND	0.79	ND	0.36	
74-83-9	Bromomethane	ND	0.79	ND	0.20	
75-00-3	Chloroethane	ND	0.79	ND	0.30	
64-17-5	Ethanol	8.5	7.9	4.5	4.2	
75-05-8	Acetonitrile	ND	0.79	ND	0.47	
107-02-8	Acrolein	ND	3.2	ND	1.4	
67-64-1	Acetone	19	7.9	8.2	3.3	
75-69-4	Trichlorofluoromethane	1.1	0.79	0.20	0.14	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.9	ND	3.2	
107-13-1	Acrylonitrile	ND	0.79	ND	0.36	
75-35-4	1,1-Dichloroethene	ND	0.79	ND	0.20	
75-09-2	Methylene Chloride	0.88	0.79	0.25	0.23	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.79	ND	0.25	
76-13-1	Trichlorotrifluoroethane	ND	0.79	ND	0.10	
75-15-0	Carbon Disulfide	ND	7.9	ND	2.5	
156-60-5	trans-1,2-Dichloroethene	ND	0.79	ND	0.20	
75-34-3	1,1-Dichloroethane	ND	0.79	ND	0.20	
1634-04-4	Methyl tert-Butyl Ether	ND	0.79	ND	0.22	
108-05-4	Vinyl Acetate	ND	7.9	ND	2.2	
78-93-3	2-Butanone (MEK)	11	7.9	3.7	2.7	

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.

## RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** L Summitt Valley  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-017

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC01066

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -3.07 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.58

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.79	ND	0.20	
141-78-6	Ethyl Acetate	1.6	1.6	0.45	0.44	
110-54-3	n-Hexane	ND	0.79	ND	0.22	
67-66-3	Chloroform	ND	0.79	ND	0.16	
109-99-9	Tetrahydrofuran (THF)	4.7	0.79	1.6	0.27	
107-06-2	1,2-Dichloroethane	ND	0.79	ND	0.20	
71-55-6	1,1,1-Trichloroethane	ND	0.79	ND	0.14	
71-43-2	Benzene	6.2	0.79	1.9	0.25	
56-23-5	Carbon Tetrachloride	ND	0.79	ND	0.13	
110-82-7	Cyclohexane	ND	1.6	ND	0.46	
78-87-5	1,2-Dichloropropane	ND	0.79	ND	0.17	
75-27-4	Bromodichloromethane	ND	0.79	ND	0.12	
79-01-6	Trichloroethene	ND	0.79	ND	0.15	
123-91-1	1,4-Dioxane	ND	0.79	ND	0.22	
80-62-6	Methyl Methacrylate	ND	1.6	ND	0.39	
142-82-5	n-Heptane	ND	0.79	ND	0.19	
10061-01-5	cis-1,3-Dichloropropene	ND	0.79	ND	0.17	
108-10-1	4-Methyl-2-pentanone	ND	0.79	ND	0.19	
10061-02-6	trans-1,3-Dichloropropene	ND	0.79	ND	0.17	
79-00-5	1,1,2-Trichloroethane	ND	0.79	ND	0.14	
108-88-3	Toluene	1.6	0.79	0.42	0.21	
591-78-6	2-Hexanone	ND	0.79	ND	0.19	
124-48-1	Dibromochloromethane	ND	0.79	ND	0.093	
106-93-4	1,2-Dibromoethane	ND	0.79	ND	0.10	
123-86-4	n-Butyl Acetate	ND	0.79	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.

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** L Summitt Valley  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-017

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC01066

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.58

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.79	ND	0.17	
127-18-4	Tetrachloroethene	ND	0.79	ND	0.12	
108-90-7	Chlorobenzene	ND	0.79	ND	0.17	
100-41-4	Ethylbenzene	ND	0.79	ND	0.18	
179601-23-1	m,p-Xylenes	ND	1.6	ND	0.36	
75-25-2	Bromoform	ND	0.79	ND	0.076	
100-42-5	Styrene	ND	0.79	ND	0.19	
95-47-6	o-Xylene	ND	0.79	ND	0.18	
111-84-2	n-Nonane	ND	0.79	ND	0.15	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.79	ND	0.12	
98-82-8	Cumene	ND	0.79	ND	0.16	
80-56-8	alpha-Pinene	ND	0.79	ND	0.14	
103-65-1	n-Propylbenzene	ND	0.79	ND	0.16	
622-96-8	4-Ethyltoluene	ND	0.79	ND	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.79	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	ND	0.79	ND	0.16	
100-44-7	Benzyl Chloride	ND	0.79	ND	0.15	
541-73-1	1,3-Dichlorobenzene	ND	0.79	ND	0.13	
106-46-7	1,4-Dichlorobenzene	ND	0.79	ND	0.13	
95-50-1	1,2-Dichlorobenzene	ND	0.79	ND	0.13	
5989-27-5	d-Limonene	ND	0.79	ND	0.14	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.79	ND	0.082	
120-82-1	1,2,4-Trichlorobenzene	ND	0.79	ND	0.11	
91-20-3	Naphthalene	ND	0.79	ND	0.15	
87-68-3	Hexachlorobutadiene	ND	0.79	ND	0.074	

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.



RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** L Summitt Valley

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-017

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC01066

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07      Final Pressure (psig): 3.66

Canister Dilution Factor: 1.58

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
7.54	Furan	13	
8.14	Dimethyl Sulfide	12	
8.42	Methyl Acetate	10	
11.19	2-Methylfuran	14	
11.96	Methyl Propionate	5.5	
13.06	C6H10 Alkene	4.6	
14.72	Methyl Butyrate	12	
16.47	Ethyl Butyrate	4.5	

T = Analyte is a tentatively identified compound, result is estimated.

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** M Grassy Knoll Center (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-018

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC01626

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -1.60      Final Pressure (psig): 3.56

Canister Dilution Factor: 1.39

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	ND	0.70	ND	0.40	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.1</b>	0.70	<b>0.43</b>	0.14	
74-87-3	Chloromethane	ND	0.70	ND	0.34	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.70	ND	0.099	
75-01-4	Vinyl Chloride	ND	0.70	ND	0.27	
106-99-0	1,3-Butadiene	ND	0.70	ND	0.31	
74-83-9	Bromomethane	ND	0.70	ND	0.18	
75-00-3	Chloroethane	ND	0.70	ND	0.26	
64-17-5	Ethanol	ND	7.0	ND	3.7	
75-05-8	Acetonitrile	<b>0.78</b>	0.70	<b>0.47</b>	0.41	
107-02-8	Acrolein	ND	2.8	ND	1.2	
67-64-1	Acetone	ND	7.0	ND	2.9	
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.70	<b>0.20</b>	0.12	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.0	ND	2.8	
107-13-1	Acrylonitrile	ND	0.70	ND	0.32	
75-35-4	1,1-Dichloroethene	ND	0.70	ND	0.18	
75-09-2	Methylene Chloride	ND	0.70	ND	0.20	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.70	ND	0.22	
76-13-1	Trichlorotrifluoroethane	ND	0.70	ND	0.091	
75-15-0	Carbon Disulfide	ND	7.0	ND	2.2	
156-60-5	trans-1,2-Dichloroethene	ND	0.70	ND	0.18	
75-34-3	1,1-Dichloroethane	ND	0.70	ND	0.17	
1634-04-4	Methyl tert-Butyl Ether	ND	0.70	ND	0.19	
108-05-4	Vinyl Acetate	ND	7.0	ND	2.0	
78-93-3	2-Butanone (MEK)	ND	7.0	ND	2.4	

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.

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** M Grassy Knoll Center (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-018

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC01626

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -1.60      Final Pressure (psig): 3.56

Canister Dilution Factor: 1.39

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.70	ND	0.18	
141-78-6	Ethyl Acetate	ND	1.4	ND	0.39	
110-54-3	n-Hexane	ND	0.70	ND	0.20	
67-66-3	Chloroform	ND	0.70	ND	0.14	
109-99-9	Tetrahydrofuran (THF)	ND	0.70	ND	0.24	
107-06-2	1,2-Dichloroethane	ND	0.70	ND	0.17	
71-55-6	1,1,1-Trichloroethane	ND	0.70	ND	0.13	
71-43-2	Benzene	ND	0.70	ND	0.22	
56-23-5	Carbon Tetrachloride	ND	0.70	ND	0.11	
110-82-7	Cyclohexane	ND	1.4	ND	0.40	
78-87-5	1,2-Dichloropropane	ND	0.70	ND	0.15	
75-27-4	Bromodichloromethane	ND	0.70	ND	0.10	
79-01-6	Trichloroethene	ND	0.70	ND	0.13	
123-91-1	1,4-Dioxane	ND	0.70	ND	0.19	
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.34	
142-82-5	n-Heptane	ND	0.70	ND	0.17	
10061-01-5	cis-1,3-Dichloropropene	ND	0.70	ND	0.15	
108-10-1	4-Methyl-2-pentanone	ND	0.70	ND	0.17	
10061-02-6	trans-1,3-Dichloropropene	ND	0.70	ND	0.15	
79-00-5	1,1,2-Trichloroethane	ND	0.70	ND	0.13	
108-88-3	Toluene	ND	0.70	ND	0.18	
591-78-6	2-Hexanone	ND	0.70	ND	0.17	
124-48-1	Dibromochloromethane	ND	0.70	ND	0.082	
106-93-4	1,2-Dibromoethane	ND	0.70	ND	0.090	
123-86-4	n-Butyl Acetate	ND	0.70	ND	0.15	

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.

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** M Grassy Knoll Center (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-018

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC01626

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -1.60      Final Pressure (psig): 3.56

Canister Dilution Factor: 1.39

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.70	ND	0.15	
127-18-4	Tetrachloroethene	ND	0.70	ND	0.10	
108-90-7	Chlorobenzene	ND	0.70	ND	0.15	
100-41-4	Ethylbenzene	ND	0.70	ND	0.16	
179601-23-1	m,p-Xylenes	ND	1.4	ND	0.32	
75-25-2	Bromoform	ND	0.70	ND	0.067	
100-42-5	Styrene	ND	0.70	ND	0.16	
95-47-6	o-Xylene	ND	0.70	ND	0.16	
111-84-2	n-Nonane	ND	0.70	ND	0.13	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.70	ND	0.10	
98-82-8	Cumene	ND	0.70	ND	0.14	
80-56-8	alpha-Pinene	ND	0.70	ND	0.12	
103-65-1	n-Propylbenzene	ND	0.70	ND	0.14	
622-96-8	4-Ethyltoluene	ND	0.70	ND	0.14	
108-67-8	1,3,5-Trimethylbenzene	ND	0.70	ND	0.14	
95-63-6	1,2,4-Trimethylbenzene	ND	0.70	ND	0.14	
100-44-7	Benzyl Chloride	ND	0.70	ND	0.13	
541-73-1	1,3-Dichlorobenzene	ND	0.70	ND	0.12	
106-46-7	1,4-Dichlorobenzene	ND	0.70	ND	0.12	
95-50-1	1,2-Dichlorobenzene	ND	0.70	ND	0.12	
5989-27-5	d-Limonene	ND	0.70	ND	0.12	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.70	ND	0.072	
120-82-1	1,2,4-Trichlorobenzene	ND	0.70	ND	0.094	
91-20-3	Naphthalene	ND	0.70	ND	0.13	
87-68-3	Hexachlorobutadiene	ND	0.70	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.

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** M Grassy Knoll Center (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-018

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes: **T**  
 Container ID: SC01626

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.60      Final Pressure (psig): 3.56

Canister Dilution Factor: 1.39

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
16.47	Ethyl Butyrate	5.4	

T = Analyte is a tentatively identified compound, result is estimated.

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** N Grassy Knoll West (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-019

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00889

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.50      Final Pressure (psig): 3.64

Canister Dilution Factor: 1.50

CAS #	Compound	Result		MRL		Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	ND	0.75	ND	0.44	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.2</b>	0.75	<b>0.44</b>	0.15	
74-87-3	Chloromethane	ND	0.75	ND	0.36	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.75	ND	0.11	
75-01-4	Vinyl Chloride	ND	0.75	ND	0.29	
106-99-0	1,3-Butadiene	ND	0.75	ND	0.34	
74-83-9	Bromomethane	ND	0.75	ND	0.19	
75-00-3	Chloroethane	ND	0.75	ND	0.28	
64-17-5	Ethanol	ND	7.5	ND	4.0	
75-05-8	Acetonitrile	ND	0.75	ND	0.45	
107-02-8	Acrolein	ND	3.0	ND	1.3	
67-64-1	Acetone	ND	7.5	ND	3.2	
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.75	<b>0.20</b>	0.13	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.5	ND	3.1	
107-13-1	Acrylonitrile	ND	0.75	ND	0.35	
75-35-4	1,1-Dichloroethene	ND	0.75	ND	0.19	
75-09-2	Methylene Chloride	ND	0.75	ND	0.22	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.75	ND	0.24	
76-13-1	Trichlorotrifluoroethane	ND	0.75	ND	0.098	
75-15-0	Carbon Disulfide	ND	7.5	ND	2.4	
156-60-5	trans-1,2-Dichloroethene	ND	0.75	ND	0.19	
75-34-3	1,1-Dichloroethane	ND	0.75	ND	0.19	
1634-04-4	Methyl tert-Butyl Ether	ND	0.75	ND	0.21	
108-05-4	Vinyl Acetate	ND	7.5	ND	2.1	
78-93-3	2-Butanone (MEK)	ND	7.5	ND	2.5	

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.

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** N Grassy Knoll West (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-019

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00889

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -2.50      Final Pressure (psig): 3.64

Canister Dilution Factor: 1.50

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.75	ND	0.19	
141-78-6	Ethyl Acetate	ND	1.5	ND	0.42	
110-54-3	n-Hexane	ND	0.75	ND	0.21	
67-66-3	Chloroform	ND	0.75	ND	0.15	
109-99-9	Tetrahydrofuran (THF)	ND	0.75	ND	0.25	
107-06-2	1,2-Dichloroethane	ND	0.75	ND	0.19	
71-55-6	1,1,1-Trichloroethane	ND	0.75	ND	0.14	
71-43-2	Benzene	ND	0.75	ND	0.23	
56-23-5	Carbon Tetrachloride	ND	0.75	ND	0.12	
110-82-7	Cyclohexane	ND	1.5	ND	0.44	
78-87-5	1,2-Dichloropropane	ND	0.75	ND	0.16	
75-27-4	Bromodichloromethane	ND	0.75	ND	0.11	
79-01-6	Trichloroethene	ND	0.75	ND	0.14	
123-91-1	1,4-Dioxane	ND	0.75	ND	0.21	
80-62-6	Methyl Methacrylate	ND	1.5	ND	0.37	
142-82-5	n-Heptane	ND	0.75	ND	0.18	
10061-01-5	cis-1,3-Dichloropropene	ND	0.75	ND	0.17	
108-10-1	4-Methyl-2-pentanone	ND	0.75	ND	0.18	
10061-02-6	trans-1,3-Dichloropropene	ND	0.75	ND	0.17	
79-00-5	1,1,2-Trichloroethane	ND	0.75	ND	0.14	
108-88-3	Toluene	ND	0.75	ND	0.20	
591-78-6	2-Hexanone	ND	0.75	ND	0.18	
124-48-1	Dibromochloromethane	ND	0.75	ND	0.088	
106-93-4	1,2-Dibromoethane	ND	0.75	ND	0.098	
123-86-4	n-Butyl Acetate	ND	0.75	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.

## RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** N Grassy Knoll West (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-019

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00889

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -2.50      Final Pressure (psig): 3.64

Canister Dilution Factor: 1.50

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.75	ND	0.16	
127-18-4	Tetrachloroethene	<b>1.8</b>	0.75	<b>0.26</b>	0.11	
108-90-7	Chlorobenzene	ND	0.75	ND	0.16	
100-41-4	Ethylbenzene	ND	0.75	ND	0.17	
179601-23-1	m,p-Xylenes	ND	1.5	ND	0.35	
75-25-2	Bromoform	ND	0.75	ND	0.073	
100-42-5	Styrene	ND	0.75	ND	0.18	
95-47-6	o-Xylene	ND	0.75	ND	0.17	
111-84-2	n-Nonane	ND	0.75	ND	0.14	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.75	ND	0.11	
98-82-8	Cumene	ND	0.75	ND	0.15	
80-56-8	alpha-Pinene	ND	0.75	ND	0.13	
103-65-1	n-Propylbenzene	ND	0.75	ND	0.15	
622-96-8	4-Ethyltoluene	ND	0.75	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.75	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	ND	0.75	ND	0.15	
100-44-7	Benzyl Chloride	ND	0.75	ND	0.14	
541-73-1	1,3-Dichlorobenzene	ND	0.75	ND	0.12	
106-46-7	1,4-Dichlorobenzene	ND	0.75	ND	0.12	
95-50-1	1,2-Dichlorobenzene	ND	0.75	ND	0.12	
5989-27-5	d-Limonene	ND	0.75	ND	0.13	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.75	ND	0.078	
120-82-1	1,2,4-Trichlorobenzene	ND	0.75	ND	0.10	
91-20-3	Naphthalene	ND	0.75	ND	0.14	
87-68-3	Hexachlorobutadiene	ND	0.75	ND	0.070	

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.



RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** N Grassy Knoll West (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-019

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes: **T**  
 Container ID: SC00889

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.50      Final Pressure (psig): 3.64

Canister Dilution Factor: 1.50

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
16.47	Ethyl Butyrate	6.0	

T = Analyte is a tentatively identified compound, result is estimated.

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** O Grassy Knoll North (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-020

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC01649

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/30/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -2.07      Final Pressure (psig): 3.52

Canister Dilution Factor: 1.44

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	ND	0.72	ND	0.42	
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.2</b>	0.72	<b>0.45</b>	0.15	
74-87-3	Chloromethane	ND	0.72	ND	0.35	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.72	ND	0.10	
75-01-4	Vinyl Chloride	ND	0.72	ND	0.28	
106-99-0	1,3-Butadiene	ND	0.72	ND	0.33	
74-83-9	Bromomethane	ND	0.72	ND	0.19	
75-00-3	Chloroethane	ND	0.72	ND	0.27	
64-17-5	Ethanol	ND	7.2	ND	3.8	
75-05-8	Acetonitrile	<b>0.88</b>	0.72	<b>0.52</b>	0.43	
107-02-8	Acrolein	ND	2.9	ND	1.3	
67-64-1	Acetone	ND	7.2	ND	3.0	
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.72	<b>0.20</b>	0.13	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.2	ND	2.9	
107-13-1	Acrylonitrile	ND	0.72	ND	0.33	
75-35-4	1,1-Dichloroethene	ND	0.72	ND	0.18	
75-09-2	Methylene Chloride	ND	0.72	ND	0.21	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.72	ND	0.23	
76-13-1	Trichlorotrifluoroethane	ND	0.72	ND	0.094	
75-15-0	Carbon Disulfide	ND	7.2	ND	2.3	
156-60-5	trans-1,2-Dichloroethene	ND	0.72	ND	0.18	
75-34-3	1,1-Dichloroethane	ND	0.72	ND	0.18	
1634-04-4	Methyl tert-Butyl Ether	ND	0.72	ND	0.20	
108-05-4	Vinyl Acetate	ND	7.2	ND	2.0	
78-93-3	2-Butanone (MEK)	ND	7.2	ND	2.4	

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.

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** O Grassy Knoll North (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P1203506-020

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC01649

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/30/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Initial Pressure (psig): -2.07 Final Pressure (psig): 3.52

Canister Dilution Factor: 1.44

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.72	ND	0.18	
141-78-6	Ethyl Acetate	ND	1.4	ND	0.40	
110-54-3	n-Hexane	ND	0.72	ND	0.20	
67-66-3	Chloroform	ND	0.72	ND	0.15	
109-99-9	Tetrahydrofuran (THF)	ND	0.72	ND	0.24	
107-06-2	1,2-Dichloroethane	ND	0.72	ND	0.18	
71-55-6	1,1,1-Trichloroethane	ND	0.72	ND	0.13	
71-43-2	Benzene	ND	0.72	ND	0.23	
56-23-5	Carbon Tetrachloride	ND	0.72	ND	0.11	
110-82-7	Cyclohexane	ND	1.4	ND	0.42	
78-87-5	1,2-Dichloropropane	ND	0.72	ND	0.16	
75-27-4	Bromodichloromethane	ND	0.72	ND	0.11	
79-01-6	Trichloroethene	ND	0.72	ND	0.13	
123-91-1	1,4-Dioxane	ND	0.72	ND	0.20	
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.35	
142-82-5	n-Heptane	ND	0.72	ND	0.18	
10061-01-5	cis-1,3-Dichloropropene	ND	0.72	ND	0.16	
108-10-1	4-Methyl-2-pentanone	ND	0.72	ND	0.18	
10061-02-6	trans-1,3-Dichloropropene	ND	0.72	ND	0.16	
79-00-5	1,1,2-Trichloroethane	ND	0.72	ND	0.13	
108-88-3	Toluene	ND	0.72	ND	0.19	
591-78-6	2-Hexanone	ND	0.72	ND	0.18	
124-48-1	Dibromochloromethane	ND	0.72	ND	0.085	
106-93-4	1,2-Dibromoethane	ND	0.72	ND	0.094	
123-86-4	n-Butyl Acetate	ND	0.72	ND	0.15	

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.

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** O Grassy Knoll North (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-020

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01649

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/30/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.07 Final Pressure (psig): 3.52

Canister Dilution Factor: 1.44

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.72	ND	0.15	
127-18-4	Tetrachloroethene	ND	0.72	ND	0.11	
108-90-7	Chlorobenzene	ND	0.72	ND	0.16	
100-41-4	Ethylbenzene	ND	0.72	ND	0.17	
179601-23-1	m,p-Xylenes	ND	1.4	ND	0.33	
75-25-2	Bromoform	ND	0.72	ND	0.070	
100-42-5	Styrene	ND	0.72	ND	0.17	
95-47-6	o-Xylene	ND	0.72	ND	0.17	
111-84-2	n-Nonane	ND	0.72	ND	0.14	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.72	ND	0.10	
98-82-8	Cumene	ND	0.72	ND	0.15	
80-56-8	alpha-Pinene	ND	0.72	ND	0.13	
103-65-1	n-Propylbenzene	ND	0.72	ND	0.15	
622-96-8	4-Ethyltoluene	ND	0.72	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.72	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	ND	0.72	ND	0.15	
100-44-7	Benzyl Chloride	ND	0.72	ND	0.14	
541-73-1	1,3-Dichlorobenzene	ND	0.72	ND	0.12	
106-46-7	1,4-Dichlorobenzene	ND	0.72	ND	0.12	
95-50-1	1,2-Dichlorobenzene	ND	0.72	ND	0.12	
5989-27-5	d-Limonene	ND	0.72	ND	0.13	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.72	ND	0.075	
120-82-1	1,2,4-Trichlorobenzene	ND	0.72	ND	0.097	
91-20-3	Naphthalene	ND	0.72	ND	0.14	
87-68-3	Hexachlorobutadiene	ND	0.72	ND	0.068	

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.

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** O Grassy Knoll North (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-020

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes: **T**  
 Container ID: SC01649

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/30/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.07      Final Pressure (psig): 3.52

Canister Dilution Factor: 1.44

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
16.47	Ethyl Butyrate	5.6	

T = Analyte is a tentatively identified compound, result is estimated.

## RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-021

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 6.0 L Summa Canister  
**Test Notes:**  
**Container ID:** SC00994

**Date Collected:** 8/21/12  
**Date Received:** 8/24/12  
**Date Analyzed:** 8/28/12  
**Volume(s) Analyzed:** 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	ND	0.50	ND	0.29	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	ND	0.10	
74-87-3	Chloromethane	ND	0.50	ND	0.24	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	ND	0.072	
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20	
106-99-0	1,3-Butadiene	ND	0.50	ND	0.23	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.50	ND	0.19	
64-17-5	Ethanol	ND	5.0	ND	2.7	
75-05-8	Acetonitrile	ND	0.50	ND	0.30	
107-02-8	Acrolein	ND	2.0	ND	0.87	
67-64-1	Acetone	ND	5.0	ND	2.1	
75-69-4	Trichlorofluoromethane	ND	0.50	ND	0.089	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	ND	2.0	
107-13-1	Acrylonitrile	ND	0.50	ND	0.23	
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13	
75-09-2	Methylene Chloride	ND	0.50	ND	0.14	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	ND	0.16	
76-13-1	Trichlorotrifluoroethane	ND	0.50	ND	0.065	
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4	
78-93-3	2-Butanone (MEK)	ND	5.0	ND	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.

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-021

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00994

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
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>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13	
141-78-6	Ethyl Acetate	ND	1.0	ND	0.28	
110-54-3	n-Hexane	ND	0.50	ND	0.14	
67-66-3	Chloroform	ND	0.50	ND	0.10	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	ND	0.17	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092	
71-43-2	Benzene	ND	0.50	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080	
110-82-7	Cyclohexane	ND	1.0	ND	0.29	
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11	
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075	
79-01-6	Trichloroethene	ND	0.50	ND	0.093	
123-91-1	1,4-Dioxane	ND	0.50	ND	0.14	
80-62-6	Methyl Methacrylate	ND	1.0	ND	0.24	
142-82-5	n-Heptane	ND	0.50	ND	0.12	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11	
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092	
108-88-3	Toluene	ND	0.50	ND	0.13	
591-78-6	2-Hexanone	ND	0.50	ND	0.12	
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
123-86-4	n-Butyl Acetate	ND	0.50	ND	0.11	

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.

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-021

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00994

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 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>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	ND	0.11	
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074	
108-90-7	Chlorobenzene	ND	0.50	ND	0.11	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
75-25-2	Bromoform	ND	0.50	ND	0.048	
100-42-5	Styrene	ND	0.50	ND	0.12	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
111-84-2	n-Nonane	ND	0.50	ND	0.095	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073	
98-82-8	Cumene	ND	0.50	ND	0.10	
80-56-8	alpha-Pinene	ND	0.50	ND	0.090	
103-65-1	n-Propylbenzene	ND	0.50	ND	0.10	
622-96-8	4-Ethyltoluene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	
100-44-7	Benzyl Chloride	ND	0.50	ND	0.097	
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083	
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083	
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083	
5989-27-5	d-Limonene	ND	0.50	ND	0.090	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	ND	0.052	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	ND	0.067	
91-20-3	Naphthalene	ND	0.50	ND	0.095	
87-68-3	Hexachlorobutadiene	ND	0.50	ND	0.047	

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.



RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-021

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00994

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 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			

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-022

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00098

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
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>	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	0.50	ND	0.29	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	ND	0.10	
74-87-3	Chloromethane	ND	0.50	ND	0.24	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	ND	0.072	
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20	
106-99-0	1,3-Butadiene	ND	0.50	ND	0.23	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.50	ND	0.19	
64-17-5	Ethanol	ND	5.0	ND	2.7	
75-05-8	Acetonitrile	ND	0.50	ND	0.30	
107-02-8	Acrolein	ND	2.0	ND	0.87	
67-64-1	Acetone	ND	5.0	ND	2.1	
75-69-4	Trichlorofluoromethane	ND	0.50	ND	0.089	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	ND	2.0	
107-13-1	Acrylonitrile	ND	0.50	ND	0.23	
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13	
75-09-2	Methylene Chloride	ND	0.50	ND	0.14	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	ND	0.16	
76-13-1	Trichlorotrifluoroethane	ND	0.50	ND	0.065	
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4	
78-93-3	2-Butanone (MEK)	<b>13</b>	5.0	<b>4.3</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.

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-022

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00098

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
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>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13	
141-78-6	Ethyl Acetate	1.4	1.0	0.39	0.28	
110-54-3	n-Hexane	ND	0.50	ND	0.14	
67-66-3	Chloroform	ND	0.50	ND	0.10	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	ND	0.17	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092	
71-43-2	Benzene	ND	0.50	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080	
110-82-7	Cyclohexane	ND	1.0	ND	0.29	
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11	
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075	
79-01-6	Trichloroethene	ND	0.50	ND	0.093	
123-91-1	1,4-Dioxane	ND	0.50	ND	0.14	
80-62-6	Methyl Methacrylate	ND	1.0	ND	0.24	
142-82-5	n-Heptane	ND	0.50	ND	0.12	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11	
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092	
108-88-3	Toluene	ND	0.50	ND	0.13	
591-78-6	2-Hexanone	ND	0.50	ND	0.12	
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
123-86-4	n-Butyl Acetate	ND	0.50	ND	0.11	

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.

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-022

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00098

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
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>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	ND	0.11	
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074	
108-90-7	Chlorobenzene	ND	0.50	ND	0.11	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
75-25-2	Bromoform	ND	0.50	ND	0.048	
100-42-5	Styrene	ND	0.50	ND	0.12	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
111-84-2	n-Nonane	ND	0.50	ND	0.095	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073	
98-82-8	Cumene	ND	0.50	ND	0.10	
80-56-8	alpha-Pinene	ND	0.50	ND	0.090	
103-65-1	n-Propylbenzene	ND	0.50	ND	0.10	
622-96-8	4-Ethyltoluene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	
100-44-7	Benzyl Chloride	ND	0.50	ND	0.097	
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083	
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083	
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083	
5989-27-5	d-Limonene	ND	0.50	ND	0.090	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	ND	0.052	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	ND	0.067	
91-20-3	Naphthalene	ND	0.50	ND	0.095	
87-68-3	Hexachlorobutadiene	ND	0.50	ND	0.047	

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.

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-022

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes: **T**  
 Container ID: SC00098

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$	Data Qualifier
17.12	Hexamethylcyclotrisiloxane	2,200	
19.50	Unidentified Compound	370	

T = Analyte is a tentatively identified compound, result is estimated.

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P120828-MB

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result		MRL		Data Qualifier
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	ppbV	ppbV	
115-07-1	Propene	ND	0.50	ND	0.29	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	ND	0.10	
74-87-3	Chloromethane	ND	0.50	ND	0.24	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	ND	0.072	
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20	
106-99-0	1,3-Butadiene	ND	0.50	ND	0.23	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.50	ND	0.19	
64-17-5	Ethanol	ND	5.0	ND	2.7	
75-05-8	Acetonitrile	ND	0.50	ND	0.30	
107-02-8	Acrolein	ND	2.0	ND	0.87	
67-64-1	Acetone	ND	5.0	ND	2.1	
75-69-4	Trichlorofluoromethane	ND	0.50	ND	0.089	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	ND	2.0	
107-13-1	Acrylonitrile	ND	0.50	ND	0.23	
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13	
75-09-2	Methylene Chloride	ND	0.50	ND	0.14	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	ND	0.16	
76-13-1	Trichlorotrifluoroethane	ND	0.50	ND	0.065	
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4	
78-93-3	2-Butanone (MEK)	ND	5.0	ND	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.

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P120828-MB

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/28/12  
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>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13	
141-78-6	Ethyl Acetate	ND	1.0	ND	0.28	
110-54-3	n-Hexane	ND	0.50	ND	0.14	
67-66-3	Chloroform	ND	0.50	ND	0.10	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	ND	0.17	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092	
71-43-2	Benzene	ND	0.50	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080	
110-82-7	Cyclohexane	ND	1.0	ND	0.29	
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11	
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075	
79-01-6	Trichloroethene	ND	0.50	ND	0.093	
123-91-1	1,4-Dioxane	ND	0.50	ND	0.14	
80-62-6	Methyl Methacrylate	ND	1.0	ND	0.24	
142-82-5	n-Heptane	ND	0.50	ND	0.12	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11	
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092	
108-88-3	Toluene	ND	0.50	ND	0.13	
591-78-6	2-Hexanone	ND	0.50	ND	0.12	
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
123-86-4	n-Butyl Acetate	ND	0.50	ND	0.11	

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.

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120828-MB

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/28/12  
 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>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	ND	0.11	
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074	
108-90-7	Chlorobenzene	ND	0.50	ND	0.11	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
75-25-2	Bromoform	ND	0.50	ND	0.048	
100-42-5	Styrene	ND	0.50	ND	0.12	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
111-84-2	n-Nonane	ND	0.50	ND	0.095	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073	
98-82-8	Cumene	ND	0.50	ND	0.10	
80-56-8	alpha-Pinene	ND	0.50	ND	0.090	
103-65-1	n-Propylbenzene	ND	0.50	ND	0.10	
622-96-8	4-Ethyltoluene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	
100-44-7	Benzyl Chloride	ND	0.50	ND	0.097	
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083	
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083	
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083	
5989-27-5	d-Limonene	ND	0.50	ND	0.090	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	ND	0.052	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	ND	0.067	
91-20-3	Naphthalene	ND	0.50	ND	0.095	
87-68-3	Hexachlorobutadiene	ND	0.50	ND	0.047	

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.



RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P120828-MB

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 1.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/28/12

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			

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P120829-MB

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV	
115-07-1	Propene	ND	0.50	ND	0.29	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	ND	0.10	
74-87-3	Chloromethane	ND	0.50	ND	0.24	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	ND	0.072	
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20	
106-99-0	1,3-Butadiene	ND	0.50	ND	0.23	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.50	ND	0.19	
64-17-5	Ethanol	ND	5.0	ND	2.7	
75-05-8	Acetonitrile	ND	0.50	ND	0.30	
107-02-8	Acrolein	ND	2.0	ND	0.87	
67-64-1	Acetone	ND	5.0	ND	2.1	
75-69-4	Trichlorofluoromethane	ND	0.50	ND	0.089	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	ND	2.0	
107-13-1	Acrylonitrile	ND	0.50	ND	0.23	
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13	
75-09-2	Methylene Chloride	ND	0.50	ND	0.14	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	ND	0.16	
76-13-1	Trichlorotrifluoroethane	ND	0.50	ND	0.065	
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4	
78-93-3	2-Butanone (MEK)	ND	5.0	ND	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.

## RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

**CAS Project ID:** P1203506  
**CAS Sample ID:** P120829-MB

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 1.0 L Summa Canister  
**Test Notes:**

**Date Collected:** NA  
**Date Received:** NA  
**Date Analyzed:** 8/29/12  
**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>	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13	
141-78-6	Ethyl Acetate	ND	1.0	ND	0.28	
110-54-3	n-Hexane	ND	0.50	ND	0.14	
67-66-3	Chloroform	ND	0.50	ND	0.10	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	ND	0.17	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092	
71-43-2	Benzene	ND	0.50	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080	
110-82-7	Cyclohexane	ND	1.0	ND	0.29	
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11	
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075	
79-01-6	Trichloroethene	ND	0.50	ND	0.093	
123-91-1	1,4-Dioxane	ND	0.50	ND	0.14	
80-62-6	Methyl Methacrylate	ND	1.0	ND	0.24	
142-82-5	n-Heptane	ND	0.50	ND	0.12	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11	
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092	
108-88-3	Toluene	ND	0.50	ND	0.13	
591-78-6	2-Hexanone	ND	0.50	ND	0.12	
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
123-86-4	n-Butyl Acetate	ND	0.50	ND	0.11	

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.

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P120829-MB

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/29/12  
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>	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	ND	0.11	
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074	
108-90-7	Chlorobenzene	ND	0.50	ND	0.11	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
75-25-2	Bromoform	ND	0.50	ND	0.048	
100-42-5	Styrene	ND	0.50	ND	0.12	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
111-84-2	n-Nonane	ND	0.50	ND	0.095	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073	
98-82-8	Cumene	ND	0.50	ND	0.10	
80-56-8	alpha-Pinene	ND	0.50	ND	0.090	
103-65-1	n-Propylbenzene	ND	0.50	ND	0.10	
622-96-8	4-Ethyltoluene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	
100-44-7	Benzyl Chloride	ND	0.50	ND	0.097	
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083	
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083	
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083	
5989-27-5	d-Limonene	ND	0.50	ND	0.090	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	ND	0.052	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	ND	0.067	
91-20-3	Naphthalene	ND	0.50	ND	0.095	
87-68-3	Hexachlorobutadiene	ND	0.50	ND	0.047	

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.

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P120829-MB

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 1.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/29/12

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			

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister(s)  
 Test Notes:

Date(s) Collected: 8/21/12  
 Date(s) Received: 8/24/12  
 Date(s) Analyzed: 8/28 - 8/30/12

Client Sample ID	CAS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P120828-MB	103	99	104	70-130	
Method Blank	P120829-MB	103	98	105	70-130	
Lab Control Sample	P120828-LCS	101	98	104	70-130	
Lab Control Sample	P120829-LCS	99	96	105	70-130	
1 Amphitheater, Grab	P1203506-001	102	89	98	70-130	
2 Level 2, Grab	P1203506-002	99	97	105	70-130	
3 East Side, Grab	P1203506-003	101	93	102	70-130	
4 Field Blank	P1203506-004	100	97	106	70-130	
A Pond Center	P1203506-005	102	97	105	70-130	
B Pond East	P1203506-006	102	97	104	70-130	
C Pond West	P1203506-007	101	98	105	70-130	
D Summit	P1203506-008	100	98	105	70-130	
E Amphitheater	P1203506-009	101	97	104	70-130	
F Grassy Knoll Center	P1203506-010	101	97	104	70-130	
G Grassy Knoll West	P1203506-011	101	97	104	70-130	
H Grassy Knoll North	P1203506-012	101	97	104	70-130	
H Grassy Knoll North	P1203506-012DUP	102	96	103	70-130	
I East Fenceline #1	P1203506-013	101	99	105	70-130	
J East Fenceline #2	P1203506-014	102	97	104	70-130	
K South Fenceline	P1203506-015	102	99	106	70-130	
K South Fenceline (i)	P1203506-016	102	98	104	70-130	
L Summitt Valley	P1203506-017	102	99	106	70-130	
M Grassy Knoll Center (2)	P1203506-018	100	97	105	70-130	
N Grassy Knoll West (2)	P1203506-019	101	97	104	70-130	
O Grassy Knoll North (2)	P1203506-020	102	95	106	70-130	
Field Blank 1	P1203506-021	101	99	104	70-130	
Field Blank 2	P1203506-022	103	97	106	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.

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P120828-LCS

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	CAS	Data Qualifier
					Acceptance Limits	
115-07-1	Propene	204	189	93	59-137	
75-71-8	Dichlorodifluoromethane (CFC 12)	202	187	93	63-115	
74-87-3	Chloromethane	196	176	90	59-124	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	206	194	94	65-113	
75-01-4	Vinyl Chloride	200	187	94	59-121	
106-99-0	1,3-Butadiene	210	208	99	60-138	
74-83-9	Bromomethane	200	192	96	69-129	
75-00-3	Chloroethane	202	187	93	60-120	
64-17-5	Ethanol	958	792	83	58-121	
75-05-8	Acetonitrile	202	191	95	64-129	
107-02-8	Acrolein	204	182	89	54-127	
67-64-1	Acetone	1,040	938	90	59-114	
75-69-4	Trichlorofluoromethane	210	184	88	66-108	
67-63-0	2-Propanol (Isopropyl Alcohol)	396	401	101	50-113	
107-13-1	Acrylonitrile	206	234	114	72-135	
75-35-4	1,1-Dichloroethene	218	206	94	70-117	
75-09-2	Methylene Chloride	212	205	97	61-108	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	214	195	91	70-131	
76-13-1	Trichlorotrifluoroethane	212	199	94	70-113	
75-15-0	Carbon Disulfide	208	184	88	65-112	
156-60-5	trans-1,2-Dichloroethene	202	201	100	71-119	
75-34-3	1,1-Dichloroethane	206	188	91	71-116	
1634-04-4	Methyl tert-Butyl Ether	204	196	96	67-116	
108-05-4	Vinyl Acetate	988	1080	109	59-142	
78-93-3	2-Butanone (MEK)	212	224	106	68-125	

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.

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P120828-LCS

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	CAS	Data Qualifier
					Acceptance Limits	
156-59-2	cis-1,2-Dichloroethene	214	204	95	69-119	
141-78-6	Ethyl Acetate	412	422	102	63-130	
110-54-3	n-Hexane	206	184	89	57-120	
67-66-3	Chloroform	222	197	89	69-111	
109-99-9	Tetrahydrofuran (THF)	208	199	96	57-123	
107-06-2	1,2-Dichloroethane	208	201	97	70-118	
71-55-6	1,1,1-Trichloroethane	204	194	95	73-119	
71-43-2	Benzene	208	185	89	66-121	
56-23-5	Carbon Tetrachloride	212	211	100	74-129	
110-82-7	Cyclohexane	402	365	91	70-113	
78-87-5	1,2-Dichloropropane	204	187	92	69-118	
75-27-4	Bromodichloromethane	204	199	98	75-124	
79-01-6	Trichloroethene	198	198	100	73-115	
123-91-1	1,4-Dioxane	206	193	94	71-123	
80-62-6	Methyl Methacrylate	414	404	98	72-127	
142-82-5	n-Heptane	202	183	91	68-120	
10061-01-5	cis-1,3-Dichloropropene	196	198	101	71-130	
108-10-1	4-Methyl-2-pentanone	210	198	94	69-130	
10061-02-6	trans-1,3-Dichloropropene	218	234	107	76-133	
79-00-5	1,1,2-Trichloroethane	202	190	94	73-120	
108-88-3	Toluene	208	185	89	67-111	
591-78-6	2-Hexanone	228	206	90	70-123	
124-48-1	Dibromochloromethane	216	214	99	75-129	
106-93-4	1,2-Dibromoethane	208	196	94	73-122	
123-86-4	n-Butyl Acetate	228	208	91	68-132	

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.



## LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120828-LCS

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 1.0 L Summa Canister  
**Test Notes:**

**Date Collected:** NA  
**Date Received:** NA  
**Date Analyzed:** 8/28/12  
**Volume(s) Analyzed:** 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	CAS	Data Qualifier
					Acceptance Limits	
111-65-9	n-Octane	206	182	88	68-116	
127-18-4	Tetrachloroethene	190	173	91	67-119	
108-90-7	Chlorobenzene	208	190	91	69-113	
100-41-4	Ethylbenzene	206	183	89	71-117	
179601-23-1	m,p-Xylenes	412	363	88	70-116	
75-25-2	Bromoform	216	209	97	69-127	
100-42-5	Styrene	208	196	94	71-125	
95-47-6	o-Xylene	200	177	89	70-116	
111-84-2	n-Nonane	202	175	87	68-116	
79-34-5	1,1,2,2-Tetrachloroethane	198	178	90	70-119	
98-82-8	Cumene	196	172	88	70-116	
80-56-8	alpha-Pinene	192	173	90	71-119	
103-65-1	n-Propylbenzene	198	178	90	71-119	
622-96-8	4-Ethyltoluene	204	188	92	71-119	
108-67-8	1,3,5-Trimethylbenzene	208	188	90	71-121	
95-63-6	1,2,4-Trimethylbenzene	200	183	92	73-127	
100-44-7	Benzyl Chloride	206	208	101	65-137	
541-73-1	1,3-Dichlorobenzene	206	192	93	68-123	
106-46-7	1,4-Dichlorobenzene	212	188	89	65-120	
95-50-1	1,2-Dichlorobenzene	204	187	92	67-121	
5989-27-5	d-Limonene	206	189	92	67-130	
96-12-8	1,2-Dibromo-3-chloropropane	202	195	97	72-133	
120-82-1	1,2,4-Trichlorobenzene	200	180	90	62-133	
91-20-3	Naphthalene	178	150	84	56-138	
87-68-3	Hexachlorobutadiene	208	178	86	60-128	

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.

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120829-LCS

**Test Code:** EPA TO-15  
**Instrument ID:** Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
**Analyst:** Lusine Hakobyan  
**Sampling Media:** 1.0 L Summa Canister  
**Test Notes:**

**Date Collected:** NA  
**Date Received:** NA  
**Date Analyzed:** 8/29/12  
**Volume(s) Analyzed:** 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	CAS	Data Qualifier
					Acceptance Limits	
115-07-1	Propene	204	193	95	59-137	
75-71-8	Dichlorodifluoromethane (CFC 12)	202	176	87	63-115	
74-87-3	Chloromethane	196	173	88	59-124	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	206	187	91	65-113	
75-01-4	Vinyl Chloride	200	181	91	59-121	
106-99-0	1,3-Butadiene	210	199	95	60-138	
74-83-9	Bromomethane	200	181	91	69-129	
75-00-3	Chloroethane	202	184	91	60-120	
64-17-5	Ethanol	958	770	80	58-121	
75-05-8	Acetonitrile	202	189	94	64-129	
107-02-8	Acrolein	204	182	89	54-127	
67-64-1	Acetone	1,040	901	87	59-114	
75-69-4	Trichlorofluoromethane	210	176	84	66-108	
67-63-0	2-Propanol (Isopropyl Alcohol)	396	340	86	50-113	
107-13-1	Acrylonitrile	206	233	113	72-135	
75-35-4	1,1-Dichloroethene	218	200	92	70-117	
75-09-2	Methylene Chloride	212	199	94	61-108	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	214	190	89	70-131	
76-13-1	Trichlorotrifluoroethane	212	191	90	70-113	
75-15-0	Carbon Disulfide	208	180	87	65-112	
156-60-5	trans-1,2-Dichloroethene	202	194	96	71-119	
75-34-3	1,1-Dichloroethane	206	184	89	71-116	
1634-04-4	Methyl tert-Butyl Ether	204	188	92	67-116	
108-05-4	Vinyl Acetate	988	1100	111	59-142	
78-93-3	2-Butanone (MEK)	212	215	101	68-125	

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.

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P120829-LCS

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	CAS	Data Qualifier
					Acceptance Limits	
156-59-2	cis-1,2-Dichloroethene	214	199	93	69-119	
141-78-6	Ethyl Acetate	412	412	100	63-130	
110-54-3	n-Hexane	206	177	86	57-120	
67-66-3	Chloroform	222	192	86	69-111	
109-99-9	Tetrahydrofuran (THF)	208	193	93	57-123	
107-06-2	1,2-Dichloroethane	208	193	93	70-118	
71-55-6	1,1,1-Trichloroethane	204	189	93	73-119	
71-43-2	Benzene	208	182	88	66-121	
56-23-5	Carbon Tetrachloride	212	206	97	74-129	
110-82-7	Cyclohexane	402	357	89	70-113	
78-87-5	1,2-Dichloropropane	204	182	89	69-118	
75-27-4	Bromodichloromethane	204	194	95	75-124	
79-01-6	Trichloroethene	198	192	97	73-115	
123-91-1	1,4-Dioxane	206	189	92	71-123	
80-62-6	Methyl Methacrylate	414	398	96	72-127	
142-82-5	n-Heptane	202	181	90	68-120	
10061-01-5	cis-1,3-Dichloropropene	196	195	99	71-130	
108-10-1	4-Methyl-2-pentanone	210	193	92	69-130	
10061-02-6	trans-1,3-Dichloropropene	218	229	105	76-133	
79-00-5	1,1,2-Trichloroethane	202	187	93	73-120	
108-88-3	Toluene	208	174	84	67-111	
591-78-6	2-Hexanone	228	197	86	70-123	
124-48-1	Dibromochloromethane	216	203	94	75-129	
106-93-4	1,2-Dibromoethane	208	188	90	73-122	
123-86-4	n-Butyl Acetate	228	203	89	68-132	

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.

LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P120829-LCS

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	CAS	Data Qualifier
					Acceptance Limits	
111-65-9	n-Octane	206	173	84	68-116	
127-18-4	Tetrachloroethene	190	163	86	67-119	
108-90-7	Chlorobenzene	208	180	87	69-113	
100-41-4	Ethylbenzene	206	176	85	71-117	
179601-23-1	m,p-Xylenes	412	344	83	70-116	
75-25-2	Bromoform	216	198	92	69-127	
100-42-5	Styrene	208	188	90	71-125	
95-47-6	o-Xylene	200	169	85	70-116	
111-84-2	n-Nonane	202	168	83	68-116	
79-34-5	1,1,2,2-Tetrachloroethane	198	170	86	70-119	
98-82-8	Cumene	196	164	84	70-116	
80-56-8	alpha-Pinene	192	168	88	71-119	
103-65-1	n-Propylbenzene	198	169	85	71-119	
622-96-8	4-Ethyltoluene	204	177	87	71-119	
108-67-8	1,3,5-Trimethylbenzene	208	180	87	71-121	
95-63-6	1,2,4-Trimethylbenzene	200	174	87	73-127	
100-44-7	Benzyl Chloride	206	202	98	65-137	
541-73-1	1,3-Dichlorobenzene	206	183	89	68-123	
106-46-7	1,4-Dichlorobenzene	212	180	85	65-120	
95-50-1	1,2-Dichlorobenzene	204	178	87	67-121	
5989-27-5	d-Limonene	206	191	93	67-130	
96-12-8	1,2-Dibromo-3-chloropropane	202	187	93	72-133	
120-82-1	1,2,4-Trichlorobenzene	200	177	89	62-133	
91-20-3	Naphthalene	178	150	84	56-138	
87-68-3	Hexachlorobutadiene	208	173	83	60-128	

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.

LABORATORY DUPLICATE SUMMARY RESULTS

Page 1 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-012DUP

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00078

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65

Final Pressure (psig): 3.70

Canister Dilution Factor: 1.53

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	ND	ND	ND	ND	-	-	25	
Dichlorodifluoromethane (CFC 12)	2.16	0.437	2.63	0.532	2.395	20	25	
Chloromethane	ND	ND	ND	ND	-	-	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	ND	ND	ND	ND	-	-	25	
Bromomethane	ND	ND	ND	ND	-	-	25	
Chloroethane	ND	ND	ND	ND	-	-	25	
Ethanol	ND	ND	ND	ND	-	-	25	
Acetonitrile	ND	ND	ND	ND	-	-	25	
Acrolein	ND	ND	ND	ND	-	-	25	
Acetone	21.2	8.91	25.1	10.6	23.15	17	25	
Trichlorofluoromethane	1.12	0.200	1.35	0.241	1.235	19	25	
2-Propanol (Isopropyl Alcohol)	ND	ND	ND	ND	-	-	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	ND	ND	ND	ND	-	-	25	
trans-1,2-Dichloroethene	ND	ND	ND	ND	-	-	25	
1,1-Dichloroethane	ND	ND	ND	ND	-	-	25	
Methyl tert-Butyl Ether	ND	ND	ND	ND	-	-	25	
Vinyl Acetate	ND	ND	ND	ND	-	-	25	
2-Butanone (MEK)	ND	ND	ND	ND	-	-	25	

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

LABORATORY DUPLICATE SUMMARY RESULTS

Page 2 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-012DUP

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00078

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65

Final Pressure (psig): 3.70

Canister Dilution Factor: 1.53

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	2.68	0.744	3.19	0.884	2.935	17	25	
n-Hexane	ND	ND	ND	ND	-	-	25	
Chloroform	ND	ND	ND	ND	-	-	25	
Tetrahydrofuran (THF)	ND	ND	ND	ND	-	-	25	
1,2-Dichloroethane	ND	ND	ND	ND	-	-	25	
1,1,1-Trichloroethane	ND	ND	ND	ND	-	-	25	
Benzene	ND	ND	ND	ND	-	-	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	ND	ND	ND	ND	-	-	25	
1,4-Dioxane	ND	ND	ND	ND	-	-	25	
Methyl Methacrylate	ND	ND	ND	ND	-	-	25	
n-Heptane	ND	ND	ND	ND	-	-	25	
cis-1,3-Dichloropropene	ND	ND	ND	ND	-	-	25	
4-Methyl-2-pentanone	ND	ND	ND	ND	-	-	25	
trans-1,3-Dichloropropene	ND	ND	ND	ND	-	-	25	
1,1,2-Trichloroethane	ND	ND	ND	ND	-	-	25	
Toluene	1.08	0.288	1.32	0.349	1.2	20	25	
2-Hexanone	ND	ND	ND	ND	-	-	25	
Dibromochloromethane	ND	ND	ND	ND	-	-	25	
1,2-Dibromoethane	ND	ND	ND	ND	-	-	25	
n-Butyl Acetate	ND	ND	ND	ND	-	-	25	

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

LABORATORY DUPLICATE SUMMARY RESULTS

Page 3 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-012DUP

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00078

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65

Final Pressure (psig): 3.70

Canister Dilution Factor: 1.53

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	ND	ND	ND	ND	-	-	25	
Tetrachloroethene	ND	ND	ND	ND	-	-	25	
Chlorobenzene	ND	ND	ND	ND	-	-	25	
Ethylbenzene	ND	ND	ND	ND	-	-	25	
m,p-Xylenes	ND	ND	ND	ND	-	-	25	
Bromoform	ND	ND	ND	ND	-	-	25	
Styrene	ND	ND	ND	ND	-	-	25	
o-Xylene	ND	ND	ND	ND	-	-	25	
n-Nonane	ND	ND	ND	ND	-	-	25	
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	-	-	25	
Cumene	ND	ND	ND	ND	-	-	25	
alpha-Pinene	ND	ND	ND	ND	-	-	25	
n-Propylbenzene	ND	ND	ND	ND	-	-	25	
4-Ethyltoluene	ND	ND	ND	ND	-	-	25	
1,3,5-Trimethylbenzene	ND	ND	ND	ND	-	-	25	
1,2,4-Trimethylbenzene	ND	ND	ND	ND	-	-	25	
Benzyl Chloride	ND	ND	ND	ND	-	-	25	
1,3-Dichlorobenzene	ND	ND	ND	ND	-	-	25	
1,4-Dichlorobenzene	ND	ND	ND	ND	-	-	25	
1,2-Dichlorobenzene	ND	ND	ND	ND	-	-	25	
d-Limonene	ND	ND	ND	ND	-	-	25	
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	-	-	25	
1,2,4-Trichlorobenzene	ND	ND	ND	ND	-	-	25	
Naphthalene	ND	ND	ND	ND	-	-	25	
Hexachlorobutadiene	ND	ND	ND	ND	-	-	25	

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

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1 Amphitheater, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-001

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00027

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.0020 Liter(s)  
 0.00020 Liter(s)

Initial Pressure (psig): -0.79      Final Pressure (psig): 5.07

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	<b>27,000</b>	360	<b>15,000</b>	210
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	360	ND	72
74-87-3	Chloromethane	ND	360	ND	170
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	360	ND	51
75-01-4	Vinyl Chloride	ND	360	ND	140
106-99-0	1,3-Butadiene	<b>590</b>	360	<b>270</b>	160
74-83-9	Bromomethane	ND	360	ND	91
75-00-3	Chloroethane	ND	360	ND	130
64-17-5	Ethanol	<b>99,000</b>	3,600	<b>52,000</b>	1,900
75-05-8	Acetonitrile	ND	360	ND	210
107-02-8	Acrolein	ND	1,400	ND	620
67-64-1	Acetone	<b>500,000</b>	36,000	<b>210,000</b>	15,000
75-69-4	Trichlorofluoromethane	ND	360	ND	63
67-63-0	2-Propanol (Isopropyl Alcohol)	<b>60,000</b>	3,600	<b>24,000</b>	1,400
107-13-1	Acrylonitrile	ND	360	ND	160
75-35-4	1,1-Dichloroethene	ND	360	ND	90
75-09-2	Methylene Chloride	ND	360	ND	100
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	360	ND	110
76-13-1	Trichlorotrifluoroethane	ND	360	ND	46
75-15-0	Carbon Disulfide	ND	3,600	ND	1,100
156-60-5	trans-1,2-Dichloroethene	ND	360	ND	90
75-34-3	1,1-Dichloroethane	ND	360	ND	88
1634-04-4	Methyl tert-Butyl Ether	ND	360	ND	99
108-05-4	Vinyl Acetate	ND	3,600	ND	1,000
78-93-3	2-Butanone (MEK)	<b>340,000</b>	36,000	<b>120,000</b>	12,000

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 m

D = The reported result is from a dilution.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1 Amphitheater, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-001

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00027

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.0020 Liter(s)  
 0.00020 Liter(s)

Initial Pressure (psig): -0.79      Final Pressure (psig): 5.07

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	360	ND	90
141-78-6	Ethyl Acetate	4,800	710	1,300	200
110-54-3	n-Hexane	2,100	360	580	100
67-66-3	Chloroform	ND	360	ND	73
109-99-9	Tetrahydrofuran (THF)	170,000	3,600	56,000	1,200
107-06-2	1,2-Dichloroethane	ND	360	ND	88
71-55-6	1,1,1-Trichloroethane	ND	360	ND	65
71-43-2	Benzene	120,000	3,600	37,000	1,100
56-23-5	Carbon Tetrachloride	ND	360	ND	56
110-82-7	Cyclohexane	1,100	710	320	210
78-87-5	1,2-Dichloropropane	ND	360	ND	77
75-27-4	Bromodichloromethane	ND	360	ND	53
79-01-6	Trichloroethene	ND	360	ND	66
123-91-1	1,4-Dioxane	4,100	360	1,100	99
80-62-6	Methyl Methacrylate	ND	710	ND	170
142-82-5	n-Heptane	3,200	360	790	87
10061-01-5	cis-1,3-Dichloropropene	ND	360	ND	78
108-10-1	4-Methyl-2-pentanone	30,000	360	7,200	87
10061-02-6	trans-1,3-Dichloropropene	ND	360	ND	78
79-00-5	1,1,2-Trichloroethane	ND	360	ND	65
108-88-3	Toluene	43,000	360	11,000	94
591-78-6	2-Hexanone	11,000	360	2,800	87
124-48-1	Dibromochloromethane	ND	360	ND	42
106-93-4	1,2-Dibromoethane	ND	360	ND	46
123-86-4	n-Butyl Acetate	12,000	360	2,500	75

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 m

D = The reported result is from a dilution.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 1 Amphitheater, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-001

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00027

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.0020 Liter(s)  
 0.00020 Liter(s)

Initial Pressure (psig): -0.79      Final Pressure (psig): 5.07

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	9,500	360	2,000	76
127-18-4	Tetrachloroethene	ND	360	ND	52
108-90-7	Chlorobenzene	3,000	360	650	77
100-41-4	Ethylbenzene	27,000	360	6,200	82
179601-23-1	m,p-Xylenes	57,000	710	13,000	160
75-25-2	Bromoform	ND	360	ND	34
100-42-5	Styrene	1,200	360	280	83
95-47-6	o-Xylene	20,000	360	4,600	82
111-84-2	n-Nonane	16,000	360	3,100	68
79-34-5	1,1,2,2-Tetrachloroethane	ND	360	ND	52
98-82-8	Cumene	6,000	360	1,200	72
80-56-8	alpha-Pinene	12,000	360	2,100	64
103-65-1	n-Propylbenzene	3,800	360	780	72
622-96-8	4-Ethyltoluene	4,900	360	990	72
108-67-8	1,3,5-Trimethylbenzene	6,700	360	1,400	72
95-63-6	1,2,4-Trimethylbenzene	19,000	360	3,900	72
100-44-7	Benzyl Chloride	ND	360	ND	69
541-73-1	1,3-Dichlorobenzene	ND	360	ND	59
106-46-7	1,4-Dichlorobenzene	10,000	360	1,700	59
95-50-1	1,2-Dichlorobenzene	ND	360	ND	59
5989-27-5	d-Limonene	22,000	360	3,900	64
96-12-8	1,2-Dibromo-3-chloropropane	ND	360	ND	37
120-82-1	1,2,4-Trichlorobenzene	ND	360	ND	48
91-20-3	Naphthalene	510	360	97	68
87-68-3	Hexachlorobutadiene	ND	360	ND	33

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** 1 Amphitheater, Grab

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-001

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes: **T**  
Container ID: 1SC00027

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 0.0020 Liter(s)  
0.00020 Liter(s)

Initial Pressure (psig): -0.79      Final Pressure (psig): 5.07

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
7.57	Furan	46,000
8.16	Dimethyl Sulfide	68,000
8.45	Methyl Acetate	44,000
11.21	2-Methylfuran	68,000
11.98	Methyl Propionate	45,000
13.09	1-Butanol	73,000
13.60	2-Pentanone	59,000
14.74	Methyl Butyrate	110,000
15.35	Dimethyl disulfide	70,000
17.17	2-Methylcyclopentanone	51,000
18.48	Methyl Hexanoate	43,000
18.73	2-Ethylcyclopentanone	41,000
19.66	n-Decane	40,000
19.95	p-Isopropyltoluene	120,000
20.68	n-Undecane	46,000

T = Analyte is a tentatively identified compound, result is estimated.

1.42

**Data  
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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 2 Level 2, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-002

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00355

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.00015 Liter(s)

Initial Pressure (psig): -0.97      Final Pressure (psig): 5.18

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	95,000	4,800	55,000	2,800
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	4,800	ND	980
74-87-3	Chloromethane	ND	4,800	ND	2,300
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	4,800	ND	690
75-01-4	Vinyl Chloride	ND	4,800	ND	1,900
106-99-0	1,3-Butadiene	ND	4,800	ND	2,200
74-83-9	Bromomethane	ND	4,800	ND	1,200
75-00-3	Chloroethane	5,600	4,800	2,100	1,800
64-17-5	Ethanol	ND	48,000	ND	26,000
75-05-8	Acetonitrile	ND	4,800	ND	2,900
107-02-8	Acrolein	ND	19,000	ND	8,400
67-64-1	Acetone	ND	48,000	ND	20,000
75-69-4	Trichlorofluoromethane	ND	4,800	ND	860
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	48,000	ND	20,000
107-13-1	Acrylonitrile	ND	4,800	ND	2,200
75-35-4	1,1-Dichloroethene	ND	4,800	ND	1,200
75-09-2	Methylene Chloride	ND	4,800	ND	1,400
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	4,800	ND	1,500
76-13-1	Trichlorotrifluoroethane	ND	4,800	ND	630
75-15-0	Carbon Disulfide	ND	48,000	ND	16,000
156-60-5	trans-1,2-Dichloroethene	ND	4,800	ND	1,200
75-34-3	1,1-Dichloroethane	ND	4,800	ND	1,200
1634-04-4	Methyl tert-Butyl Ether	ND	4,800	ND	1,300
108-05-4	Vinyl Acetate	ND	48,000	ND	14,000
78-93-3	2-Butanone (MEK)	ND	48,000	ND	16,000

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 2 Level 2, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-002

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00355

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.00015 Liter(s)

Initial Pressure (psig): -0.97      Final Pressure (psig): 5.18

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	4,800	ND	1,200
141-78-6	Ethyl Acetate	ND	9,700	ND	2,700
110-54-3	n-Hexane	ND	4,800	ND	1,400
67-66-3	Chloroform	ND	4,800	ND	990
109-99-9	Tetrahydrofuran (THF)	<b>39,000</b>	4,800	<b>13,000</b>	1,600
107-06-2	1,2-Dichloroethane	ND	4,800	ND	1,200
71-55-6	1,1,1-Trichloroethane	ND	4,800	ND	890
71-43-2	Benzene	<b>620,000</b>	4,800	<b>200,000</b>	1,500
56-23-5	Carbon Tetrachloride	ND	4,800	ND	770
110-82-7	Cyclohexane	ND	9,700	ND	2,800
78-87-5	1,2-Dichloropropane	ND	4,800	ND	1,000
75-27-4	Bromodichloromethane	ND	4,800	ND	720
79-01-6	Trichloroethene	ND	4,800	ND	900
123-91-1	1,4-Dioxane	ND	4,800	ND	1,300
80-62-6	Methyl Methacrylate	ND	9,700	ND	2,400
142-82-5	n-Heptane	<b>8,000</b>	4,800	<b>2,000</b>	1,200
10061-01-5	cis-1,3-Dichloropropene	ND	4,800	ND	1,100
108-10-1	4-Methyl-2-pentanone	ND	4,800	ND	1,200
10061-02-6	trans-1,3-Dichloropropene	ND	4,800	ND	1,100
79-00-5	1,1,2-Trichloroethane	ND	4,800	ND	890
108-88-3	Toluene	<b>100,000</b>	4,800	<b>27,000</b>	1,300
591-78-6	2-Hexanone	ND	4,800	ND	1,200
124-48-1	Dibromochloromethane	ND	4,800	ND	570
106-93-4	1,2-Dibromoethane	ND	4,800	ND	630
123-86-4	n-Butyl Acetate	ND	4,800	ND	1,000

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 2 Level 2, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-002

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00355

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.00015 Liter(s)

Initial Pressure (psig): -0.97      Final Pressure (psig): 5.18

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	17,000	4,800	3,700	1,000
127-18-4	Tetrachloroethene	ND	4,800	ND	710
108-90-7	Chlorobenzene	ND	4,800	ND	1,000
100-41-4	Ethylbenzene	32,000	4,800	7,400	1,100
179601-23-1	m,p-Xylenes	37,000	9,700	8,600	2,200
75-25-2	Bromoform	ND	4,800	ND	470
100-42-5	Styrene	ND	4,800	ND	1,100
95-47-6	o-Xylene	12,000	4,800	2,800	1,100
111-84-2	n-Nonane	17,000	4,800	3,200	920
79-34-5	1,1,2,2-Tetrachloroethane	ND	4,800	ND	700
98-82-8	Cumene	5,200	4,800	1,100	980
80-56-8	alpha-Pinene	53,000	4,800	9,400	870
103-65-1	n-Propylbenzene	ND	4,800	ND	980
622-96-8	4-Ethyltoluene	ND	4,800	ND	980
108-67-8	1,3,5-Trimethylbenzene	ND	4,800	ND	980
95-63-6	1,2,4-Trimethylbenzene	ND	4,800	ND	980
100-44-7	Benzyl Chloride	ND	4,800	ND	930
541-73-1	1,3-Dichlorobenzene	ND	4,800	ND	800
106-46-7	1,4-Dichlorobenzene	ND	4,800	ND	800
95-50-1	1,2-Dichlorobenzene	ND	4,800	ND	800
5989-27-5	d-Limonene	22,000	4,800	3,900	870
96-12-8	1,2-Dibromo-3-chloropropane	ND	4,800	ND	500
120-82-1	1,2,4-Trichlorobenzene	ND	4,800	ND	650
91-20-3	Naphthalene	ND	4,800	ND	920
87-68-3	Hexachlorobutadiene	ND	4,800	ND	450

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 2 Level 2, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-002

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes: **T**  
Container ID: 1SC00355

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 0.00015 Liter(s)

Initial Pressure (psig): -0.97      Final Pressure (psig): 5.18

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
4.45	Dimethyl Ether	120,000
5.13	Isobutene	140,000
5.31	n-Butane	41,000
5.51	C4H8 Alkene	83,000
5.80	C4H8 Alkene	90,000
7.54	Furan	120,000
8.14	Dimethyl Sulfide	83,000
8.52	Isopentene	42,000
9.71	Cyclopentene	41,000
11.19	2-Methylfuran	380,000
13.07	C6H10 Alkene	110,000
14.58	C7H12 Alkene	92,000
14.63	C7H12 Alkene	110,000
16.76	3-Methyl-3-heptene	27,000
16.96	C8H14 Alkene	22,000

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 3 East Side, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-003

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00562

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.00040 Liter(s)

Initial Pressure (psig): -0.87      Final Pressure (psig): 5.38

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	<b>37,000</b>	1,800	<b>22,000</b>	1,100
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	1,800	ND	370
74-87-3	Chloromethane	<b>2,700</b>	1,800	<b>1,300</b>	880
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	1,800	ND	260
75-01-4	Vinyl Chloride	ND	1,800	ND	710
106-99-0	1,3-Butadiene	ND	1,800	ND	820
74-83-9	Bromomethane	ND	1,800	ND	470
75-00-3	Chloroethane	ND	1,800	ND	690
64-17-5	Ethanol	ND	18,000	ND	9,600
75-05-8	Acetonitrile	ND	1,800	ND	1,100
107-02-8	Acrolein	ND	7,300	ND	3,200
67-64-1	Acetone	<b>72,000</b>	18,000	<b>31,000</b>	7,600
75-69-4	Trichlorofluoromethane	ND	1,800	ND	320
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	18,000	ND	7,400
107-13-1	Acrylonitrile	ND	1,800	ND	840
75-35-4	1,1-Dichloroethene	ND	1,800	ND	460
75-09-2	Methylene Chloride	ND	1,800	ND	520
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	1,800	ND	580
76-13-1	Trichlorotrifluoroethane	ND	1,800	ND	240
75-15-0	Carbon Disulfide	ND	18,000	ND	5,800
156-60-5	trans-1,2-Dichloroethene	ND	1,800	ND	460
75-34-3	1,1-Dichloroethane	ND	1,800	ND	450
1634-04-4	Methyl tert-Butyl Ether	ND	1,800	ND	500
108-05-4	Vinyl Acetate	ND	18,000	ND	5,100
78-93-3	2-Butanone (MEK)	<b>89,000</b>	18,000	<b>30,000</b>	6,100

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 3 East Side, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-003

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00562

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.00040 Liter(s)

Initial Pressure (psig): -0.87      Final Pressure (psig): 5.38

Canister Dilution Factor:

CAS #	Compound	Result	MRL	Result	MRL
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV
156-59-2	cis-1,2-Dichloroethene	ND	1,800	ND	460
141-78-6	Ethyl Acetate	ND	3,600	ND	1,000
110-54-3	n-Hexane	<b>2,900</b>	1,800	<b>830</b>	510
67-66-3	Chloroform	ND	1,800	ND	370
109-99-9	Tetrahydrofuran (THF)	<b>70,000</b>	1,800	<b>24,000</b>	610
107-06-2	1,2-Dichloroethane	ND	1,800	ND	450
71-55-6	1,1,1-Trichloroethane	ND	1,800	ND	330
71-43-2	Benzene	<b>390,000</b>	1,800	<b>120,000</b>	570
56-23-5	Carbon Tetrachloride	ND	1,800	ND	290
110-82-7	Cyclohexane	ND	3,600	ND	1,100
78-87-5	1,2-Dichloropropane	ND	1,800	ND	390
75-27-4	Bromodichloromethane	ND	1,800	ND	270
79-01-6	Trichloroethene	ND	1,800	ND	340
123-91-1	1,4-Dioxane	ND	1,800	ND	500
80-62-6	Methyl Methacrylate	ND	3,600	ND	890
142-82-5	n-Heptane	<b>3,300</b>	1,800	<b>820</b>	440
10061-01-5	cis-1,3-Dichloropropene	ND	1,800	ND	400
108-10-1	4-Methyl-2-pentanone	<b>16,000</b>	1,800	<b>3,800</b>	440
10061-02-6	trans-1,3-Dichloropropene	ND	1,800	ND	400
79-00-5	1,1,2-Trichloroethane	ND	1,800	ND	330
108-88-3	Toluene	<b>48,000</b>	1,800	<b>13,000</b>	480
591-78-6	2-Hexanone	<b>3,100</b>	1,800	<b>770</b>	440
124-48-1	Dibromochloromethane	ND	1,800	ND	210
106-93-4	1,2-Dibromoethane	ND	1,800	ND	240
123-86-4	n-Butyl Acetate	ND	1,800	ND	380

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 3 East Side, Grab  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-003

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00562

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.00040 Liter(s)

Initial Pressure (psig): -0.87      Final Pressure (psig): 5.38

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	13,000	1,800	2,800	390
127-18-4	Tetrachloroethene	ND	1,800	ND	270
108-90-7	Chlorobenzene	ND	1,800	ND	390
100-41-4	Ethylbenzene	22,000	1,800	5,200	420
179601-23-1	m,p-Xylenes	40,000	3,600	9,300	830
75-25-2	Bromoform	ND	1,800	ND	180
100-42-5	Styrene	ND	1,800	ND	430
95-47-6	o-Xylene	16,000	1,800	3,700	420
111-84-2	n-Nonane	9,000	1,800	1,700	350
79-34-5	1,1,2,2-Tetrachloroethane	ND	1,800	ND	260
98-82-8	Cumene	4,300	1,800	870	370
80-56-8	alpha-Pinene	16,000	1,800	2,900	330
103-65-1	n-Propylbenzene	2,200	1,800	450	370
622-96-8	4-Ethyltoluene	2,900	1,800	580	370
108-67-8	1,3,5-Trimethylbenzene	3,500	1,800	720	370
95-63-6	1,2,4-Trimethylbenzene	8,300	1,800	1,700	370
100-44-7	Benzyl Chloride	ND	1,800	ND	350
541-73-1	1,3-Dichlorobenzene	ND	1,800	ND	300
106-46-7	1,4-Dichlorobenzene	3,200	1,800	530	300
95-50-1	1,2-Dichlorobenzene	ND	1,800	ND	300
5989-27-5	d-Limonene	21,000	1,800	3,700	330
96-12-8	1,2-Dibromo-3-chloropropane	ND	1,800	ND	190
120-82-1	1,2,4-Trichlorobenzene	ND	1,800	ND	240
91-20-3	Naphthalene	ND	1,800	ND	350
87-68-3	Hexachlorobutadiene	ND	1,800	ND	170

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** 3 East Side, Grab

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-003

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes: **T**  
Container ID: 1SC00562

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 0.00040 Liter(s)

Initial Pressure (psig): -0.87      Final Pressure (psig): 5.38

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
5.13	Isobutene	85,000
5.31	n-Butane	35,000
5.50	C4H8 Alkene	33,000
5.80	C4H8 Alkene	34,000
7.55	Furan	300,000
8.15	Dimethyl Sulfide	280,000
9.71	Cyclopentene	33,000
11.20	2-Methylfuran	240,000
13.07	C6H10 Alkene	74,000
14.58	C7H12 Alkene	71,000
14.63	C7H12 Alkene	93,000
15.33	Dimethyl disulfide	42,000
16.76	3-Methyl-3-heptene	29,000
16.89	C8H14 Alkene	31,000
19.94	p-Isopropyltoluene	42,000

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 4 Field Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-004

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00919

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 0.40 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	1.3	ND	0.73
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	1.3	ND	0.25
74-87-3	Chloromethane	ND	1.3	ND	0.61
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	1.3	ND	0.18
75-01-4	Vinyl Chloride	ND	1.3	ND	0.49
106-99-0	1,3-Butadiene	ND	1.3	ND	0.57
74-83-9	Bromomethane	ND	1.3	ND	0.32
75-00-3	Chloroethane	ND	1.3	ND	0.47
64-17-5	Ethanol	ND	13	ND	6.6
75-05-8	Acetonitrile	ND	1.3	ND	0.74
107-02-8	Acrolein	ND	5.0	ND	2.2
67-64-1	Acetone	ND	13	ND	5.3
75-69-4	Trichlorofluoromethane	ND	1.3	ND	0.22
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	13	ND	5.1
107-13-1	Acrylonitrile	ND	1.3	ND	0.58
75-35-4	1,1-Dichloroethene	ND	1.3	ND	0.32
75-09-2	Methylene Chloride	ND	1.3	ND	0.36
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	1.3	ND	0.40
76-13-1	Trichlorotrifluoroethane	ND	1.3	ND	0.16
75-15-0	Carbon Disulfide	ND	13	ND	4.0
156-60-5	trans-1,2-Dichloroethene	ND	1.3	ND	0.32
75-34-3	1,1-Dichloroethane	ND	1.3	ND	0.31
1634-04-4	Methyl tert-Butyl Ether	ND	1.3	ND	0.35
108-05-4	Vinyl Acetate	ND	13	ND	3.6
78-93-3	2-Butanone (MEK)	ND	13	ND	4.2

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 4 Field Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-004

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00919

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 0.40 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	1.3	ND	0.32
141-78-6	Ethyl Acetate	ND	2.5	ND	0.69
110-54-3	n-Hexane	ND	1.3	ND	0.35
67-66-3	Chloroform	ND	1.3	ND	0.26
109-99-9	Tetrahydrofuran (THF)	ND	1.3	ND	0.42
107-06-2	1,2-Dichloroethane	ND	1.3	ND	0.31
71-55-6	1,1,1-Trichloroethane	ND	1.3	ND	0.23
71-43-2	Benzene	ND	1.3	ND	0.39
56-23-5	Carbon Tetrachloride	ND	1.3	ND	0.20
110-82-7	Cyclohexane	ND	2.5	ND	0.73
78-87-5	1,2-Dichloropropane	ND	1.3	ND	0.27
75-27-4	Bromodichloromethane	ND	1.3	ND	0.19
79-01-6	Trichloroethene	ND	1.3	ND	0.23
123-91-1	1,4-Dioxane	ND	1.3	ND	0.35
80-62-6	Methyl Methacrylate	ND	2.5	ND	0.61
142-82-5	n-Heptane	ND	1.3	ND	0.31
10061-01-5	cis-1,3-Dichloropropene	ND	1.3	ND	0.28
108-10-1	4-Methyl-2-pentanone	ND	1.3	ND	0.31
10061-02-6	trans-1,3-Dichloropropene	ND	1.3	ND	0.28
79-00-5	1,1,2-Trichloroethane	ND	1.3	ND	0.23
108-88-3	Toluene	ND	1.3	ND	0.33
591-78-6	2-Hexanone	ND	1.3	ND	0.31
124-48-1	Dibromochloromethane	ND	1.3	ND	0.15
106-93-4	1,2-Dibromoethane	ND	1.3	ND	0.16
123-86-4	n-Butyl Acetate	ND	1.3	ND	0.26

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** 4 Field Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-004

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:  
 Container ID: 1SC00919

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 0.40 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	1.3	ND	0.27
127-18-4	Tetrachloroethene	ND	1.3	ND	0.18
108-90-7	Chlorobenzene	ND	1.3	ND	0.27
100-41-4	Ethylbenzene	ND	1.3	ND	0.29
179601-23-1	m,p-Xylenes	ND	2.5	ND	0.58
75-25-2	Bromoform	ND	1.3	ND	0.12
100-42-5	Styrene	ND	1.3	ND	0.29
95-47-6	o-Xylene	ND	1.3	ND	0.29
111-84-2	n-Nonane	ND	1.3	ND	0.24
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.3	ND	0.18
98-82-8	Cumene	ND	1.3	ND	0.25
80-56-8	alpha-Pinene	ND	1.3	ND	0.22
103-65-1	n-Propylbenzene	ND	1.3	ND	0.25
622-96-8	4-Ethyltoluene	ND	1.3	ND	0.25
108-67-8	1,3,5-Trimethylbenzene	ND	1.3	ND	0.25
95-63-6	1,2,4-Trimethylbenzene	ND	1.3	ND	0.25
100-44-7	Benzyl Chloride	ND	1.3	ND	0.24
541-73-1	1,3-Dichlorobenzene	ND	1.3	ND	0.21
106-46-7	1,4-Dichlorobenzene	ND	1.3	ND	0.21
95-50-1	1,2-Dichlorobenzene	ND	1.3	ND	0.21
5989-27-5	d-Limonene	ND	1.3	ND	0.22
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.3	ND	0.13
120-82-1	1,2,4-Trichlorobenzene	ND	1.3	ND	0.17
91-20-3	Naphthalene	ND	1.3	ND	0.24
87-68-3	Hexachlorobutadiene	ND	1.3	ND	0.12

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** 4 Field Blank

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-004

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 1.0 L Summa Canister

Test Notes:

Container ID: 1SC00919

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/28/12

Volume(s) Analyzed: 0.40 Liter(s)

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
<hr/> No Compounds Detected <hr/>		

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** A Pond Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-005

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00121

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.98      Final Pressure (psig): 3.56

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	1.6	0.67	0.93	0.39
75-71-8	Dichlorodifluoromethane (CFC 12)	2.2	0.67	0.44	0.13
74-87-3	Chloromethane	ND	0.67	ND	0.32
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.67	ND	0.095
75-01-4	Vinyl Chloride	ND	0.67	ND	0.26
106-99-0	1,3-Butadiene	ND	0.67	ND	0.30
74-83-9	Bromomethane	ND	0.67	ND	0.17
75-00-3	Chloroethane	ND	0.67	ND	0.25
64-17-5	Ethanol	ND	6.7	ND	3.5
75-05-8	Acetonitrile	0.82	0.67	0.49	0.40
107-02-8	Acrolein	ND	2.7	ND	1.2
67-64-1	Acetone	17	6.7	7.1	2.8
75-69-4	Trichlorofluoromethane	1.2	0.67	0.21	0.12
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.7	ND	2.7
107-13-1	Acrylonitrile	ND	0.67	ND	0.31
75-35-4	1,1-Dichloroethene	ND	0.67	ND	0.17
75-09-2	Methylene Chloride	ND	0.67	ND	0.19
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.67	ND	0.21
76-13-1	Trichlorotrifluoroethane	ND	0.67	ND	0.087
75-15-0	Carbon Disulfide	ND	6.7	ND	2.1
156-60-5	trans-1,2-Dichloroethene	ND	0.67	ND	0.17
75-34-3	1,1-Dichloroethane	ND	0.67	ND	0.16
1634-04-4	Methyl tert-Butyl Ether	ND	0.67	ND	0.18
108-05-4	Vinyl Acetate	ND	6.7	ND	1.9
78-93-3	2-Butanone (MEK)	ND	6.7	ND	2.3

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** A Pond Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-005

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00121

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.98      Final Pressure (psig): 3.56

Canister Dilution Factor:

CAS #	Compound	Result	MRL	Result	MRL
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.67	ND	0.17
141-78-6	Ethyl Acetate	<b>17</b>	1.3	<b>4.8</b>	0.37
110-54-3	n-Hexane	ND	0.67	ND	0.19
67-66-3	Chloroform	ND	0.67	ND	0.14
109-99-9	Tetrahydrofuran (THF)	<b>2.7</b>	0.67	<b>0.91</b>	0.23
107-06-2	1,2-Dichloroethane	ND	0.67	ND	0.16
71-55-6	1,1,1-Trichloroethane	ND	0.67	ND	0.12
71-43-2	Benzene	<b>10</b>	0.67	<b>3.1</b>	0.21
56-23-5	Carbon Tetrachloride	ND	0.67	ND	0.11
110-82-7	Cyclohexane	ND	1.3	ND	0.39
78-87-5	1,2-Dichloropropane	ND	0.67	ND	0.14
75-27-4	Bromodichloromethane	ND	0.67	ND	0.099
79-01-6	Trichloroethene	ND	0.67	ND	0.12
123-91-1	1,4-Dioxane	ND	0.67	ND	0.18
80-62-6	Methyl Methacrylate	ND	1.3	ND	0.32
142-82-5	n-Heptane	ND	0.67	ND	0.16
10061-01-5	cis-1,3-Dichloropropene	ND	0.67	ND	0.15
108-10-1	4-Methyl-2-pentanone	ND	0.67	ND	0.16
10061-02-6	trans-1,3-Dichloropropene	ND	0.67	ND	0.15
79-00-5	1,1,2-Trichloroethane	ND	0.67	ND	0.12
108-88-3	Toluene	<b>3.7</b>	0.67	<b>0.97</b>	0.18
591-78-6	2-Hexanone	ND	0.67	ND	0.16
124-48-1	Dibromochloromethane	ND	0.67	ND	0.078
106-93-4	1,2-Dibromoethane	ND	0.67	ND	0.087
123-86-4	n-Butyl Acetate	ND	0.67	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** A Pond Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-005

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00121

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.98      Final Pressure (psig): 3.56

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.67	ND	0.14
127-18-4	Tetrachloroethene	ND	0.67	ND	0.098
108-90-7	Chlorobenzene	ND	0.67	ND	0.14
100-41-4	Ethylbenzene	<b>0.72</b>	0.67	<b>0.17</b>	0.15
179601-23-1	m,p-Xylenes	<b>1.5</b>	1.3	<b>0.34</b>	0.31
75-25-2	Bromoform	ND	0.67	ND	0.064
100-42-5	Styrene	ND	0.67	ND	0.16
95-47-6	o-Xylene	ND	0.67	ND	0.15
111-84-2	n-Nonane	ND	0.67	ND	0.13
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.67	ND	0.097
98-82-8	Cumene	ND	0.67	ND	0.14
80-56-8	alpha-Pinene	ND	0.67	ND	0.12
103-65-1	n-Propylbenzene	ND	0.67	ND	0.14
622-96-8	4-Ethyltoluene	ND	0.67	ND	0.14
108-67-8	1,3,5-Trimethylbenzene	ND	0.67	ND	0.14
95-63-6	1,2,4-Trimethylbenzene	ND	0.67	ND	0.14
100-44-7	Benzyl Chloride	ND	0.67	ND	0.13
541-73-1	1,3-Dichlorobenzene	ND	0.67	ND	0.11
106-46-7	1,4-Dichlorobenzene	ND	0.67	ND	0.11
95-50-1	1,2-Dichlorobenzene	ND	0.67	ND	0.11
5989-27-5	d-Limonene	<b>0.99</b>	0.67	<b>0.18</b>	0.12
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.67	ND	0.069
120-82-1	1,2,4-Trichlorobenzene	ND	0.67	ND	0.090
91-20-3	Naphthalene	ND	0.67	ND	0.13
87-68-3	Hexachlorobutadiene	ND	0.67	ND	0.062

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** A Pond Center

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-005

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC00121

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/28/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.98      Final Pressure (psig): 3.56

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>
7.54	Furan	3.4
8.14	Dimethyl Sulfide	4.5
9.41	Unidentified Compound	4.1
11.19	2-Methylfuran	3.7
14.42	Ethyl Propionate	14
16.47	Ethyl Butyrate	14
17.12	Hexamethylcyclotrisiloxane	12
19.81	2-Ethyl-1-hexanol	3.2

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** B Pond East  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-006

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01025

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.43      Final Pressure (psig): 3.60

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	<b>1.8</b>	0.69	<b>1.1</b>	0.40
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.7</b>	0.69	<b>0.55</b>	0.14
74-87-3	Chloromethane	ND	0.69	ND	0.33
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.69	ND	0.099
75-01-4	Vinyl Chloride	ND	0.69	ND	0.27
106-99-0	1,3-Butadiene	ND	0.69	ND	0.31
74-83-9	Bromomethane	ND	0.69	ND	0.18
75-00-3	Chloroethane	ND	0.69	ND	0.26
64-17-5	Ethanol	ND	6.9	ND	3.7
75-05-8	Acetonitrile	ND	0.69	ND	0.41
107-02-8	Acrolein	ND	2.8	ND	1.2
67-64-1	Acetone	<b>18</b>	6.9	<b>7.8</b>	2.9
75-69-4	Trichlorofluoromethane	<b>1.4</b>	0.69	<b>0.25</b>	0.12
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.9	ND	2.8
107-13-1	Acrylonitrile	ND	0.69	ND	0.32
75-35-4	1,1-Dichloroethene	ND	0.69	ND	0.17
75-09-2	Methylene Chloride	ND	0.69	ND	0.20
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.69	ND	0.22
76-13-1	Trichlorotrifluoroethane	ND	0.69	ND	0.090
75-15-0	Carbon Disulfide	ND	6.9	ND	2.2
156-60-5	trans-1,2-Dichloroethene	ND	0.69	ND	0.17
75-34-3	1,1-Dichloroethane	ND	0.69	ND	0.17
1634-04-4	Methyl tert-Butyl Ether	ND	0.69	ND	0.19
108-05-4	Vinyl Acetate	ND	6.9	ND	2.0
78-93-3	2-Butanone (MEK)	ND	6.9	ND	2.3

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** B Pond East  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-006

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01025

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.43      Final Pressure (psig): 3.60

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.69	ND	0.17
141-78-6	Ethyl Acetate	<b>5.0</b>	1.4	<b>1.4</b>	0.38
110-54-3	n-Hexane	ND	0.69	ND	0.20
67-66-3	Chloroform	ND	0.69	ND	0.14
109-99-9	Tetrahydrofuran (THF)	<b>2.6</b>	0.69	<b>0.89</b>	0.23
107-06-2	1,2-Dichloroethane	ND	0.69	ND	0.17
71-55-6	1,1,1-Trichloroethane	ND	0.69	ND	0.13
71-43-2	Benzene	<b>10</b>	0.69	<b>3.1</b>	0.22
56-23-5	Carbon Tetrachloride	ND	0.69	ND	0.11
110-82-7	Cyclohexane	ND	1.4	ND	0.40
78-87-5	1,2-Dichloropropane	ND	0.69	ND	0.15
75-27-4	Bromodichloromethane	ND	0.69	ND	0.10
79-01-6	Trichloroethene	ND	0.69	ND	0.13
123-91-1	1,4-Dioxane	ND	0.69	ND	0.19
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.34
142-82-5	n-Heptane	ND	0.69	ND	0.17
10061-01-5	cis-1,3-Dichloropropene	ND	0.69	ND	0.15
108-10-1	4-Methyl-2-pentanone	ND	0.69	ND	0.17
10061-02-6	trans-1,3-Dichloropropene	ND	0.69	ND	0.15
79-00-5	1,1,2-Trichloroethane	ND	0.69	ND	0.13
108-88-3	Toluene	<b>3.3</b>	0.69	<b>0.89</b>	0.18
591-78-6	2-Hexanone	ND	0.69	ND	0.17
124-48-1	Dibromochloromethane	ND	0.69	ND	0.081
106-93-4	1,2-Dibromoethane	ND	0.69	ND	0.090
123-86-4	n-Butyl Acetate	ND	0.69	ND	0.15

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** B Pond East  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-006

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01025

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.43      Final Pressure (psig): 3.60

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.69	ND	0.15
127-18-4	Tetrachloroethene	ND	0.69	ND	0.10
108-90-7	Chlorobenzene	ND	0.69	ND	0.15
100-41-4	Ethylbenzene	<b>0.83</b>	0.69	<b>0.19</b>	0.16
179601-23-1	m,p-Xylenes	<b>1.7</b>	1.4	<b>0.38</b>	0.32
75-25-2	Bromoform	ND	0.69	ND	0.067
100-42-5	Styrene	ND	0.69	ND	0.16
95-47-6	o-Xylene	ND	0.69	ND	0.16
111-84-2	n-Nonane	ND	0.69	ND	0.13
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.69	ND	0.10
98-82-8	Cumene	ND	0.69	ND	0.14
80-56-8	alpha-Pinene	ND	0.69	ND	0.12
103-65-1	n-Propylbenzene	ND	0.69	ND	0.14
622-96-8	4-Ethyltoluene	ND	0.69	ND	0.14
108-67-8	1,3,5-Trimethylbenzene	ND	0.69	ND	0.14
95-63-6	1,2,4-Trimethylbenzene	ND	0.69	ND	0.14
100-44-7	Benzyl Chloride	ND	0.69	ND	0.13
541-73-1	1,3-Dichlorobenzene	ND	0.69	ND	0.11
106-46-7	1,4-Dichlorobenzene	ND	0.69	ND	0.11
95-50-1	1,2-Dichlorobenzene	ND	0.69	ND	0.11
5989-27-5	d-Limonene	ND	0.69	ND	0.12
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.69	ND	0.071
120-82-1	1,2,4-Trichlorobenzene	ND	0.69	ND	0.093
91-20-3	Naphthalene	ND	0.69	ND	0.13
87-68-3	Hexachlorobutadiene	ND	0.69	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** B Pond East

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-006

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC01025

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/28/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.43      Final Pressure (psig): 3.60

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>
7.54	Furan	4.7
8.15	Dimethyl Sulfide	4.4
9.41	Unidentified Compound	4.0
11.14	Acetic Acid	4.7
11.19	2-Methylfuran	5.4
14.42	Ethyl Propionate	7.1
16.47	Ethyl Butyrate	8.4
17.12	Hexamethylcyclotrisiloxane	3.5

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** C Pond West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-007

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00862

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.36      Final Pressure (psig): 3.65

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	2.0	0.69	1.2	0.40
75-71-8	Dichlorodifluoromethane (CFC 12)	2.3	0.69	0.46	0.14
74-87-3	Chloromethane	ND	0.69	ND	0.33
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.69	ND	0.099
75-01-4	Vinyl Chloride	ND	0.69	ND	0.27
106-99-0	1,3-Butadiene	ND	0.69	ND	0.31
74-83-9	Bromomethane	ND	0.69	ND	0.18
75-00-3	Chloroethane	ND	0.69	ND	0.26
64-17-5	Ethanol	ND	6.9	ND	3.7
75-05-8	Acetonitrile	ND	0.69	ND	0.41
107-02-8	Acrolein	ND	2.8	ND	1.2
67-64-1	Acetone	13	6.9	5.5	2.9
75-69-4	Trichlorofluoromethane	1.3	0.69	0.23	0.12
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.9	ND	2.8
107-13-1	Acrylonitrile	ND	0.69	ND	0.32
75-35-4	1,1-Dichloroethene	ND	0.69	ND	0.17
75-09-2	Methylene Chloride	ND	0.69	ND	0.20
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.69	ND	0.22
76-13-1	Trichlorotrifluoroethane	ND	0.69	ND	0.090
75-15-0	Carbon Disulfide	ND	6.9	ND	2.2
156-60-5	trans-1,2-Dichloroethene	ND	0.69	ND	0.17
75-34-3	1,1-Dichloroethane	ND	0.69	ND	0.17
1634-04-4	Methyl tert-Butyl Ether	ND	0.69	ND	0.19
108-05-4	Vinyl Acetate	ND	6.9	ND	2.0
78-93-3	2-Butanone (MEK)	ND	6.9	ND	2.3

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** C Pond West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-007

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00862

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.36      Final Pressure (psig): 3.65

Canister Dilution Factor:

CAS #	Compound	Result	MRL	Result	MRL
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.69	ND	0.17
141-78-6	Ethyl Acetate	<b>8.7</b>	1.4	<b>2.4</b>	0.38
110-54-3	n-Hexane	ND	0.69	ND	0.20
67-66-3	Chloroform	ND	0.69	ND	0.14
109-99-9	Tetrahydrofuran (THF)	<b>3.0</b>	0.69	<b>1.0</b>	0.23
107-06-2	1,2-Dichloroethane	ND	0.69	ND	0.17
71-55-6	1,1,1-Trichloroethane	ND	0.69	ND	0.13
71-43-2	Benzene	<b>16</b>	0.69	<b>5.1</b>	0.22
56-23-5	Carbon Tetrachloride	ND	0.69	ND	0.11
110-82-7	Cyclohexane	ND	1.4	ND	0.40
78-87-5	1,2-Dichloropropane	ND	0.69	ND	0.15
75-27-4	Bromodichloromethane	ND	0.69	ND	0.10
79-01-6	Trichloroethene	ND	0.69	ND	0.13
123-91-1	1,4-Dioxane	ND	0.69	ND	0.19
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.34
142-82-5	n-Heptane	ND	0.69	ND	0.17
10061-01-5	cis-1,3-Dichloropropene	ND	0.69	ND	0.15
108-10-1	4-Methyl-2-pentanone	ND	0.69	ND	0.17
10061-02-6	trans-1,3-Dichloropropene	ND	0.69	ND	0.15
79-00-5	1,1,2-Trichloroethane	ND	0.69	ND	0.13
108-88-3	Toluene	<b>3.4</b>	0.69	<b>0.90</b>	0.18
591-78-6	2-Hexanone	ND	0.69	ND	0.17
124-48-1	Dibromochloromethane	ND	0.69	ND	0.081
106-93-4	1,2-Dibromoethane	ND	0.69	ND	0.090
123-86-4	n-Butyl Acetate	ND	0.69	ND	0.15

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** C Pond West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-007

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00862

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.36      Final Pressure (psig): 3.65

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	0.98	0.69	0.21	0.15
127-18-4	Tetrachloroethene	ND	0.69	ND	0.10
108-90-7	Chlorobenzene	ND	0.69	ND	0.15
100-41-4	Ethylbenzene	0.91	0.69	0.21	0.16
179601-23-1	m,p-Xylenes	3.2	1.4	0.74	0.32
75-25-2	Bromoform	ND	0.69	ND	0.067
100-42-5	Styrene	ND	0.69	ND	0.16
95-47-6	o-Xylene	1.1	0.69	0.26	0.16
111-84-2	n-Nonane	0.87	0.69	0.17	0.13
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.69	ND	0.10
98-82-8	Cumene	ND	0.69	ND	0.14
80-56-8	alpha-Pinene	ND	0.69	ND	0.12
103-65-1	n-Propylbenzene	ND	0.69	ND	0.14
622-96-8	4-Ethyltoluene	ND	0.69	ND	0.14
108-67-8	1,3,5-Trimethylbenzene	ND	0.69	ND	0.14
95-63-6	1,2,4-Trimethylbenzene	ND	0.69	ND	0.14
100-44-7	Benzyl Chloride	ND	0.69	ND	0.13
541-73-1	1,3-Dichlorobenzene	ND	0.69	ND	0.11
106-46-7	1,4-Dichlorobenzene	ND	0.69	ND	0.11
95-50-1	1,2-Dichlorobenzene	ND	0.69	ND	0.11
5989-27-5	d-Limonene	ND	0.69	ND	0.12
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.69	ND	0.071
120-82-1	1,2,4-Trichlorobenzene	ND	0.69	ND	0.093
91-20-3	Naphthalene	ND	0.69	ND	0.13
87-68-3	Hexachlorobutadiene	ND	0.69	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** C Pond West

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-007

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC00862

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/28/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.36      Final Pressure (psig): 3.65

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>
5.13	Isobutene	2.9
8.14	Dimethyl Sulfide	2.8
9.41	Unidentified Compound	3.3
14.42	Ethyl Propionate	11
16.47	Ethyl Butyrate	11
17.12	Hexamethylcyclotrisiloxane	3.4

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** D Summit  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-008

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00104

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.99      Final Pressure (psig): 3.67

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.67	ND	0.39
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.2</b>	0.67	<b>0.45</b>	0.14
74-87-3	Chloromethane	ND	0.67	ND	0.32
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.67	ND	0.096
75-01-4	Vinyl Chloride	ND	0.67	ND	0.26
106-99-0	1,3-Butadiene	ND	0.67	ND	0.30
74-83-9	Bromomethane	ND	0.67	ND	0.17
75-00-3	Chloroethane	ND	0.67	ND	0.25
64-17-5	Ethanol	ND	6.7	ND	3.6
75-05-8	Acetonitrile	ND	0.67	ND	0.40
107-02-8	Acrolein	ND	2.7	ND	1.2
67-64-1	Acetone	<b>13</b>	6.7	<b>5.4</b>	2.8
75-69-4	Trichlorofluoromethane	<b>1.3</b>	0.67	<b>0.24</b>	0.12
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	6.7	ND	2.7
107-13-1	Acrylonitrile	ND	0.67	ND	0.31
75-35-4	1,1-Dichloroethene	ND	0.67	ND	0.17
75-09-2	Methylene Chloride	ND	0.67	ND	0.19
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.67	ND	0.21
76-13-1	Trichlorotrifluoroethane	ND	0.67	ND	0.087
75-15-0	Carbon Disulfide	ND	6.7	ND	2.2
156-60-5	trans-1,2-Dichloroethene	ND	0.67	ND	0.17
75-34-3	1,1-Dichloroethane	ND	0.67	ND	0.17
1634-04-4	Methyl tert-Butyl Ether	ND	0.67	ND	0.19
108-05-4	Vinyl Acetate	ND	6.7	ND	1.9
78-93-3	2-Butanone (MEK)	ND	6.7	ND	2.3

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** D Summit  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-008

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00104

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.99      Final Pressure (psig): 3.67

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.67	ND	0.17
141-78-6	Ethyl Acetate	<b>8.0</b>	1.3	<b>2.2</b>	0.37
110-54-3	n-Hexane	ND	0.67	ND	0.19
67-66-3	Chloroform	ND	0.67	ND	0.14
109-99-9	Tetrahydrofuran (THF)	ND	0.67	ND	0.23
107-06-2	1,2-Dichloroethane	ND	0.67	ND	0.17
71-55-6	1,1,1-Trichloroethane	ND	0.67	ND	0.12
71-43-2	Benzene	ND	0.67	ND	0.21
56-23-5	Carbon Tetrachloride	ND	0.67	ND	0.11
110-82-7	Cyclohexane	ND	1.3	ND	0.39
78-87-5	1,2-Dichloropropane	ND	0.67	ND	0.15
75-27-4	Bromodichloromethane	ND	0.67	ND	0.10
79-01-6	Trichloroethene	ND	0.67	ND	0.12
123-91-1	1,4-Dioxane	ND	0.67	ND	0.19
80-62-6	Methyl Methacrylate	ND	1.3	ND	0.33
142-82-5	n-Heptane	ND	0.67	ND	0.16
10061-01-5	cis-1,3-Dichloropropene	ND	0.67	ND	0.15
108-10-1	4-Methyl-2-pentanone	ND	0.67	ND	0.16
10061-02-6	trans-1,3-Dichloropropene	ND	0.67	ND	0.15
79-00-5	1,1,2-Trichloroethane	ND	0.67	ND	0.12
108-88-3	Toluene	<b>1.7</b>	0.67	<b>0.46</b>	0.18
591-78-6	2-Hexanone	ND	0.67	ND	0.16
124-48-1	Dibromochloromethane	ND	0.67	ND	0.079
106-93-4	1,2-Dibromoethane	ND	0.67	ND	0.087
123-86-4	n-Butyl Acetate	ND	0.67	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** D Summit  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-008

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00104

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.99      Final Pressure (psig): 3.67

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.67	ND	0.14
127-18-4	Tetrachloroethene	ND	0.67	ND	0.099
108-90-7	Chlorobenzene	ND	0.67	ND	0.15
100-41-4	Ethylbenzene	ND	0.67	ND	0.15
179601-23-1	m,p-Xylenes	ND	1.3	ND	0.31
75-25-2	Bromoform	ND	0.67	ND	0.065
100-42-5	Styrene	ND	0.67	ND	0.16
95-47-6	o-Xylene	ND	0.67	ND	0.15
111-84-2	n-Nonane	ND	0.67	ND	0.13
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.67	ND	0.098
98-82-8	Cumene	ND	0.67	ND	0.14
80-56-8	alpha-Pinene	ND	0.67	ND	0.12
103-65-1	n-Propylbenzene	ND	0.67	ND	0.14
622-96-8	4-Ethyltoluene	ND	0.67	ND	0.14
108-67-8	1,3,5-Trimethylbenzene	ND	0.67	ND	0.14
95-63-6	1,2,4-Trimethylbenzene	ND	0.67	ND	0.14
100-44-7	Benzyl Chloride	ND	0.67	ND	0.13
541-73-1	1,3-Dichlorobenzene	ND	0.67	ND	0.11
106-46-7	1,4-Dichlorobenzene	ND	0.67	ND	0.11
95-50-1	1,2-Dichlorobenzene	ND	0.67	ND	0.11
5989-27-5	d-Limonene	ND	0.67	ND	0.12
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.67	ND	0.069
120-82-1	1,2,4-Trichlorobenzene	ND	0.67	ND	0.090
91-20-3	Naphthalene	ND	0.67	ND	0.13
87-68-3	Hexachlorobutadiene	ND	0.67	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** D Summit  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-008

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes: **T**  
Container ID: SC00104

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -0.99      Final Pressure (psig): 3.67

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>
14.42	Ethyl Propionate	9.9
16.47	Ethyl Butyrate	9.7
18.27	2-Butoxyethanol	2.8

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** E Amphitheater  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-009

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC00884

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.62

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.76	ND	0.44
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.1</b>	0.76	<b>0.42</b>	0.15
74-87-3	Chloromethane	ND	0.76	ND	0.37
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.76	ND	0.11
75-01-4	Vinyl Chloride	ND	0.76	ND	0.30
106-99-0	1,3-Butadiene	ND	0.76	ND	0.34
74-83-9	Bromomethane	ND	0.76	ND	0.19
75-00-3	Chloroethane	ND	0.76	ND	0.29
64-17-5	Ethanol	<b>16</b>	7.6	<b>8.4</b>	4.0
75-05-8	Acetonitrile	<b>0.76</b>	0.76	<b>0.45</b>	0.45
107-02-8	Acrolein	ND	3.0	ND	1.3
67-64-1	Acetone	<b>14</b>	7.6	<b>6.0</b>	3.2
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.76	<b>0.19</b>	0.13
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.6	ND	3.1
107-13-1	Acrylonitrile	ND	0.76	ND	0.35
75-35-4	1,1-Dichloroethene	ND	0.76	ND	0.19
75-09-2	Methylene Chloride	ND	0.76	ND	0.22
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.76	ND	0.24
76-13-1	Trichlorotrifluoroethane	ND	0.76	ND	0.099
75-15-0	Carbon Disulfide	ND	7.6	ND	2.4
156-60-5	trans-1,2-Dichloroethene	ND	0.76	ND	0.19
75-34-3	1,1-Dichloroethane	ND	0.76	ND	0.19
1634-04-4	Methyl tert-Butyl Ether	ND	0.76	ND	0.21
108-05-4	Vinyl Acetate	ND	7.6	ND	2.1
78-93-3	2-Butanone (MEK)	ND	7.6	ND	2.6

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** E Amphitheater  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-009

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00884

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.62

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.76	ND	0.19
141-78-6	Ethyl Acetate	<b>3.1</b>	1.5	<b>0.85</b>	0.42
110-54-3	n-Hexane	ND	0.76	ND	0.21
67-66-3	Chloroform	ND	0.76	ND	0.15
109-99-9	Tetrahydrofuran (THF)	ND	0.76	ND	0.26
107-06-2	1,2-Dichloroethane	ND	0.76	ND	0.19
71-55-6	1,1,1-Trichloroethane	ND	0.76	ND	0.14
71-43-2	Benzene	<b>1.1</b>	0.76	<b>0.34</b>	0.24
56-23-5	Carbon Tetrachloride	ND	0.76	ND	0.12
110-82-7	Cyclohexane	ND	1.5	ND	0.44
78-87-5	1,2-Dichloropropane	ND	0.76	ND	0.16
75-27-4	Bromodichloromethane	ND	0.76	ND	0.11
79-01-6	Trichloroethene	ND	0.76	ND	0.14
123-91-1	1,4-Dioxane	ND	0.76	ND	0.21
80-62-6	Methyl Methacrylate	ND	1.5	ND	0.37
142-82-5	n-Heptane	ND	0.76	ND	0.18
10061-01-5	cis-1,3-Dichloropropene	ND	0.76	ND	0.17
108-10-1	4-Methyl-2-pentanone	ND	0.76	ND	0.18
10061-02-6	trans-1,3-Dichloropropene	ND	0.76	ND	0.17
79-00-5	1,1,2-Trichloroethane	ND	0.76	ND	0.14
108-88-3	Toluene	<b>1.6</b>	0.76	<b>0.43</b>	0.20
591-78-6	2-Hexanone	ND	0.76	ND	0.18
124-48-1	Dibromochloromethane	ND	0.76	ND	0.089
106-93-4	1,2-Dibromoethane	ND	0.76	ND	0.098
123-86-4	n-Butyl Acetate	ND	0.76	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** E Amphitheater  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-009

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00884

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.62

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.76	ND	0.16
127-18-4	Tetrachloroethene	ND	0.76	ND	0.11
108-90-7	Chlorobenzene	ND	0.76	ND	0.16
100-41-4	Ethylbenzene	ND	0.76	ND	0.17
179601-23-1	m,p-Xylenes	ND	1.5	ND	0.35
75-25-2	Bromoform	ND	0.76	ND	0.073
100-42-5	Styrene	ND	0.76	ND	0.18
95-47-6	o-Xylene	ND	0.76	ND	0.17
111-84-2	n-Nonane	ND	0.76	ND	0.14
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.76	ND	0.11
98-82-8	Cumene	ND	0.76	ND	0.15
80-56-8	alpha-Pinene	ND	0.76	ND	0.14
103-65-1	n-Propylbenzene	ND	0.76	ND	0.15
622-96-8	4-Ethyltoluene	ND	0.76	ND	0.15
108-67-8	1,3,5-Trimethylbenzene	ND	0.76	ND	0.15
95-63-6	1,2,4-Trimethylbenzene	ND	0.76	ND	0.15
100-44-7	Benzyl Chloride	ND	0.76	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	0.76	ND	0.13
106-46-7	1,4-Dichlorobenzene	ND	0.76	ND	0.13
95-50-1	1,2-Dichlorobenzene	ND	0.76	ND	0.13
5989-27-5	d-Limonene	ND	0.76	ND	0.14
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.76	ND	0.078
120-82-1	1,2,4-Trichlorobenzene	ND	0.76	ND	0.10
91-20-3	Naphthalene	ND	0.76	ND	0.14
87-68-3	Hexachlorobutadiene	ND	0.76	ND	0.071

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

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**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** E Amphitheater  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-009

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes: **T**  
Container ID: SC00884

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.62

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
7.06	Isopentane	<b>4.9</b>
14.42	Ethyl Propionate	<b>4.1</b>
16.47	Ethyl Butyrate	<b>5.9</b>

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** F Grassy Knoll Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-010

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00790

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07      Final Pressure (psig): 3.64

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.79	ND	0.46
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.1</b>	0.79	<b>0.43</b>	0.16
74-87-3	Chloromethane	ND	0.79	ND	0.38
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.79	ND	0.11
75-01-4	Vinyl Chloride	ND	0.79	ND	0.31
106-99-0	1,3-Butadiene	ND	0.79	ND	0.36
74-83-9	Bromomethane	ND	0.79	ND	0.20
75-00-3	Chloroethane	ND	0.79	ND	0.30
64-17-5	Ethanol	ND	7.9	ND	4.2
75-05-8	Acetonitrile	ND	0.79	ND	0.47
107-02-8	Acrolein	ND	3.2	ND	1.4
67-64-1	Acetone	<b>12</b>	7.9	<b>4.9</b>	3.3
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.79	<b>0.20</b>	0.14
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.9	ND	3.2
107-13-1	Acrylonitrile	ND	0.79	ND	0.36
75-35-4	1,1-Dichloroethene	ND	0.79	ND	0.20
75-09-2	Methylene Chloride	ND	0.79	ND	0.23
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.79	ND	0.25
76-13-1	Trichlorotrifluoroethane	ND	0.79	ND	0.10
75-15-0	Carbon Disulfide	ND	7.9	ND	2.5
156-60-5	trans-1,2-Dichloroethene	ND	0.79	ND	0.20
75-34-3	1,1-Dichloroethane	ND	0.79	ND	0.20
1634-04-4	Methyl tert-Butyl Ether	ND	0.79	ND	0.22
108-05-4	Vinyl Acetate	ND	7.9	ND	2.2
78-93-3	2-Butanone (MEK)	ND	7.9	ND	2.7

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** F Grassy Knoll Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-010

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00790

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07      Final Pressure (psig): 3.64

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.79	ND	0.20
141-78-6	Ethyl Acetate	<b>2.6</b>	1.6	<b>0.71</b>	0.44
110-54-3	n-Hexane	ND	0.79	ND	0.22
67-66-3	Chloroform	ND	0.79	ND	0.16
109-99-9	Tetrahydrofuran (THF)	ND	0.79	ND	0.27
107-06-2	1,2-Dichloroethane	ND	0.79	ND	0.20
71-55-6	1,1,1-Trichloroethane	ND	0.79	ND	0.14
71-43-2	Benzene	ND	0.79	ND	0.25
56-23-5	Carbon Tetrachloride	ND	0.79	ND	0.13
110-82-7	Cyclohexane	ND	1.6	ND	0.46
78-87-5	1,2-Dichloropropane	ND	0.79	ND	0.17
75-27-4	Bromodichloromethane	ND	0.79	ND	0.12
79-01-6	Trichloroethene	ND	0.79	ND	0.15
123-91-1	1,4-Dioxane	ND	0.79	ND	0.22
80-62-6	Methyl Methacrylate	ND	1.6	ND	0.39
142-82-5	n-Heptane	ND	0.79	ND	0.19
10061-01-5	cis-1,3-Dichloropropene	ND	0.79	ND	0.17
108-10-1	4-Methyl-2-pentanone	ND	0.79	ND	0.19
10061-02-6	trans-1,3-Dichloropropene	ND	0.79	ND	0.17
79-00-5	1,1,2-Trichloroethane	ND	0.79	ND	0.14
108-88-3	Toluene	<b>1.0</b>	0.79	<b>0.28</b>	0.21
591-78-6	2-Hexanone	ND	0.79	ND	0.19
124-48-1	Dibromochloromethane	ND	0.79	ND	0.093
106-93-4	1,2-Dibromoethane	ND	0.79	ND	0.10
123-86-4	n-Butyl Acetate	ND	0.79	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** F Grassy Knoll Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-010

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00790

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07      Final Pressure (psig): 3.64

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.79	ND	0.17
127-18-4	Tetrachloroethene	<b>1.4</b>	0.79	<b>0.20</b>	0.12
108-90-7	Chlorobenzene	ND	0.79	ND	0.17
100-41-4	Ethylbenzene	ND	0.79	ND	0.18
179601-23-1	m,p-Xylenes	ND	1.6	ND	0.36
75-25-2	Bromoform	ND	0.79	ND	0.076
100-42-5	Styrene	ND	0.79	ND	0.19
95-47-6	o-Xylene	ND	0.79	ND	0.18
111-84-2	n-Nonane	ND	0.79	ND	0.15
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.79	ND	0.12
98-82-8	Cumene	ND	0.79	ND	0.16
80-56-8	alpha-Pinene	ND	0.79	ND	0.14
103-65-1	n-Propylbenzene	ND	0.79	ND	0.16
622-96-8	4-Ethyltoluene	ND	0.79	ND	0.16
108-67-8	1,3,5-Trimethylbenzene	ND	0.79	ND	0.16
95-63-6	1,2,4-Trimethylbenzene	ND	0.79	ND	0.16
100-44-7	Benzyl Chloride	ND	0.79	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	0.79	ND	0.13
106-46-7	1,4-Dichlorobenzene	ND	0.79	ND	0.13
95-50-1	1,2-Dichlorobenzene	ND	0.79	ND	0.13
5989-27-5	d-Limonene	ND	0.79	ND	0.14
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.79	ND	0.082
120-82-1	1,2,4-Trichlorobenzene	ND	0.79	ND	0.11
91-20-3	Naphthalene	ND	0.79	ND	0.15
87-68-3	Hexachlorobutadiene	ND	0.79	ND	0.074

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** F Grassy Knoll Center  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-010

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes: **T**  
Container ID: SC00790

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07      Final Pressure (psig): 3.64

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>
9.41	Unidentified Compound	3.3
14.42	Ethyl Propionate	5.0
16.47	Ethyl Butyrate	7.6
17.12	Hexamethylcyclotrisiloxane	3.3

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** G Grassy Knoll West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-011

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00925

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.68      Final Pressure (psig): 3.72

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.77	ND	0.44
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.2</b>	0.77	<b>0.45</b>	0.15
74-87-3	Chloromethane	ND	0.77	ND	0.37
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.77	ND	0.11
75-01-4	Vinyl Chloride	ND	0.77	ND	0.30
106-99-0	1,3-Butadiene	ND	0.77	ND	0.35
74-83-9	Bromomethane	ND	0.77	ND	0.20
75-00-3	Chloroethane	ND	0.77	ND	0.29
64-17-5	Ethanol	ND	7.7	ND	4.1
75-05-8	Acetonitrile	ND	0.77	ND	0.46
107-02-8	Acrolein	ND	3.1	ND	1.3
67-64-1	Acetone	<b>13</b>	7.7	<b>5.5</b>	3.2
75-69-4	Trichlorofluoromethane	<b>1.2</b>	0.77	<b>0.21</b>	0.14
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.7	ND	3.1
107-13-1	Acrylonitrile	ND	0.77	ND	0.35
75-35-4	1,1-Dichloroethene	ND	0.77	ND	0.19
75-09-2	Methylene Chloride	ND	0.77	ND	0.22
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.77	ND	0.24
76-13-1	Trichlorotrifluoroethane	ND	0.77	ND	0.10
75-15-0	Carbon Disulfide	ND	7.7	ND	2.5
156-60-5	trans-1,2-Dichloroethene	ND	0.77	ND	0.19
75-34-3	1,1-Dichloroethane	ND	0.77	ND	0.19
1634-04-4	Methyl tert-Butyl Ether	ND	0.77	ND	0.21
108-05-4	Vinyl Acetate	ND	7.7	ND	2.2
78-93-3	2-Butanone (MEK)	ND	7.7	ND	2.6

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** G Grassy Knoll West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-011

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00925

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.68      Final Pressure (psig): 3.72

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.77	ND	0.19
141-78-6	Ethyl Acetate	<b>3.0</b>	1.5	<b>0.83</b>	0.42
110-54-3	n-Hexane	ND	0.77	ND	0.22
67-66-3	Chloroform	ND	0.77	ND	0.16
109-99-9	Tetrahydrofuran (THF)	ND	0.77	ND	0.26
107-06-2	1,2-Dichloroethane	ND	0.77	ND	0.19
71-55-6	1,1,1-Trichloroethane	ND	0.77	ND	0.14
71-43-2	Benzene	ND	0.77	ND	0.24
56-23-5	Carbon Tetrachloride	ND	0.77	ND	0.12
110-82-7	Cyclohexane	ND	1.5	ND	0.44
78-87-5	1,2-Dichloropropane	ND	0.77	ND	0.17
75-27-4	Bromodichloromethane	ND	0.77	ND	0.11
79-01-6	Trichloroethene	ND	0.77	ND	0.14
123-91-1	1,4-Dioxane	ND	0.77	ND	0.21
80-62-6	Methyl Methacrylate	ND	1.5	ND	0.37
142-82-5	n-Heptane	ND	0.77	ND	0.19
10061-01-5	cis-1,3-Dichloropropene	ND	0.77	ND	0.17
108-10-1	4-Methyl-2-pentanone	ND	0.77	ND	0.19
10061-02-6	trans-1,3-Dichloropropene	ND	0.77	ND	0.17
79-00-5	1,1,2-Trichloroethane	ND	0.77	ND	0.14
108-88-3	Toluene	<b>1.4</b>	0.77	<b>0.38</b>	0.20
591-78-6	2-Hexanone	ND	0.77	ND	0.19
124-48-1	Dibromochloromethane	ND	0.77	ND	0.090
106-93-4	1,2-Dibromoethane	ND	0.77	ND	0.10
123-86-4	n-Butyl Acetate	ND	0.77	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** G Grassy Knoll West  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-011

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00925

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.68      Final Pressure (psig): 3.72

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.77	ND	0.16
127-18-4	Tetrachloroethene	ND	0.77	ND	0.11
108-90-7	Chlorobenzene	ND	0.77	ND	0.17
100-41-4	Ethylbenzene	ND	0.77	ND	0.18
179601-23-1	m,p-Xylenes	ND	1.5	ND	0.35
75-25-2	Bromoform	ND	0.77	ND	0.074
100-42-5	Styrene	ND	0.77	ND	0.18
95-47-6	o-Xylene	ND	0.77	ND	0.18
111-84-2	n-Nonane	ND	0.77	ND	0.15
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.77	ND	0.11
98-82-8	Cumene	ND	0.77	ND	0.16
80-56-8	alpha-Pinene	ND	0.77	ND	0.14
103-65-1	n-Propylbenzene	ND	0.77	ND	0.16
622-96-8	4-Ethyltoluene	ND	0.77	ND	0.16
108-67-8	1,3,5-Trimethylbenzene	ND	0.77	ND	0.16
95-63-6	1,2,4-Trimethylbenzene	ND	0.77	ND	0.16
100-44-7	Benzyl Chloride	ND	0.77	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	0.77	ND	0.13
106-46-7	1,4-Dichlorobenzene	ND	0.77	ND	0.13
95-50-1	1,2-Dichlorobenzene	ND	0.77	ND	0.13
5989-27-5	d-Limonene	ND	0.77	ND	0.14
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.77	ND	0.079
120-82-1	1,2,4-Trichlorobenzene	ND	0.77	ND	0.10
91-20-3	Naphthalene	ND	0.77	ND	0.15
87-68-3	Hexachlorobutadiene	ND	0.77	ND	0.072

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** G Grassy Knoll West

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-011

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC00925

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.68      Final Pressure (psig): 3.72

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>
11.10	Acetic Acid	3.7
14.42	Ethyl Propionate	4.7
16.47	Ethyl Butyrate	6.5

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-012

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00078

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65      Final Pressure (psig): 3.70

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.77	ND	0.44
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.2</b>	0.77	<b>0.44</b>	0.15
74-87-3	Chloromethane	ND	0.77	ND	0.37
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.77	ND	0.11
75-01-4	Vinyl Chloride	ND	0.77	ND	0.30
106-99-0	1,3-Butadiene	ND	0.77	ND	0.35
74-83-9	Bromomethane	ND	0.77	ND	0.20
75-00-3	Chloroethane	ND	0.77	ND	0.29
64-17-5	Ethanol	ND	7.7	ND	4.1
75-05-8	Acetonitrile	ND	0.77	ND	0.46
107-02-8	Acrolein	ND	3.1	ND	1.3
67-64-1	Acetone	<b>21</b>	7.7	<b>8.9</b>	3.2
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.77	<b>0.20</b>	0.14
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.7	ND	3.1
107-13-1	Acrylonitrile	ND	0.77	ND	0.35
75-35-4	1,1-Dichloroethene	ND	0.77	ND	0.19
75-09-2	Methylene Chloride	ND	0.77	ND	0.22
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.77	ND	0.24
76-13-1	Trichlorotrifluoroethane	ND	0.77	ND	0.10
75-15-0	Carbon Disulfide	ND	7.7	ND	2.5
156-60-5	trans-1,2-Dichloroethene	ND	0.77	ND	0.19
75-34-3	1,1-Dichloroethane	ND	0.77	ND	0.19
1634-04-4	Methyl tert-Butyl Ether	ND	0.77	ND	0.21
108-05-4	Vinyl Acetate	ND	7.7	ND	2.2
78-93-3	2-Butanone (MEK)	ND	7.7	ND	2.6

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-012

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00078

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65      Final Pressure (psig): 3.70

Canister Dilution Factor:

CAS #	Compound	Result	MRL	Result	MRL
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.77	ND	0.19
141-78-6	Ethyl Acetate	<b>2.7</b>	1.5	<b>0.74</b>	0.42
110-54-3	n-Hexane	ND	0.77	ND	0.22
67-66-3	Chloroform	ND	0.77	ND	0.16
109-99-9	Tetrahydrofuran (THF)	ND	0.77	ND	0.26
107-06-2	1,2-Dichloroethane	ND	0.77	ND	0.19
71-55-6	1,1,1-Trichloroethane	ND	0.77	ND	0.14
71-43-2	Benzene	ND	0.77	ND	0.24
56-23-5	Carbon Tetrachloride	ND	0.77	ND	0.12
110-82-7	Cyclohexane	ND	1.5	ND	0.44
78-87-5	1,2-Dichloropropane	ND	0.77	ND	0.17
75-27-4	Bromodichloromethane	ND	0.77	ND	0.11
79-01-6	Trichloroethene	ND	0.77	ND	0.14
123-91-1	1,4-Dioxane	ND	0.77	ND	0.21
80-62-6	Methyl Methacrylate	ND	1.5	ND	0.37
142-82-5	n-Heptane	ND	0.77	ND	0.19
10061-01-5	cis-1,3-Dichloropropene	ND	0.77	ND	0.17
108-10-1	4-Methyl-2-pentanone	ND	0.77	ND	0.19
10061-02-6	trans-1,3-Dichloropropene	ND	0.77	ND	0.17
79-00-5	1,1,2-Trichloroethane	ND	0.77	ND	0.14
108-88-3	Toluene	<b>1.1</b>	0.77	<b>0.29</b>	0.20
591-78-6	2-Hexanone	ND	0.77	ND	0.19
124-48-1	Dibromochloromethane	ND	0.77	ND	0.090
106-93-4	1,2-Dibromoethane	ND	0.77	ND	0.10
123-86-4	n-Butyl Acetate	ND	0.77	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-012

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00078

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65      Final Pressure (psig): 3.70

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.77	ND	0.16
127-18-4	Tetrachloroethene	ND	0.77	ND	0.11
108-90-7	Chlorobenzene	ND	0.77	ND	0.17
100-41-4	Ethylbenzene	ND	0.77	ND	0.18
179601-23-1	m,p-Xylenes	ND	1.5	ND	0.35
75-25-2	Bromoform	ND	0.77	ND	0.074
100-42-5	Styrene	ND	0.77	ND	0.18
95-47-6	o-Xylene	ND	0.77	ND	0.18
111-84-2	n-Nonane	ND	0.77	ND	0.15
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.77	ND	0.11
98-82-8	Cumene	ND	0.77	ND	0.16
80-56-8	alpha-Pinene	ND	0.77	ND	0.14
103-65-1	n-Propylbenzene	ND	0.77	ND	0.16
622-96-8	4-Ethyltoluene	ND	0.77	ND	0.16
108-67-8	1,3,5-Trimethylbenzene	ND	0.77	ND	0.16
95-63-6	1,2,4-Trimethylbenzene	ND	0.77	ND	0.16
100-44-7	Benzyl Chloride	ND	0.77	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	0.77	ND	0.13
106-46-7	1,4-Dichlorobenzene	ND	0.77	ND	0.13
95-50-1	1,2-Dichlorobenzene	ND	0.77	ND	0.13
5989-27-5	d-Limonene	ND	0.77	ND	0.14
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.77	ND	0.079
120-82-1	1,2,4-Trichlorobenzene	ND	0.77	ND	0.10
91-20-3	Naphthalene	ND	0.77	ND	0.15
87-68-3	Hexachlorobutadiene	ND	0.77	ND	0.072

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-012

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes: **T**  
Container ID: SC00078

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65      Final Pressure (psig): 3.70

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
9.41	Unidentified Compound	4.6
14.42	Ethyl Propionate	5.2
16.47	Ethyl Butyrate	7.9
17.12	Hexamethylcyclotrisiloxane	12
19.00	Benzaldehyde	3.4

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** I East Fenceline #1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-013

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00091

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.85      Final Pressure (psig): 3.69

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	<b>1.8</b>	0.72	<b>1.0</b>	0.42
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.2</b>	0.72	<b>0.45</b>	0.14
74-87-3	Chloromethane	ND	0.72	ND	0.35
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.72	ND	0.10
75-01-4	Vinyl Chloride	ND	0.72	ND	0.28
106-99-0	1,3-Butadiene	ND	0.72	ND	0.32
74-83-9	Bromomethane	ND	0.72	ND	0.18
75-00-3	Chloroethane	ND	0.72	ND	0.27
64-17-5	Ethanol	ND	7.2	ND	3.8
75-05-8	Acetonitrile	<b>0.88</b>	0.72	<b>0.52</b>	0.43
107-02-8	Acrolein	ND	2.9	ND	1.2
67-64-1	Acetone	<b>11</b>	7.2	<b>4.5</b>	3.0
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.72	<b>0.20</b>	0.13
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.2	ND	2.9
107-13-1	Acrylonitrile	ND	0.72	ND	0.33
75-35-4	1,1-Dichloroethene	ND	0.72	ND	0.18
75-09-2	Methylene Chloride	<b>0.94</b>	0.72	<b>0.27</b>	0.21
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.72	ND	0.23
76-13-1	Trichlorotrifluoroethane	ND	0.72	ND	0.093
75-15-0	Carbon Disulfide	ND	7.2	ND	2.3
156-60-5	trans-1,2-Dichloroethene	ND	0.72	ND	0.18
75-34-3	1,1-Dichloroethane	ND	0.72	ND	0.18
1634-04-4	Methyl tert-Butyl Ether	ND	0.72	ND	0.20
108-05-4	Vinyl Acetate	ND	7.2	ND	2.0
78-93-3	2-Butanone (MEK)	ND	7.2	ND	2.4

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** I East Fenceline #1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-013

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00091

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.85      Final Pressure (psig): 3.69

Canister Dilution Factor:

CAS #	Compound	Result	MRL	Result	MRL
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.72	ND	0.18
141-78-6	Ethyl Acetate	ND	1.4	ND	0.40
110-54-3	n-Hexane	ND	0.72	ND	0.20
67-66-3	Chloroform	ND	0.72	ND	0.15
109-99-9	Tetrahydrofuran (THF)	<b>2.5</b>	0.72	<b>0.85</b>	0.24
107-06-2	1,2-Dichloroethane	ND	0.72	ND	0.18
71-55-6	1,1,1-Trichloroethane	ND	0.72	ND	0.13
71-43-2	Benzene	<b>11</b>	0.72	<b>3.4</b>	0.22
56-23-5	Carbon Tetrachloride	ND	0.72	ND	0.11
110-82-7	Cyclohexane	ND	1.4	ND	0.42
78-87-5	1,2-Dichloropropane	ND	0.72	ND	0.15
75-27-4	Bromodichloromethane	ND	0.72	ND	0.11
79-01-6	Trichloroethene	ND	0.72	ND	0.13
123-91-1	1,4-Dioxane	ND	0.72	ND	0.20
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.35
142-82-5	n-Heptane	ND	0.72	ND	0.17
10061-01-5	cis-1,3-Dichloropropene	ND	0.72	ND	0.16
108-10-1	4-Methyl-2-pentanone	ND	0.72	ND	0.17
10061-02-6	trans-1,3-Dichloropropene	ND	0.72	ND	0.16
79-00-5	1,1,2-Trichloroethane	ND	0.72	ND	0.13
108-88-3	Toluene	<b>2.0</b>	0.72	<b>0.52</b>	0.19
591-78-6	2-Hexanone	ND	0.72	ND	0.17
124-48-1	Dibromochloromethane	ND	0.72	ND	0.084
106-93-4	1,2-Dibromoethane	ND	0.72	ND	0.093
123-86-4	n-Butyl Acetate	ND	0.72	ND	0.15

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** I East Fenceline #1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-013

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00091

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.85      Final Pressure (psig): 3.69

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.72	ND	0.15
127-18-4	Tetrachloroethene	ND	0.72	ND	0.11
108-90-7	Chlorobenzene	ND	0.72	ND	0.16
100-41-4	Ethylbenzene	ND	0.72	ND	0.16
179601-23-1	m,p-Xylenes	ND	1.4	ND	0.33
75-25-2	Bromoform	ND	0.72	ND	0.069
100-42-5	Styrene	ND	0.72	ND	0.17
95-47-6	o-Xylene	ND	0.72	ND	0.16
111-84-2	n-Nonane	ND	0.72	ND	0.14
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.72	ND	0.10
98-82-8	Cumene	ND	0.72	ND	0.15
80-56-8	alpha-Pinene	<b>1.1</b>	0.72	<b>0.19</b>	0.13
103-65-1	n-Propylbenzene	ND	0.72	ND	0.15
622-96-8	4-Ethyltoluene	ND	0.72	ND	0.15
108-67-8	1,3,5-Trimethylbenzene	ND	0.72	ND	0.15
95-63-6	1,2,4-Trimethylbenzene	ND	0.72	ND	0.15
100-44-7	Benzyl Chloride	ND	0.72	ND	0.14
541-73-1	1,3-Dichlorobenzene	ND	0.72	ND	0.12
106-46-7	1,4-Dichlorobenzene	ND	0.72	ND	0.12
95-50-1	1,2-Dichlorobenzene	ND	0.72	ND	0.12
5989-27-5	d-Limonene	ND	0.72	ND	0.13
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.72	ND	0.074
120-82-1	1,2,4-Trichlorobenzene	ND	0.72	ND	0.096
91-20-3	Naphthalene	ND	0.72	ND	0.14
87-68-3	Hexachlorobutadiene	ND	0.72	ND	0.067

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** I East Fenceline #1

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-013

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes: **T**  
Container ID: SC00091

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.85      Final Pressure (psig): 3.69

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>
7.54	Furan	3.5
8.14	Dimethyl Sulfide	5.2
9.40	Unidentified Compound	3.1
11.19	2-Methylfuran	3.9
16.47	Ethyl Butyrate	3.9
17.12	Hexamethylcyclotrisiloxane	15

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** J East Fenceline #2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-014

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00905

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.59

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	1.1	0.76	0.64	0.44
75-71-8	Dichlorodifluoromethane (CFC 12)	2.2	0.76	0.44	0.15
74-87-3	Chloromethane	ND	0.76	ND	0.37
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.76	ND	0.11
75-01-4	Vinyl Chloride	ND	0.76	ND	0.30
106-99-0	1,3-Butadiene	ND	0.76	ND	0.34
74-83-9	Bromomethane	ND	0.76	ND	0.19
75-00-3	Chloroethane	ND	0.76	ND	0.29
64-17-5	Ethanol	12	7.6	6.2	4.0
75-05-8	Acetonitrile	14	0.76	8.1	0.45
107-02-8	Acrolein	ND	3.0	ND	1.3
67-64-1	Acetone	ND	7.6	ND	3.2
75-69-4	Trichlorofluoromethane	1.1	0.76	0.20	0.13
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.6	ND	3.1
107-13-1	Acrylonitrile	ND	0.76	ND	0.35
75-35-4	1,1-Dichloroethene	ND	0.76	ND	0.19
75-09-2	Methylene Chloride	0.79	0.76	0.23	0.22
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.76	ND	0.24
76-13-1	Trichlorotrifluoroethane	ND	0.76	ND	0.099
75-15-0	Carbon Disulfide	ND	7.6	ND	2.4
156-60-5	trans-1,2-Dichloroethene	ND	0.76	ND	0.19
75-34-3	1,1-Dichloroethane	ND	0.76	ND	0.19
1634-04-4	Methyl tert-Butyl Ether	ND	0.76	ND	0.21
108-05-4	Vinyl Acetate	ND	7.6	ND	2.1
78-93-3	2-Butanone (MEK)	ND	7.6	ND	2.6

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** J East Fenceline #2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-014

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00905

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.59

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.76	ND	0.19
141-78-6	Ethyl Acetate	ND	1.5	ND	0.42
110-54-3	n-Hexane	ND	0.76	ND	0.21
67-66-3	Chloroform	ND	0.76	ND	0.15
109-99-9	Tetrahydrofuran (THF)	<b>1.2</b>	0.76	<b>0.42</b>	0.26
107-06-2	1,2-Dichloroethane	ND	0.76	ND	0.19
71-55-6	1,1,1-Trichloroethane	ND	0.76	ND	0.14
71-43-2	Benzene	ND	0.76	ND	0.24
56-23-5	Carbon Tetrachloride	ND	0.76	ND	0.12
110-82-7	Cyclohexane	ND	1.5	ND	0.44
78-87-5	1,2-Dichloropropane	ND	0.76	ND	0.16
75-27-4	Bromodichloromethane	ND	0.76	ND	0.11
79-01-6	Trichloroethene	ND	0.76	ND	0.14
123-91-1	1,4-Dioxane	ND	0.76	ND	0.21
80-62-6	Methyl Methacrylate	ND	1.5	ND	0.37
142-82-5	n-Heptane	ND	0.76	ND	0.18
10061-01-5	cis-1,3-Dichloropropene	ND	0.76	ND	0.17
108-10-1	4-Methyl-2-pentanone	ND	0.76	ND	0.18
10061-02-6	trans-1,3-Dichloropropene	ND	0.76	ND	0.17
79-00-5	1,1,2-Trichloroethane	ND	0.76	ND	0.14
108-88-3	Toluene	ND	0.76	ND	0.20
591-78-6	2-Hexanone	ND	0.76	ND	0.18
124-48-1	Dibromochloromethane	ND	0.76	ND	0.089
106-93-4	1,2-Dibromoethane	ND	0.76	ND	0.098
123-86-4	n-Butyl Acetate	ND	0.76	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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** J East Fenceline #2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-014

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00905

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.59

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.76	ND	0.16
127-18-4	Tetrachloroethene	<b>2.1</b>	0.76	<b>0.31</b>	0.11
108-90-7	Chlorobenzene	ND	0.76	ND	0.16
100-41-4	Ethylbenzene	ND	0.76	ND	0.17
179601-23-1	m,p-Xylenes	ND	1.5	ND	0.35
75-25-2	Bromoform	ND	0.76	ND	0.073
100-42-5	Styrene	ND	0.76	ND	0.18
95-47-6	o-Xylene	ND	0.76	ND	0.17
111-84-2	n-Nonane	ND	0.76	ND	0.14
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.76	ND	0.11
98-82-8	Cumene	ND	0.76	ND	0.15
80-56-8	alpha-Pinene	ND	0.76	ND	0.14
103-65-1	n-Propylbenzene	ND	0.76	ND	0.15
622-96-8	4-Ethyltoluene	ND	0.76	ND	0.15
108-67-8	1,3,5-Trimethylbenzene	ND	0.76	ND	0.15
95-63-6	1,2,4-Trimethylbenzene	ND	0.76	ND	0.15
100-44-7	Benzyl Chloride	ND	0.76	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	0.76	ND	0.13
106-46-7	1,4-Dichlorobenzene	ND	0.76	ND	0.13
95-50-1	1,2-Dichlorobenzene	ND	0.76	ND	0.13
5989-27-5	d-Limonene	ND	0.76	ND	0.14
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.76	ND	0.078
120-82-1	1,2,4-Trichlorobenzene	ND	0.76	ND	0.10
91-20-3	Naphthalene	ND	0.76	ND	0.14
87-68-3	Hexachlorobutadiene	ND	0.76	ND	0.071

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** J East Fenceline #2

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-014

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00905

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55      Final Pressure (psig): 3.59

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>
<hr/> No Compounds Detected <hr/>		

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**Data**  
**Qualifier**

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-015

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00689

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.59      Final Pressure (psig): 3.55

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	<b>0.86</b>	0.82	<b>0.50</b>	0.48
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.3</b>	0.82	<b>0.46</b>	0.17
74-87-3	Chloromethane	ND	0.82	ND	0.40
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.82	ND	0.12
75-01-4	Vinyl Chloride	ND	0.82	ND	0.32
106-99-0	1,3-Butadiene	ND	0.82	ND	0.37
74-83-9	Bromomethane	ND	0.82	ND	0.21
75-00-3	Chloroethane	ND	0.82	ND	0.31
64-17-5	Ethanol	ND	8.2	ND	4.4
75-05-8	Acetonitrile	ND	0.82	ND	0.49
107-02-8	Acrolein	ND	3.3	ND	1.4
67-64-1	Acetone	<b>8.9</b>	8.2	<b>3.7</b>	3.5
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.82	<b>0.20</b>	0.15
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	8.2	ND	3.3
107-13-1	Acrylonitrile	ND	0.82	ND	0.38
75-35-4	1,1-Dichloroethene	ND	0.82	ND	0.21
75-09-2	Methylene Chloride	ND	0.82	ND	0.24
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.82	ND	0.26
76-13-1	Trichlorotrifluoroethane	ND	0.82	ND	0.11
75-15-0	Carbon Disulfide	ND	8.2	ND	2.6
156-60-5	trans-1,2-Dichloroethene	ND	0.82	ND	0.21
75-34-3	1,1-Dichloroethane	ND	0.82	ND	0.20
1634-04-4	Methyl tert-Butyl Ether	ND	0.82	ND	0.23
108-05-4	Vinyl Acetate	ND	8.2	ND	2.3
78-93-3	2-Butanone (MEK)	ND	8.2	ND	2.8

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-015

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00689

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.59      Final Pressure (psig): 3.55

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.82	ND	0.21
141-78-6	Ethyl Acetate	ND	1.6	ND	0.46
110-54-3	n-Hexane	ND	0.82	ND	0.23
67-66-3	Chloroform	ND	0.82	ND	0.17
109-99-9	Tetrahydrofuran (THF)	ND	0.82	ND	0.28
107-06-2	1,2-Dichloroethane	ND	0.82	ND	0.20
71-55-6	1,1,1-Trichloroethane	ND	0.82	ND	0.15
71-43-2	Benzene	<b>1.5</b>	0.82	<b>0.47</b>	0.26
56-23-5	Carbon Tetrachloride	ND	0.82	ND	0.13
110-82-7	Cyclohexane	ND	1.6	ND	0.48
78-87-5	1,2-Dichloropropane	ND	0.82	ND	0.18
75-27-4	Bromodichloromethane	ND	0.82	ND	0.12
79-01-6	Trichloroethene	ND	0.82	ND	0.15
123-91-1	1,4-Dioxane	ND	0.82	ND	0.23
80-62-6	Methyl Methacrylate	ND	1.6	ND	0.40
142-82-5	n-Heptane	ND	0.82	ND	0.20
10061-01-5	cis-1,3-Dichloropropene	ND	0.82	ND	0.18
108-10-1	4-Methyl-2-pentanone	ND	0.82	ND	0.20
10061-02-6	trans-1,3-Dichloropropene	ND	0.82	ND	0.18
79-00-5	1,1,2-Trichloroethane	ND	0.82	ND	0.15
108-88-3	Toluene	<b>1.1</b>	0.82	<b>0.29</b>	0.22
591-78-6	2-Hexanone	ND	0.82	ND	0.20
124-48-1	Dibromochloromethane	ND	0.82	ND	0.096
106-93-4	1,2-Dibromoethane	ND	0.82	ND	0.11
123-86-4	n-Butyl Acetate	ND	0.82	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-015

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00689

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.59      Final Pressure (psig): 3.55

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.82	ND	0.18
127-18-4	Tetrachloroethene	ND	0.82	ND	0.12
108-90-7	Chlorobenzene	ND	0.82	ND	0.18
100-41-4	Ethylbenzene	ND	0.82	ND	0.19
179601-23-1	m,p-Xylenes	ND	1.6	ND	0.38
75-25-2	Bromoform	ND	0.82	ND	0.079
100-42-5	Styrene	ND	0.82	ND	0.19
95-47-6	o-Xylene	ND	0.82	ND	0.19
111-84-2	n-Nonane	ND	0.82	ND	0.16
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.82	ND	0.12
98-82-8	Cumene	ND	0.82	ND	0.17
80-56-8	alpha-Pinene	ND	0.82	ND	0.15
103-65-1	n-Propylbenzene	ND	0.82	ND	0.17
622-96-8	4-Ethyltoluene	ND	0.82	ND	0.17
108-67-8	1,3,5-Trimethylbenzene	ND	0.82	ND	0.17
95-63-6	1,2,4-Trimethylbenzene	ND	0.82	ND	0.17
100-44-7	Benzyl Chloride	ND	0.82	ND	0.16
541-73-1	1,3-Dichlorobenzene	ND	0.82	ND	0.14
106-46-7	1,4-Dichlorobenzene	ND	0.82	ND	0.14
95-50-1	1,2-Dichlorobenzene	ND	0.82	ND	0.14
5989-27-5	d-Limonene	ND	0.82	ND	0.15
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.82	ND	0.085
120-82-1	1,2,4-Trichlorobenzene	ND	0.82	ND	0.11
91-20-3	Naphthalene	ND	0.82	ND	0.16
87-68-3	Hexachlorobutadiene	ND	0.82	ND	0.077

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-015

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes: **T**  
Container ID: SC00689

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.59      Final Pressure (psig): 3.55

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
16.47	Ethyl Butyrate	4.9

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline (i)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-016

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01647

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -8.17      Final Pressure (psig): 3.78

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	2.2	1.4	1.3	0.82
75-71-8	Dichlorodifluoromethane (CFC 12)	2.3	1.4	0.47	0.29
74-87-3	Chloromethane	ND	1.4	ND	0.69
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	1.4	ND	0.20
75-01-4	Vinyl Chloride	ND	1.4	ND	0.55
106-99-0	1,3-Butadiene	ND	1.4	ND	0.64
74-83-9	Bromomethane	ND	1.4	ND	0.36
75-00-3	Chloroethane	ND	1.4	ND	0.54
64-17-5	Ethanol	ND	14	ND	7.5
75-05-8	Acetonitrile	1.9	1.4	1.1	0.84
107-02-8	Acrolein	ND	5.7	ND	2.5
67-64-1	Acetone	21	14	8.7	6.0
75-69-4	Trichlorofluoromethane	ND	1.4	ND	0.25
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	14	ND	5.8
107-13-1	Acrylonitrile	ND	1.4	ND	0.65
75-35-4	1,1-Dichloroethene	ND	1.4	ND	0.36
75-09-2	Methylene Chloride	2.1	1.4	0.60	0.41
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	1.4	ND	0.45
76-13-1	Trichlorotrifluoroethane	ND	1.4	ND	0.18
75-15-0	Carbon Disulfide	ND	14	ND	4.5
156-60-5	trans-1,2-Dichloroethene	ND	1.4	ND	0.36
75-34-3	1,1-Dichloroethane	ND	1.4	ND	0.35
1634-04-4	Methyl tert-Butyl Ether	ND	1.4	ND	0.39
108-05-4	Vinyl Acetate	ND	14	ND	4.0
78-93-3	2-Butanone (MEK)	ND	14	ND	4.8

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline (i)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-016

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01647

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -8.17      Final Pressure (psig): 3.78

Canister Dilution Factor:

CAS #	Compound	Result	MRL	Result	MRL
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV
156-59-2	cis-1,2-Dichloroethene	ND	1.4	ND	0.36
141-78-6	Ethyl Acetate	ND	2.8	ND	0.79
110-54-3	n-Hexane	ND	1.4	ND	0.40
67-66-3	Chloroform	ND	1.4	ND	0.29
109-99-9	Tetrahydrofuran (THF)	<b>2.0</b>	1.4	<b>0.67</b>	0.48
107-06-2	1,2-Dichloroethane	ND	1.4	ND	0.35
71-55-6	1,1,1-Trichloroethane	ND	1.4	ND	0.26
71-43-2	Benzene	<b>6.1</b>	1.4	<b>1.9</b>	0.44
56-23-5	Carbon Tetrachloride	ND	1.4	ND	0.23
110-82-7	Cyclohexane	ND	2.8	ND	0.82
78-87-5	1,2-Dichloropropane	ND	1.4	ND	0.31
75-27-4	Bromodichloromethane	ND	1.4	ND	0.21
79-01-6	Trichloroethene	ND	1.4	ND	0.26
123-91-1	1,4-Dioxane	ND	1.4	ND	0.39
80-62-6	Methyl Methacrylate	ND	2.8	ND	0.69
142-82-5	n-Heptane	ND	1.4	ND	0.35
10061-01-5	cis-1,3-Dichloropropene	ND	1.4	ND	0.31
108-10-1	4-Methyl-2-pentanone	ND	1.4	ND	0.35
10061-02-6	trans-1,3-Dichloropropene	ND	1.4	ND	0.31
79-00-5	1,1,2-Trichloroethane	ND	1.4	ND	0.26
108-88-3	Toluene	<b>2.6</b>	1.4	<b>0.70</b>	0.38
591-78-6	2-Hexanone	ND	1.4	ND	0.35
124-48-1	Dibromochloromethane	ND	1.4	ND	0.17
106-93-4	1,2-Dibromoethane	ND	1.4	ND	0.18
123-86-4	n-Butyl Acetate	ND	1.4	ND	0.30

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** K South Fenceline (i)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-016

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01647

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -8.17      Final Pressure (psig): 3.78

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	1.4	ND	0.30
127-18-4	Tetrachloroethene	ND	1.4	ND	0.21
108-90-7	Chlorobenzene	ND	1.4	ND	0.31
100-41-4	Ethylbenzene	ND	1.4	ND	0.33
179601-23-1	m,p-Xylenes	ND	2.8	ND	0.65
75-25-2	Bromoform	ND	1.4	ND	0.14
100-42-5	Styrene	ND	1.4	ND	0.33
95-47-6	o-Xylene	ND	1.4	ND	0.33
111-84-2	n-Nonane	ND	1.4	ND	0.27
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.4	ND	0.21
98-82-8	Cumene	ND	1.4	ND	0.29
80-56-8	alpha-Pinene	ND	1.4	ND	0.25
103-65-1	n-Propylbenzene	ND	1.4	ND	0.29
622-96-8	4-Ethyltoluene	ND	1.4	ND	0.29
108-67-8	1,3,5-Trimethylbenzene	ND	1.4	ND	0.29
95-63-6	1,2,4-Trimethylbenzene	ND	1.4	ND	0.29
100-44-7	Benzyl Chloride	ND	1.4	ND	0.27
541-73-1	1,3-Dichlorobenzene	ND	1.4	ND	0.24
106-46-7	1,4-Dichlorobenzene	ND	1.4	ND	0.24
95-50-1	1,2-Dichlorobenzene	ND	1.4	ND	0.24
5989-27-5	d-Limonene	ND	1.4	ND	0.25
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.4	ND	0.15
120-82-1	1,2,4-Trichlorobenzene	ND	1.4	ND	0.19
91-20-3	Naphthalene	ND	1.4	ND	0.27
87-68-3	Hexachlorobutadiene	ND	1.4	ND	0.13

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** K South Fenceline (i)

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-016

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC01647

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -8.17      Final Pressure (psig): 3.78

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
8.14	Dimethyl Sulfide	7.5

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** L Summitt Valley  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-017

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01066

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07      Final Pressure (psig): 3.66

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	1.8	0.79	1.1	0.46
75-71-8	Dichlorodifluoromethane (CFC 12)	2.2	0.79	0.44	0.16
74-87-3	Chloromethane	ND	0.79	ND	0.38
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.79	ND	0.11
75-01-4	Vinyl Chloride	ND	0.79	ND	0.31
106-99-0	1,3-Butadiene	ND	0.79	ND	0.36
74-83-9	Bromomethane	ND	0.79	ND	0.20
75-00-3	Chloroethane	ND	0.79	ND	0.30
64-17-5	Ethanol	8.5	7.9	4.5	4.2
75-05-8	Acetonitrile	ND	0.79	ND	0.47
107-02-8	Acrolein	ND	3.2	ND	1.4
67-64-1	Acetone	19	7.9	8.2	3.3
75-69-4	Trichlorofluoromethane	1.1	0.79	0.20	0.14
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.9	ND	3.2
107-13-1	Acrylonitrile	ND	0.79	ND	0.36
75-35-4	1,1-Dichloroethene	ND	0.79	ND	0.20
75-09-2	Methylene Chloride	0.88	0.79	0.25	0.23
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.79	ND	0.25
76-13-1	Trichlorotrifluoroethane	ND	0.79	ND	0.10
75-15-0	Carbon Disulfide	ND	7.9	ND	2.5
156-60-5	trans-1,2-Dichloroethene	ND	0.79	ND	0.20
75-34-3	1,1-Dichloroethane	ND	0.79	ND	0.20
1634-04-4	Methyl tert-Butyl Ether	ND	0.79	ND	0.22
108-05-4	Vinyl Acetate	ND	7.9	ND	2.2
78-93-3	2-Butanone (MEK)	11	7.9	3.7	2.7

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** L Summitt Valley  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-017

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01066

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07      Final Pressure (psig): 3.66

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.79	ND	0.20
141-78-6	Ethyl Acetate	<b>1.6</b>	1.6	<b>0.45</b>	0.44
110-54-3	n-Hexane	ND	0.79	ND	0.22
67-66-3	Chloroform	ND	0.79	ND	0.16
109-99-9	Tetrahydrofuran (THF)	<b>4.7</b>	0.79	<b>1.6</b>	0.27
107-06-2	1,2-Dichloroethane	ND	0.79	ND	0.20
71-55-6	1,1,1-Trichloroethane	ND	0.79	ND	0.14
71-43-2	Benzene	<b>6.2</b>	0.79	<b>1.9</b>	0.25
56-23-5	Carbon Tetrachloride	ND	0.79	ND	0.13
110-82-7	Cyclohexane	ND	1.6	ND	0.46
78-87-5	1,2-Dichloropropane	ND	0.79	ND	0.17
75-27-4	Bromodichloromethane	ND	0.79	ND	0.12
79-01-6	Trichloroethene	ND	0.79	ND	0.15
123-91-1	1,4-Dioxane	ND	0.79	ND	0.22
80-62-6	Methyl Methacrylate	ND	1.6	ND	0.39
142-82-5	n-Heptane	ND	0.79	ND	0.19
10061-01-5	cis-1,3-Dichloropropene	ND	0.79	ND	0.17
108-10-1	4-Methyl-2-pentanone	ND	0.79	ND	0.19
10061-02-6	trans-1,3-Dichloropropene	ND	0.79	ND	0.17
79-00-5	1,1,2-Trichloroethane	ND	0.79	ND	0.14
108-88-3	Toluene	<b>1.6</b>	0.79	<b>0.42</b>	0.21
591-78-6	2-Hexanone	ND	0.79	ND	0.19
124-48-1	Dibromochloromethane	ND	0.79	ND	0.093
106-93-4	1,2-Dibromoethane	ND	0.79	ND	0.10
123-86-4	n-Butyl Acetate	ND	0.79	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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** L Summitt Valley  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-017

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01066

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07      Final Pressure (psig): 3.66

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.79	ND	0.17
127-18-4	Tetrachloroethene	ND	0.79	ND	0.12
108-90-7	Chlorobenzene	ND	0.79	ND	0.17
100-41-4	Ethylbenzene	ND	0.79	ND	0.18
179601-23-1	m,p-Xylenes	ND	1.6	ND	0.36
75-25-2	Bromoform	ND	0.79	ND	0.076
100-42-5	Styrene	ND	0.79	ND	0.19
95-47-6	o-Xylene	ND	0.79	ND	0.18
111-84-2	n-Nonane	ND	0.79	ND	0.15
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.79	ND	0.12
98-82-8	Cumene	ND	0.79	ND	0.16
80-56-8	alpha-Pinene	ND	0.79	ND	0.14
103-65-1	n-Propylbenzene	ND	0.79	ND	0.16
622-96-8	4-Ethyltoluene	ND	0.79	ND	0.16
108-67-8	1,3,5-Trimethylbenzene	ND	0.79	ND	0.16
95-63-6	1,2,4-Trimethylbenzene	ND	0.79	ND	0.16
100-44-7	Benzyl Chloride	ND	0.79	ND	0.15
541-73-1	1,3-Dichlorobenzene	ND	0.79	ND	0.13
106-46-7	1,4-Dichlorobenzene	ND	0.79	ND	0.13
95-50-1	1,2-Dichlorobenzene	ND	0.79	ND	0.13
5989-27-5	d-Limonene	ND	0.79	ND	0.14
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.79	ND	0.082
120-82-1	1,2,4-Trichlorobenzene	ND	0.79	ND	0.11
91-20-3	Naphthalene	ND	0.79	ND	0.15
87-68-3	Hexachlorobutadiene	ND	0.79	ND	0.074

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** L Summitt Valley

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-017

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC01066

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07      Final Pressure (psig): 3.66

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>
7.54	Furan	13
8.14	Dimethyl Sulfide	12
8.42	Methyl Acetate	10
11.19	2-Methylfuran	14
11.96	Methyl Propionate	5.5
13.06	C6H10 Alkene	4.6
14.72	Methyl Butyrate	12
16.47	Ethyl Butyrate	4.5

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** M Grassy Knoll Center (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-018

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01626

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.60      Final Pressure (psig): 3.56

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.70	ND	0.40
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.1</b>	0.70	<b>0.43</b>	0.14
74-87-3	Chloromethane	ND	0.70	ND	0.34
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.70	ND	0.099
75-01-4	Vinyl Chloride	ND	0.70	ND	0.27
106-99-0	1,3-Butadiene	ND	0.70	ND	0.31
74-83-9	Bromomethane	ND	0.70	ND	0.18
75-00-3	Chloroethane	ND	0.70	ND	0.26
64-17-5	Ethanol	ND	7.0	ND	3.7
75-05-8	Acetonitrile	<b>0.78</b>	0.70	<b>0.47</b>	0.41
107-02-8	Acrolein	ND	2.8	ND	1.2
67-64-1	Acetone	ND	7.0	ND	2.9
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.70	<b>0.20</b>	0.12
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.0	ND	2.8
107-13-1	Acrylonitrile	ND	0.70	ND	0.32
75-35-4	1,1-Dichloroethene	ND	0.70	ND	0.18
75-09-2	Methylene Chloride	ND	0.70	ND	0.20
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.70	ND	0.22
76-13-1	Trichlorotrifluoroethane	ND	0.70	ND	0.091
75-15-0	Carbon Disulfide	ND	7.0	ND	2.2
156-60-5	trans-1,2-Dichloroethene	ND	0.70	ND	0.18
75-34-3	1,1-Dichloroethane	ND	0.70	ND	0.17
1634-04-4	Methyl tert-Butyl Ether	ND	0.70	ND	0.19
108-05-4	Vinyl Acetate	ND	7.0	ND	2.0
78-93-3	2-Butanone (MEK)	ND	7.0	ND	2.4

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** M Grassy Knoll Center (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-018

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01626

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.60      Final Pressure (psig): 3.56

Canister Dilution Factor:

CAS #	Compound	Result		MRL	
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.70	ND	0.18
141-78-6	Ethyl Acetate	ND	1.4	ND	0.39
110-54-3	n-Hexane	ND	0.70	ND	0.20
67-66-3	Chloroform	ND	0.70	ND	0.14
109-99-9	Tetrahydrofuran (THF)	ND	0.70	ND	0.24
107-06-2	1,2-Dichloroethane	ND	0.70	ND	0.17
71-55-6	1,1,1-Trichloroethane	ND	0.70	ND	0.13
71-43-2	Benzene	ND	0.70	ND	0.22
56-23-5	Carbon Tetrachloride	ND	0.70	ND	0.11
110-82-7	Cyclohexane	ND	1.4	ND	0.40
78-87-5	1,2-Dichloropropane	ND	0.70	ND	0.15
75-27-4	Bromodichloromethane	ND	0.70	ND	0.10
79-01-6	Trichloroethene	ND	0.70	ND	0.13
123-91-1	1,4-Dioxane	ND	0.70	ND	0.19
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.34
142-82-5	n-Heptane	ND	0.70	ND	0.17
10061-01-5	cis-1,3-Dichloropropene	ND	0.70	ND	0.15
108-10-1	4-Methyl-2-pentanone	ND	0.70	ND	0.17
10061-02-6	trans-1,3-Dichloropropene	ND	0.70	ND	0.15
79-00-5	1,1,2-Trichloroethane	ND	0.70	ND	0.13
108-88-3	Toluene	ND	0.70	ND	0.18
591-78-6	2-Hexanone	ND	0.70	ND	0.17
124-48-1	Dibromochloromethane	ND	0.70	ND	0.082
106-93-4	1,2-Dibromoethane	ND	0.70	ND	0.090
123-86-4	n-Butyl Acetate	ND	0.70	ND	0.15

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** M Grassy Knoll Center (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-018

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01626

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.60      Final Pressure (psig): 3.56

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.70	ND	0.15
127-18-4	Tetrachloroethene	ND	0.70	ND	0.10
108-90-7	Chlorobenzene	ND	0.70	ND	0.15
100-41-4	Ethylbenzene	ND	0.70	ND	0.16
179601-23-1	m,p-Xylenes	ND	1.4	ND	0.32
75-25-2	Bromoform	ND	0.70	ND	0.067
100-42-5	Styrene	ND	0.70	ND	0.16
95-47-6	o-Xylene	ND	0.70	ND	0.16
111-84-2	n-Nonane	ND	0.70	ND	0.13
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.70	ND	0.10
98-82-8	Cumene	ND	0.70	ND	0.14
80-56-8	alpha-Pinene	ND	0.70	ND	0.12
103-65-1	n-Propylbenzene	ND	0.70	ND	0.14
622-96-8	4-Ethyltoluene	ND	0.70	ND	0.14
108-67-8	1,3,5-Trimethylbenzene	ND	0.70	ND	0.14
95-63-6	1,2,4-Trimethylbenzene	ND	0.70	ND	0.14
100-44-7	Benzyl Chloride	ND	0.70	ND	0.13
541-73-1	1,3-Dichlorobenzene	ND	0.70	ND	0.12
106-46-7	1,4-Dichlorobenzene	ND	0.70	ND	0.12
95-50-1	1,2-Dichlorobenzene	ND	0.70	ND	0.12
5989-27-5	d-Limonene	ND	0.70	ND	0.12
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.70	ND	0.072
120-82-1	1,2,4-Trichlorobenzene	ND	0.70	ND	0.094
91-20-3	Naphthalene	ND	0.70	ND	0.13
87-68-3	Hexachlorobutadiene	ND	0.70	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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** M Grassy Knoll Center (2)

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-018

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC01626

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.60      Final Pressure (psig): 3.56

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
16.47	Ethyl Butyrate	5.4

T = Analyte is a tentatively identified compound, result is estimated.

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**Data**  
**Qualifier**

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** N Grassy Knoll West (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-019

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00889

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.50      Final Pressure (psig): 3.64

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.75	ND	0.44
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.2</b>	0.75	<b>0.44</b>	0.15
74-87-3	Chloromethane	ND	0.75	ND	0.36
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.75	ND	0.11
75-01-4	Vinyl Chloride	ND	0.75	ND	0.29
106-99-0	1,3-Butadiene	ND	0.75	ND	0.34
74-83-9	Bromomethane	ND	0.75	ND	0.19
75-00-3	Chloroethane	ND	0.75	ND	0.28
64-17-5	Ethanol	ND	7.5	ND	4.0
75-05-8	Acetonitrile	ND	0.75	ND	0.45
107-02-8	Acrolein	ND	3.0	ND	1.3
67-64-1	Acetone	ND	7.5	ND	3.2
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.75	<b>0.20</b>	0.13
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.5	ND	3.1
107-13-1	Acrylonitrile	ND	0.75	ND	0.35
75-35-4	1,1-Dichloroethene	ND	0.75	ND	0.19
75-09-2	Methylene Chloride	ND	0.75	ND	0.22
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.75	ND	0.24
76-13-1	Trichlorotrifluoroethane	ND	0.75	ND	0.098
75-15-0	Carbon Disulfide	ND	7.5	ND	2.4
156-60-5	trans-1,2-Dichloroethene	ND	0.75	ND	0.19
75-34-3	1,1-Dichloroethane	ND	0.75	ND	0.19
1634-04-4	Methyl tert-Butyl Ether	ND	0.75	ND	0.21
108-05-4	Vinyl Acetate	ND	7.5	ND	2.1
78-93-3	2-Butanone (MEK)	ND	7.5	ND	2.5

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** N Grassy Knoll West (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-019

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00889

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.50      Final Pressure (psig): 3.64

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.75	ND	0.19
141-78-6	Ethyl Acetate	ND	1.5	ND	0.42
110-54-3	n-Hexane	ND	0.75	ND	0.21
67-66-3	Chloroform	ND	0.75	ND	0.15
109-99-9	Tetrahydrofuran (THF)	ND	0.75	ND	0.25
107-06-2	1,2-Dichloroethane	ND	0.75	ND	0.19
71-55-6	1,1,1-Trichloroethane	ND	0.75	ND	0.14
71-43-2	Benzene	ND	0.75	ND	0.23
56-23-5	Carbon Tetrachloride	ND	0.75	ND	0.12
110-82-7	Cyclohexane	ND	1.5	ND	0.44
78-87-5	1,2-Dichloropropane	ND	0.75	ND	0.16
75-27-4	Bromodichloromethane	ND	0.75	ND	0.11
79-01-6	Trichloroethene	ND	0.75	ND	0.14
123-91-1	1,4-Dioxane	ND	0.75	ND	0.21
80-62-6	Methyl Methacrylate	ND	1.5	ND	0.37
142-82-5	n-Heptane	ND	0.75	ND	0.18
10061-01-5	cis-1,3-Dichloropropene	ND	0.75	ND	0.17
108-10-1	4-Methyl-2-pentanone	ND	0.75	ND	0.18
10061-02-6	trans-1,3-Dichloropropene	ND	0.75	ND	0.17
79-00-5	1,1,2-Trichloroethane	ND	0.75	ND	0.14
108-88-3	Toluene	ND	0.75	ND	0.20
591-78-6	2-Hexanone	ND	0.75	ND	0.18
124-48-1	Dibromochloromethane	ND	0.75	ND	0.088
106-93-4	1,2-Dibromoethane	ND	0.75	ND	0.098
123-86-4	n-Butyl Acetate	ND	0.75	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** N Grassy Knoll West (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-019

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00889

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.50      Final Pressure (psig): 3.64

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.75	ND	0.16
127-18-4	Tetrachloroethene	<b>1.8</b>	0.75	<b>0.26</b>	0.11
108-90-7	Chlorobenzene	ND	0.75	ND	0.16
100-41-4	Ethylbenzene	ND	0.75	ND	0.17
179601-23-1	m,p-Xylenes	ND	1.5	ND	0.35
75-25-2	Bromoform	ND	0.75	ND	0.073
100-42-5	Styrene	ND	0.75	ND	0.18
95-47-6	o-Xylene	ND	0.75	ND	0.17
111-84-2	n-Nonane	ND	0.75	ND	0.14
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.75	ND	0.11
98-82-8	Cumene	ND	0.75	ND	0.15
80-56-8	alpha-Pinene	ND	0.75	ND	0.13
103-65-1	n-Propylbenzene	ND	0.75	ND	0.15
622-96-8	4-Ethyltoluene	ND	0.75	ND	0.15
108-67-8	1,3,5-Trimethylbenzene	ND	0.75	ND	0.15
95-63-6	1,2,4-Trimethylbenzene	ND	0.75	ND	0.15
100-44-7	Benzyl Chloride	ND	0.75	ND	0.14
541-73-1	1,3-Dichlorobenzene	ND	0.75	ND	0.12
106-46-7	1,4-Dichlorobenzene	ND	0.75	ND	0.12
95-50-1	1,2-Dichlorobenzene	ND	0.75	ND	0.12
5989-27-5	d-Limonene	ND	0.75	ND	0.13
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.75	ND	0.078
120-82-1	1,2,4-Trichlorobenzene	ND	0.75	ND	0.10
91-20-3	Naphthalene	ND	0.75	ND	0.14
87-68-3	Hexachlorobutadiene	ND	0.75	ND	0.070

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** N Grassy Knoll West (2)

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-019

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes: **T**

Container ID: SC00889

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.50      Final Pressure (psig): 3.64

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
16.47	Ethyl Butyrate	6.0

T = Analyte is a tentatively identified compound, result is estimated.

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**Data**  
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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** O Grassy Knoll North (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-020

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes:  
Container ID: SC01649

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/30/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.07      Final Pressure (psig): 3.52

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.72	ND	0.42
75-71-8	Dichlorodifluoromethane (CFC 12)	<b>2.2</b>	0.72	<b>0.45</b>	0.15
74-87-3	Chloromethane	ND	0.72	ND	0.35
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.72	ND	0.10
75-01-4	Vinyl Chloride	ND	0.72	ND	0.28
106-99-0	1,3-Butadiene	ND	0.72	ND	0.33
74-83-9	Bromomethane	ND	0.72	ND	0.19
75-00-3	Chloroethane	ND	0.72	ND	0.27
64-17-5	Ethanol	ND	7.2	ND	3.8
75-05-8	Acetonitrile	<b>0.88</b>	0.72	<b>0.52</b>	0.43
107-02-8	Acrolein	ND	2.9	ND	1.3
67-64-1	Acetone	ND	7.2	ND	3.0
75-69-4	Trichlorofluoromethane	<b>1.1</b>	0.72	<b>0.20</b>	0.13
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.2	ND	2.9
107-13-1	Acrylonitrile	ND	0.72	ND	0.33
75-35-4	1,1-Dichloroethene	ND	0.72	ND	0.18
75-09-2	Methylene Chloride	ND	0.72	ND	0.21
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.72	ND	0.23
76-13-1	Trichlorotrifluoroethane	ND	0.72	ND	0.094
75-15-0	Carbon Disulfide	ND	7.2	ND	2.3
156-60-5	trans-1,2-Dichloroethene	ND	0.72	ND	0.18
75-34-3	1,1-Dichloroethane	ND	0.72	ND	0.18
1634-04-4	Methyl tert-Butyl Ether	ND	0.72	ND	0.20
108-05-4	Vinyl Acetate	ND	7.2	ND	2.0
78-93-3	2-Butanone (MEK)	ND	7.2	ND	2.4

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** O Grassy Knoll North (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-020

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01649

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/30/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.07      Final Pressure (psig): 3.52

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.72	ND	0.18
141-78-6	Ethyl Acetate	ND	1.4	ND	0.40
110-54-3	n-Hexane	ND	0.72	ND	0.20
67-66-3	Chloroform	ND	0.72	ND	0.15
109-99-9	Tetrahydrofuran (THF)	ND	0.72	ND	0.24
107-06-2	1,2-Dichloroethane	ND	0.72	ND	0.18
71-55-6	1,1,1-Trichloroethane	ND	0.72	ND	0.13
71-43-2	Benzene	ND	0.72	ND	0.23
56-23-5	Carbon Tetrachloride	ND	0.72	ND	0.11
110-82-7	Cyclohexane	ND	1.4	ND	0.42
78-87-5	1,2-Dichloropropane	ND	0.72	ND	0.16
75-27-4	Bromodichloromethane	ND	0.72	ND	0.11
79-01-6	Trichloroethene	ND	0.72	ND	0.13
123-91-1	1,4-Dioxane	ND	0.72	ND	0.20
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.35
142-82-5	n-Heptane	ND	0.72	ND	0.18
10061-01-5	cis-1,3-Dichloropropene	ND	0.72	ND	0.16
108-10-1	4-Methyl-2-pentanone	ND	0.72	ND	0.18
10061-02-6	trans-1,3-Dichloropropene	ND	0.72	ND	0.16
79-00-5	1,1,2-Trichloroethane	ND	0.72	ND	0.13
108-88-3	Toluene	ND	0.72	ND	0.19
591-78-6	2-Hexanone	ND	0.72	ND	0.18
124-48-1	Dibromochloromethane	ND	0.72	ND	0.085
106-93-4	1,2-Dibromoethane	ND	0.72	ND	0.094
123-86-4	n-Butyl Acetate	ND	0.72	ND	0.15

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** O Grassy Knoll North (2)  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-020

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC01649

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/30/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.07      Final Pressure (psig): 3.52

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.72	ND	0.15
127-18-4	Tetrachloroethene	ND	0.72	ND	0.11
108-90-7	Chlorobenzene	ND	0.72	ND	0.16
100-41-4	Ethylbenzene	ND	0.72	ND	0.17
179601-23-1	m,p-Xylenes	ND	1.4	ND	0.33
75-25-2	Bromoform	ND	0.72	ND	0.070
100-42-5	Styrene	ND	0.72	ND	0.17
95-47-6	o-Xylene	ND	0.72	ND	0.17
111-84-2	n-Nonane	ND	0.72	ND	0.14
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.72	ND	0.10
98-82-8	Cumene	ND	0.72	ND	0.15
80-56-8	alpha-Pinene	ND	0.72	ND	0.13
103-65-1	n-Propylbenzene	ND	0.72	ND	0.15
622-96-8	4-Ethyltoluene	ND	0.72	ND	0.15
108-67-8	1,3,5-Trimethylbenzene	ND	0.72	ND	0.15
95-63-6	1,2,4-Trimethylbenzene	ND	0.72	ND	0.15
100-44-7	Benzyl Chloride	ND	0.72	ND	0.14
541-73-1	1,3-Dichlorobenzene	ND	0.72	ND	0.12
106-46-7	1,4-Dichlorobenzene	ND	0.72	ND	0.12
95-50-1	1,2-Dichlorobenzene	ND	0.72	ND	0.12
5989-27-5	d-Limonene	ND	0.72	ND	0.13
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.72	ND	0.075
120-82-1	1,2,4-Trichlorobenzene	ND	0.72	ND	0.097
91-20-3	Naphthalene	ND	0.72	ND	0.14
87-68-3	Hexachlorobutadiene	ND	0.72	ND	0.068

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** O Grassy Knoll North (2)

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-020

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes: **T**  
Container ID: SC01649

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/30/12  
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.07      Final Pressure (psig): 3.52

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
16.47	Ethyl Butyrate	5.6

T = Analyte is a tentatively identified compound, result is estimated.

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**Data**  
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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-021

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00994

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.50	ND	0.29
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	ND	0.10
74-87-3	Chloromethane	ND	0.50	ND	0.24
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	ND	0.072
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20
106-99-0	1,3-Butadiene	ND	0.50	ND	0.23
74-83-9	Bromomethane	ND	0.50	ND	0.13
75-00-3	Chloroethane	ND	0.50	ND	0.19
64-17-5	Ethanol	ND	5.0	ND	2.7
75-05-8	Acetonitrile	ND	0.50	ND	0.30
107-02-8	Acrolein	ND	2.0	ND	0.87
67-64-1	Acetone	ND	5.0	ND	2.1
75-69-4	Trichlorofluoromethane	ND	0.50	ND	0.089
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	ND	2.0
107-13-1	Acrylonitrile	ND	0.50	ND	0.23
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13
75-09-2	Methylene Chloride	ND	0.50	ND	0.14
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	ND	0.16
76-13-1	Trichlorotrifluoroethane	ND	0.50	ND	0.065
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4
78-93-3	2-Butanone (MEK)	ND	5.0	ND	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-021

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00994

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13
141-78-6	Ethyl Acetate	ND	1.0	ND	0.28
110-54-3	n-Hexane	ND	0.50	ND	0.14
67-66-3	Chloroform	ND	0.50	ND	0.10
109-99-9	Tetrahydrofuran (THF)	ND	0.50	ND	0.17
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092
71-43-2	Benzene	ND	0.50	ND	0.16
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080
110-82-7	Cyclohexane	ND	1.0	ND	0.29
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075
79-01-6	Trichloroethene	ND	0.50	ND	0.093
123-91-1	1,4-Dioxane	ND	0.50	ND	0.14
80-62-6	Methyl Methacrylate	ND	1.0	ND	0.24
142-82-5	n-Heptane	ND	0.50	ND	0.12
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092
108-88-3	Toluene	ND	0.50	ND	0.13
591-78-6	2-Hexanone	ND	0.50	ND	0.12
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065
123-86-4	n-Butyl Acetate	ND	0.50	ND	0.11

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 1  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-021

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00994

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.50	ND	0.11
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074
108-90-7	Chlorobenzene	ND	0.50	ND	0.11
100-41-4	Ethylbenzene	ND	0.50	ND	0.12
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23
75-25-2	Bromoform	ND	0.50	ND	0.048
100-42-5	Styrene	ND	0.50	ND	0.12
95-47-6	o-Xylene	ND	0.50	ND	0.12
111-84-2	n-Nonane	ND	0.50	ND	0.095
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073
98-82-8	Cumene	ND	0.50	ND	0.10
80-56-8	alpha-Pinene	ND	0.50	ND	0.090
103-65-1	n-Propylbenzene	ND	0.50	ND	0.10
622-96-8	4-Ethyltoluene	ND	0.50	ND	0.10
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10
100-44-7	Benzyl Chloride	ND	0.50	ND	0.097
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083
5989-27-5	d-Limonene	ND	0.50	ND	0.090
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	ND	0.052
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	ND	0.067
91-20-3	Naphthalene	ND	0.50	ND	0.095
87-68-3	Hexachlorobutadiene	ND	0.50	ND	0.047

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** Field Blank 1

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P1203506-021

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00994

Date Collected: 8/21/12

Date Received: 8/24/12

Date Analyzed: 8/28/12

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
No Compounds Detected		

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-022

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00098

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.50	ND	0.29
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	ND	0.10
74-87-3	Chloromethane	ND	0.50	ND	0.24
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	ND	0.072
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20
106-99-0	1,3-Butadiene	ND	0.50	ND	0.23
74-83-9	Bromomethane	ND	0.50	ND	0.13
75-00-3	Chloroethane	ND	0.50	ND	0.19
64-17-5	Ethanol	ND	5.0	ND	2.7
75-05-8	Acetonitrile	ND	0.50	ND	0.30
107-02-8	Acrolein	ND	2.0	ND	0.87
67-64-1	Acetone	ND	5.0	ND	2.1
75-69-4	Trichlorofluoromethane	ND	0.50	ND	0.089
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	ND	2.0
107-13-1	Acrylonitrile	ND	0.50	ND	0.23
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13
75-09-2	Methylene Chloride	ND	0.50	ND	0.14
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	ND	0.16
76-13-1	Trichlorotrifluoroethane	ND	0.50	ND	0.065
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4
78-93-3	2-Butanone (MEK)	<b>13</b>	5.0	<b>4.3</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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-022

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00098

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13
141-78-6	Ethyl Acetate	<b>1.4</b>	1.0	<b>0.39</b>	0.28
110-54-3	n-Hexane	ND	0.50	ND	0.14
67-66-3	Chloroform	ND	0.50	ND	0.10
109-99-9	Tetrahydrofuran (THF)	ND	0.50	ND	0.17
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092
71-43-2	Benzene	ND	0.50	ND	0.16
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080
110-82-7	Cyclohexane	ND	1.0	ND	0.29
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075
79-01-6	Trichloroethene	ND	0.50	ND	0.093
123-91-1	1,4-Dioxane	ND	0.50	ND	0.14
80-62-6	Methyl Methacrylate	ND	1.0	ND	0.24
142-82-5	n-Heptane	ND	0.50	ND	0.12
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092
108-88-3	Toluene	ND	0.50	ND	0.13
591-78-6	2-Hexanone	ND	0.50	ND	0.12
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065
123-86-4	n-Butyl Acetate	ND	0.50	ND	0.11

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-022

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00098

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.50	ND	0.11
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074
108-90-7	Chlorobenzene	ND	0.50	ND	0.11
100-41-4	Ethylbenzene	ND	0.50	ND	0.12
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23
75-25-2	Bromoform	ND	0.50	ND	0.048
100-42-5	Styrene	ND	0.50	ND	0.12
95-47-6	o-Xylene	ND	0.50	ND	0.12
111-84-2	n-Nonane	ND	0.50	ND	0.095
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073
98-82-8	Cumene	ND	0.50	ND	0.10
80-56-8	alpha-Pinene	ND	0.50	ND	0.090
103-65-1	n-Propylbenzene	ND	0.50	ND	0.10
622-96-8	4-Ethyltoluene	ND	0.50	ND	0.10
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10
100-44-7	Benzyl Chloride	ND	0.50	ND	0.097
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083
5989-27-5	d-Limonene	ND	0.50	ND	0.090
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	ND	0.052
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	ND	0.067
91-20-3	Naphthalene	ND	0.50	ND	0.095
87-68-3	Hexachlorobutadiene	ND	0.50	ND	0.047

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Field Blank 2  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P1203506-022

**Tentatively Identified Compounds**

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 6.0 L Summa Canister  
Test Notes: **T**  
Container ID: SC00098

Date Collected: 8/21/12  
Date Received: 8/24/12  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration µg/m <sup>3</sup>
17.12	Hexamethylcyclotrisiloxane	2,200
19.50	Unidentified Compound	370

T = Analyte is a tentatively identified compound, result is estimated.

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120828-MB

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.50	ND	0.29
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	ND	0.10
74-87-3	Chloromethane	ND	0.50	ND	0.24
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	ND	0.072
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20
106-99-0	1,3-Butadiene	ND	0.50	ND	0.23
74-83-9	Bromomethane	ND	0.50	ND	0.13
75-00-3	Chloroethane	ND	0.50	ND	0.19
64-17-5	Ethanol	ND	5.0	ND	2.7
75-05-8	Acetonitrile	ND	0.50	ND	0.30
107-02-8	Acrolein	ND	2.0	ND	0.87
67-64-1	Acetone	ND	5.0	ND	2.1
75-69-4	Trichlorofluoromethane	ND	0.50	ND	0.089
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	ND	2.0
107-13-1	Acrylonitrile	ND	0.50	ND	0.23
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13
75-09-2	Methylene Chloride	ND	0.50	ND	0.14
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	ND	0.16
76-13-1	Trichlorotrifluoroethane	ND	0.50	ND	0.065
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4
78-93-3	2-Butanone (MEK)	ND	5.0	ND	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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P120828-MB

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/28/12  
Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result	MRL	Result	MRL
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13
141-78-6	Ethyl Acetate	ND	1.0	ND	0.28
110-54-3	n-Hexane	ND	0.50	ND	0.14
67-66-3	Chloroform	ND	0.50	ND	0.10
109-99-9	Tetrahydrofuran (THF)	ND	0.50	ND	0.17
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092
71-43-2	Benzene	ND	0.50	ND	0.16
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080
110-82-7	Cyclohexane	ND	1.0	ND	0.29
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075
79-01-6	Trichloroethene	ND	0.50	ND	0.093
123-91-1	1,4-Dioxane	ND	0.50	ND	0.14
80-62-6	Methyl Methacrylate	ND	1.0	ND	0.24
142-82-5	n-Heptane	ND	0.50	ND	0.12
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092
108-88-3	Toluene	ND	0.50	ND	0.13
591-78-6	2-Hexanone	ND	0.50	ND	0.12
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065
123-86-4	n-Butyl Acetate	ND	0.50	ND	0.11

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120828-MB

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.50	ND	0.11
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074
108-90-7	Chlorobenzene	ND	0.50	ND	0.11
100-41-4	Ethylbenzene	ND	0.50	ND	0.12
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23
75-25-2	Bromoform	ND	0.50	ND	0.048
100-42-5	Styrene	ND	0.50	ND	0.12
95-47-6	o-Xylene	ND	0.50	ND	0.12
111-84-2	n-Nonane	ND	0.50	ND	0.095
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073
98-82-8	Cumene	ND	0.50	ND	0.10
80-56-8	alpha-Pinene	ND	0.50	ND	0.090
103-65-1	n-Propylbenzene	ND	0.50	ND	0.10
622-96-8	4-Ethyltoluene	ND	0.50	ND	0.10
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10
100-44-7	Benzyl Chloride	ND	0.50	ND	0.097
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083
5989-27-5	d-Limonene	ND	0.50	ND	0.090
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	ND	0.052
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	ND	0.067
91-20-3	Naphthalene	ND	0.50	ND	0.095
87-68-3	Hexachlorobutadiene	ND	0.50	ND	0.047

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P120828-MB

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 1.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/28/12

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
<hr/>		
No Compounds Detected		
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**Data**  
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**COLUMBIA ANALYTICAL SERVICES, INC.**

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RESULTS OF ANALYSIS

Page 1 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120829-MB

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
115-07-1	Propene	ND	0.50	ND	0.29
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	ND	0.10
74-87-3	Chloromethane	ND	0.50	ND	0.24
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	ND	0.072
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20
106-99-0	1,3-Butadiene	ND	0.50	ND	0.23
74-83-9	Bromomethane	ND	0.50	ND	0.13
75-00-3	Chloroethane	ND	0.50	ND	0.19
64-17-5	Ethanol	ND	5.0	ND	2.7
75-05-8	Acetonitrile	ND	0.50	ND	0.30
107-02-8	Acrolein	ND	2.0	ND	0.87
67-64-1	Acetone	ND	5.0	ND	2.1
75-69-4	Trichlorofluoromethane	ND	0.50	ND	0.089
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	ND	2.0
107-13-1	Acrylonitrile	ND	0.50	ND	0.23
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13
75-09-2	Methylene Chloride	ND	0.50	ND	0.14
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	ND	0.16
76-13-1	Trichlorotrifluoroethane	ND	0.50	ND	0.065
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4
78-93-3	2-Butanone (MEK)	ND	5.0	ND	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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 2 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120829-MB

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result	MRL	Result	MRL
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppbV	ppbV
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13
141-78-6	Ethyl Acetate	ND	1.0	ND	0.28
110-54-3	n-Hexane	ND	0.50	ND	0.14
67-66-3	Chloroform	ND	0.50	ND	0.10
109-99-9	Tetrahydrofuran (THF)	ND	0.50	ND	0.17
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092
71-43-2	Benzene	ND	0.50	ND	0.16
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080
110-82-7	Cyclohexane	ND	1.0	ND	0.29
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075
79-01-6	Trichloroethene	ND	0.50	ND	0.093
123-91-1	1,4-Dioxane	ND	0.50	ND	0.14
80-62-6	Methyl Methacrylate	ND	1.0	ND	0.24
142-82-5	n-Heptane	ND	0.50	ND	0.12
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092
108-88-3	Toluene	ND	0.50	ND	0.13
591-78-6	2-Hexanone	ND	0.50	ND	0.12
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065
123-86-4	n-Butyl Acetate	ND	0.50	ND	0.11

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 m

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 3 of 4

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Method Blank  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120829-MB

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV
111-65-9	n-Octane	ND	0.50	ND	0.11
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074
108-90-7	Chlorobenzene	ND	0.50	ND	0.11
100-41-4	Ethylbenzene	ND	0.50	ND	0.12
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23
75-25-2	Bromoform	ND	0.50	ND	0.048
100-42-5	Styrene	ND	0.50	ND	0.12
95-47-6	o-Xylene	ND	0.50	ND	0.12
111-84-2	n-Nonane	ND	0.50	ND	0.095
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073
98-82-8	Cumene	ND	0.50	ND	0.10
80-56-8	alpha-Pinene	ND	0.50	ND	0.090
103-65-1	n-Propylbenzene	ND	0.50	ND	0.10
622-96-8	4-Ethyltoluene	ND	0.50	ND	0.10
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10
100-44-7	Benzyl Chloride	ND	0.50	ND	0.097
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083
5989-27-5	d-Limonene	ND	0.50	ND	0.090
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	ND	0.052
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	ND	0.067
91-20-3	Naphthalene	ND	0.50	ND	0.095
87-68-3	Hexachlorobutadiene	ND	0.50	ND	0.047

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 m

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

RESULTS OF ANALYSIS

Page 4 of 4

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

**Client Sample ID:** Method Blank

**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

CAS Sample ID: P120829-MB

**Tentatively Identified Compounds**

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16

Analyst: Lusine Hakobyan

Sampling Media: 1.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/29/12

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor:

GC/MS Retention Time	Compound Identification	Concentration $\mu\text{g}/\text{m}^3$
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No Compounds Detected		
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**Data**  
**Qualifier**

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**COLUMBIA ANALYTICAL SERVICES, INC.**

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**SURROGATE SPIKE RECOVERY RESULTS**

Page 1 of 1

**Client:** Stantec Consulting Services, Inc.  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister(s)  
 Test Notes:

Date(s) Collected: 8/21/12  
 Date(s) Received: 8/24/12  
 Date(s) Analyzed: 8/28 - 8/30/12

Client Sample ID	CAS Sample ID	1,2-Dichloroethane-d <sub>4</sub>	Toluene-d <sub>8</sub>	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P120828-MB	103	99	104	70-130	
Method Blank	P120829-MB	103	98	105	70-130	
Lab Control Sample	P120828-LCS	101	98	104	70-130	
Lab Control Sample	P120829-LCS	99	96	105	70-130	
1 Amphitheater, Grab	P1203506-001	102	89	98	70-130	
2 Level 2, Grab	P1203506-002	99	97	105	70-130	
3 East Side, Grab	P1203506-003	101	93	102	70-130	
4 Field Blank	P1203506-004	100	97	106	70-130	
A Pond Center	P1203506-005	102	97	105	70-130	
B Pond East	P1203506-006	102	97	104	70-130	
C Pond West	P1203506-007	101	98	105	70-130	
D Summit	P1203506-008	100	98	105	70-130	
E Amphitheater	P1203506-009	101	97	104	70-130	
F Grassy Knoll Center	P1203506-010	101	97	104	70-130	
G Grassy Knoll West	P1203506-011	101	97	104	70-130	
H Grassy Knoll North	P1203506-012	101	97	104	70-130	
H Grassy Knoll North	P1203506-012DUF	102	96	103	70-130	
I East Fenceline #1	P1203506-013	101	99	105	70-130	
J East Fenceline #2	P1203506-014	102	97	104	70-130	
K South Fenceline	P1203506-015	102	99	106	70-130	
K South Fenceline (i)	P1203506-016	102	98	104	70-130	
L Summitt Valley	P1203506-017	102	99	106	70-130	
M Grassy Knoll Center (2)	P1203506-018	100	97	105	70-130	
N Grassy Knoll West (2)	P1203506-019	101	97	104	70-130	
O Grassy Knoll North (2)	P1203506-020	102	95	106	70-130	
Field Blank 1	P1203506-021	101	99	104	70-130	
Field Blank 2	P1203506-022	103	97	106	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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120828-LCS

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount μg/m <sup>3</sup>	Result μg/m <sup>3</sup>	% Recovery	CAS Acceptance Limits
115-07-1	Propene	204	189	93	59-137
75-71-8	Dichlorodifluoromethane (CFC 12)	202	187	93	63-115
74-87-3	Chloromethane	196	176	90	59-124
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	206	194	94	65-113
75-01-4	Vinyl Chloride	200	187	94	59-121
106-99-0	1,3-Butadiene	210	208	99	60-138
74-83-9	Bromomethane	200	192	96	69-129
75-00-3	Chloroethane	202	187	93	60-120
64-17-5	Ethanol	958	792	83	58-121
75-05-8	Acetonitrile	202	191	95	64-129
107-02-8	Acrolein	204	182	89	54-127
67-64-1	Acetone	1,040	938	90	59-114
75-69-4	Trichlorofluoromethane	210	184	88	66-108
67-63-0	2-Propanol (Isopropyl Alcohol)	396	401	101	50-113
107-13-1	Acrylonitrile	206	234	114	72-135
75-35-4	1,1-Dichloroethene	218	206	94	70-117
75-09-2	Methylene Chloride	212	205	97	61-108
107-05-1	3-Chloro-1-propene (Allyl Chloride)	214	195	91	70-131
76-13-1	Trichlorotrifluoroethane	212	199	94	70-113
75-15-0	Carbon Disulfide	208	184	88	65-112
156-60-5	trans-1,2-Dichloroethene	202	201	100	71-119
75-34-3	1,1-Dichloroethane	206	188	91	71-116
1634-04-4	Methyl tert-Butyl Ether	204	196	96	67-116
108-05-4	Vinyl Acetate	988	1080	109	59-142
78-93-3	2-Butanone (MEK)	212	224	106	68-125

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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120828-LCS

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	CAS Acceptance Limits
156-59-2	cis-1,2-Dichloroethene	214	204	95	69-119
141-78-6	Ethyl Acetate	412	422	102	63-130
110-54-3	n-Hexane	206	184	89	57-120
67-66-3	Chloroform	222	197	89	69-111
109-99-9	Tetrahydrofuran (THF)	208	199	96	57-123
107-06-2	1,2-Dichloroethane	208	201	97	70-118
71-55-6	1,1,1-Trichloroethane	204	194	95	73-119
71-43-2	Benzene	208	185	89	66-121
56-23-5	Carbon Tetrachloride	212	211	100	74-129
110-82-7	Cyclohexane	402	365	91	70-113
78-87-5	1,2-Dichloropropane	204	187	92	69-118
75-27-4	Bromodichloromethane	204	199	98	75-124
79-01-6	Trichloroethene	198	198	100	73-115
123-91-1	1,4-Dioxane	206	193	94	71-123
80-62-6	Methyl Methacrylate	414	404	98	72-127
142-82-5	n-Heptane	202	183	91	68-120
10061-01-5	cis-1,3-Dichloropropene	196	198	101	71-130
108-10-1	4-Methyl-2-pentanone	210	198	94	69-130
10061-02-6	trans-1,3-Dichloropropene	218	234	107	76-133
79-00-5	1,1,2-Trichloroethane	202	190	94	73-120
108-88-3	Toluene	208	185	89	67-111
591-78-6	2-Hexanone	228	206	90	70-123
124-48-1	Dibromochloromethane	216	214	99	75-129
106-93-4	1,2-Dibromoethane	208	196	94	73-122
123-86-4	n-Butyl Acetate	228	208	91	68-132

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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120828-LCS

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/28/12  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount μg/m <sup>3</sup>	Result μg/m <sup>3</sup>	% Recovery	CAS Acceptance Limits
111-65-9	n-Octane	206	182	88	68-116
127-18-4	Tetrachloroethene	190	173	91	67-119
108-90-7	Chlorobenzene	208	190	91	69-113
100-41-4	Ethylbenzene	206	183	89	71-117
179601-23-1	m,p-Xylenes	412	363	88	70-116
75-25-2	Bromoform	216	209	97	69-127
100-42-5	Styrene	208	196	94	71-125
95-47-6	o-Xylene	200	177	89	70-116
111-84-2	n-Nonane	202	175	87	68-116
79-34-5	1,1,2,2-Tetrachloroethane	198	178	90	70-119
98-82-8	Cumene	196	172	88	70-116
80-56-8	alpha-Pinene	192	173	90	71-119
103-65-1	n-Propylbenzene	198	178	90	71-119
622-96-8	4-Ethyltoluene	204	188	92	71-119
108-67-8	1,3,5-Trimethylbenzene	208	188	90	71-121
95-63-6	1,2,4-Trimethylbenzene	200	183	92	73-127
100-44-7	Benzyl Chloride	206	208	101	65-137
541-73-1	1,3-Dichlorobenzene	206	192	93	68-123
106-46-7	1,4-Dichlorobenzene	212	188	89	65-120
95-50-1	1,2-Dichlorobenzene	204	187	92	67-121
5989-27-5	d-Limonene	206	189	92	67-130
96-12-8	1,2-Dibromo-3-chloropropane	202	195	97	72-133
120-82-1	1,2,4-Trichlorobenzene	200	180	90	62-133
91-20-3	Naphthalene	178	150	84	56-138
87-68-3	Hexachlorobutadiene	208	178	86	60-128

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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120829-LCS

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	CAS Acceptance Limits
115-07-1	Propene	204	193	95	59-137
75-71-8	Dichlorodifluoromethane (CFC 12)	202	176	87	63-115
74-87-3	Chloromethane	196	173	88	59-124
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	206	187	91	65-113
75-01-4	Vinyl Chloride	200	181	91	59-121
106-99-0	1,3-Butadiene	210	199	95	60-138
74-83-9	Bromomethane	200	181	91	69-129
75-00-3	Chloroethane	202	184	91	60-120
64-17-5	Ethanol	958	770	80	58-121
75-05-8	Acetonitrile	202	189	94	64-129
107-02-8	Acrolein	204	182	89	54-127
67-64-1	Acetone	1,040	901	87	59-114
75-69-4	Trichlorofluoromethane	210	176	84	66-108
67-63-0	2-Propanol (Isopropyl Alcohol)	396	340	86	50-113
107-13-1	Acrylonitrile	206	233	113	72-135
75-35-4	1,1-Dichloroethene	218	200	92	70-117
75-09-2	Methylene Chloride	212	199	94	61-108
107-05-1	3-Chloro-1-propene (Allyl Chloride)	214	190	89	70-131
76-13-1	Trichlorotrifluoroethane	212	191	90	70-113
75-15-0	Carbon Disulfide	208	180	87	65-112
156-60-5	trans-1,2-Dichloroethene	202	194	96	71-119
75-34-3	1,1-Dichloroethane	206	184	89	71-116
1634-04-4	Methyl tert-Butyl Ether	204	188	92	67-116
108-05-4	Vinyl Acetate	988	1100	111	59-142
78-93-3	2-Butanone (MEK)	212	215	101	68-125

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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P120829-LCS

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 1.0 L Summa Canister  
 Test Notes:

Date Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m <sup>3</sup>	Result µg/m <sup>3</sup>	% Recovery	CAS Acceptance Limits
156-59-2	cis-1,2-Dichloroethene	214	199	93	69-119
141-78-6	Ethyl Acetate	412	412	100	63-130
110-54-3	n-Hexane	206	177	86	57-120
67-66-3	Chloroform	222	192	86	69-111
109-99-9	Tetrahydrofuran (THF)	208	193	93	57-123
107-06-2	1,2-Dichloroethane	208	193	93	70-118
71-55-6	1,1,1-Trichloroethane	204	189	93	73-119
71-43-2	Benzene	208	182	88	66-121
56-23-5	Carbon Tetrachloride	212	206	97	74-129
110-82-7	Cyclohexane	402	357	89	70-113
78-87-5	1,2-Dichloropropane	204	182	89	69-118
75-27-4	Bromodichloromethane	204	194	95	75-124
79-01-6	Trichloroethene	198	192	97	73-115
123-91-1	1,4-Dioxane	206	189	92	71-123
80-62-6	Methyl Methacrylate	414	398	96	72-127
142-82-5	n-Heptane	202	181	90	68-120
10061-01-5	cis-1,3-Dichloropropene	196	195	99	71-130
108-10-1	4-Methyl-2-pentanone	210	193	92	69-130
10061-02-6	trans-1,3-Dichloropropene	218	229	105	76-133
79-00-5	1,1,2-Trichloroethane	202	187	93	73-120
108-88-3	Toluene	208	174	84	67-111
591-78-6	2-Hexanone	228	197	86	70-123
124-48-1	Dibromochloromethane	216	203	94	75-129
106-93-4	1,2-Dibromoethane	208	188	90	73-122
123-86-4	n-Butyl Acetate	228	203	89	68-132

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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_



**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

## LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
CAS Sample ID: P120829-LCS

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
Analyst: Lusine Hakobyan  
Sampling Media: 1.0 L Summa Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 8/29/12  
Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount $\mu\text{g}/\text{m}^3$	Result $\mu\text{g}/\text{m}^3$	% Recovery	CAS Acceptance Limits
111-65-9	n-Octane	206	173	84	68-116
127-18-4	Tetrachloroethene	190	163	86	67-119
108-90-7	Chlorobenzene	208	180	87	69-113
100-41-4	Ethylbenzene	206	176	85	71-117
179601-23-1	m,p-Xylenes	412	344	83	70-116
75-25-2	Bromoform	216	198	92	69-127
100-42-5	Styrene	208	188	90	71-125
95-47-6	o-Xylene	200	169	85	70-116
111-84-2	n-Nonane	202	168	83	68-116
79-34-5	1,1,2,2-Tetrachloroethane	198	170	86	70-119
98-82-8	Cumene	196	164	84	70-116
80-56-8	alpha-Pinene	192	168	88	71-119
103-65-1	n-Propylbenzene	198	169	85	71-119
622-96-8	4-Ethyltoluene	204	177	87	71-119
108-67-8	1,3,5-Trimethylbenzene	208	180	87	71-121
95-63-6	1,2,4-Trimethylbenzene	200	174	87	73-127
100-44-7	Benzyl Chloride	206	202	98	65-137
541-73-1	1,3-Dichlorobenzene	206	183	89	68-123
106-46-7	1,4-Dichlorobenzene	212	180	85	65-120
95-50-1	1,2-Dichlorobenzene	204	178	87	67-121
5989-27-5	d-Limonene	206	191	93	67-130
96-12-8	1,2-Dibromo-3-chloropropane	202	187	93	72-133
120-82-1	1,2,4-Trichlorobenzene	200	177	89	62-133
91-20-3	Naphthalene	178	150	84	56-138
87-68-3	Hexachlorobutadiene	208	173	83	60-128

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.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

LABORATORY DUPLICATE SUMMARY RESULTS

Page 1 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-012DUF

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00078

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65                      Final Pressure (psig): 3.70

Canister Dilution Factor:

Compound	Sample Result		Duplicate Sample Result		Average µg/m <sup>3</sup>	% RPD	RPD Limit
	µg/m <sup>3</sup>	ppbV	µg/m <sup>3</sup>	ppbV			
Propene	ND	ND	ND	ND	-	-	25
Dichlorodifluoromethane (CFC 12)	2.16	0.437	2.63	0.532	2.395	20	25
Chloromethane	ND	ND	ND	ND	-	-	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	ND	ND	ND	ND	-	-	25
Bromomethane	ND	ND	ND	ND	-	-	25
Chloroethane	ND	ND	ND	ND	-	-	25
Ethanol	ND	ND	ND	ND	-	-	25
Acetonitrile	ND	ND	ND	ND	-	-	25
Acrolein	ND	ND	ND	ND	-	-	25
Acetone	21.2	8.91	25.1	10.6	23.15	17	25
Trichlorofluoromethane	1.12	0.200	1.35	0.241	1.235	19	25
2-Propanol (Isopropyl Alcohol)	ND	ND	ND	ND	-	-	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	ND	ND	ND	ND	-	-	25
trans-1,2-Dichloroethene	ND	ND	ND	ND	-	-	25
1,1-Dichloroethane	ND	ND	ND	ND	-	-	25
Methyl tert-Butyl Ether	ND	ND	ND	ND	-	-	25
Vinyl Acetate	ND	ND	ND	ND	-	-	25
2-Butanone (MEK)	ND	ND	ND	ND	-	-	25

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

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

LABORATORY DUPLICATE SUMMARY RESULTS

Page 2 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-012DUF

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00078

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65                      Final Pressure (psig): 3.70

Canister Dilution Factor:

Compound	Sample Result		Duplicate Sample Result		Average µg/m <sup>3</sup>	% RPD	RPD Limit
	µg/m <sup>3</sup>	ppbV	µg/m <sup>3</sup>	ppbV			
cis-1,2-Dichloroethene	ND	ND	ND	ND	-	-	25
Ethyl Acetate	2.68	0.744	3.19	0.884	2.935	17	25
n-Hexane	ND	ND	ND	ND	-	-	25
Chloroform	ND	ND	ND	ND	-	-	25
Tetrahydrofuran (THF)	ND	ND	ND	ND	-	-	25
1,2-Dichloroethane	ND	ND	ND	ND	-	-	25
1,1,1-Trichloroethane	ND	ND	ND	ND	-	-	25
Benzene	ND	ND	ND	ND	-	-	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	ND	ND	ND	ND	-	-	25
1,4-Dioxane	ND	ND	ND	ND	-	-	25
Methyl Methacrylate	ND	ND	ND	ND	-	-	25
n-Heptane	ND	ND	ND	ND	-	-	25
cis-1,3-Dichloropropene	ND	ND	ND	ND	-	-	25
4-Methyl-2-pentanone	ND	ND	ND	ND	-	-	25
trans-1,3-Dichloropropene	ND	ND	ND	ND	-	-	25
1,1,2-Trichloroethane	ND	ND	ND	ND	-	-	25
Toluene	1.08	0.288	1.32	0.349	1.2	20	25
2-Hexanone	ND	ND	ND	ND	-	-	25
Dibromochloromethane	ND	ND	ND	ND	-	-	25
1,2-Dibromoethane	ND	ND	ND	ND	-	-	25
n-Butyl Acetate	ND	ND	ND	ND	-	-	25

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

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**COLUMBIA ANALYTICAL SERVICES, INC.**

Now Part of the ALS Group

LABORATORY DUPLICATE SUMMARY RESULTS

Page 3 of 3

**Client:** Stantec Consulting Services, Inc.  
**Client Sample ID:** H Grassy Knoll North  
**Client Project ID:** Bridgeton Landfill / 182608005 Task 300

CAS Project ID: P1203506  
 CAS Sample ID: P1203506-012DUF

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16  
 Analyst: Lusine Hakobyan  
 Sampling Media: 6.0 L Summa Canister  
 Test Notes:  
 Container ID: SC00078

Date Collected: 8/21/12  
 Date Received: 8/24/12  
 Date Analyzed: 8/29/12  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.65                      Final Pressure (psig): 3.70

Canister Dilution Factor:

Compound	Sample Result		Duplicate Sample Result		Average µg/m <sup>3</sup>	% RPD	RPD Limit
	µg/m <sup>3</sup>	ppbV	µg/m <sup>3</sup>	ppbV			
n-Octane	ND	ND	ND	ND	-	-	25
Tetrachloroethene	ND	ND	ND	ND	-	-	25
Chlorobenzene	ND	ND	ND	ND	-	-	25
Ethylbenzene	ND	ND	ND	ND	-	-	25
m,p-Xylenes	ND	ND	ND	ND	-	-	25
Bromoform	ND	ND	ND	ND	-	-	25
Styrene	ND	ND	ND	ND	-	-	25
o-Xylene	ND	ND	ND	ND	-	-	25
n-Nonane	ND	ND	ND	ND	-	-	25
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	-	-	25
Cumene	ND	ND	ND	ND	-	-	25
alpha-Pinene	ND	ND	ND	ND	-	-	25
n-Propylbenzene	ND	ND	ND	ND	-	-	25
4-Ethyltoluene	ND	ND	ND	ND	-	-	25
1,3,5-Trimethylbenzene	ND	ND	ND	ND	-	-	25
1,2,4-Trimethylbenzene	ND	ND	ND	ND	-	-	25
Benzyl Chloride	ND	ND	ND	ND	-	-	25
1,3-Dichlorobenzene	ND	ND	ND	ND	-	-	25
1,4-Dichlorobenzene	ND	ND	ND	ND	-	-	25
1,2-Dichlorobenzene	ND	ND	ND	ND	-	-	25
d-Limonene	ND	ND	ND	ND	-	-	25
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	-	-	25
1,2,4-Trichlorobenzene	ND	ND	ND	ND	-	-	25
Naphthalene	ND	ND	ND	ND	-	-	25
Hexachlorobutadiene	ND	ND	ND	ND	-	-	25

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

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

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